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VOL 4 / HEXAGON SERIES ON HUMAN
AND ENVIRONMENTAL SECURITY AND PEACE



Facing Global Environmental Change

Environmental, Human, Energy, Food,
Health and Water Security Concepts

 Springer

**Hexagon Series on Human
and Environmental Security and Peace**

Vol. 4

Series Editor: Hans Günter Brauch

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Patricia Kameri-Mbote, Navnita Chadha Behera, Béchir Chourou,
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Facing Global Environmental Change

Environmental, Human, Energy, Food, Health and Water Security Concepts

With Forewords by R.K. Pachauri, Director General, The Energy and Resources Institute (TERI), Chairman, Intergovernmental Panel on Climate Change (IPCC); Achim Steiner, Executive Director of UNEP, UN Under-Secretary General; Joy Ogwu, former Foreign Minister of Nigeria, Permanent Representative of Nigeria to the UN; Stavros Dimas, Commissioner for the Environment, European Union

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With 249 Figures, 135 Tables and 27 Boxes

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ISBN: 978-3-540-68487-9

e-ISBN: 978-3-540-68488-6

DOI: 10.1007/978-3-540-68488-6

Hexagon Series on Human and Environmental Security and Peace ISSN: 1865-5793
e-ISSN: 1865-5807

Library of Congress Control Number: 2008938902

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Cover design: deblik, Berlin

Cover illustration: Photo of Villa Nuevo Potosi, La Paz, Bolivia and of a group of people in San Juan Tembladerani Parte Baja, La Paz, Bolivia, taken in 2006 by Fabien Nathan, IHEID, Geneva, Switzerland. Fabien.Nathan@iued.unige.ch

Typesetting and layout: Thomas Bast, AFES-PRESS e.V., Mosbach, Germany

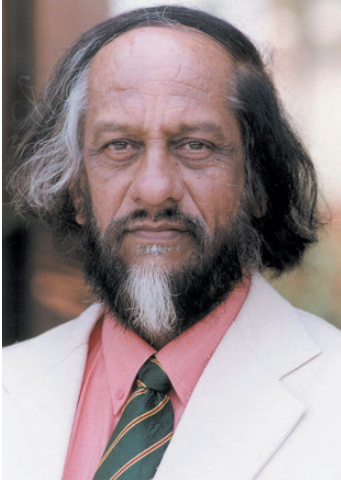
Production: Christine Adolph and Almas Schimmel

Printing and Binding: Stürtz GmbH, Würzburg

Printed on acid-free paper

9 8 7 6 5 4 3 2 1

Springer.com



Foreword

The year 2007 could perhaps accurately be described as the year when climate change finally received the attention that this challenge deserves globally. Much of the information and knowledge that was created in this field during the year was the result of the findings of the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC), which were disseminated on a large scale and reported extensively by the media. This was the result not only of a heightened interest on the part of the public on various aspects of climate change, but also because the IPCC itself proactively attempted to spread the findings of its AR4 to the public at large.

The interest generated on the scientific realities of climate change was further enhanced by the award of the Nobel Peace Prize to the IPCC and former Vice President of the US, Al Gore. By taking this decision in favour of a leader who has done a great deal to create awareness on climate change, and a body that assesses all scientific aspects of climate change and disseminates the result of its findings, the Norwegian Nobel Committee has clearly drawn the link between climate change and peace in the world.

There are several reasons why unmitigated climate change can be considered as a potential source of conflict and disruption of peace. The impacts of climate change are varied and can become serious unless effective steps are taken to stabilize the earth's atmosphere and the consequent changes in climate that would occur in the absence of such actions. Firstly, there is now adequate evidence to show that several extreme events are becoming more frequent and more intense. These include extreme precipitation events, heat waves, floods as well as droughts. Impacts of climate change include sea level rise which threatens several low lying islands as well as coastal areas. Melting of ice bodies such as glaciers across the globe and impacts on human health as well as on biodiversity are also projected to become much more serious over time. Climate change can also cause irreversible changes such as a threat to extinction of several species. Of all those species that were assessed by the IPCC, 20 to 30 percent were seen to face the threat of extinction with temperature increases of over 1.5 to 2.5 °C. Impacts on agriculture could also be serious, and there is already some evidence of a decline in productivity and yield of some species as a result of climate change. Recent research in India shows such a trend in the case of wheat productivity.

All of this means that human society could suffer serious consequences as a result of climate change which could not only result in conflict over resources such as water, exhibiting increasing scarcity in several parts of the world, but also lead to displacement of populations linked with these factors. Particularly vulnerable are the megadeltas in Asia, which include cities like Shanghai, Dhaka and Calcutta. These are centers not only of large populations, but also substantial assets of property and infrastructure. The threat of coastal flooding can, therefore, have high magnitude impacts on these megadeltas.

The growing impacts of climate change make it essential for communities and countries to adapt to the impacts of climate change. However, these impacts and the costs of adaptation will increase disproportionately as the impacts become more severe. Hence, an essential policy that would be required for minimizing the negative impacts which would otherwise take place in the future would be to carry out effective mitigation of greenhouse gas (GHG) emissions. The IPCC has clearly brought out several measures and options by which mitigation can take place with existing technologies and methods, but these would have to be supported by appropriate policies to be put in place by governments, including agreements at the global level. Fortunately, the costs of mitigation have been assessed as being very low and the co-benefits in the form of lower levels of local pollution, higher levels of energy security, improved health etc. would make these mitigation options far more attractive than has been believed by certain sections of society which have been resistant to action.

This book serves an extremely useful purpose, because it covers several critical elements of climate change and the challenges that are thrown up by consideration of the impacts of climate change and security issues related to it. Such a volume is not only highly readable for a very wide audience, but also contains valuable information and research based analysis that would provide a valuable reservoir of knowledge to researchers and students working in this field.

New Delhi, September 2008

R. K. Pachauri
Director General, The Energy and
Resources Institute (TERI)
Chairman, Intergovernmental Panel
on Climate Change (IPCC)
Peace Nobel Laureate, 2007



Foreword

International discourse on the link between declining natural resources and instability, tensions and even conflicts has reached a new and urgent level in the early 21st century.

This is in part as a result of growing understanding that on many of the sustainability indicators humanity is pushing the limits - if not pushing past the limits - on many key fronts.

UNEP's latest Global Environment Outlook-4 puts these sobering realities into sharp focus.

- In 1987, around 15 per cent of global fish stocks were classed as collapsed. GEO-4 says this has roughly doubled to 30 per cent.
- 20 years ago around a fifth of fish stocks were deemed over-exploited this has now risen to about 40 per cent.
- Land use intensity, with links to land degradation, soil erosion, water scarcity, nutrient depletion and pollution has increased. In 1987, a hectare of cropland yielded 1.8 tonnes. Now the intensity is 2.5 tonnes.
- In Latin America and the Caribbean, desertification - caused by deforestation, over grazing and inadequate irrigation - affects a quarter of the region.
- Available freshwater resources are declining; by 2025, close to two billion people are likely to live with 'absolute' water scarcity.
- Populations of freshwater vertebrates have declined on average by nearly 50 per cent since 1987 as compared with an around 30 per cent decline for terrestrial and marine species.
- About 40 per cent of big estuaries in the United States including those that link to the Gulf of Mexico and Chesapeake Bay suffer severe eutrophication - which can lead to deoxygenated 'dead zones' - because of nitrogen enrichment.
- In the Caribbean, over 60 per cent of economically important coral reefs are threatened by sediments, pollution and over-fishing.
- War and conflict has raised the number of refugees and internally displaced people in West Asia to about four million.

On top of these come the ever more worrying impacts of climate change, outlined in the 4th assessment of the Intergovernmental Panel on Climate Change (IPCC).

It is not by chance that the IPCC - jointly established by UNEP and the World Meteorological Organisation - jointly won the Nobel Peace Prize.

How indeed will the world cope with the millions of people on small islands and in low lying areas such as Bangladesh who are set to lose their land, livelihoods and their homes?

What will tens of million - if not hundreds of millions - of people in Asia, Africa and Latin America do when the glaciers melt away turning many of the world's mighty rivers into seasonal, rather all year round runs.

It is for these very reasons that climate change and security was placed in 2007 and for the first time, on the agenda on the UN Security Council.

Also why it has begun animating leading members of the military in countries such as Australia, the United States and the United Kingdom.

There is clearly an urgent need to bring more intelligence and creative solutions to the way we manage the world's ecosystems and the nature-based assets that fundamentally underpin human well-being while also investing in a new and more sustainable energy mix.

The returns, both economic and social, are potentially enormous from overcoming poverty and providing the food and livelihoods for over six billion people - shortly rising to nine billion - and at the same time delivering equity and stability to communities and countries across the globe: in short a peace policy for the new millennium.

So I welcome this *Security Handbook for the Anthropocene - Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts* and its 100 peer-reviewed chapters as an eye-opener to both the challenges but also the opportunities of our age.

I hope that private foundations and donors can ensure that its important ideas, debates and essential reading find their way equally onto the library book shelves of the South as well as the nations of the North.

Nairobi, September 2008

Achim Steiner
UN Under-Secretary General and
Executive Director
UN Environment Programme (UNEP)



Foreword

This volume – *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts* – is of utmost importance for Africa. I am pleased that one of the coeditors is a Kenyan and 15 authors come from, live or worked on problems related to the challenges facing the African continent during this century.

This scientific peer-reviewed volume with 100 chapters contributes to global dialogue and learning based on topical new evidence from several disciplines and mutual respect for cultural diversity. Africa has already been severely affected by the effects of global environmental change during the 20th century due to progressing desertification, drought, famine as well as floods and heat waves that have killed and affected or forced millions of Africans to leave their homes.

This book deals in detail with these natural hazards and their often severe impacts Africa has been facing. Chapters in this book discuss the severe food insecurity and the impact of HIV/AIDS and of other pandemics on national and human health security and the need for a sustainable energy system. Problems of water security in the Nile Basin and in other parts of Africa have triggered cooperative solutions, as with the Nile Basin Initiative. In the past environmental security problems have repeatedly contributed to conflicts in Sub-Saharan Africa and they stress an urgent need for Pan-African as well as national human and environmental, water, food and health security approaches across Africa and elsewhere

The fourth IPCC Assessment Report of 2007 has stressed that climate change will have many negative impacts for the African people regarding their access to clean water, sufficient food, stable health conditions, ecosystem resources, and security of settlements. In the view of the IPCC there is also high confidence that many semi-arid areas, e.g. in North and Southern Africa will become severely water-stressed, and by 2020, between 75 and 250 million people are projected to experience increased water stress.

Climate change will not only affect food security, but also exacerbate malnutrition. By 2020, in some African countries, yields from rain-fed agriculture could be reduced by up to 50 per cent. Agricultural production and access to food will be severely compromised. Africa is also likely to be strongly affected by climate change, because of its limited adaptive capacity to projected climate change impacts. Furthermore, several African mega-deltas, due to large populations and high exposure to sea level rise, storm surges, and river flooding will also suffer from the impacts of global environmental and climate change to which Africans have historically contributed little.

This huge volume of excellent scholarship from all parts of the world helps to sensitize policy makers but also a young generation of professors and students globally but specifically in the most affected countries in the South for the need for proactive and cooperative action and for a global science partnership to reduce the worst impacts of the projected trends in business as usual strategies.

This book deserves many readers in all parts of the world, but especially in those countries where university and research libraries are unable to afford such references books. It is my sincere hope that this high-quality and multidisciplinary study and reference book and its key messages will be made available with the support of private foundations and public donors to the young generation in the global South that will face these challenges to their security in the 21st century. I wish the book-aid project success for the benefit of university libraries and research institutes and their readers in Africa, Asia and Latin America.

New York, September 2008

Ambassador Prof. Dr. Joy Ogwu
Permanent Representative of the
Federal Republic of Nigeria to the
United Nations
New York, NY



Foreword

The title of this volume - *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts* - sums up many of the dilemmas and challenges facing policy-makers today. First, environmental change is global; no part of the world is spared. Second, we have to face change now; ignoring the challenge is not an option if our children are to thrive. Third, in an increasingly connected world, security is more than just the absence of war; it depends on diverse, but linked - indeed, often competing - factors such as political, social, economic, and environmental interests. Central to these, as the title of this book suggests, is the environment.

As a large and economically powerful union, the EU enjoys economies of scale. These can be exploited to address environmental threats - at local, national, and Union levels. It is sobering to recall, however, that even the enlarged EU is not autonomous and that the health of the European environment also depends on policies and practices in other parts of the world. Nowhere is this more evident than with climate change. Changes and challenges are now global, and thus our policy responses must be global too. Our security is indivisible, but our responses remain all too clearly fractured and divided.

Second, the concept of 'sustainable development' shows that time is a crucial factor in environmental security. The future can only be secured insofar as we act responsibly now; prevarication will have costs which future generations will pay. This implies urgent choices now. Fortunately, the developing science of costing environmental goods and services suggests that taking action on the environment not only has costs, but also has significant short- to medium-term financial and other benefits. Nonetheless, questions remain as to when best to take action and how such action can accommodate political and economic timetables.

Third, the environment is indeed a key component of modern security. Environmental degradation may destabilize societies by reducing economic opportunity. Degraded environments can be breeding grounds for other social ills, such as impaired human health or declining social cohesion. Developing countries with populations directly dependent on environmental resources are also particularly vulnerable to conflict over access to limited or declining resources. Environment is thus central to modern security, but also needs to be integrated with other factors such as energy, mobility, and food requirements. The question for policy-makers is how, in practical terms, to align these diverse interests.

Since the end of the Cold War, the security debate has changed fundamentally. A study which addresses the new challenges and suggests responses will therefore be a welcome addition to the policy-maker's toolkit. For this reason, I warmly welcome this volume.

A handwritten signature in black ink, appearing to read 'Stavros Dimas'.

Brussels, September 2008

Stavros Dimas
Commissioner for the
Environment, European Union

We the eight editors from eight countries

coming from four continents:

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Navnita Chadha Behera (India)

Béchir Chourou (Tunisia)

John Grin (The Netherlands)

Patricia Kameri-Mbote (Kenya)

Heinz Krummenacher (Switzerland)

Czeslaw Mesjasz (Poland)

Úrsula Oswald Spring (Mexico)

dedicate this volume to

our children or godchildren

representing all children of the globe

who will experience

during the 21st century

whether

the messages of these

joint scientific efforts will become reality.

For

Ananya, Anna, Chloe, Hela,

Ian, Ivo, Janusz, Karin,

Melanie, Micha, Natalia, Nathan,

Omar, Serena Eréndira, Slim, Ulrike

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Acknowledgements

This volume emerged from a series of ten panels on “Reconceptualizing Security in an Era of Globalization” at the 5th Pan-European Conference on International Relations in The Hague, The Netherlands, 9–11 September 2004, and from two previous workshops at the 45th annual ISA Convention in Montreal, Canada, 17–20 March 2004 and two panels at the 20th IPRA conference in Sopron, Hungary, 5–9 July 2004 were early versions of selected chapters were presented.¹ Most chapters were subsequently commissioned from invited experts from different disciplines and all parts of the world and all submissions were anonymously peer reviewed and subsequently revised by the authors.

Financial contributions for these workshops and for the preparation and production of this book were made by the following donors: the Berghof Foundation for Conflict Research in Berlin, the European Commission and NATO in Brussels, the Netherlands Organisation for Scientific Research (NOW) in The Hague and by Springer-Verlag in Heidelberg.

Hans Günter Brauch is grateful to the Berghof Foundation for Conflict Research in Germany, a private scientific foundation, and to the chairman of its Funding Committee, Prof. Dr. Horst Fischer (GTZ Brussels). A foundation grant covered a part of the editorial and production costs of this book. He is especially grateful to the founder of the Berghof Foundation, Prof. Dr. rer. nat. Georg Zundel, a former Professor at the University of Munich, who died on 11 March 2007.² For more than three decades, the Berghof Foundation has funded often unconventional, trans- and multidisciplinary and goal-oriented international research and scientific cooperation.

- AFES-PRESS received a financial support under grant SNE-3-CT-1003-503699 from the DG Aerospace and Industry, European Commission to cover the costs of an AFES-PRESS research team consisting of three AFES-PRESS board members from Germany, The Netherlands and Poland, of two associated colleagues from Tunisia and Egypt and four Ph.D. candidates from Germany, France and Italy to participate at three workshops during 2004:
 - at the 45th ISA Convention in Montreal Canada, 17–20 March 2004;
 - at the 20th IPRA Conference in Sopron, Hungary, 5–9 July 2004;
 - at the 5th Pan-European Conference on International Relations, 8–11 September 2004.and to start with the review, editorial and production process of the two volumes emerging from these workshops as well as to prepare two workshops in 2005 in Istanbul and Bonn.
- AFES-PRESS appreciates a subsidy from NATO contributing to a realization of the workshop in The Hague enabling the participation of seven colleagues from NATO Mediterranean dialogue countries (Algeria, Egypt, Israel, Jordan, Tunisia, Turkey) and from Palestine.
- Prof. Dr. John Grin would like to thank the Netherlands Organisation for Scientific Research (NOW) in The Hague that covered the travel costs of two participants and co-editors from Mexico and India for the third workshop in The Hague.

1 The contributions have been documented for the workshop in Montreal at: <http://www.afespress.de/html/download_isa.html>; for the workshop in Sopron at: <http://www.afespress.de/html/download_sopron.html> and for the workshop in The Hague at: <http://www.afespress.de/html/the_hague_programme.html>.

2 The previous volume in the Hexagon Book Series was dedicated to the memory of Prof. Dr. Georg Zundel.

The editors of this book would like to thank their institutions for permitting to use a part of their time and their infrastructure for the realization of this project:

- *PD Dr. Hans Günter Brauch* would like to thank Úrsula Oswald Spring for her good cooperation, scientific advice, friendship, encouragement and support, Czeslaw Mesjasz and John Grin for their good advice, friendship and support and all co-editors for their devotion and hard work as reviewers and contributors. Without this global team this volume would not have been possible.
- *Prof. Dr. Úrsula Oswald Spring* is grateful to the Centre for Regional Multidisciplinary Studies (CRIM) and the National University of Mexico (UNAM), for permitting her to allocate a part of her research time to this project. As the first MunichRE chair on Social Vulnerability at UNU-EHS she appreciates the support of UNU-EHS in Bonn and of the MunichRe Foundation. Finally, she wants to thank AFES-PRESS for permitting her to use its research library and office facilities during her stay in Europe in the summers of 2005, 2006 and 2007 and for the intellectually stimulating professional discussions with Hans Günter Brauch.
- *Prof. Dr. Czeslaw Mesjasz* would like to thank Lidya for her patience and support and Hans Guenter Brauch for his compassion, hard work, inspiration and friendship.
- *Prof. Dr. John Grin* wishes to thank his fellow editors, especially Hans Günter Brauch, who pairs incredible energy to patience and understanding. He owes his assistant Amy-Jane Gielen for relieving him of many other duties, thus being able to spend time on this volume, and his family for adding the sort of duties which keep one in healthy balance.
- *Prof. Dr. Patricia Kameri-Mbote* would like to thank her husband John Mbote for his unwavering support, patience and friendship and Hans Guenter for spurring team spirit and getting work done.
- *Prof. Navmita Chadha Behera* would like to thank Hans Guenter for his encouragement and hard work, and all co-editors for good cooperation and to Ajay and her daughter Ananya for their unfailing support and patience.
- *Dr. Heinz Kruppenacher* would like to extend his appreciation and gratitude to his partner Pia for her patient support.

Hans Günter Brauch would like to thank Dr. Christian Witschel, Editorial Director Geosciences, Springer-Verlag, for his support of this project and his patience with an international team and Ms. Christine Adolph and Ms. Almas Schimmel, the producers of this book within Springer-Verlag, for their efficient coordination and implementation of this project, as well as the many other unnamed persons within Springer-Verlag for their devotion to this publication.

All editorial decisions were made by the editors in their personal capacity only. The funders had no influence on the themes of this book and on the views expressed by its authors. None of the authors and editors receives any personal remuneration from this collaborative research project. Any income will be used by AFES-PRESS, a non-profit scientific society under German law, for future projects to further global scientific cooperation including the book-aid project for Third World Libraries.³

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All editors are grateful to Thomas Bast, who in his quiet and efficient way, acted as the webmaster and produced several versions of the proofs, the whole layout as well as the index.

The editors and the producer would like to thank Ms. Patrizia Kummer, director of D.T.u.L. GmbH in Fellbach near Stuttgart, for permitting the producer to use the infrastructure of her company for this book selflessly. This support has greatly facilitated the work of the producer.

The editors are grateful to Ronald Lappin, the International Programme Director of *Gute Bücher für Alle* e.V., in Mosbach (Germany), for his extremely careful language editing. He speaks many languages and thus he could often anticipate what the non-native speakers intended to express, and adapt the language of most non-native speakers to proper British English.

Last but not least, the editors are grateful to the 130 authors and editors, coming from 47 countries and many scientific disciplines for their contributions to this book and for their readiness to reflect the critiques and suggestions of the anonymous reviewers trying to look beyond the boundaries of their respective discipline and expertise.

The editors are grateful to *Prof. Dr. Rajendra K. Pachauri* (India), Director-General of TERI and Chairman of the Intergovernmental Panel on Climate Change (IPCC), to *Mr. Achim Steiner* (Germany), UN Under-Secretary General and Executive Director, UN Environment Programme (UNEP), to Her Excellency *Amb. Prof. Dr. Joy Ogwu*, Permanent Representative of the Federal Republic of Nigeria to the United Nations, and to *Mr. Stavros Dimas* (Greece), Commissioner for the Environment in the European Commission for their forewords, and to *Luc Gnacadja* (Benin), Executive Secretary of the United Nations Convention to Combat Desertification (UNCCD), *Dr. Sálvano Briceño* (Venezuela), Director of the Secretariat of the International Strategy for Disaster Reduction (UN/ISDR), *Michael Zammit Cutajar* (Malta), former Executive Secretary of the UN Framework Convention on Climate Change (1996–2002), and to *Dr. Vandana Shiva* (India), a recipient of the alternative Nobel Prize, for their perceptive preface essays.

Mosbach, Cuernavaca, Amsterdam, Cracow, Nairobi, New Delhi, Tunis and Berne
in September 2008

Hans Günter Brauch
Úrsula Oswald Spring
John Grin
Czesław Mesjasz
Patricia Kameri-Mbote
Navnita Chadha Behera
Béchir Chourou
Heinz Krummenacher

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In chapter 10, Ali Ghazi is grateful to Hans Günter Brauch who added the following seven figures to illustrate his chapter that are all in the public domain (FAO, UNEP).

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Most tables are based on both authors' field work:

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- *Table 13.4*: Knowledge of Vulnerable Groups and Planning of Programmes to Reduce Vulnerability In Mexico City and Los Angeles (per cent of officials).
- *Table 13.5*: Groups Perceived by Disaster Management Professionals to be Highly Vulnerable to Disasters (per cent of officials).

- *Table 13.6*: Knowledge of Vulnerable Groups and Planning of Programmes to Reduce Vulnerability (per cent of officials).
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In chapter 16, *Nana K. Poku and Bjorg Sandkjaer*, drafted these diagrams and table based on their own data or on data by UN organizations that are in the public domain:

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In chapter 17, *Sophia Benz* added two tables and a figure that are based on her own research Benz (2005):

- *Figure 17.1*: The Final Theoretical Model.
- *Table 17.1*: Results of Final OLS Regression Analyses (with HIV-Prevalence as the dependent variable)
- *Table 17.2*: Measurement and Data Sources (all variables)

In chapter 18, *Janos J. Bogardi, Jörn Birkmann, Niklas Gebert and Neysa J. Setiadi* included six figures that rely on their own research and on previous publications for which they obtained the permission from the respective copyright holders:

- *Box 18.2*: 14 Indicators for assessing emergency planning for the city government.
- *Figure 18.1*: The BBC conceptual framework. Source: Birkmann 2006: 34, based on Bogardi/Birkmann (2004) and Cardona (1999, 2001).
- *Figure 18.2*: The Risk Hierarchy. Source: Adapted from Cannon (2006: 11).
- *Figure 18.3*: Map of recent and plausible future sources of Sumatran tsunami. Source: Borrero/Sieh/Chlich/Synolakis (2006: 19674).
- *Figure 18.4*: Indices of the household preparedness level in three different hazard zones. Source: Own figures based on data from Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo (2006).
- *Figure 18.5*: The knowledge and attitude index based on different levels of education. Source: Own figures based on data from Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo (2006).
- *Figure 18.6*: Sources of information about tsunami and earthquakes from specific sources. Source: Own figures based on data from Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo (2006).

Permission was granted by the authors to use the text in this box:

- *Box 18.1*: Questionnaire contents for households. Source: Authors based on Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo 2006. Summary of the authors based on components of the study's questionnaire.

In chapter 19, *Imtiaz Ahmed* is grateful to the respective copyright holders for permission to reproduce several photos, maps and tables.

- *Figure 19.1*: Maps of Bangladesh, A: Climate-related Natural Events, and B: Internal Migration. Sources: A: Ericksen/Ahmad/Chowdhury (1996: 264); B: Ericksen/Ahmad/Chowdhury (1996: 245). Permission was granted by Springer-Verlag, the successor of Kluwer Academic Publishers.
- *Figure 19.2*: Map of Bangladesh. Source: Official map of the government of Bangladesh that is in the public domain.
- *Figure 19.3*: A snake charmer among the 213 people stranded at Satgachi, West Bengal, pleads for food, 4 February 2003. Source: *Frontline*, 20,4 (February 2003): 15-28. Reprinted with permission.
- *Figure 19.4*: Indian government's construction of a fence on the Indo-Bangladesh border. Source: BBC News/South Asia, Tripura, Tuesday, 28 June, 2005; at: <www.bbc.com>; Photos by Bapi Roy Choudhury that are reprinted with permission of the photographer.
- *Figure 19.5*: The fence on the Indo-Bangladesh border. Source: Photos by Bapi Roy Choudhury and Shubhashish Roy that are reprinted with permission of the photographers.
- *Table 19.1*: Reasons for leaving Bangladesh (multiple responses).
- *Table 19.2*: Original home of environmental refugees. Source: Author's calculation from a survey conducted by Ranabir Samaddar of Maulana Azad Institute of Asian Studies, Calcutta (1996).
- *Table 19.3*: Incidence of Distress Selling (percentage of villages). Source: Sen/Hashemi/Ahmed (1998); also Ahmed (1999b: 38). Reprinted with permission of the publisher.

In chapter 20, *Thomas Homer-Dixon and Tom Deligiannis* three figures were drafted by the authors for this volume and the fourth is taken from a previous publication by one author:

- *Figure 20.1*: Supply-induced scarcity.
- *Figure 20.2*: Demand-induced scarcity.
- *Figure 20.3*: Structural scarcity.
- *Figure 20.4*: The Toronto Group's Core Model of the Causal Links between Environmental Scarcity and violence. Source: Homer-Dixon (1999). Reprinted with permission of the author.

In chapter 21, *Simon J.A. Mason, Tobias Hagmann, Christine Bichsel, Eva Ludi and Jacob Arsano* reproduced a map with the permission of the copyright holder and compiled a table based on data by UN organizations that are in the public domain:

- *Figure 21.1*: Countries of the Nile Basin. Source: From Amer et al. (2005) © EAWAG, Duebendorf, 2005; reproduced with permission of Eawag.
- *Table 21.1*: Food security in the Nile Countries, Source: Mason 2004, based on data from: a) FAO (2000b); b) FAO (2000a); c) FAO (2000c); d) UNDP (2000); and e) UNFPA (2002) that are in the public domain.

In chapter 22, *Saleem H. Ali* produced a new table based on his own analysis.

- *Table 22.1*: Divergent Arguments on Sustainability of Mineral Extraction Activities.

In chapter 23, *Klaus-Dietmar Jacoby* relies in his tables and figures on official IEA data for which permission was granted by IEA to reproduce them in this volume:

- *Figure 23.1*: IEA Gulf War Contingency Response Plan.
- *Figure 23.2*: Stock release and increased production, 2005 IEA Collective Action.
- *Figure 23.3*: Oil import dependence in IEA.
- *Figure 23.4*: Natural gas import dependence in IEA.
- *Table 23.1*: Total IEA Response, 2005 IEA Collective Action.
- *Table 23.2*: World Primary Energy Demand in the Reference Scenario (Mtoe).
- *Table 23.3*: World Oil Production in the Reference Scenario (million barrels per day).

The Copyright for the IEA figures and tables remains with IEA.

In chapter 24, *Leo Schrattenholzer* used three tables from previous publications to which he was a co-author and a table and figure of colleagues at IIASA for which permission was obtained.

- *Figure 24.1*: Annual Production and Known Reserves of Crude Oil and Natural Gas (1945-1995). Source: Nakicenovic/McDonald/Grübler (1998).
- *Table 24.1*: Typology of Long-Term Energy-Economy-Environment Scenarios according to IPCC-SRES. Source: Nakicenovic/Swart (2000); Metz/Davidson/Swart/Pan (2001). Permission was granted by the IPCC. This table was taken from the IPCC Special Report on Emissions Scenarios (2001) that was published by Cambridge University Press.
- *Table 24.2*: Selected results and indicators of sustainable development scenarios. Indicators of long-term energy security are emphasized. Source: Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004).
- *Table 24.3*: Selected results and indicators of CO₂ mitigation scenarios. Indicators of long-term energy security are emphasized. Source: Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004).
- *Table 24.4*: Selected results and indicators of high-impact scenarios. Indicators of long-term energy security are emphasized. Source: Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004).

In chapter 25, *Werner Zittel and Joerg Schindler* in six figures and one table provided their own analysis that are partly based on other cited statistical sources:

- *Figure 25.1*: Oil production of countries/regions outside OPEC and FSU. Estimates for 2005 based on government statistics, analysis and projection by LBST. Source: IHS 2003; BP St. Rev. 2005
- *Figure 25.2*: Annual gas production 1920-2004 and extrapolation. Source: History: IHS Energy (2005); projection: LBST (Schindler/Zittel 2006).
- *Figure 25.3*: Gas production forecast for Russia. Source: Laherrere (2003), LBST estimate (2004).
- *Figure 25.4*: Worldwide Gas production according to LBST Scenario Calculations. Source: IHS Energy (2005); BP Statistical Review of Energy (2005); Projection: LBST (2005).
- *Figure 25.5*: 'High fossil' scenarios of future production of fossil and nuclear fuels. Source: for oil and gas: Campbell/ASPO (2005); coal and nuclear scenario: LBST (Schindler/Zittel 2006).
- *Figure 25.6*: 'Low fossil' scenario of future production of fossil and nuclear fuels. Source: for oil, gas, coal, and nuclear scenario: LBST (Schindler/Zittel 2006).
- *Figure 25.7*: Possible market penetration of renewable energy sources. Sources: LBST (Schindler/Zittel 2006).
- *Table 25.1*: Remaining proven oil reserves for 'ME Five'. Sources: [1] O&GJ, 19 December 2005 (for 1 January 2006); [2] BP, June 2005 (until end of 2004); [3] ASPO Newsletter, 62, February 2006; [4] Bakhtiari, February 2006.

In chapter 26, *André P.C. Faaij* drafted two figures and compiled two tables that are based on cited scientific sources that are used under the fair use clause:

- *Figure 26.1*: Projections for global final energy demand for the four IPCC scenarios and energy models as used in Fig. 2.2. (A1, A2, B1, B2). Source: Based on IPCC (2000).
- *Figure 26.2*: Geographical potential of woody biomass energy crops as assessed for the four SRES scenarios over time, as well as the simulated total primary energy consumption. Source: Based on Hoogwijk/Faaij/Eickhout/de Vries/Turkenburg (2005).
- *Table 26.1*: Overview of the global potential bio-energy supply in the long term for a number of categories, and the main pre-conditions and assumptions that determine these potentials. Sources: Compiled by the author based on: Hoogwijk/Faaij/van den Broek/Berndes/Gielen/ Turkenburg (2003); Berndes/Hoogwijk/van den Broek (2003); Smeets/Faaij/Lewandowski/Turkenburg (2007); Hoogwijk/Faaij/Eickhout/de Vries/Turkenburg (2005).
- *Table 26.2*: Generic overview of performance projections for different options and biomass markets on shorter (~5) and longer (>~20) years. Source: Based on data in Faaij (2006).

In chapter 27, *David Faiman* drafted eight figures and compiled one table based on statistical data published by IEA (2003) that are in the public domain:

- *Figure 27.1*: World electricity production during the years 1994-2003. Growth rate = 395 TWh per year.
- *Figure 27.5*: Electricity production in Mexico during the years 1994-2003. Growth rate = 8.2 TWh per year.
- *Figure 27.6*: Electricity production in Chile during the years 1994-2003. Growth rate = 2.5 TWh per year.
- *Figure 27.7*: Electricity production in Spain during the years 1994-2003. Growth rate = 10.6 TWh per year.
- *Figure 27.8*: Electricity production in South Africa during the years 1994-2003. Growth rate = 4.0 TWh per year.
- *Figure 27.9*: Electricity production in Saudi Arabia during the years 1994-2003. Growth rate = 5.7 TWh per year.
- *Figure 27.10*: Electricity production in India during the years 1994-2003. Growth rate = 23.4 TWh per year.
- *Figure 27.11*: Electricity production in Australia during the years 1994-2003. Growth rate = 6.6 TWh per year.
- *Table 27.1*: World electricity generation statistics on a regional basis and linear projections to the year 2012.

Two figures are based on photos taken by the author for which he holds the copyright:

- *Figure 27.3*: CPV cell module exposed at 1000X at the 400 m² *PETAL* solar dish test facility in Sede Boqer, Israel.
- *Figure 27.4*: A large pre-commercial CPV system under test in Phoenix, AZ, USA.

One figure and one table are based on internet sources that are in the public domain:

- *Figure 27.2*: Distribution of the world's deserts. Source: U.S. Geological Survey; at: <<http://geology.com/records/sahara-desert-map.gif>>.
- *Table 27.2*: Estimated area of desert land required for enabling each geographical region to freeze its fossil fuel requirements at the anticipated 2012 level. Source: <www.geosource.ac.uk/worldguide/guide_deserts.html> after Chambers Book of Facts (2003).

In chapter 28, *Franz Trieb, Wolfram Krewitt and Nadine May* used several figures that are based on studies (MED-CSP 2005; TRANS-CSP 2006) to which they contributed:

- *Figure 28.1*: Countries of the EU-MENA region analysed within the MED-CSP Study.
- *Figure 28.2*: Gross electricity consumption of countries analysed.

- *Figure 28.3*: Water demand projection in the MENA countries in the MED-CSP scenario.
- *Figure 28.4*: Maps of renewable energy yields of different sources in the EU-MENA.
- *Figure 28.5*: Annual Direct Solar Irradiance in the Southern EU-MENA Region.
- *Figure 28.6*: Share of different technologies for electricity generation in the year 2000.
- *Figure 28.7*: Total electricity consumption and share of different technologies for electricity generation in the analysed countries in the year 2050 according to the MED-CSP scenario.
- *Figure 28.8*: Annual electricity demand and generation within the countries analysed in the MED-CSP scenario.
- *Figure 28.9*: Installed power capacity and peak load within the analysed countries in the MED-CSP scenario.
- *Figure 28.10*: Example of electricity costs and learning in the MED-CSP scenario. Source: MED-CSP 2005.
- *Figure 28.11*: CO₂ emissions of electricity generation in million tons per year for all countries for the MED-CSP scenario and emissions that would occur in a business as usual case (BAU).
- *Figure 28.13*: Three samples of high voltage direct current (HVDC) interconnections between Europe, the Middle East, and North Africa (EUMENA) analysed for potential environmental impacts and costs. Source: TRANS-CSP (2006).
- *Figure 28.14*: Vision of a future Trans-Mediterranean HVDC electricity grid interconnecting sites of high renewable electricity potentials in Europe and beyond. Source: Trieb/Mueller-Steinhagen (2007).
- *Figure 28.15*: A scenario of the power sector in 30 European countries aiming at economic and ecological sustainability using a balanced mix of national and imported renewable electricity sources. Source: TRANS-CSP (2006).
- *Table 28.1*: Some characteristics of contemporary power technologies. Source: The authors.

For one additional figure the permission was granted by the authors.

- *Figure 28.12*: A new circuit of development: CO₂ reduction in Europe fosters development for North Africa and the Middle East. Source: Kabariti/Moeller/Knies (2003). Permission was granted and a more recent version was supplied by Gerhard Knies.

In chapter 30, *Gareth M. Winrow* compiled two tables based on published sources under the fair use clause:

- *Table 30.1*: Electricity Demand Scenarios by MENR (kWh). Source: Isik (2004: 4).
- *Table 30.2*: Natural Gas Supply and Demand Scenarios (bcm). Source: BOTAS website; at: <http://www.botas.gov.tr/eng/naturalgas/ng_sup_dem.asp> (21 September 2005).

In chapter 31, *Nogoye Thiam* produced three diagrams and one table based on published sources by the IEA, the national energy ministries of Mali and Senegal, the U.S. Department of Energy and reproduced two maps from US universities that are all in the public domain:

- *Figure 31.1*: 1973 and 2003 Regional Shares of Total Final Energy Consumption. Source: IEA; at: <<http://www.iea.org/statist/index.htm>>.
- *Figure 31.2*: Africa's Share of Total Primary Energy Supply in 2003. Source: IEA (2006); at: <<http://www.iea.org/statist/index.htm>>.
- *Figure 31.3*: Energy consumption profiles for Mali and Senegal in 2004. Source: Produced by this author based on annual reports by the National Ministries of Energy in Mali and Senegal.
- *Figure 31.4*: Map of oil and gas fields and pipelines in West Africa: Source: U.S. Department of Energy; at: <<http://www.eia.doe.gov/emeu/cabs/archives/africa/wafrica.pdf>>.

- *Figure 31.5*: West African Gas Pipeline (WAGP). Source: U.S. Department of Energy, Energy Information Administration; at: <<http://www.eia.doe.gov/emeu/cabs/wagp.html>>.
- *Figure 31.6*: Map of Mali. Source: The University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/africa/mali_rel94.jpg>. The map is in the public domain.
- *Figure 31.7*: Map of ECOWAS countries. Source: University of Purdue, West Africa Power Pool Development Group, ECOWAS; at: <<http://www.purdue.edu/dp/energy/images/ECOWAS.gif>>. The map is in the public domain.
- *Table 31.1*: Stoves Efficiency. Source: Ministry of Energy and Mines and PERACOD (2005).

The text in the following boxes is based on the author's research:

- *Box 31.1*: West African Gas Pipeline (WAGP).
- *Box 31.2*: Biofuel: Mali's experience with pourghere.
- *Box 31.3*: The West African Power Pool (WAPP).

In chapter 32, *Rolf Linkohr* reproduced one map for which permission was obtained.

- *Figure 32.1*: Solar cell land requirements where six boxes (100 km on a side), in areas of high solar radiation, can each provide 3.3 TW of electrical power. Source: Smalley (2005).

In chapter 33, *Úrsula Oswald Spring* designed and reproduced figures, compiled tables and wrote text in boxes that rely on the author's previous publications and on new research:

- *Figure 33.1*: Conditions of the Structural Adjustment Policy (SAP) of the IMF for Debt Repayment in Developing Countries. Source: Strahm/Oswald (1990: 130).
- *Figure 33.6*: International migrants and refugees (1960-2005). Source: UN (2006); at: <<http://esa.un.org/migration/>>.
- *Figure 33.11*: Food sovereignty: equal access to food and symmetrical access to food consumption. Source: Chávez/Ávila/Shamah (2007); modified by Oswald (2007a).
- *Table 33.1*: Models of World Global Food Consumption by Social Classes. Source: Lang/Heaseman (2004 or 2005: 195), modified by Oswald.
- *Table 33.4*: Advantages and disadvantages in the food production sectors. Source: Compiled by the author.
- *Box 33.4*: Major survival strategies. Source: Oswald (1991, 2007, 2008a).

The following figures were reproduced from websites of international organizations and national agencies that are in the public domain:

- *Figure 33.2*: Vicious circle of hunger, undernourishment, poverty, and ignorance. Source: Chávez/Ávila/Shamah (2007: 208).
- *Figure 33.3*: Food Production, Prices, and Undernourishment. Source: FAOSTATS Millennium Ecosystem Assessment.
- *Figure 33.4*: The Global Hunger Index Progress towards the MDGs. Source: IFPRI (2007); at: <<http://www.ifpri.org/media/20071012GHI/GHIMap07hr.jpg>>.
- *Figure 33.5*: Proportion of Undernourished in Developing Regions. Source: FAO/IFAD/WFP (2002: 9).
- *Figure 33.7*: Undernourished Population in Latin America and in the Caribbean. Source: The estimates by CEPAL (2004) are based on FAO data.
- *Figure 33.8*: Comparison of national surveys on food, nutritional stage of children below 5 years of age. Source: National Nutritional Survey (INNSZ 1974, 1979, 1989, 1996).
- *Figure 33.9*: Map of municipalities in Mexico with high and very high needs for nutritional attention. Source: Chávez/Ávila/Samah (2007), based on the National Survey of Nutrition (2005).
- *Figure 33.10*: Programme 'Fome zero' (without hunger) in Brazil. Source: Instituto Cidadania (2001), São Paulo, Brazil.

- *Table 33.2:* Social Vulnerability and Internal Gaps in Wealth and Income in Mexico. Source: INEGI (2005) and Bank of Mexico (2004).
- *Table 33.3:* Nutritional Priority in 2,443 Municipalities in Mexico. Source: Chávez/Ávila/Shamana (2006); based on the National Survey of Nutrition (INNSZ 2005).
- *Box 33.1:* The evolution of the concept of food security within the FAO.
- *Box 33.2:* Concept of food sovereignty as developed by social movements.
- *Box 33.3:* Food Sovereignty Document, September 2005. Source: <http://www.aefjn.be/index.php?option=com_content&task=view&cid=31&Itemid=37>.

In chapter 35, *Selim Kapur, Burcak Kapur, Erhan Akca, Hari Eswaran and Mustafa Ayдын* have designed the following figures and compiled the table based on their own research and on governmental sources:

- *Figure 35.1:* The irrigation basins of the GAP. Source: <www.gap.gov.tr>.
- *Figure 35.2:* Agricultural added value in the GAP per capita
- *Figure 35.3:* Actual and potential salinity of the Harran Plain in 1985. Sources: Dinç/Kapur (1991); Şenol/Yeğingil/Dinç/Öztürk (1991); Özkutlu/Ince (1999).
- *Figure 35.5:* Harran project activity chart. Source: modified from Kapur/Eswaran/Akça/Dinçil (2002).
- *Table 35.1:* Comparison of the whole product in Turkey with increase of some crops after the GAP irrigation.

The permission was obtained by the authors to reproduce these figures:

- *Figure 35.4:* The land suitability map of the Harran Plain. Source: Şenol/Yeğingil/Dinç/Öztürk (1991).

In chapter 36, *Hans-Georg Bohle* reproduced this figure that is in the public domain.

- *Figure 36.1:* The Sustainable Livelihood Framework. Source: DFID (1999).

In chapter 37, *Guénaél Rodier and Mary Kay Kindhauser* based table 37.1 on WHO data:

- *Table 37.1:* Cases and deaths from recent outbreaks. Source: WHO Statistics; at: <<http://www.who.int/research/en/>>.

In chapter 38, *Jennifer Leaning* created two figures based on data by UN and UNDP publications and designed a figure based on UNWTO data that are all in the public domain:

- *Figure 38.1:* Population of the World 1950-2050 according to different projection variants. Source: Created by the author based on data from: United Nations Population Division, World Population Prospects: The 2006 Revision Population Database; at: <<http://esa.un.org/unpp/>>.
- *Figure 38.2:* Urban and rural population of the world, 1950-2030. Source: Created by the author based on data from: United Nations Population Division, World Urbanization Prospects: The 2007 Revision Population Database; at: <<http://esa.un.org/unup/index.asp>>.
- *Figure 38.3:* Growing Disparities between the Rich and the Poor. Source: Based on data from: UNDP (2006: 288-290). In 1980 data were available on fewer countries than in 2004.
- *Figure 38.4:* Change in water run-off compared with average 1961-1990 (%) for 2050 based on IPCC Scenario A1. Source: UNDP (2006: 162); at: <<http://www.hdr.undp.org>>.
- *Figure 38.5:* International Tourist Arrivals (1950-2005). Source: Created by author based on data from: UNWTO (2006: Annex 3); at: <<http://www.worldtourism.org/facts/menu.html>>.

In chapter 39, *Fred Eboko and Tereza Nemeckova* reproduced a figure that is in the public domain:

- *Figure 39.1*: Political Map of Southern Africa (2005). Source: University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/ciao7/bots-wana_sm_2007.gif>.

They produced four tables based on data by international organizations and national agencies that are in the public domain:

- *Table 39.1*: HIV and AIDS statistics in Sub-Saharan Africa, 2001 and 2007 Source: UN-AIDS (2007: 7).
- *Table 39.2*: Botswana key figures (2007). Source: OECD (2007: 135).
- *Table 39.3*: HIV prevalence by residence and age (2003), in percentages. Source: AIDS surveillance 2003; at: <www.naca.gov.bw/documents/flyer_english_A4.pdf>: 3.
- *Table 39.4*: HIV prevalence among men and women aged 15-49 years (2003), in percentages. Source: AIDS surveillance 2003; at: <www.naca.gov.bw/documents/flyer_english_A4.pdf>: 3.

In chapter 40, *Isabel Fischer and Mohammad Musfequs Salehin* reproduced a figure from a previous publication of one author and compiled a table based on UNDP data that are public:

- *Figure 40.2*: Health, poverty and human security interactions. Source: Salehin (2005: 10).
- *Table 40.1*: Country Facts Vietnam, Bangladesh and Japan. Source: UNDP's HDR (2007/2008), selected Indicators for Vietnam, Bangladesh and Japan; at: <<http://hdrstats.undp.org/indicators/>>.
- *Box 41.1*: Millennium Development Goals on Health Issues. Source: United Nations Millennium Declaration; at: <<http://www.un.org/millennium/>>; UNDP (2000): Millennium Development Goals, at: <<http://www.undp.org/mdg/basics.shtml>> and at: <<http://www.undp.org/mdg/goallist.shtml>>.

For the reproduction of this figure they obtained permission from the copyright holder:

- *Figure 40.1*: Human Security and its Relationship to Health. Source: Chen/Narasimhan (2003: 6).

In chapter 41, *Tony Allan* offered his own scientific estimates in the following five tables to data supplied in the literature:

- *Table 41.1*: Estimates of global use of water and 'trade' in virtual water. Source: Hoekstra/Chapagain (2004) and author's estimates.
- *Table 41.2*: Population estimates for more and less developed economies – UN medium variant in millions. Source: UN 2004, Medium Variant, US Census Bureau, historic estimates and author's interpolations.
- *Table 41.3*: Water use estimates per head in litres per day assuming level use by less developed economies and a reduction by users in more developed economies. Source: Hoekstra/Chapagain (2004) and author's estimates.
- *Table 41.4*: Water use in more and less developed regions on the basis of population estimates [medium variant] and projected use in Laces same as in 2000. Source: Author's estimates.
- *Table 41.5*: Estimates of water use per head – more and less developed economies. Source: Chapagain/Hoekstra (2004b) and author's estimates.

He obtained the permission of the authors to reproduce this table and figure:

- *Table 41.6*: Global Virtual Water Crop and Livestock Related 'Exports' and 'Imports' by region. Source: Chapagain/Hoekstra (2004): 46.

- *Figure 41.1*: The national water footprint per capita and the contribution of different consumption categories for some selected countries. Source: Hoekstra/Chapagain (2007: 44).

In chapter 42, *Vandana Shiva* compiled table 42.1 comparing the Himalayan and the Peninsular Components.

In chapter 43, *Bastien Affeltranger* compiled two tables based on published sources:

- *Table 43.1*: Mekong River Basin - Hydrological contributions from riparian countries Source: Wolf (1999).
- *Table 43.2*: Estimation of damages of the 2005 flood in the Lower Mekong countries. Source: MRC Website; at: <<http://www.mrcmekong.org/programmes/flood.htm>>.

In chapter 44, *Mustafa Aydin and Fulya Ereker* appreciate the permission of the copyright holders to reproduce the following figures and tables.

- *Figure 44.1*: General Layout of the Euphrates-Tigris Basin. Source: Altýnbilek (2004: 17).
- *Figure 44.2*: Average Annual Flow Values for Euphrates-Tigris Rivers. Source: Altýnbilek (2004: 19).
- *Figure 44.3*: Dams in the Euphrates-Tigris Basin. Source: Allan (2002, Annexes).
- *Table 44.1*: Potential Water Demands on the Euphrates (mcm). Source: Beaumont (1998: 179).
- *Table 44.2*: Potential Water Demands on the Tigris (mcm). Source: Beaumont (1998: 182).
- *Table 44.3*: GAP Land and Water Resources Development Projects. Source: GAP Regional Development Administration (2006: 2).

In chapter 45, *Bassam Ossama Hayek* reproduced this map that is in the public domain:

- *Figure 45.2*: Map of Jordan. Source: University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/middle_east_and_asia/jordan_rel_2004.jpg>. This map is in the public domain.

The following figure and table was reproduced from a publication of the Jordanian Ministry of Water and Irrigation that is in the public domain:

- *Figure 45.3*: Water use distribution among sectors (million cubic meters supplied), in 2000. Source: Ministry of Water and Irrigation (2002: 9).
- *Table 45.1*: Projected water demand per sector (million cubic metres, MCM). Source: Ministry of Water and Irrigation (2002: 9).

Permission was granted by Otto Simonett of UNEP/GRID with the consent of the designer to reproduce this figure:

- *Figure 45.1*: Availability of Freshwater in 2000. Average River Flows and Groundwater Recharge. Source: Designed by Philippe Rekacewicz, UNEP/GRID-Arendal (2000); in: World Resources Institute: *World Resources 2000-2001, 'People and Ecosystems: the Fraying Web of Life'* (Washington, D.C.: WRI); at: <<http://maps.grida.no/go/graphic/freshwater-availability-groundwater-and-river-flow>>.

In chapter 48, *Emad Adly and Tarek Ahmed* reproduced the following three maps and satellite images as well as four tables that are based on sources that are in the public domain:

- *Figure 48.1*: The Nile River Basin. Source: NBI (2005); at: (<<http://www.nilebasin.org>>).
- *Figure 48.2*: Satellite Image of the Nile River. Source: NASA, Visible World; Credit Jeff Schmaltz, MODIS Rapid Response Team, NASA/GSFC, Sensor Terra/MODIS, 27 August 2003; <<http://veimages.gsfc.nasa.gov/5724/Egypt.A2003235.0845.250m.jpg>>.

- *Figure 48.3*: Rainfall Patterns in the Nile Basin. Source: SPIDER International Ltd. (1994, 1997): *Water Resources Atlas of the River Nile Basin* (Ottawa: Canadian International Development Agency).
- *Table 48.1*: Population Growth in the Nile Basin Countries. Sources: Data for 1950 and 2000 and projections for 2025 and 2050: UN (2007); at: <<http://esa.un.org/unpp>>. Compiled by H.G. Brauch, 23 January 2008.
- *Table 48.2*: Per Capita Share of Water Consumption (m³/year) in Riparian Countries in 1995, and Anticipated Share in 2025 and 2050. Source: FAO, Natural Resources Management and Environment Department, 1997: *Irrigation Potential in Africa: A Basin Approach* (Rome: FAO); at: <www.fao.org/docrep/w4347E/w4347eok.htm>.
- *Table 48.3*: Estimated Water Balance of Egypt in 1997 and 2017 (in km³/year). Source: Egypt, Ministry of Water Resources and Irrigation (2002).
- *Table 48.4*: Indicators Used to Report on the State of Food Security in Egypt. Source: Egypt, Ministry of Water Resources and Irrigation (2003).

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- *Figure 49.1*: Landcover Classes in the Nile Basin. Source: IUCN: *Water Resources E Atlas. Watersheds of the World*; at: <<http://www.iucn.org/themes/wani/eatlas/html/af15.html>>; © World Resources Institute (2003). WRI was informed three times and did not object the reproduction under the fair use clause.
- *Figure 49.2*: The Upper Nile Basin and Lake Victoria. Source: USDA, Production Estimates and Crop Assessment Division Foreign Agricultural Service; at: <http://www.fas.usda.gov/pecad/highlights/2005/09/uganda_26sep2005/images/nile_basin.htm>.
- *Figure 49.3*: Population Distribution on the Nile Basin in 2005 and 2030. Source: FAO <<http://www.fao.org/images/PopulationDistribution29Nov.png>>.
- *Figure 49.4*: Figure 50.4: Dominant Crops in the Nile Basin Farming System. Source: FAONile; at: <<http://www.fao.org/images/dorminantcrops.png>>.

In chapter 50, *Peter Ashton and Anthony Turton* designed three figures based on data that are either in the public domain or on their own data.

- *Figure 50.1*: Map of Africa showing the locations and names of the continent's 63 international (shared) river basins. Source: Map modified and redrawn from UNEP (2002: 27), plus own data.
- *Figure 50.2*: Map of Southern Africa, showing the international (shared) aquifer systems used by the SADC states. Source: Map is drawn from data in UNESCO-ISARM (2004: 7), plus own data.
- *Figure 50.3*: Map of Southern Africa showing the locations of large water supply dams in relation to the shared river basins in Southern Africa. Source: Map drawn from data in WCD (2000: 370), plus own data.
- *Box 50.1*: “Protocol on Shared Watercourses in the Southern African Development Community (SADC)” signed in 2000.

Two additional figures were drafted and two tables were compiled by the authors:

- *Figure 50.4*: Map of the Southern African Hydropolitical Complex.
- *Figure 50.5*: Schematic diagram illustrating the relationships between shared river basins within the SADC region and countries comprising the Southern African Hydropolitical Complex. Source: amended and redrawn from Turton (2003a: 294); Ashton/Turton (2004: 7).
- *Table 50.1*: Countries sharing the international river basins found in the SADC region.
- *Table 50.2*: Projected Population Growth in SADC Countries, compared with other African regions.

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- Figure 52.2: Scheme: Integrated Model of Regime Formation. Source: Based on Borghese (2005)
- Figure 52.6: Volta Basin Regime Genesis. Source: Based on Borghese (2005).

For the remaining figures and tables the author obtained the permission from the copyright holders:

- Figure 52.3: Map: Representation of the Volta River Basin Showing Political Boundaries. Source: UNEP (2002: 2).
- Figure 52.4: Freshwater Stress and Scarcity in Africa by 2025. Source: UNECA (2000); UNEP (1999).
- Figure 52.5: Map: Environmental Critical Areas in the Volta Basin. Source: UNEP (2001), RCN 2/4.
- Table 52.1: Distribution of the Basin in the Six Riparian Countries. Sources: Data for the Volta River Basin are from respective UNEP National Reports (UNEP 2001a, 2001b, 2001c, 2001d, 2001e, 2001f).
- Table 52.2: Annual Rainfall and Evaporation in the Riparian Countries of the Volta Basin. Source: Barry/Obuobie/Andrein/Andah/Pluquet (2004: 13).
- Table 52.3: Population projection in the Volta River basin. Source: UN, cited from: Barry/Obuobie/Andrein/Andah/Pluquet (2004: 22).

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- Table 54.1: Socio-economic Indicators of the Aral Sea Basin's Riparian Countries (2005). Source: CIA Factbook (2005).
- Box 54.1: The Malthusian Discourse.

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- Figure 55.2: Images of a Shrinking Aral Sea (1960-2010). Source: Spoor/Krutov (2004/2005): 285.
- Figure 55.3: Water Issues in the Ferghana Valley. Source: Victor Novikov; Philippe Rekacewicz, UNEP/GRID-ARENDAL, April 2005, see at: <<http://www.relief-web.int/rw/RWB.NSF/db900LargeMaps/AHAA-6CYLV7?OpenDocument>>. This figure is in the public domain.
- Figure 55.4: Three Dimensional View of the Ferghana Valley Region. Source: UNEP and: <<http://www.reliefweb.int/rw/RWB.NSF/db900LargeMaps/AHAA-6CCRDG?OpenDocument>>. This figure is in the public domain.

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- *Table 56.1*: Framework of Conflict Dimensions. Source: The author.
- *Table 56.2*: Conflict Dimensions of Water-Related Conflicts in Central Asia. Source: The author.
- *Table 56.3*: The Central Asian Water Agreements. Source: Compiled by the author.
- *Table 56.4*: Central Asian Participation in International Water Law. Source: The author.

In chapter 57, *Christopher Martius, Jochen Froebrich and Ernst-August Nuppenau* developed their own figures and table based on public data:

- *Figure 57.1*: Irrigated Lowlands of the Amu Darya (Amu Darya Lowlands or ADL). Source: The authors.
- *Figure 57.2*: Essential Utility Aspects of Water and Cross-cutting Themes for Achieving IWRM in the Amu Darya Lowlands. Source: The authors.
- *Figure 57.3*: Generalized pattern for implementing key activities as partial elements within an IWRM framework. Source: The authors.
- *Table 57.1*: Examples of key technologies to be implemented in the framework of an IWRM concept for the ADL. Source: The authors.

In chapter 58, *Mara Tignino* compiled a table based on public data and used a map that is in the public domain:

- *Figure 58.1*: Map of current International Committee of the Red Cross Water and Sanitation Programmes around the world. Source: ICRC; at: <www.icrc.org>.
- *Table 58.1*: Excerpts of relevant instruments on water security during armed conflicts.

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- *Figure 61.2*: Political Map of Belarus (1997). Source: Map 3776, Rev. 3, January 2004. United Nations, Department of Peacekeeping Operations, Cartographic Section. Reprinted with permission.
- *Figure 61.3*: Political Map of Ukraine (1993). Source: Map 3773, Rev. 4, January 2005. UN, Department of Peacekeeping Operations, Cartographic Section. Reprinted with permission.
- *Figure 61.4*: Key Environmental Problem Areas in Russia. Source: University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/commonwealth/russia_environmental98.pdf> from the *Handbook of International Economic Statistics* (1996).
- *Figure 61.5*: Map of Radiation Hotspots Resulting from the Chernobyl Nuclear Power Plant Accident in 1986. Source: University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/commonwealth/chornobyl_radiation96.jpg> from *Handbook of International Economic Statistics* 1996.

In chapter 62, *P.S. Ramakrishnan* used two figures and a table from his previous publications:

- *Figure 62.1*: Demojong, the land of hidden treasures: Pictorial depiction of holy sites in West Sikkim, Eastern Himalayas. Source: Ramakrishnan (1996).
- *Figure 62.4*: Interdisciplinary interactions called for in tropical forest management and conservation. Source: Ramakrishnan (2001).
- *Table 62.1*: TEK centred on the socially selected keystone species, *Quercus* spp., acting as a trigger for rehabilitation of the mountain landscape in the Central Himalaya. Source: Ramakrishnan (2001).

The Map of India is in the public domain:

- Figure 62.2: Map of India. Source: University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/middle_east_and_asia/india_polo1.jpg>.

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- Figure 69.2: Fresh Water Stress in 2000 and Projection for 2025. Source: UNEP-GRIP, Vital Graphics; at: <<http://www.unep.org/vitalwater/25-waterstress-world.htm>>.
- Figure 69.3: Water Availability and Water Stress in Africa in 2000 and 2005. Source: UNEP-GRIP, Vital Graphics; at: <<http://www.grida.no/climate/vitalafrica/english/15.htm>>.
- Figure 69.4: Aridity Zones in Africa. Source: UNEP-GRIP, Vital Graphics; at: <<http://www.grida.no/climate/vitalafrica/english/25.htm>>.
- Figure 69.5: Deforestation in Africa. Source: UNEP-GRIP, Vital Graphics; at: <<http://www.grida.no/climate/vitalafrica/english/07.htm>>.
- Figure 69.6: Food Production in Africa and the World. Food Production Index, Net per Capita (PIN base 1989-1991). Source: UNEP-GRIP, Vital Graphics; at: <<http://www.grida.no/climate/vitalafrica/english/26.htm>>.
- Figure 69.7: Food Shortages, chronic malnutrition, famines and conflicts in Africa during the 1990’s. Source: UNEPGRIP, Vital Graphics; at: <<http://www.grida.no/climate/vitalafrica/english/27.htm>>. Permission was obtained from Philippe Rekacewicz, UNEP-Arendal.
- Figure 69.8: Freshwater Stress and Scarcity in Africa by 2025. Source: UNEP-GRIP, Vital Graphics; at: <<http://www.unep.org/vitalwater/25-waterstress-africa.htm>>.

- *Figure 69.9*: People Affected by Natural Disasters in Africa. Source: UNEP-GRIP, Vital Graphics; at: <<http://www.grida.no/climate/vitalafrica/english/o8.htm>>.

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- *Box 71.1*: EnvSec activities with a specific focus on the Southern Caucasus. Source: EnvSec; at: <<http://www.envsec.org/about.php>> and <<http://www.envsec.org/southcauc/index.php#maps>>.
- *Figure 71.1*: Environment and Security Priority Areas in the Southern Caucasus. Source: EnvSec; at: <<http://www.envsec.org/southcauc/maps/priorities.jpg>>.
- *Figure 71.2*: National environment and security issues in Armenia. Source: EnvSec; at: <<http://www.envsec.org/southcauc/maps/armenia.jpg>>.
- *Figure 71.3*: National environment and security issues in Georgia. Source: EnvSec; at: <<http://www.envsec.org/southcauc/maps/georgia.jpg>>.
- *Figure 71.4*: National environment and security issues in Azerbaijan. Source: EnvSec; at: <<http://www.envsec.org/southcauc/maps/azerbaijan.jpg>>.
- *Figure 71.5*: Transportation and communication links in Southern Cascaia Source: EnvSec; at: <<http://www.envsec.org/southcauc/maps/transport.jpg>>.

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- *Table 72.1*: Selected Indicators on the Asia-Pacific Region. Source: ADB (2004).
- *Table 72.2*: Population Change for Selected Asia-Pacific Countries. Source: UN (2004).

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- *Table 72.3*: Some Selected Environmental Problems for Selected Countries In The Asia-Pacific Region. Source: Compiled by the author.
- *Table 72.4*: Contrasting Climate Change and Atoll Countries with Water Problems in China. Source: Compiled by the author.

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- *Figure 73.1*: Map of the Arctic Region. Source: University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/islands_oceans_poles/arctic_ref802647_1999.jpg>.
- *Figure 73.2*: Map of the Antarctic Region. Source: University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/islands_oceans_poles/antarctic_ref802648_1999.pdf>.

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- *Table 74.1*: Contextualizing human security concepts, pillars, and policy agendas. Source: compiled by the author.
- *Table 74.2*: Systematic overview on referent objects, key values, nature of threats, and agents of insecurity and policy agendas referred to in the debate in the United Nations General Assembly on 22 May 2008. Source: speeches analysed by the author.
- *Table 74.3*: Four Pillars of Human Security. Source: The table was stimulated by Ulbert and Werthes (2008: 21) who developed it based on Hampson/Daudelin/Hay/Martin/Reid (2002: 33).
- *Table 74.4*: Compilation of Human Security Threats, Challenges, Vulnerabilities, Risks: Source: Brauch (2005a: 80).

- *Table 74.5:* ‘Human Security’ Policies and Measures for Coping with Environmental Threats, Challenges, Vulnerabilities, and Risks for ‘Ecosystems’ and ‘Sustainability’. Source: compiled by the author.

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- *Box 75.1:* Excerpts from the paper for the Greek Presidency on: “Human security and the climate change impact on vulnerable groups” of 8 May 2007. Source: HSN, documents of the 9th Ministerial in Slovenia, 17–18 May 2007; at: <<http://www.humansecuritynetwork.org/docs/2007-ministerial-meeting-04-greek%20paper.doc>>.
- *Table 75.1:* Countries of the Human Security Network. Source: Population: PRB 2005: 2005 *World Population Data Set*; Human Development Index. GDP per capita: UNDP 2005; Membership in multilateral international organizations. Source: Compiled and updated by Hans Guenter Brauch.
- *Table 75.2:* Agendas of nine Ministerial Meetings of the HSN (1999–2007). Source: Compilation by the authors based on “Chair’s Summary” of the Ministerial Meetings of the HSN.
- *Table 75.3:* List of Lead and Partner Countries for HSN Activities. Source: at: <<http://www.humansecuritynetwork.org/docs/Table%20of%20Lead%20and%20Partner%20Countries-e.php>>.
- *Table 75.4:* The Human Security Network and the four pillars of the Human Security Concept. Source: Hans Günter Brauch for UNESCO (2006, 2008).

In chapter 76, the three tables are based on compilations by the author *Abdus Sabur*:

- *Table 76.1:* Dimensions of National and Human Security.
- *Table 76.2:* Human Security Issues and Possible Responses.
- *Table 76.3:* Human Security Issues in South Asia and Possible Responses.

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- *Table 78.1:* Direct and Indirect Threats to Human Security. Source: Bajpai (2000: 40).

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- *Figure 78.1:* Map of the wider Maghreb consisting of Algeria, Libya, Mauritania, Morocco and Tunisia. Source: This map is in the public domain and not protected by copyright; at: <http://www.maghrebarab.com/maghreb_arab_map.html>.
- *Table 78.3:* Selected social and economic indicators for the ‘Core’ Maghreb. Source: UNDP’s *Human Development Report 2006*.

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- *Table 78.2:* History of Regimes in the Maghreb.

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- *Figure 79.1*: Map of Southeast Asia and of the ASEAN Countries. Source: University of Texas at Austin, Perry-Castañeda Library Map Collection. This map is in the public domain; at: <http://www.lib.utexas.edu/maps/middle_east_and_asia/southeast_asia_pol_2003.jpg>.
- *Table 79.1*: Membership of Southeast Asian countries in regional IGOS and NGOs. Source: Compiled by the author.
- *Table 79.2*: Demographic and Socio-Economic Information of ASEAN States. Source: CIA (2007); at: <<https://www.cia.gov/library/publications/the-world-factbook/>> (15 May 2007); and at: <http://www.aseansec.org> (25 February 2008). Compiled by the author.
- *Table 79.3*: Characteristics of Comprehensive Security and Human Security. Source: Compiled by the author.

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- *Figure 80.1*: The increase in proportion of hungry is the greatest in sub-Saharan Africa. Source: United Nations (2005: 8).
- *Figure 80.2*: Undernourished in Africa, estimated and projected, in millions. Source: United Nations (2005) and United Nations Millennium Development Goal Indicators Data Base; at: <<http://mdgs.un.org/unsd/mdg/Default.aspx>> (28 February 2006).
- *Figure 80.3*: Gender and education in sub-Saharan Africa. Source: UNICEF (2006: 117).
- *Figure 80.4*: Children not enrolled in school, sub-Saharan Africa, per cent. Source: UNESCO Data Base on Millennium Development Goal Attainment; at: <http://www.uis.unesco.org/ev.php?URL_ID=5261&URL_DO=DO_TOPIC&URL_SECTION=201> (28 February 2006).
- *Figure 80.5*: Infant Mortality Rate. Source: United Nations World Population Prospects Data Base; at <<http://http://esa.un.org/unpp/>> (27 February 2006).
- *Figure 80.6*: Maternal mortality, SSA countries with rates higher than 1000 in 2000. Source: UN Statistics Division MDG indicators data base.
- *Figure 80.7*: Women in Parliament in 2004. Source: Population Reference Bureau (2005); United Nations (2005).
- *Table 80.1*: GDP growth under adjustment - agriculture growth rate (median) sub-Saharan Africa, 1981-1983, 1987-1991 and 1992-1997. Source: ADB and IMF databases.
- *Table 80.2*: Summary of poverty indicators for Africa (figures have been rounded). Source: CPRC (2005) and World Bank (2003).
- *Table 80.3*: African poverty 1980 - 2003 (Figures have been rounded). Source: CPRC (2005) and World Bank (2003).
- *Table 80.4*: The Millennium Development Goals (MDGs) and targets. Source: UN Millennium Project (2005).

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- *Table 81.1*: Perceptions of threats to human security ranked by sub-region. Source: Rojas (2004: 10).
- *Table 81.2*: Inter-state militarized conflicts in the Americas, 1990-2001. Source: Own calculations based on Mares (2003).
- *Table 81.3*: Selected development indicators for Central America. Source: <<http://hdr.undp.org/statistics>> and own calculations.
- *Table 81.4*: Stock of Natural Disasters Affecting Central American Countries. Source: OFDA/CRED International Disaster Database (EM-DAT); at: <www.em-dat.net> own calculations.

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- *Table 82.1*: Conceptualization of National, International and Human Security Dimensions. Source: Gurtov (1999: 25-26). Permission was obtained from Rienner Publishers.

The box and other two tables are based on a previous publication and were compiled for this chapter:

- *Box 83.1*: South American Presidential Summits.
- *Table 82.2*: The five variables of human security and mutual vulnerability. Source: Goucha/Rojas Aravena (2003: 22).
- *Table 82.3*: South American Data. Source: prepared by author.

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- *Figure 85.1*: Interview Situation in the Village Tienfala, Mali, 2003. Source: photo by Max Schott.
- *Table 85.1*: Perception of causes/effects related to the seven human security dimensions by the local population of Mali in urban, pre-urban and rural areas. Source: Compiled by the author.
- *Table 85.2*: Ranking of the seven human security dimensions by local populations. Source: Author.

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- *Figure 88.2*: Impact of the Tsunami in the Indian Ocean on 26 December 2004. Source: UNOCHA Situation Report No. 18 (14 January 2005), ReliefWeb Map Centre; at: http://www.reliefweb.int/rw/fullMaps_Sa.nsf/luFullMap/.
- *Figure 88.4*: Satellite images of the Northern Kho Lak Bay (Thailand) before and after the Tsunami. Source: UNOSAT, International Charter Space and Major Disasters Product ID: 325 - 14 Jan, 2005; at: <<http://unosat.web.cern.ch/unosat/>>.
- *Figure 88.5*: Satellite images of Ko Phuket (Thailand) after the Tsunami. Source: UNOSAT, International Charter Space and Major Disasters Product ID: 327 - 14 Jan, 2005; at: <<http://unosat.web.cern.ch/unosat/>>.

The UN Cartographic Service approved reproducing this map:

- *Figure 88.3*: Map of Thailand. Source: Map 3853, Rev. 1, January 2004. UN Cartographic Service. Department of Field Support; at: <<http://www.un.org/Depts/Cartographic/map/profile/thailand.pdf>>.

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- *Figure 88.6*: The Vulnerability Cycle. Source: Designed by the author.
- *Table 88.1*: Summarized Table of Natural Disasters in Thailand from 1955 to 2006. Source: EM-DAT: The OFDA/CRED International Disaster Database; at: <www.em-dat.net>, Université Catholique de Louvain, Belgium; created on 31 March 2007.

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- *Table 90.1*: Human, Gender, and Environmental Security (HUGE): A Transradical Approach. Source: Møller (2003: 279); Oswald Spring (2001, 2004, 2007).

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- *Box 92.4*: Background data on Guatemala that are in the public domain.
- *Figure 92.1*: Map of South East Asia. Source: This map provided by Relief Web on 24 January 1997; at: <http://www.reliefweb.int/mapc/asi_se/reg/seasia.html>.
- *Figure 92.2*: Map of the Philippines. Source: University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/islands_oceans_poles/philippines.gif>.
- *Figure 92.3*: Map of Central America. Source: University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/americas/camerica_caribbean_95.jpg>.
- *Figure 92.4*: Trafficking Routes in Central America. Source: Casa Alianza, Guatemala (2003).

The following figure was designed by *Úrsula Oswald Spring*:

- *Figure 92.5*: Human Gender and Environmental Security from Bottom-up and Top-down. Source: Úrsula Oswald Spring (2004a).

The text of the following box was drafted by *Hans Günter Brauch*:

- *Box 92.1*: Conflicts in South East Asia Affecting the National, Human, Gender, and Environmental Security of the countries and their people.

The text of box 92.3 was written and table 92.1 compiled by *Úrsula Oswald Spring*:

- *Box 92.3*: Overview of military rule, guerrilla wars, and foreign military presence in Central America.
- *Table 92.1*: Violence in Central America (1946-2005) due to military and authoritarian rule, guerrilla activities, and foreign intervention into their internal affairs.

Chapter 93 by *Madhavi Malalgoda Ariyabandu and Dilrukshi Fonseka* was illustrated with satellite images of UNOSAT and Strasbourg University, with two maps and a table by the donor community that are in the public domain:

- *Box 93.1*: Map and figures in the Impact of the Tsunami in Sri Lanka and in India. Source: <<http://worldatlas.com/aatlas/infopage/tsunami.htm>>.
- *Figure 93.1*: Damage assessment map of the Tsunami on the coast line of Tamil Nadu, India (29 December 2004). Source: UNOSAT/Infoterra; at: <http://www.respond-int.org/Respond/viewmapdetails.html?map_id=266>.
- *Figure 93.2*: Sri Lanka East Coast. Potentially Affected Areas of the Tsunami (2 January 2005). Comparison Tsunami Pre & Post Crisis Image Comparison in Sri Lanka. Source: Produced by SERTIT: at:<http://sertit.u-strasbg.fr/documents/asiae/mid/p32_potentially_affected_area_eastcoast_midres.jpg>.
- *Figure 93.3*: Satellite images on the Impact of the Tsunami on the South West Coast of Sri Lanka, Galle Area (before and after the disaster). Source: UNOSAT; at: <http://unosat.web.cern.ch/unosat/freeproducts/Tsunami/Sertit/Latest/P79_SriLanka_SW_Galle_lowres.jpg>.
- *Figure 93.4*: Satellite images on the Impact of the Tsunami on the South East Coast of Sri Lanka, Galle Area (before and after the disaster). Source: UNOSAT; at: <<http://unosat>>.

web.cern.ch/unosat/freeproducts/Tsunami/Sertit/Latest/P86_SriLanka_SE_mahirawa_lowres.jpg >.

- *Figure 93.5*: Satellite images on the Impact of the Tsunami on the East Coast of Sri Lanka (before and after the disaster). Source: UNOSAT; at: <http://unosat.web.cern.ch/unosat/freeproducts/Tsunami/Sertit/Latest/P63_se_mullaittivu%20irs_before_after_highres.jpeg>.
- Table 93.1: Post-tsunami Construction Status - Donorbuilt Housing Projects (December 2005). Source: RADA (2005: 12).

In chapter 94, *Shahrbanou Tadjbakhsh* included two maps that are in the public domain:

- *Figure 94.1*: Relief Map of Afghanistan (2003). Source: University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/middle_east_and_asia/afghanistan_rel_2003.jpg>.
- *Figure 94.2*: NATO in Afghanistan: International Security Assistance Force (ISAF) and Provincial Reconstruction Teams (PRTs). Data valid as of 15 November 2006 Source: NATO; at: <<http://www.nato.int/issues/afghanistan/graphics/eo40628a.jpg>>.

In chapter 97, *Dirk H. Hoekman* used several satellite images for which the permission was granted by the by JAXA/GRFM project while the fourth figure was produced by the author:

- *Figure 97.1*: Satellite radar observations of JERS-1 at 24 September 1996 and 21 January 1998 of an area in Central Kalimantan near Palangkaraya. Source: Courtesy: GRFM project.
- *Figure 97.2*: JERS-1 SAR time series of the collapse of the peat dome in Kahiyu: (a) 12 Jul 1995; (b) 19 Mar 1997; (c) 11 Sep 1997; (d) 25 Oct 1997; (e) 21 Jan 1998.
- *Figure 97.3*: In the Sebangau National park several areas of peat dome forest collapse, caused by the 1997 ENSO event, show up as bright areas indicated by the arrows (date: 17 July 1998).
- *Figure 97.4*: Analysis of high-resolution interferometric airborne radar data.

In chapter 98, *Úrsula Oswald Spring, Hans Günter Brauch and Simon Dalby* were granted permission to publish these three figures:

- *Figure 98.1*: IPCC Survey of Scenarios from 2000 to 2100 (in the absence of additional climate policies and projections of surface temperatures). Source: IPCC: AR4 SYR for Policymakers (IPCC 2007c: 8); at: <http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf>. The use is permitted under the terms of the IPCC and the IPCC Secretariat did not object its use.
- *Figure 98.2*: Development of major natural hazards between 1950-2007 (Number of events). Source: © 2008 Münchener Rückversicherungs-Gesellschaft GmbH, GEO Risk Research. NatCatSERVICE. Reprinted with permission.
- *Figure 98.3*: Development of major hydro-meteorological hazards between 1950-2007 (Trend of economic and insured damages). Source: © 2008 Münchener Rückversicherungs-Gesellschaft GmbH, GEO Risk Research. NatCatSERVICE. Reprinted with permission.

In chapter 99, *Hans Günter Brauch and Úrsula Oswald Spring* are grateful for the permission of the IPCC and UNEP to reproduce two figures while they compiled the table themselves:

- *Figure 99.1*: Schematic framework of anthropogenic climate change drivers, impacts, and responses. Source: IPCC (2007c: 26). The use is permitted under the terms of the IPCC and the IPCC Secretariat did not object its use.

- *Figure 99.2*: Global GINI index of income across states and households. (Lesser is more equal). Source: UNEP (2007: 413). Permission was granted by UNEP.
- *Table 99.1*: Phases, levels, and instruments of peace-building.

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Facing Global Environment Change

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United Nations Convention to Combat Desertification

Social Consequences of Environmental Degradation

Environmental deterioration includes a long and expanding list of major and multiple dysfunctions that feed on each other (White 1993), increasing the chain of vulnerabilities. In the specific case of land degradation and desertification, its huge economic and social costs, and ultimately, implications for peace and security, have not been given adequate recognition. There is also a common misperception that desertification is a 'natural' problem of advancing deserts in faraway developing countries. In reality, it is about the loss of the land's biological productivity. In terms of its global reach, the drylands include approximately one third of the Earth's surface and more than one hundred countries. Over 250 million people are directly affected by desertification, while one billion are at risk.

With regard to the causal chain that leads to desertification, this has been analysed at length and with different findings. The suggested causes include drought and climate change as well as human-induced factors such as over-cultivation, over-grazing and deforestation, which have to be seen in the broader context of population dynamic, poverty and external constraints imposed by the global economy. None of these causes can explain the process by itself. However, there is a strong correlation between food insecurity, poverty, population dynamic, and land degradation.

A Challenge for Survival: Food Insecurity and Famines

The phenomenon of land degradation, desertification and drought has major bearing on the potential of the arable lands to produce adequate food for human consumption. Depending on the source or the method of calculation, it is estimated that between 40 million and 115 million people are directly affected by food insecurity. Under nourishment, however, is a much wider problem. Although the proportion of the world population affected has steadily declined, the total number of people going hungry has actually increased and is currently above 500 million persons.

The recent world food crisis has brought into the spotlights another important aspect of natural resource scarcity, namely that of endangering human rights. Many of the ongoing conflicts and crises have been considered also as results of the impact of serious drought, desertification and land degradation with rising conflict over deteriorating resources. Together with the Special UN Rapporteur on the Right to Food, the secretariat of the *United Nations Convention to Combat Desertification* (UNCCD) released a study at the 16th session of the CSD in May 2008 in New York (Ziegler/UNCCD 2008).

In several countries there is difficulty to access food due to unprecedented price hikes for commodities, but also due to emerging impacts climate change resulting in frequent and severe *desertification, land degradation and drought* (DLDD). Inflated international food prices have already led to food riots in some countries, while the most vulnerable are also seeing the food aid process being threatened by this economic context. However, available information indicates that occurrences of food shortages, hunger and malnutrition are prevalent in those regions of the

world, in South Asia and Sub-Saharan Africa, where people are least dependent on imports from the world markets. Hunger is caused in these countries not only by high international food prices, but often by local level conditions, especially rural poverty, arable land degradation, desertification and frequent droughts that result in low agricultural productivity. Most of the actual hunger takes place in the villages and in the countryside, and it persists even when international food prices are low. Food crisis grows primarily out of the low productivity of the practiced subsistence farming, mostly undertaken in inherently marginal and degraded lands, with highly unreliable rainfall, remotely located from the markets and public services and infrastructures, without improved seeds, nitrogen fertilizers and irrigation in the event of a drought.

Water availability plays a major role in determining the production and availability of food in developing countries and regions, where crop production is mostly dependent on the rainfall. Inadequate water resources availability, more often than not tends to lead to food shortages and food insecurity owing to a drop in agricultural production and famine that in turn lead to forced human migration and loss of life.

The international community should face this crisis through structural actions. Subsidizing agricultural inputs or food aid will not last. Measures on sustainable land management and soil protection must be implemented under a clear strategy of returning investments to rural areas. Developing countries, particularly those affected by drought and desertification should be encouraged and supported, to propel the expansion of domestic agricultural production through effectively reversing the processes of land degradation and desertification and returning degraded arable land to crop production, improving local level infrastructure and distribution and storage systems and removing policy distortions that discourage food production.

Desertification and Poverty

Also contributing to the exacerbation of desertification is poverty, which is most prevalent among rural populations. According to the World Bank, nearly 75 per cent of the poorest populations live in rural areas, and a large majority of them depend on agriculture for daily subsistence and income. In drylands, the fragile ecosystems make it hard to accumulate a surplus in agricultural production, and poor households

are forced to extract more from their lands than can be sustained in the long term. Overexploitation and burdening of land results in the impoverishment of soils, leading to the vicious downward spiral of increasing desertification and rising poverty. Thus the poor become both the agent and the victims of land degradation and desertification.

The shrinking availability of arable land for food production, a reduced supply of safe water, a growing number of forced migrants, and conflicts induced by scarcity of natural resources or the aggravated impact of national catastrophes are all factors that shed a sharper light on the combined effects of poverty and land degradation.

Desertification and Migration

The loss of livelihoods and natural resources sets in motion a train of events leading from poverty to migration to conflict, to disastrous effects. Traditional ways of life are eroded; disputes over land and natural resources arise. Sometimes, the affected populations have no choice but to leave their homes to make a living elsewhere. Uncontrolled, large-scale rural to urban migration can strain the social order in towns and cities, particularly by swelling the ranks of the urban unemployed or underemployed. Such a mass displacement of people, particularly in cases of severe food shortage, can place enormous strain on the existing social structures in recipient areas, leading to social unrest.

Desertification as a Threat to Security

Increased environmental degradation, meanwhile, has enhanced the destructive potential of natural disasters and in some cases hastened their occurrence. The dramatic increase in major disasters witnessed in the last 50 years provides worrying evidence of this trend. More than two billion people were affected by such disasters in the last decade, and in the same period the economic toll surpassed that of the previous four decades combined. If climate change produces more acute flooding, heat waves, droughts and storms, this pace may accelerate. However, rarely are environmental concerns factored into security, development or humanitarian strategies.

The United Nations has a role to play in this regard. It remains the most universal institution of multilateralism and provides a forum where sovereign states can come together to share burdens, address

common problems, and seize common opportunities. Conflicts resulting from competition over scarce resources also have the potential to escalate into interstate violence. From this viewpoint, desertification is seen as a threat to national security. The perception of national security must therefore be enlarged, so as to include awareness of mounting threats to the global environment. Environmental strains that transcend national borders are already beginning to break down the boundaries of national sovereignty.

Desertification, according to the report of the Millennium Ecosystem Assessment (2005a) is one of the greatest environmental challenges and a major impediment to meeting basic human needs in drylands. With 90 per cent of the drylands population of almost two billion people living in developing countries, the report also cites desertification as “potentially the most threatening ecosystem change impacting the livelihoods of the poor.”

The *United Nations Convention to Combat Desertification* (UNCCD) has been acknowledged as a major player in achieving the MDGs, particularly with regard to the eradication of poverty. Moreover, with desertification having played a role in sparking off 10 of the last armed conflicts in arid lands (Baechler 1995), it is an example of an international treaty, which addresses a global challenge that could pose a steadily increasing threat to international security and geopolitical stability.

In a concerted effort to combat desertification and thus ensure the long-term productivity of inhabited drylands, 193 parties have now joined the UNCCD. Its aim is to promote effective action through innovative action programmes and supportive international partnerships.

Adopted in 1994, the Convention is moving towards implementation, with affected countries beginning to carry out national, sub-regional, and regional action programmes. Criteria for preparing these programmes are detailed in the treaty’s five “regional implementation annexes”: Africa, Asia, Latin America and the Caribbean, the Northern Mediterranean, and Central and Eastern Europe. Drawing on past lessons, the Convention states that these programmes must adopt a bottom-up approach. They should emphasize participation processes and the creation of an ‘enabling environment’ designed to allow local people to help themselves to reverse land degradation.

Governments remain responsible for creating this enabling environment, however, by making politically sensitive changes, such as decentralizing authority, improving land tenure systems, and empowering

women, farmers, and pastoralists. They should also closely collaborate with relevant non-governmental organizations and community based organizations in the UNCCD implementation processes. In contrast to many past efforts, these action programmes are to be fully integrated into national policies for sustainable development. They should be flexible and modified as circumstances change. Desertification can only be reversed through profound changes in local and international behaviour. Step by step, these changes will ultimately lead to sustainable land use and food security. Combating desertification, then, is really just part of a much broader objective: the promotion of sustainable development in fragile ecosystems, and the positive implications for national and international security.

Reducing the risk to security by confidence-building desertification, land degradation and drought are amongst the main threats to ecosystem change. The potential of including desertification within the security debate does not lie in merely identifying how desertification acts as a cause for instability and conflicts. Rather, the focus on desertification brings forward a new type of confidence-building measures that can effectively reduce the risks to security. A more holistic defence concept would involve supporting international agencies in focusing on food security and poverty eradication within the context of drought and scarcity of resources, as they make an important contribution in preventing conflicts. The development of a global political coalition, which abandons traditional assumptions and combines security, energy, and sustainable environmental development as well as poverty alleviation, can contribute significantly to our common objective of peace and stability.

Desertification and Climate Change

Synergies between the UNCCD National Action Programmes, which are building bridges between development and environment policies, and the United Nations Framework Convention on Climate Change National Adaptation Programmes of Action, present a unique yet still untapped - opportunity to establish comprehensive policy instruments. Such an integrated approach to tackling desertification and climate change will have multiple benefits, especially for the poor in the world’s drylands, who are suffering most from the double blow of desertification and climate change.

Linking the activities of the two conventions rather than designing, implementing and managing climate policy separately from combating desertification makes sense from an efficiency and mainstreaming perspective. In countries with scarce financial and human resources this is particularly true. Indeed, coordinating mitigation and adaptation strategies to address aspects of climate change and desertification in one stroke is needed to facilitate the development of innovative poverty reduction strategies, strengthen the adaptation capacities of vulnerable lower income groups, and fight climate change through carbon sequestration and emission reductions.

Carbon sequestration projects in the wide expanses of dryland agro ecosystems, for example, could have significantly greater benefits than expected through soils conservation. The sequestration of carbon in these soils has the potential to counter degradation and increase the productivity and sustainability of these ecosystems. These projects could also provide significant social benefits by increasing food security, which in turn would promote better habitat conservation. Local population could therefore mitigate climate change while combating desertification and protecting biological diversity.

The Ten-Year Strategic Plan: Framework for Implementation of the UNCCD (2008 - 2018)

The Ten-Year Strategic Plan and framework to enhance the implementation of the *United Nations Convention to Combat Desertification* (UNCCD) (2008–2018), adopted by its Parties at the *Conference of the Parties* (COP 8) in Madrid in September 2007, is the latest manifestation of the international community's resolve to address the problem of land degradation and desertification as a major barrier in the fight against poverty in many parts of the globe.

This UNCCD Strategy recognizes that combating *desertification, land degradation and drought* (DLDD) is a global environmental challenge, which deserves a specific momentum and strong international mobilization. This new UNCCD Strategy is to provide a global framework to support the development and implementation of action programmes and policies to prevent, control and reverse deserta-

tion/land degradation and mitigate the effects of drought.

The main objectives of the Strategy include actions to improve both the living conditions of affected populations and the conditions of affected ecosystems; to generate global benefits through effective implementation of the Convention, and to mobilize resources to support the implementation process through building effective partnerships between national and international actors.

Facing Environmental Change by Combating Desertification

Desertification is a major factor contributing to global environmental change in arid and semi arid regions. It contributes to the degradation of agricultural land that becomes also scarcer due to the population dynamic. Both often result in environmental stress. Desertification is also closely linked with several human-induced natural hazards, such as drought, that often trigger famines. In some cases, both the cause (desertification) and the impact (drought, famine) have posed complex threats, challenges, vulnerabilities and risks to human and national security, confronting the affected people often with a "survival dilemma" (Brauch 2004, 2005, 2006, 2008c), either to stay on their degraded land or to move to the urban centres or to emigrate to other countries and supporting the families left behind with remittances. In a few cases these complex interactions may have contributed to conflicts with low levels of violence, in others they may have fostered cooperation within and between countries.

The UNCCD operates today in an environment, which has evolved considerably since the Convention was first negotiated and faces different opportunities and constraints. The policy environment has changed since Rio as a result of the outcome of the *World Summit on Sustainable Development* (WSSD) and the adoption of the *Millennium Development Goals* (MDGs). The newly adopted UNCCD Ten-Year strategic plan offers an historical opportunity to make a lasting contribution to the achievement of sustainable development, particularly goal number one regarding the eradication of extreme poverty and hunger.

Box: Background information on UNCCD and on the UNCCD Secretariat in Bonn

The Convention

In 1977 the United Nations Conference on Desertification (UNCOD) adopted a Plan of Action to Combat Desertification (PACD). The United Nations Environment Programme (UNEP) concluded in 1991 that the problem of land degradation in arid, semi-arid and dry sub-humid areas had intensified, although there were "local examples of success".

The United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 supported an integrated approach to the problem, emphasizing action to promote sustainable development at the community level. It also called on the United Nations General Assembly to establish an Intergovernmental Negotiating Committee (INC) to prepare, by June 1994, a Convention to Combat Desertification, particularly in Africa. In December 1992, the General Assembly agreed and adopted resolution 47/188.

The Convention was adopted in Paris on 17 June 1994 and entered into force on 26 December 1996. It is the only international legal instrument to address the issue of desertification and now counts 193 country Parties.

The UNCCD Secretariat

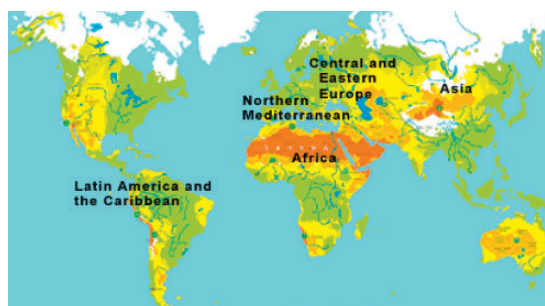
The permanent Secretariat of the UNCCD was established in 1997. It has been located in Bonn, Germany, since January 1999, and moved to the new UN campus in July 2006.

The functions of the secretariat are to make arrangements for sessions of the Conference of the Parties (COP) and its subsidiary bodies established under the Convention and to provide them with services as required. One key task of the secretariat is to compile and transmit reports submitted to it.

Pursuant to the adoption of the UNCCD Ten-Year Strategic Plan (2008–2018), the Secretariat undertook a comprehensive process of corporate review and structural adjustment, which aims not only at providing enhanced substantive services to the Conference of the Parties and its subsidiary bodies, but also upgrading its analytical and knowledge-brokering functions. In this regard, the Secretariat encourages coalition building and system-wide cooperation to enhance support at all levels. It further facilitates the treatment of emerging issues, new mechanisms or legislative tools to support sustainable land management. Support to the strengthening of the scientific basis of the UNCCD process is amongst the main areas of work of the secretariat, with focus on assisting the Committee on Science and Technology to bring forth scientific and technological excellence and standard setting.

UNCCD activities are coordinated with the secretariats of other relevant international bodies and conventions, such as the UN Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD).

Desertification in the world



Access to regional and country overviews at:
<http://www.unccd.int/regional/menu.php>

National, Sub-regional and Regional Action Programmes

National Action Programmes (NAP) are one of the key instruments in the implementation of the Convention and are strengthened by Action Programmes at Sub-regional (SRAP) and Regional (RAP) levels. National Action Programmes take a participatory approach, with direct involvement of the affected local communities. They spell out the practical steps and measures to be taken to combat desertification and to promote sustainable development in arid ecosystems.

Youth in the UNCCD implementation processes

The UNCCD has facilitated a number of initiatives in recent years in the fight against desertification. Significant among these are 'youth and environment' projects in different parts of the world. These are seen as particularly valuable, because as the future generation, young people will manage the scarce natural resources as well as suffer the severe consequences of environmental degradation, including poverty and unemployment.

Reforestation projects undertaken by Argentina, China and Mozambique, for example, accomplish a number of objectives. While helping to preserve the environment, they also create income-generating activities for young people in areas of high unemployment. The projects also increase the capacity of these communities to implement sustainable development policies in the framework of the UNCCD National Action Programmes.

In addition, the projects have been implemented in areas where they can address the issues of poverty, land degradation, carbon sequestration and loss of biodiversity at the same time, thus strengthening synergies between the Rio Conventions on Desertification, Climate change and Biodiversity.

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Facing Global Environment Change and Disaster Risk Reduction

Salvano Briceño¹

Environmental disruptions are generally recognized as an increasingly important factor of migration. The linkage between population displacement, environmental change and vulnerability to natural hazards has been a topic of growing concern to the international community. Environmental disruption is recognized as both a cause and a consequence of population movements. It is a cause when people can no longer gain a secure livelihood in their homelands and are obliged to flee, having no other alternative. It is a consequence when environmental degradation results from the mass movement of people, both in the departure and the receiving areas.

This environmental disruption can take many forms: brutal or slow-onset, natural or man-made, due to a single or cumulative change. For example, the projected impacts of drought and global warming in the drylands of Africa are overwhelmingly negative and it will have significant impacts on human livelihoods, health, water resources, agricultural production and food security, as well as nature-based tourism. If we are to succeed in ensuring environmental security in the face of great challenges to the sustainability of our planet, the United States and the European Union must firmly commit to serving as international leaders in devising and abiding by practical and appropriate multilateral approaches for preserving the environment.

People affected by well-publicized environmental disasters like the 8 October 2006 earthquake in Pakistan, the 2004 Indian Ocean tsunami or the U.S. Gulf Coast hurricanes benefit from the mobilization of private and public sector generosity and humanitarian relief. Countless millions of others around the world,

however, are uprooted by gradual environmental change like desertification, land degradation and sea level rise. Forced to move elsewhere, these displaced people receive comparatively little support such as food, tools, shelter, medical care and grants, and are not even recognized as “refugees”. There are international mechanisms to assist those fleeing wars or conflicts but there is nothing right now to deal with environmental refugees. We should prepare now, to define, accept and accommodate this new breed of ‘refugee’ within international frameworks. The term ‘environmental refugee’ must be carefully defined and distinguished from economic migrants, who depart voluntarily to find a better life but may return home without persecution. But defining an environmental refugee is a contentious issue.

People often believe that nearly all environmental disasters are disasters caused by natural hazards when in fact they are the result of human actions, such as unsustainable use of natural resources, unplanned urban growth, lack of awareness and institutional capacities, insufficient land use planning, housing, infrastructures located in hazard prone areas, ecosystem degradation, and so on. Even in the case of natural events like hurricanes, building a city like New Orleans below sea level in a known hurricane zone was a human decision that led to an environmental and human catastrophe. Worries about toxins in the environment and the costs of rebuilding will likely mean that a large percentage of people displaced from New Orleans will never move back.

Chief among the slow-moving disasters is land degradation or desertification, where croplands and pastures - because of mismanagement enhanced by

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changing climate, - can no longer support the people that live there. Millions of people in Africa and Asia have been forced off their land, and where states cannot cope, the international community has to step in.

On the issue of environmental security, migration and disasters resulting from increased vulnerability, like so many global challenges, my duty as Director of the United Nations International Strategy for Disaster Reduction (UN/ISDR) is to ensure that those countries experiencing disasters due to vulnerability to natural hazards, particularly in the developing world, find their voice, and that their voice is heard. During the second World Conference on Disaster Reduction (WCDR, Kobe, Hyogo, Japan, 18-22 January 2005), more than 160 governments agreed on the *Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters*. The *Hyogo Framework* carries a strong commitment and ownership of governments and regional, international and non-governmental organizations to reduce the vulnerability to hazards by 2015. All relevant actors coming from different development sectors (health, education, agriculture, tourism, etc.), national disaster management systems, business sector, academic, scientific and technical support organizations have now proceeded to ensure effectiveness in translating the hopeful expectations of the *Hyogo Framework* into the practical measures at international, regional, national, and community levels, and tangible activities by which progress in disaster reduction must be measured.

The *Hyogo Framework* puts forward three strategic goals which may serve as guiding principles in any efforts to advance future education for disaster reduction. It calls for the integration of disaster risk reduction into sustainable development policies and plan-

ning; the need to develop and strengthen institutions and capacities to build resilience to hazards; and the systematic incorporation of risk reduction practices into emergency preparedness, response and recovery programmes.

Most importantly, it provides a basis that commits governments as well as regional, international, and non-governmental organizations to reduce disaster risks through a range of possible approaches and activities presented in five priority areas for action:

1. *Governance* - to ensure that disaster risk reduction is a national and local priority with strong institutional basis for implementation;
2. *Risk identification* - to identify, assess and monitor disaster risks and enhance early warning;
3. *Knowledge* - use knowledge, innovation and education to build a culture of safety and resilience at all levels;
4. Reduce underlying risk factors that increase the likelihood of disasters by involving ('mainstreaming') disaster risk awareness
5. Strengthen disaster preparedness for effective response.

To be sure, the challenges we face are vast. Today, there are millions of so-called eco-migrants who leave their homes every year because of the creeping reach of the world's deserts or the destruction of natural resources that once guaranteed jobs and a way of life. The potential for political instability from drought, famine or forced migrations as a result of desertification is enormous. Millions could be forced to flee their homes and seek new lands for agricultural production. Only by embracing global approaches in team efforts can we solve the global problems that threaten the planet and our future.



Climate Change and Security: A Destablizing Fact of Life

Michael Zammit Cutajar
Former Executive Secretary, UNFCCC
Honorary Ambassador for Climate Change, Malta

In his 2004 apocalyptic fiction movie *The Day After Tomorrow*, director Roland Emmerich included a touch of humour, showing inhabitants of the U.S. of a reversing of the usual migratory flow and crossing the Rio Grande southwards as they flee their freezing homeland. In his award-winning documentary *An Inconvenient Truth*, Al Gore shows a 20-foot sea-level rise sweeping in tsunami-like and engulfing Manhattan, as well as Shanghai and other mega-cities. Tongue-in-cheek humour in the one case, dramatic licence in the other no doubt – but both sending the same message: climate change will destabilize life as we know it and spread a new insecurity around the globe.

Climate change is an unequivocal fact. Human activity has been destabilizing the global climate. The resulting changes, mostly negative in their impacts on society and on ecology, are taking place faster than expected. There is an urgent need for action to contain this trend over the next two or three decades if it is to remain within manageable limits this century. Even within those limits, societies everywhere will have to take stock of the expected changes and adapt to them. Those, in a nutshell, are the messages coming to us from the world's scientists, with ever-greater force and confidence, in the fourth assessment of the Intergovernmental Panel on Climate Change (IPCC AR4 2007). That is the source of the political furore that breaks out from time to time over what is to be done, when and by whom.

Climate change has made it to Hollywood. Not only through a politician turned media star, but also through a media star turned politician: Governor Arnold Schwarzenegger has placed California where it likes to be, at the cutting edge of a new trend, in this case a political one. Indeed, the impacts of climate change and the responsibility for doing something about them are entering the strategic vision of politi-

cal leaders around the world. The effects of climate change fall preponderantly on the supply of food and water, the mainstays of life. The response to climate change is intertwined with the secure supply of energy, the heartbeat of the economy on which a decent and hopeful life depends. Sea-level rise induced by global warming will eat away at living space on low-lying islands and mega-deltas. Climate change will exacerbate natural disasters – hurricanes, floods, droughts – that disturb life, sometimes snatching it away prematurely.

How does this look in the eye of the ordinary family, living way below the political heights? It depends essentially on that family's wealth or poverty. Rich people – like rich countries – tend to believe they can buy their way out of most problems, although the altruistic among them seek to do well. For poor people, problems accumulate beyond their control. Climate change is one of these – an additional factor of stress and vulnerability in their already precarious lives. In areas of existing food and water stress – the Sahel, the Horn of Africa for example – the effect of global warming gives another push towards the decision to make the dangerous migration to the hope of a better life in distant lands. Globally, hundreds of millions of people will face that decision on account of their changing climate.

Adding all this up, climate change has come to be recognized as yet another threat to the prospect of a peaceful and relatively stable world, aggravating tensions over access to food, water and energy and over population movements. Addressing climate change is now an unavoidable part of the continuing struggle by governments and people to make our world a better place.

What is the cause of the problem? We all are. From the exhaust of the luxury limousine to the wood fire inside an impoverished hut, from the rotting

waste of the consumer society to the exhalations of a subsistence rice paddy, much of human activity contributes to the accumulation of gases in the atmosphere that have kicked off a warming trend, departing from the temperature pattern of the previous millennia. This human impact – known as the greenhouse effect – has been a by-product of demographic and economic growth since the start of the industrial era. But clearly an ethical distinction needs to be drawn between the emissions of plenty and those of poverty.

Thus, the historical responsibility for human-induced climate change is not evenly distributed. The countries now riding high on global prosperity account for the bulk of accumulated emissions of greenhouse gases, in aggregate and per capita, with the U.S.A. at the top of the heap. It is they that have the responsibility and the capacity to take the lead in changing technologies and consumption patterns so that prosperity may be enjoyed with less damage to the environment.

But reality is not black-and-white. Even if the presently rich countries were to wave their technological wands and conjure up 'zero emission' life-styles, climate change would continue to be fuelled by the economic growth of the developing world unless technological change is wrought there too. The populous powerhouses of the emerging world – notably China and India – run on dirty fuels using old technologies. The avarice of power combines with the desperation of poverty to strip tropical forests that could otherwise serve to absorb greenhouse gases naturally. In showing the climate-friendly way ahead, the rich world must also provide financial and technological

incentives for the rest to follow. And support must be provided, in a spirit of solidarity, to the vulnerable people and countries least able to cope with and adapt to the impacts of climate change.

For 20 years, the protection of the global climate has been on the international agenda. It was my country, Malta, that brought the issue to the United Nations in 1988. Since that time, the IPCC has been working to provide regular assessments of the science of climate change and its impacts. The world's governments have set up a framework for cooperation: the 1992 UN Framework Convention on Climate Change (UNFCCC) and its 1997 Kyoto Protocol. The latter, aiming to start off the reduction of greenhouse gas emissions by the industrialized countries, has been hindered by its rejection by the current President of the USA.

But the year 2007 has brought new encouraging signs. The confirmation of the Stern Review that prevention is better than cure – the finding that investing now in curbing greenhouse emissions will cost much less than repairing climatic impacts *ex post* – has sent a very strong and positive message around the world's capitals and boardrooms. This has been reinforced by the vigour of the IPCC's latest findings. With the European Union in the vanguard, the year 2007 has seen a resurgence of efforts to launch a multilateral attack on climate change with all the major players on board, developed and developing. There are now high hopes of a new global deal by 2009. Although negotiated with other concerns in mind, this will make an important contribution to enhancing global security.



Facing and Coping with Globalization: How Ten Years of WTO have Created an Agrarian Crisis in India

Vandana Shiva¹

WTO: An anti-democratic Agenda Beyond Trade

The *World Trade Organization* (WTO) came into existence as an outcome of the Uruguay Round of the *General Agreement on Trade and Tariffs* (GATT). The Uruguay Round changed the definition of trade dramatically. In the pre-WTO period, international trade rules governed trade in goods outside national borders. The WTO became an undemocratic instrument for interference into domestic economies, and it did not just change the nature of trade but the nature of production, and social and political patterns through which societies govern themselves. Trade and commerce were disembodied from society and democracy. New issues introduced in the Uruguay Round such as intellectual property, food and agriculture, services and investment are actually redesigning society to suit corporate interests without the consent of the people.

Global trade rules, as enshrined in the WTO's *Agreement on Agriculture* (AOA) and in the *Trade Related Intellectual Property Rights* (TRIPs) agreement, are primarily rules of robbery, camouflaged by arithmetic and in legal terms. In this economic hijack, the corporations gain, and people and nature loose. During the Uruguay Round, India led the resistance against the introduction of new issues. The Uruguay Round was concluded through a non-negotiated, take-it-or-leave-it text drafted by Arthur Dunkel, the then Director General of WTO.

The global reach of corporations to take over the resources of the poor of the Third World is made possible not just by reduction and removal of tariffs, one of the goals of the WTO. It is facilitated by the re-

moval of ethical and ecological limits on what can be owned as private property and what can be traded. The WTO's overall goal of promoting 'market competition' serves two functions. Firstly, it transforms all aspects of life into commodities for sale. Culture, biodiversity, food, water, livelihoods, needs and rights are all transformed and reduced to markets. In this way, globalization is completing the project of colonization that led to the conquest and ownership of land and territory. Biological resources and water, the very basis of life's processes, are being colonized, privatized, and commoditized.

Agriculture, which is still the primary livelihood for three quarters of humanity and two thirds of India, and which is as much a cultural activity as an economic one, is also threatened by 'trade liberalization', driven both by the structural adjustment programmes of the World Bank and the IMF, and by the WTO's *Agreement on Agriculture*. The globalization of food and agriculture systems, in effect, means the corporate take-over of the food chain, the erosion of food rights, the destruction of the cultural diversity of food and the biological diversity of crops, and the displacement of million from land-based, rural livelihoods.

WTO Disputes: Dismantling People's Rights to Seeds and Food

Two of the earliest WTO disputes were brought by the U.S against India. The first was the TRIPs dispute which forced India to change its patent laws, the second was the QR (quantitative restrictions on imports) dispute, which forced India to remove its protection against dumping and cheap imports.

1 The copyright holder for the photo is Nic Paget-Clarke <<http://www.inmotionmagazine.com/shiva.html>>.

TRIPS and Seed Monopolies

To understand the flaws of TRIPS, it is important to know that this agreement is essentially the globalization of Western patent laws that historically have been used as instruments of conquest. The word 'patents' derives from 'letters patent' – the open letters granted by European sovereigns to conquer foreign lands or to obtain import monopolies. Christopher Columbus derived his right to the conquest of the Americas through the letter patent granted to him by Queen Isabel and King Ferdinand of Spain.

The US Patent Laws are based on the takeover of knowledge. One outcome was that broad patents were granted in the US for steamboats – in spite of the steam engine having been invented and patented by James Watt in Scotland fifteen years before.

The US has continued to ignore the pre-existence and use of inventions in other countries when granting patents. Thus, paradoxically, a legal system aimed at preventing 'intellectual piracy' is itself based on legitimizing piracy. This system is codified in Section 102 of the US Patent Act of 1952, which denies patents for inventions that are in use in the US but allows patents for inventions in use in other countries unless they have been described in a publication. If somebody in Europe was operating a machine and you, in good faith, independently and without knowledge of its existence, developed your own invention of essentially the same machine, that fact would not prevent you from obtaining a patent in the US.

In addition, the US has created unilateral instruments such as clause Special 301 in its Trade Act to force other countries to follow its patent laws. Thus, a country that depended on borrowed knowledge for its own development of industrial power has acted to block such transfer of knowledge and technology to other countries.

Introduction of TRIPS

During the Uruguay Round of the GATT, the US introduced its flawed patent system into the WTO, and thus imposed it on the rest of the world. U.S corporations have admitted that they drafted and lobbied on behalf of TRIPS. As a Monsanto spokesman said "The industries and traders of world commerce have played simultaneously the role of patients, the diagnosticians, and prescribing physicians."

TRIPS not only made *Intellectual Property Rights* (IPR) laws global geographically, but also removed ethical boundaries by including life forms and biodi-

versity into patentable subject matter. Living organisms and life forms that are self-creating were thus re-defined as machines and artefacts made and invented by the patentee. IPRs and patents then give the patent holder a monopolistic right to prevent others from making, using or selling seeds. Seed saving by farmers has now been redefined from a sacred duty to a criminal offence of stealing 'property'. Article 27.3 (b) of the TRIPS agreement, which relates to patents on living resources, was basically pushed by the 'Life Science' companies to establish themselves as 'lords of life'.

The chemical companies of the world have bought up seed and biotechnology companies and reorganized themselves as life science corporations, claiming patents on genes, seeds, plants and animals. Ciba Geigy and Sandoz have combined to form Novartis, Hoechst has joined with Rhone Poulenc to form Aventis, Zeneca has merged with Astia, Dupont has bought up Pioneer HiBred, and Monsanto now owns Cargill seeds, DeKalb, Calgene, Agracetus, Delta and Pine Land, Holden and Asgrow. Eighty per cent of all genetically engineered seeds planted are Monsanto's 'intellectual property'. And Monsanto owns broad species patents on cotton, mustard, soya bean – crops that were not 'invented' or 'created' by Monsanto but have been evolved over centuries of innovation by farmers of India and East Asia working in close partnership with biodiversity gifted by nature.

The disastrous impact of WTO in creating seed monopolies has already been felt in India. India's 1970 patent act has been amended three times and there is an attempt to introduce a new seed law which would destroy biodiversity and farmers rights. The epidemic of farmer's suicide is the real barometer of the stress under which Indian agriculture and Indian farmers have been put by globalization of agriculture. Growing indebtedness and increasing crop failure are the main reasons that the farmers have committed suicide across the length and breadth of rural India. The suicides by farmers highlights these high social and ecological costs of the globalization of non-sustainable agriculture which are not restricted to the cotton growing areas of these states but have been experienced in all commercially grown and chemically farmed crop in all regions. While the benefits of globalization go to the seeds and chemical corporation through expanding markets, the cost and risks are exclusively born by the small farmers and landless peasants.

Globalization and privatization of the seed sector have eroded farmers seed supply and seed supplied by

the public sector. While the entry of private seed companies is justified on grounds of increasing farmers options and choices, by making farmers look down on their own varieties as inferior and by eroding the capacity of the public sector, globalization has in effect created a seed famine. Monopolies have contributed to farmers suicides as we analyse in our report *Seeds of Suicides*. As a consequence of the farmers' suicides and high seed costs, the Andhra Pradesh Government brought a case against Monsanto / Mahyco before the *Monopolies and Restrictive Trade Practises Commission* (MRTPC).

Monsanto enjoys a monopoly on production, supply and marketing of Bt. Cotton seed in India. The firm operates through its subsidiary - Mahyco. From the last few years, the company has been charging a 'trait value' (price fixed for research and development on Bt. Cotton seed, which can resist local pests) at Rs. 1750 per pack of 450 grams of seed. The multinational corporation (MNC) gets the seed for Rs. 300 per pack of 750 grams from the farmers who grow it under the company's supervision. The government has challenged the validity of the 'trait value' in the court and demanded its abolition. The government has also demanded Rs. 400 crore from the company, which it collected from the farmers.

The MRTPC directed the Mahyco-Monsanto to reduce the 'trait value' to a reasonable extent. The MNC tried to approach the Supreme Court to stay the order of the MRTPC. But, the apex court refused to grant a stay. Meanwhile, the Andhra Pradesh Government had convened a meeting of the seven other states - Orissa, Karnataka, Maharashtra, Tamil Nadu, Madhya Pradesh, Punjab and Haryana. It was decided in the meeting to bring pressure on Monsanto to reduce the price of Bt. Cotton seed so that farmers are not overburdened by the exorbitant price. The Andhra Pradesh Government's contention is that the high price of the Bt. Cotton seed is one of the reasons for distress among farmers. More than 2000 farmers committed suicide in the last eight years in Andhra Pradesh alone and most of them were cotton growers.

In a parliamentary debate the government admitted the more than 100,000 farmers had committed suicide in the last decade. Rising costs of seeds and other inputs, combined with falling prices of agricultural commodities are the primary cause of indebtedness and indebtedness is the primary cause of farmer's suicide. Both the rise in costs of production and decline in prices of farm produce are driven by the trade liberalization rules of WTO.

AOA, Renewal of QR's and Falling Farm Prices

All over the world, structural adjustment and trade liberalization have already driven millions of farmers off the land because of rising costs of production and collapsing prices of commodities. Instead of supporting policies that help farmers survive, WTO rules are driving small farmers to extinction and ensuring that agriculture is controlled by global corporations.

The AOA of the WTO is a rule-based system for trade liberalization of agriculture that was pushed by the US in the Uruguay Round of the GATT. However, these rules are the wrong rules for protecting food security, nature and culture. Instead, they are perfectly shaped for the objective of corporate rule over our food and agriculture systems. The AOA rules apply to countries, even though it is not countries for their farmers that engage in global trade in agriculture but global corporations like Cargill. These firms gain from every rule that marginalizes farmers by removing support from agriculture. They gain from every rule that deregulates international trade, liberalizes exports and imports, and make restrictions of exports and imports illegal. Market openings through the AOA are therefore market openings for the Cargills and Monsantos.

The outcome of negotiations for the AOA should not be surprising, because global agribusiness corporations had tremendous influence on the negotiations. In fact, the U.S delegation was led by Clayton Yeutter, a former Cargill employee. There are three components to the AOA

- Domestic Support
- Market Access
- Export Competition

The WTO dispute to remove QR's was the means to get across to India's markets. However, since the rich countries subsidize their agriculture up to \$ 400 billion annually, removal of import restrictions amounts to removing the protection against cheap imports and dumping. As a result of subsidies, prices of agricultural commodities have been falling worldwide.

The crisis in cotton is an example of the agrarian crisis created by globalization. The worst suicides are taking place in the cotton belts of Vidharbha, Andhra Pradesh, Karnataka and Punjab. More than 70 countries globally produce and export cotton. Of these, eight countries are responsible for almost 80 per cent of global output. The world's cotton market is dominated by the US, - which is the second largest pro-

Commodity	1988	1995	1997	2000	2001 (Jan.)	Percent Change 2001 over 1995
Wheat (US HW)	167	216	142	130	133	-38.2
Wheat (US RSW)	160	198	129	102	106	-46.5
Wheat (Argentina)	145	218	129	112	118	-45.9
Maize (Argentina)	116	160	133	88	80	-50.0
Maize (U.S)	118	159	112	97	92	-22.0
Rice (U.S)	265.7	-	439	271	291	-33.7
Rice (Thai)	284	226	316	207	179	-46.7
Cotton	63.5	98.2	77.5	66	49.1	-50.0
Groundnut Oil	590	991	1010	788	-	-20.5
Palm Oil	437	626	93.5	74.7	-	-88.1
Soya bean Oil	464	479	625	71.4	-	-85.1
Soya bean Seed	297	273	262	199	178	-
Soya bean Seed	110	156	111	102	99	-36.5
Sugar	10.2	13.3	11.4	10.2	9.2	-30.8
Jute	370	366	302	276	-	-24.6

ducer. Support to the cotton sector is greatest in the US, followed by China and the EU. The combined support (domestic and export subsidy) provided by the US government to cotton producers is pegged at US\$ 4 billion. The US subsidy system is based on direct payments to farmers who can sell cotton in world markets at prices well below the cost of production. Production costs are US\$ 1.70 per kg but its cotton is sold at US\$ 1.18 per kg. Export subsidies for 2005-2006 amount to US\$ 360 million.

The worst losers are farmers in the least developed countries. This subsidy is helping only a few thousand farmers in the developed nations but is putting millions of poor Africans and Indians into a death trap. For example the \$ 4 billion subsidy that the US gives is only meant for 20,000 farmers who cultivate cotton. Meantime, falling cotton prices are creating US\$ 250 million increased poverty in several central African countries such as Burkina Faso, Chad, Mali and Togo.

In India falling cotton prices driven by the removal of import restrictions are killing our farmers. Before 1990 cotton import and export was totally controlled by the central government. After the formation of WTO in 1995, cotton import and export has been free. But we could not export cotton as prices in international market had fallen to one third from what was it was in 1994. The cost of production in America of

1 kg of cotton lint is not less than US\$ 1.8. But it is sold in international market at US\$ 1.0 per kg. This is why cotton farmers in India are committing suicide.

Traditionally, India has been a net cotton exporter. But by 1998, it emerged as a major importer due to policy changes. Imports were liberalized when the Cotton Corporation of India's import monopoly was terminated in 1991. Now imports are subject to the Open General License, allowing unrestricted imports by private traders.

The story of falling prices is repeated in spices, edible oil, and dairy products. Suicides of Wynad farmers are directly connected to imports of spices. According to the Government of Kerala, falling prices have led to losses of Rs. 2958 crores for coconut farmers, Rs. 695 crores for pepper farmers, Rs. 924 crores for arecanut farmers, Rs. 388 crore for coffee growers and Rs. 178 crore for tea grower and Rs. 70 crore for cardamom growers in 2000-2001. In India, agricultural imports have gone up by 300 per cent during the last decade. While edible oil imports have increased by 398 per cent, cotton imports have multiplied by a whopping 13,153 per cent. Sugar, fruits and vegetables and spices are some other commodities that have poured in unchecked. For all agricultural commodities, our study *The Mirage of Market Access* assesses that falling prices due to imports have led to annual losses of Rs. 116200 crores of Indian farmers.

Changing the Trade Rules

The growing agrarian crisis India is experiencing, with farmers suicides as the most tragic expression of the crisis, is a direct result of WTO rules and the trade liberalization paradigm. It is an imperative to change these rules to allow for the protection of Indian farmers against cheap imports. This requires re-introducing QR's. We also need to be able to promote national and local food security policies. Food and agriculture are issues of livelihood and basic needs, not mere matters of trade. Across the world, people are calling for removing agriculture from the WTO.

Similarly, WTO is the wrong place to create rules for intellectual property. TRIPS must also be removed from WTO. This is the suggestion from experts and the call of the movements like the '*Indian People's campaign against WTO*' convened by Mr. S.P. Shukla, who was Ambassador to GATT during the Uruguay Round.

The WTO is in deep crisis because it imposed unjust and asymmetric rules on the South. The Seattle ministerial (1999) failed because of people's resistance. The Doha Round (since 2001) was negotiated in the shadow of 9/11. Cancun (2003) failed because the South organized under the G-20, with India as a leading player, and the G-90 the group of least development countries. Hong Kong (2005) too would have failed, but this time India and Brazil joined the rich countries to produce a disastrous draft. The emptiness of the promises made in Hong Kong were born out by the failure of the WTO negotiations in July 2006.

The Doha round negotiations collapsed once again at the Mini Ministerial in Geneva on 23rd July 2006. Martin Khor of Third World Network reported from Geneva that when asked of the Doha Round is dead or in intensive care, Mr. Kamal Nath, India's Commerce Minister, said it is somewhere between intensive care in hospital and the crematorium. Peter Mandelson, the EU Trade Commissioner, told the press following suspension of WTO negotiations, "we have missed the last exit on the motorway."

The US is being identified by all as responsible for the collapse of talks, by its refusal to reduce its agricultural subsidies. The US and its corporations were the driving force behind two agreements of the Uruguay Round, which have the highest impact on the poor of the Third World. The TRIPS Agreement has increased the cost of seeds and medicine by promoting monopolies. Thousands of Indian farmers have committed suicide due to debts resulting from a new

dependence on costly yet unreliable hybrid and Bt cotton sold by Monsanto and its Indian partners. The *Agreement on Agriculture* (AoA) has destroyed agricultural livelihoods of millions of peasants and food security of the world's poor. The Deputy Chairman of the Planning Commission wants to see an "exit policy for farmers of India, which in effect means planning for the destruction of their livelihoods.

The willingness of the US to allow the Doha Round negotiations to grind to a halt by showing inflexibility in offering to reduce distorting farm subsidies in exchange for increased market access is not because agricultural market access is no longer of interest to the US. The US does not have to give up anything multilaterally because it is getting market access bilaterally, often with 'non-agreements' like the US - India Knowledge Initiative in Agriculture, which is promoting GMOs, agricultural imports and the entry of the US giant Walmart into the Indian retail. Monsanto, Walmart and ADM are on the board of the US India Agriculture Initiative.

USAid is interfering directly in India's gene modification (GM) policies and has financed the push to commercialize Bt Brinjal, which would be the first GM food crop approved for large scale commercial trials and seed production in India. While India's biosafety assessment framework has no reference to the unscientific 'substantial equivalence' principle, (a principle promoted in the US to avoid looking for the unique biological impacts of GM foods), the 'substantial equivalence' is the basis of Bt Brinjal data submitted by Monsanto-Mahyco to the *Genetic Engineering Approval Committee* (GEAC), the statutory body for granting approvals for *gene modified organism* (GMOs). The virus of biosafety deregulation is thus being subtly introduced into India. GMOs are spreading bilaterally without the WTO, which had to be used against Europe in the US - EU GMO dispute.

The US biotech agenda is also being internalized into India's agricultural policy. The Planning Commission, India's highest planning body, headed by Montek Singh Ahluwalia is appointing a non-resident, the US based Dr. Deshpal Verma, Professor of Genetics and Biotechnology at Ohio, to head a cell to promote GMOs in agriculture and to increase the role of global corporations like Monsanto in the farm sector. Bilateral deals are thus mutilating into unilateral policies referred to an 'autonomous liberalization'.

US agribusiness like Cargill and ADM do not need WTO's market access rules anymore to capture India's markets. As part of the Bush-Singh agreement, India has been influenced to import wheat, even

though there was enough wheat produced in India. And domestic markets too have been captured by MNC's like Cargill, Canagra, Lever, and ITC. India's food security is being systematically dismantled. Food prices have increased dramatically, and with it, hunger and malnutrition. While being presented as an economic power and the new poster child of globalization, India now is the home of one third of the world's malnourished children. And the problem of hunger will grow as peasants are pushed off the land and food prices increase.

Meantime, corporations like Walmart are trying to grab India's retail market, which consists of the small-scale informal sector employing more than 200 million people. Walmart is trying to get into capturing this large market and has succeeded in getting FDI pushed through in retail. It is also trying to partner with Reliance Industry Ltd (RIL), which is planning to

build new super stores in 784 Indian towns, 1600 farm supply hubs, and move the produce with a 40-plane air cargo fleet. The Reliance group has also become the largest land grabber in India, using governments to forcefully acquire hundreds of thousands of acres of fertile farmland at 1/1000th the market price. These are the subsidies Walmart is seeking through partnerships. And Walmart does not need a *General Agreement on Trade in Services* (GATS) to take over retail services in India. Bilateral and unilateral policies are opening up India's markets for Walmart. WTO might be on life support, but 'free trade' is alive and kicking.

Bilateral and unilateral, initiatives are the new avatars of globalization and free trade. And it is these avatars we must challenge to stop corporate rule, while WTO hangs between intensive care and the crematorium.

1 Introduction: Facing Global Environmental Change and Sectorialization of Security

Hans Günter Brauch

1.1 Introductory Remark¹

This second volume of the *Global Security Handbook for the Anthropocene*² focuses on issues of *Global Environmental Change* (Young/Demko/Ramakrishna 1996; Munn 2002; Oldfield 2005, Ehlers 2008) that have contributed to a *reconceptualization of security in the 21st century*. This has evolved since the end of the Cold War and has significantly been influenced by the globalization process (Brauch 2008, 2008a).

This reconceptualization of security has resulted in a ‘*widening*’ of the dimensions of security from the narrow political and military focus during the Cold War era towards an inclusion of economic, societal and environmental dimensions, a ‘*deepening*’ of the referent objects from the nation state (or ‘national security’) to the international realm (international, regional, and global security), as well as to the sub-state level (of societal, communal, and human and gender security) and a ‘*sectorialization*’ of the applications of

security to different issue areas (energy, water, health, livelihood security concepts).

Three stages of *Global Environmental Change* (GEC) can be distinguished:

1. The emergence as a new multidisciplinary scientific field of study since the 1970’s and 1980’s that has focused on climate change, desertification, water and biodiversity, as well as on the depletion of the ozone layer. Since the 1990’s global change scientific networks, programmes (IGBP, IHDP, DIVERSITAS, WCRP), and projects as well as policy focused scientific epistemic communities (Haas 1989, 1990, 1992, 1993) as the IPCC (Bolin 2007) have evolved that assess and interpret scientific research results, and explain them to the global policy community and via the media to a global attentive public (*scientific agenda setting*).
2. The development of a new major policy field of international (environment) policy since the Earth Summit (UN Conference on Environment and Development) in Rio de Janeiro in 1992 has resulted in new forms of international governance (climate change, biodiversity, desertification, water regimes) that have moved to the centre of political concerns (*politicization*³ through major global governmental conferences in the framework of the annual *conference of parties* (COPs) of UNFCCC⁴, CBD⁵, UNCCD⁶, and the triennial World Water Fora (I: 1997 in Marrakesh; II: 2000 in The Hague; III: 2003 in Kyoto; IV: 2006 in Mexico City; V: 2009 in Istanbul).⁷
3. Since the early 21st century this process of *politicization* has been complemented by a process of

1 The author is grateful to two reviewers for their useful comments and suggestions.

2 The term ‘Anthropocene’ was coined by the Nobel Laureate Paul Crutzen (2002, Crutzen/Stoermer 2001, Clark/Crutzen/Schellnhuber 2004, 2005, Ehlers 2008; see chap. 98 by Oswald Spring/Brauch/Dalby). It refers to an evolving transition in Earth history from the Holocene, the present interglacial period that followed the last glacial period of the Pleistocene about 10,000 years ago (Goudie 1996: 48–66), to a new period that has been increasingly influenced by human or ‘anthropogenic’ interferences of humankind since the start of the Industrial Revolution (about 1750) due to the extensive burning of hydrocarbon energy sources (coal, oil, natural gas) that have resulted in an increase of greenhouse gases from 280 ppm (parts per million) in the atmosphere in 1750 to 379 ppm in 2005 (IPCC 2007: 2). The atmospheric concentration of CO₂ in 2005 exceeds by far the natural range over the last 650,000 years (180 to 300 ppm) as determined from ice cores.

3 An extensive scientific and political literature is available on these issues that have also contributed to this process of politicization especially of climate change issues. For a brief guide to the guide to this debate see Dessler/Parson (2006, 2008).

declaring selected global challenges (especially climate change) as political issues of utmost importance that require extraordinary means, and by addressing these global dangers and concerns as key security issues (*securitization*).

The year 2007 has been a turning point in this process of *securitization* of questions of global environmental change, and especially of climate change when the highest national policymakers (G-8, European Council) and high-level fora (UN Security Council) and officials of international organizations (UN Secretary-General) addressed global warming (often in relationship with desertification and water scarcity) as key political and security issues that may lead to internal displacements, forced distress migration, as well as crises and conflicts. This emerging *securitization* of global environmental change focuses on the environ-

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- 4 The *UN Framework Convention on Climate Change* (UNFCCC) was signed in 1992 at the Earth Summit and entered into force in 1994; its Kyoto Protocol (1997) entered into force on 16 February 2005 with the ratification by Russia and it will expire in 2012. Until April 2008 the USA and Turkey did not ratify the Kyoto Protocol. See the documentation at: <http://unfccc.int/essential_background/items/2877.php>.
 - 5 The *Convention on Biological Diversity* (CBD) was signed in 1992 at the Earth Summit and until April 2008 it was ratified by 187 countries. Its Cartagena Protocol on Biosafety was adopted in 2000 and entered into force in 2003 and by April 2008 147 countries had deposited their ratification. The USA did so far neither sign nor ratify this protocol. See the documentation at: <<http://www.cbd.int/>>.
 - 6 The UNCCD was signed in 1994 and entered into force on 26 December 1996. As of March 2002 over 179 countries were parties. See the documentation at: <<http://www.unccd.int/>>.
 - 7 The world water fora have been organized by the World Water Council, “an international multi-stakeholder platform that was established in 1996 in response to an increasing concern about world water issues from the global community. Its mission is ‘to promote awareness, build political commitment and trigger action on critical water issues at all levels, including the highest decision-making level, to facilitate the efficient conservation, protection, development, planning, management and use of water in all its dimensions on an environmentally sustainable basis for the benefit of all life on earth.’ The Council aims to reach a common strategic vision on water resources and water services management amongst all stakeholders in the water community. In the process, the Council also catalyses initiatives and activities, whose results converge toward its flagship product, the World Water Forum.” See at: <<http://worldwater-council.org/index.php?id=92&L=0>>.

mental dimension of security, and on the complex interaction between human beings and humankind as causes, triggers, and victims of the societal consequences of this process.

Below the first two stages of the global environmental change debate will be briefly reviewed: the emerging scientific research on global environmental and climate change since the 1970’s, and the political agenda-setting since the late 1980’s (1.2), and the *politicization* of global environmental change issues since the Earth Summit of 1992 (1.3.). The third stage of the emerging *securitization* of GEC issues that is closely linked to the environmental dimension of human, national, and international security will be examined separately (chap. 4 by Brauch). After a brief overview of the themes covered in this security handbook on the global rethinking on security (1.4.), the *sectorialization* of security and the sectoral security concepts (1.5.) as well as the structure and contributions of this book will be introduced (1.6.), and a few remarks will be offered on its multidisciplinary perspectives for a global audience (1.7.).

1.2 Scientific Research on Global Environmental and Climate Change and Political Agenda-Setting

Since the 1970’s, *global environmental change* (GEC) has focused on “human-induced perturbations in the environment” that encompass “a full range of globally significant issues relating to both natural and human-induced changes in the Earth’s environment, as well as their socioeconomic drivers.” According to Munn (2002: xi) “changes greater than humankind has experienced in its history are in progress and are likely to accelerate.” Dealing with future environmental trajectories requires more than a prediction of a single future path. It requires to “map a broad range of future environmental trajectories” that may confirm “that the changes of the 21st century could be far greater than experienced in the last several millennia” (Munn 2002: xii). Scientists, but also decision-makers and administrators are challenged to think the unthinkable; to minimize ‘surprise’ should nature manifest itself.

Since the 1990’s, the *International Geosphere-Biosphere Programme* (IGBP), the *International Human Dimensions Programme* (IHDP), the *World Climate Research Programme* (WCRP), and *DIVERSITAS* were instrumental for rallying a global environmental change research community around coordinated sci-

entific projects, and sensitizing policymakers and the public alike. In response to the Amsterdam Declaration on Global Change (2001), these four international GEC research programmes formed the *Earth System Science Partnership* (ESSP). Their work will be examined in the subsequent volume (Brauch/Oswald Spring/Mesjasz/Grin/Kameri-Mbote/Chourou/Dunay/Birkmann 2009)⁸.

The human dimension of global environmental change covers both the contribution and adaptation of societies to these changes. Wilson (1998) noted a growing *consilience* (the interlocking of causal explanations across disciplines) in which the “interfaces between disciplines become as important as the disciplines themselves” that would “touch the borders of the social sciences and humanities”.

As a topic of environmental history (Simmons 2002: 62–72; Radkau 2002, 2008) GEC analyses the human impact on nature during the past 10,000 years of the Holocene: 1) as hunters and gatherers from 10,000–8000 BCE (solar energy; localized impact on species and habitats); 2) agriculturalist period from 8000 BCE to CE 1750 (solar energy; impacts on soils, water, landforms); 3) industrialist era from 1750 to 1950 (fossil energy; intensification of impact and spatial extension); and 4) post-industrialist phase from 1950 to the present (fossil, nuclear, renewable energy; new chemicals, genetics create large-scale uncertainties). Since the Industrial Revolution (CE 1750) and especially since 1950 the massive use of fossil energy (coal, oil, natural gas) has contributed to an intensifying anthropogenic global environmental and climate change.

Global change combines and affects the ecosystem and the anthroposphere. The *ecosphere* comprises the *atmosphere* (climate system), the *hydrosphere* (water), the *lithosphere* (earth crust, fossil fuels), the *pedosphere* (soil), and the *biosphere* (life), while the *anthroposphere* deals with populations, social organizations, knowledge, economy and transport, and other human-related systems (WBGU 1993) such as culture (MA 2005) and cosmovisions.

Steffen, Sanderson, Tyson, Jäger, Matson, Moore, Oldfield, Richardson, Schellnhuber, Turner, and Wasson (2004: 1) have argued that a global perspective on

the interactions between environmental change and human societies has evolved. This led to an awareness of two aspects of Earth System functioning: “that the Earth is a single system within which the biosphere is an active, essential component; that human activities are now so pervasive and profound in their consequences that they affect the Earth at a global scale in complex, interactive and apparently accelerating ways”. They have further argued “that humans now have the capacity to alter the Earth System in ways that threaten the very processes and components, both biotic and abiotic, upon which the human species depends.” Oldfield (2005: 1) argued that the changes during the past 50 years were greater than those since the opening of the interglacial period of the Holocene some 10,000 years ago due to three developments:

- The rate of change in atmospheric CO₂ concentrations exceeds the mean rate during glacial-interglacial transitions by one to two orders of magnitude.
- The human population is now many orders of magnitude greater than it was at the opening of the Holocene.
- The degree to which the full range of human activities has transformed the world and the way it functions, especially over the past 50 years, has created a biosphere with no past analogues. Humans have become agents of change with diverse and increasing impacts on almost every aspect of the Earth System.

Oldfield (2005: 152–189) examined the changes that could be observed in the Anthropocene with regard to the changing atmosphere, land and aquatic environments, and ecosystems. In his conclusions he “outlined the need to bridge three methodological gaps, between contemporary and paleo-research, between empirical and modelling approaches, and between biophysical and socioeconomic perspectives ... [and] ... between well-validated research and policy-making” (Oldfield 2005: 295).

In the social sciences, the analysis of GEC and the human-nature relationship is polarized between epistemological idealism and realism (Glaeser 2002: 11–24), or between *social constructivism* and *neo-realism*. The *neo-idealist orientation* has highlighted two aspects: a) the uncertainty of scientific knowledge and claims; and b) the attempt to explain the scientific and public recognition of environmental change influenced by political and historical forces (Rosa/Dietz

8 The early activities of these programmes until 2001 are covered in the five volumes of the *Encyclopedia of Global Environmental Change* (Munn 2002); *Diversitas* (II: Mooney/Canadell 2002: 268–271); *IGBP* (II: Mooney/Canadell 2002: 350–357); *IHDP* (IV: Tolba 2002: 245); *WCRP* (I: MacCracken/Perry 2002: 753–754).

Table 1.1: Worldviews on Security and Standpoints on Environmental Issues: **Source:** Brauch 2003, 2005, 2005a).

Worldviews/Traditions on security (→)	Hobbes, Morgenthau, Waltz (neo)realist (pessimist) Power matters	Grotius liberal pragmatist Cooperation matters	Kant Neo-liberal institutionalist (optimist) International law matters and prevails
Standpoints on environmental issues (↓)			
Neo-Malthusian pessimist Resource scarcity	I	II	III
Equity-oriented pragmatist <i>Cooperation will solve problems</i>	IV	V International organizations and regimes	VI
Cornucopian neo-liberal optimist. <i>Technological ingenuity will solve problems</i>	VII	VIII	IX

1998). Two opposite scientific standpoints exist on environmental issues (Gleditsch 2003):

- the *pessimist* or *Neo-Malthusian view* (Malthus 1798) stresses the limited carrying-capacity of the Earth to feed the growing population;
- while the *optimist* or *Cornucopian view* believes that an increase in knowledge, human progress, and breakthroughs in science and technology could cope with these challenges.

These two opposite positions have dominated the environmental debate since the Club of Rome's *Limits of Growth* (Meadows/Meadows/Randers/Behrens 1972; Meadows/Meadows/Randers 1992), and Lomborg's (2001, 2004) *Skeptical Environmentalist*. Homer-Dixon (1999: 28-46) distinguished among *neo-Malthusians* (biologists, ecologists); *economic optimists* (economic historians, neoclassic economists, agricultural economists), and *distributionists* (poverty, inequality, misdistribution of resources). Brauch (2002, 2003) suggested an *equity-oriented pragmatism* as a middle ground between the two opposite views. Table 1.1 combines

- three worldviews on security of the English school (Bull 1977; Wight 1991; Brauch 2008a) represented by Hobbes (realism), Grotius (pragmatism), and Kant (idealism) with
- three ideal-type standpoints on the environment (Neo-Malthusian, Cornucopian, Pragmatist).

This leads to nine combined ideal type positions on security and environmental issues. Our perception of and policy response to the new challenges posed by global environmental change depends on the specific combination of the prevailing worldviews and stand-

points that influence the mindset of policymakers. At least three ideal type positions can be distinguished:

- I: the (neo)realist and Neo-Malthusian pessimist for whom only military, economic, and political power matters to face and cope with resource scarcity, and who often acts unilaterally;
- V: the liberal and equity-oriented pragmatist for whom multilateral cooperation (in international organizations, regimes) matters and can solve challenges.
- IX: the combination of Kantian ideas and Cornucopian optimism that democracies, the rule of law and international law, but also new technologies, can solve the new global environmental challenges.

The (neo)realist and Neo-Malthusian pessimist position is often pursued by major military powers, while the centrist position is often advocated by smaller countries and middle powers and by the multilateral United Nations system, and the optimist perspective is probably best represented by the Wilsonian tradition to international affairs. The pessimist position is reflected in many studies that analysed climate change as a threat to US national security, while the centrist standpoint has been dominant in many contributions that examined climate change as a challenge for international security. In the political realm, these three ideal type perspectives may be rare, and often issue specific responses prevail that are influenced by the political forces (parties, coalitions) and political mindsets or ideologies of decision-makers.

During the past two decades *global environmental challenges* (Brauch/Oswald Spring/Mesjasz/Grin/Dunay/Behera/Chourou/Kameri-Mbote/Liotta 2008) have created an intensive public awareness to *face* the impacts of GEC and to *cope* with its consequences

(Brauch/Oswald Spring/Mesjasz/Grin/Kameri-Mbote/Chourou/Dunay/Birkmann 2009). How policymakers, the media, and the public perceive, interpret, and convey scientific knowledge on the new global environmental dangers depends on the specific combination of the worldviews and ecological standpoints that differ both within and among countries.

Since the start of the scientific discourse on global environmental change in the 1980's and the initially policy-driven debate on environmental (Brundtland 1987; Myers 1989; Mathews 1989) or ecological security (Gorbachev 1987, 1988) in the social sciences since the global turn, there was little interchange between the natural scientists in the global change research community and the social scientists and policymakers and advisers who dominated the debate on the reconceptualization of security. Both discourses and debates were pursued in parallel by different scientific and policy communities with a limited exchange between natural and social scientists or between scientists and policymakers, environmental and security experts, international and national officials, diplomats and military officers. So far there has also been little debate between the environmental and the human security school in the social sciences and in diplomacy, with few exceptions.

In the framework of IHDP, its GECHS (*Global Environmental Change and Human Security*) project has argued since the late 1990's that these GEC impacts affect *human security*: natural disasters, cumulative changes or slow-onset changes, accidental disruptions or industrial accidents, development projects, and conflict and warfare (GECHS 1999). Authors associated with GECHS (Barnett/Matthew/O'Brien 2008) and UNU-EHS (2008) have addressed both the input factors and the often extreme societal outcomes from a people-centred human security approach. But the emerging policy debate has focused so far primarily on challenges posed by *climate change* primarily for *international* (regional and global) and *national security*. But in May 2008, the *Human Security Network* (HSN) has for the first time addressed the political impacts of climate change on human security.

1.3 Politicization of Global Environmental Change

Two parallel policy debates on a reconceptualization of security and on problems of global environmental change have gradually emerged since 1990. In the

security realm four conceptual policy debates can be distinguished:

- an initially *Northern debate* where a state-centred security concept has been extended by developing an *environmental dimension of national and international security* (in the US, Western Europe, NATO, OSCE, UNEP, UNDP, ENVSEC et al., part VIII, chap. 59–73);
- an initially *Southern debate* on a human-centred security concept that was launched by Mahbub-ul Haq⁹ with the *Human Development Report 1994* (UNDP 1994) that was promoted by UNESCO (Part IX, chap. 74–96);
- since 2000 a growing debate on *water security* (chap. 11 by Oswald/Brauch and part VII, chap. 41–58), on the *securitization of climate change* (chap. 4 by Brauch), and on desertification as a security issue (Kepner/Rubio/Mouat/Pedrazzini 2006; Brauch 2003, 2006; chap. 8 by Boulharouf/Pattie; chap. 9 by Rechkemmer); and finally
- since 2004 an emerging debate on the environmental dimension of human security and since 2007/2008 on climate change as a human security challenge that focuses on the most vulnerable and affected people that daily *face* the impacts of global environmental change.

Since the 1990's, the widening of the security concept has progressed and concepts of 'environmental security' (UNEP, OSCE, OECD, UNU, EU), 'human security' (UNDP, UNESCO, UNU), 'food security' (WHO, World Bank), 'energy security' (World Bank, IEA), 'health security' (WHO), and 'livelihood security' (UNEP, OECD) have been widely used.

1.3.1 Global Policy Debate on Environmental Security

In 1987 Soviet President Gorbachev "proposed ecological security as a top priority". The Brandt-Report (1980) noted that "few threats to peace and survival of the human community are greater than those posed by the prospects of cumulative and irreversible degradation of the biosphere on which human life depends." The Brundtland Commission (1987: 19) ar-

9 Mahbub ul Haq (1934–1998) was a Pakistani economist who in 1990 created the Human Development Index, which the UNDP used in its annual reports on people's standards of living to determine their countries' wealth. He had served as the World Bank's director of policy planning and Pakistan's finance minister.

gued that the security concept “must be expanded to include the growing impacts of environmental stress”. The Commission on Global Governance (1995) called for a broader concept of global security for states, people, and the planet. It claimed a linkage between environmental deterioration, poverty, and underdevelopment as causes of conflict. These reports put the linkage between environmental stress, conflicts, and conflict resolution on the political agenda of international organizations.¹⁰

1.3.1.1 Environmental Security Debate within the United Nations System

The *Millennium Report of the Secretary-General* (Annan 2000) mentioned several international organizations that have addressed the linkages between environmental stress and conflicts. The *World Summit on Sustainable Development* (WSSD) in Johannesburg (2002) in its political declaration and plan of implementation referred only to ‘food security’, while ‘environmental’ and ‘human security’ were not explicitly mentioned. Former UN Secretary-General Kofi Annan (2003) pointed to the potential threats posed by environmental problems. In January 2004 UNEP identified a “need for scientific assessments of the link between environment and conflict to promote conflict prevention and peace building” (Töpfer 2004: 1). UNEP’s *Division of Early Warning and Assessment* (DEWA) launched an “Environment and Conflict Prevention” initiative to stimulate “international efforts to promote conflict prevention, peace, and cooperation through activities, policies, and actions related to environmental protection, restoration and resources” (Lonergan 2004: 2). In November 2008 an UNEP Advisory Group on Environment, Conflict and Peacebuilding was launched.¹¹

10 The scientific debate on the first three phases of environmental security research is discussed below in chap. 59 by Dalby/Brauch/Oswald and proposals for the fourth phase are offered by Oswald/Brauch/Dalby (chap. 98). For a review of the political debate on environmental security in international organizations until 2002 (see Brauch 2003) and until 2004/2005 (Brauch 2005, 2007, 2007a, 2007b, 2007c). This reviews focuses primarily on the political developments between January 2003 and April 2008 within the UN, OSCE, NATO, OECD, and the EU.

11 See: “New Advisory Group on Environment, Conflict and Peacebuilding”, in: *Environment, Conflict and Cooperation Newsletter*, April 2008; at: <http://www.ecc-platform.org/index.php?option=com_content&task=view&id=1377>.

The Secretary-General’s High-level Panel on Threats, Challenges and Change (UN 2004) identified six ‘threat clusters’: 1) socioeconomic threats, including poverty, infectious diseases, and environmental degradation; 2) classic inter-state wars; 3) intrastate violence, including civil wars and genocide; 4) weapons of mass destruction; 5) terrorism; and 6) organized crime. In a succinct analysis of this document and of the policy debate within the UN about it, von Einsiedel, Nitzschke, and Chhabra (2008: 635–636) argued that “in the absence of a coherent security concept”, the UN “has dichotomized ‘hard’ security threats to ‘state security’, such as armed conflict, terrorism, and weapons of mass destruction, versus ‘soft’ threats to ‘human security’, such as poverty, infectious disease, and environmental degradation”. Furthermore, “in arguing that threats to human and state security are a threat to all states, the Panel has reaffirmed the importance of sovereignty to safeguard human security, but it has also qualified sovereignty to reaffirm the objectives of the ‘human security’ agenda.” While environmental degradation was repeatedly noted among the ‘soft’ and socioeconomic threats, the environmental security debate itself was not taken up by the SG’s High-level Panel (2004).

1.3.1.2 Environmental Security Debate of OSCE

The *Organization for Security and Co-operation in Europe* (OSCE) has dealt with security risks from environmental stress. Among the non-traditional security risks confronting OSCE countries in Central, Eastern and South-Eastern Europe, in the Caucasus, in Central Asia, and other parts of the former Soviet Union are transboundary pollution, shortage of drinking water, disposal of radioactive waste, reduction of human losses in man-made disasters and natural catastrophes. The Ministerial Council meeting in Maas-tricht in December 2003 adopted the *OSCE Strategy Document for the Economic and Environmental Dimension*, thus committing themselves

‘to cooperate on economic, good governance, sustainable development and environmental protection issues in order to tackle the threats and challenges to security that had emerged over the previous decade. In the Strategy Document, the participating States recognized that ‘environmental degradation, unsustainable uses of natural resources and mismanagement in the processing and disposal of wastes have a substantial impact on the health, welfare, stability and security of our countries.’

On 30 November 2007 the Foreign Ministers of the OESCE countries adopted the ‘*Madrid Declaration on Environment and Security*’¹² that addresses “the

issue of climate change, ... [where] the OSCE ... has a complementary role to play within its mandate in addressing this challenge in its specific region".¹³ Spain also tabled an *Action Plan on the Threats and Opportunities in the Area of Environment and Security* that was not endorsed.¹⁴ It contained specific recommendations in five areas:

- Refocusing OSCE institutions and mechanisms on environmental matters;
- Raising awareness on environmental challenges, including climate change and its security implications;
- Promoting environmental cooperation as a tool for conflict prevention and confidence building;
- Improving environmental governance; and
- Addressing social economic aspects of environmental security.

At the 15th OSCE Economic and Environmental Forum on "Environmental Security and Sustainable Development" two key issues were addressed: "land degradation, soil contamination and water management" in two meetings in Vienna on 22-23 January 2007 and in Prague on 21-23 May 2007 that were prepared by two preparatory expert conferences in Bishkek, Kyrgyzstan on 16-17 November 2006 on "Land Degradation and Soil Contamination", and in Zaragoza, Spain on 12-13 March 2007 on water management. The OSCE Chairman-in-Office, Spanish Foreign Minister Miguel Ángel Moratinos, argued that global security

'will be increasingly at risk because of man-made environmental threats. ... It is important ... to include environmental security issues in political agendas by fostering the participation of national, international, public and private actors. ... Environmental cooperation can be an effective catalyst for reducing tensions, broadening cooperation and promoting peace'.

12 Resolution on Environment and Security adopted by the Ministerial Council of the OSCE in Madrid on 30 November 2007 as "Madrid Declaration on Environment and Security", in: Organization for Security and Co-operation in Europe. MC.DOC/4/07; at: <http://www.osce.org/documents/mcs/2007/12/28657_en.pdf>.

13 See the speech by Bernard Snoy, coordinator of OSCE Economic and Environmental Activities, on 12 March 2008 at a NATO meeting, at: <http://www.nato.int/docu/comm/2008/0803-science/pdf/bernard_snoy.pdf>.

14 In his speech of 12 March 2008, Bernard Snoy also reviewed the OSCE activities in the framework of the ENVSEC Initiative and the 15th OSCE Economic and Environmental Forum on "Environmental Security and Sustainable Development" and its follow-up activities.

The OSCE launched several initiatives supporting regional cooperation:

- by establishing a *Regional Drought Management Center in Central Asia* by the countries of Central Asia to implement the UN *Convention to Combat Desertification* (UNCCD);
- by organizing a follow-up conference concentrating on degradation of land and pollution as well as on water management in Central Asia in Tashkent on 30-31 October 2007.
- by holding a workshop in Valencia on 10-11 December 2007, on "Water Scarcity, Land Degradation and Desertification in the Mediterranean Region: Environment and Security Aspects" under the joint auspices of the Spanish OSCE Chairmanship and of the NATO Science for Peace and Security Programme.¹⁵

Based on the *Madrid Declaration on Environment and Security* more attention will be given to environmental security issues and to links between the economy, environment, and security.

1.3.1.3 Applying Environmental Security: The ENVSEC Initiative

In late 2002, OSCE, UNEP, and UNDP launched a joint initiative to promote the use of environmental

15 See the conference programme at: <http://www.osce.org/documents/eea/2007/11/27982_en.pdf>. Henri-Luc Thibault, the director of the Blue Plan, which is the Regional Activity Center of the UNEP/Mediterranean Action Plan presented possible future scenarios for environmental conditions in the Mediterranean region arguing "that trends projected for water and energy demand for the next 20 years in the 21 Mediterranean-rim countries ... are simply not compatible with the objectives of sustainable development and that, compounded with the effects of climate change, they risk being associated with irreversible land and other environmental degradations, loss of livelihoods, increased migration, and ultimately serious threats to security and stability in the region. It is crucially important to improve the management of water scarcity, to save energy, to increase the share of renewable energy and to decouple economic growth from overexploitation of natural resources and excessive pressure on the environment." See this author's background study for the Blue Plan of November 2007 in English at: <http://www.planbleu.org/publications/energaia/RAPPORT_Brauch_EN.pdf> and in French at: <http://www.planbleu.org/publications/energaia/RAPPORT_Brauch_FR.pdf> and his PowerPoint presentation at: <http://www.afes-press.de/pdf/Brauch_porjected_climate_change.pdf>.

management as a strategy for reducing insecurity in South-Eastern Europe, in the Caucasus, and Central Asia. A ministerial conference in Kiev in May 2003 adopted an environmental strategy for the countries of these sub-regions. After Kiev, the *Environment and Security Initiative* (ENVSEC) has focused on:

1. vulnerability assessment and on monitoring environment and security linkages,
2. policy development and implementation,
3. institutional development, capacity building, and advocacy.¹⁶

Since 2004 many reports have been published in this framework (chap. 71 by Cheterian) on environment and security problems. In 2004 NATO became an associate, and since 2006 the *United Nations Economic Commission for Europe* (UN-ECE) and the *Regional Environment Center for Central and Eastern Europe* (REC) joined.

1.3.1.4 Environmental Security Research and Dialogue supported by NATO

Since the mid-1990's, NATO's Science Committee has supported Advanced Research Workshops on environmental security and conflict involving scientists from former Warsaw Pact and from Mediterranean dialogue partner countries (Gleditsch 1997; Brauch 2003).¹⁷ The final report of the NATO-CCMS (1999) pilot study on *'Environment and Security in an International Context'* assessed the links between environment and security, examined the consequences of economic stress and their potential impact on conflict escalation, offered a typology of environmental conflict cases, provided an integrated risk assessment, dealt with indicators, data and decision support systems, and presented an integrated approach of policy responses for environmental, development, foreign, and security policy (Lietzmann 1999: 35) that covered

early warning, preventive diplomacy, permanent mechanisms for dispute settlement, crisis and post-crisis management (NATO/CCMS 1999: 164-167). Based on its 1999 Strategic Concept, NATO's *Public Diplomacy Division* (PDD) has supported workshops and collaborative research projects on environmental security issues, facilitating cooperation with scientists from Mediterranean Dialogue and Partnership for Peace countries.

In February 2008, NATO's *Science Security Forum* (SSF) organized a high-level Forum on environmental security with experts from the natural sciences and defence establishments from NATO member, Partner, and Mediterranean Dialogue countries.¹⁸ Jean-François Bureau, NATO Assistant Secretary-General for Public Diplomacy, argued "that the number of circumstances where our defence and security policies have to take into account the environmental factor is obviously developing in the same way" which is why it "becomes a key factor of military efficiency". Environmental concerns should be integrated into NATO's operational concepts:

- Major developments in military observations and surveillance capabilities (like satellites and UAVs) also provide capabilities to monitor environmental issues; those examples show that when we look at the relationship between environment and security we mainly deal with dual technologies, those which can be applied to civil as well as military purposes;
- when NATO develops its partnership programmes, environmental security is a major item: many examples will show that NATO and its members have developed a wide spectrum of activities with Caucasus, Central Asia, Western Balkans, and Mediterranean nations.¹⁹

The environment and security issues should ... also

fit the NATO priorities when dealing with future challenges. Terrorism, proliferation of weapons of mass destruction, cyber-defence, maritime awareness, and energy security are among the most challenging. NATO nations are deciding whether and how NATO should be a key contributor in these fields which will shape our future security.

16 See at: <http://www.iisd.org/pdf/2003/envsec_post_kiev.pdf>.

17 NATO's scientific and Environmental Affairs Division financed several Advanced Research Workshops (ARWs) including on: "Conflict and the Environment" (Gleditsch 1997); on: "Environmental Change, Adaptation and Security" (Loneragan 1999); on: "Responding to Environmental Conflicts: Implications for Theory and Practice" (Petzold-Bradley/Carius/Vincze 2002); on "The Caspian Sea: a Quest for Environmental Security" (Asher/Mirovitskaya 2000); and on: "Soil Quality, Sustainable Agriculture and Environmental Security in Central and Eastern Europe" (Wilson/Maliszewska-Kordybach 2000).

18 See the NATO website on environmental security; at: <<http://www.nato.int/issues/science-environmental-security/index.html>>. This meeting and all presentations are documented at: <<http://www.nato.int/docu/comm/2008/0803-science/0803-science.htm>>.

19 See the speech by Jean-François Bureau, at: <<http://www.nato.int/docu/speech/2008/so80312a.html>>.

Jean-François Bureau wanted the security science forum “to cover key environmental issues which are also global security concerns (such as transboundary water issues, global climate change or natural catastrophes) in order to play a forward-looking, horizon-scanning role to propose a road map for future projects that will contribute to security and stability in the Euro-Atlantic zone and beyond.”

1.3.1.5 Environmental Security Debate in OECD Documents

The *Organization for Economic Co-operation and Development* (OECD) has addressed the linkages between development, environment, and conflicts in several policy statements, such as “Development Assistance, Peace and Development Co-operation of the 21st Century” (OECD/DAC 1997, 2000), and in a scoping paper on the economic dimension of environmental security which are reflected in the “Guidelines on Conflict, Peace and Development Co-operation” (OECD/DAC 2001: 89).²⁰ In February 2000, the OECD’s DAC Working Party on Development Co-operation and Environment (WP/ENV) published a *State-of-the-Art Review of Environment, Security and Development Co-operation* that was compiled by the *World Conservation Union* (IUCN) together with a group of experts.²¹

20 An overview of the activities and resources material of OECD on ‘conflict and peace’ and on the DAC Network on Conflict, Peace and Development Co-operation (CPDC, <www.oecd.org/dac/conflict) that brings together conflict prevention and peacebuilding experts from bilateral and multilateral development agencies, including from the UN system, EC, IMF and World Bank is at: <http://www.oecd.org/department/0,3355,en_2649_34567_1_1_1_1_1,00.html>. The CPDC is a subsidiary group of the OECD Development Assistance Committee (DAC).

21 For a “State-of-the Art Review on Environment, Security and Development Co-operation” by IUCN for the Working Party on Development Co-operation and Environment OECD Development Assistance (OECD 2000), see at: http://www.iisd.org/pdf/2002/envsec_oecd_summary.pdf, and the full report at: <<http://www.oecd.org/dataoecd/8/51/2446676.pdf>>. For a more recent North American review see Brown (2005); See also the documentation of a conference during the German EU presidency on: “Integrating Environment, Development, and Conflict Prevention – European and National Approaches and Challenges”, Berlin, 29–30 March 2007; at: <http://www.adelphi-consult.com/ECC2007/Downloads/Programme_ECC_Conference_2007_FINAL.pdf>.

Between 2001 and 2004, the *Working Party on Global and Structural Policies* (WPGSP) of the Environment Directorate, and the *Network on Environment and Development Co-operation* (Environet) conducted the OECD’s ‘Development and Climate Change’ project with the goal “to provide guidance on how to mainstream responses to climate change within economic development planning and assistance”. In this context several country case studies were carried through that focused at the socioeconomic and political impact of climate change for Bangladesh, Egypt, Fiji, Nepal, and Tanzania that are relevant for the environmental security debate without being directly framed in a security context.²² The OECD assumed that these insights would have implications for the development assistance community in OECD countries, and for national and regional planners in developing countries.

The *OECD Environmental Outlook to 2030* offered a baseline projection of environmental change based on the underlying economic and social factors that drive these changes. Simulations were done for specific policies to address the main environmental challenges identified, and their economic costs and environmental benefits until 2030, and in some areas up to 2050 (OECD 2008). The key environmental pressures include “climate change, biodiversity loss and water scarcity, and the key sectors exerting pressure on the environment (agriculture, energy and transport).” An OECD Policy Brief highlighted its “work on the likely impact of various courses of action to mitigate climate change, and the costs of inaction.”²³ Both publications did not reflect OECD’s previous work on environmental security.

1.3.1.6 Environmental Security Concerns and the EU’s Green Diplomacy

Since the 1990’s, the *European Union* (EU) has pursued two strategies for ‘environmental security’: a) integrating environmental goals into all sectoral policies (*Cardiff process*), including development, foreign,

22 On Bangladesh: Agrawala/Ota/Ahmed/Smith/van Aalst (2003); on Egypt: Agrawala/Moehner/El Raey/Conwa/van Aalst/Hagenstad/Smith (2004); on Fiji: Agrawala/Ota/Risbey/Hagenstad/Smith/van Aalst/Koshy/Prasad (2003); on Nepal: Agrawala/Raksakulthai/van Aalst/Larsen/Smith/Reynolds (2003); and on Tanzania: Agrawala/Moehner/Hemp/van Aalst/Hitz/Smith/Meena/Mwakifwamba/Hyera/Mwaipopo (2003).

23 OECD Policy Brief: “Climate Change: Meeting the Challenge to 2050”, Paris, February 2008; at: <<http://www.oecd.org/dataoecd/6/21/39762914.pdf>>.

and security policies; and b) stressing conflict prevention and management in its activities in international organizations (UN, OSCE) and for specific regions (Brauch 2003: 86–89).

At the meeting of the European Council held in Barcelona in March 2002, a sustainable development strategy was adopted that emphasized the integration of environmental concerns into sectoral policies. The European Council in Seville (June 2002) approved a conflict prevention programme that aimed both at short-term prevention and at the root causes of conflict, in its development cooperation with poverty reduction. The European Council in Thessaloniki in June 2003 approved a green strategy of the EU.

In spring 2008, the approach of the European Union towards environmental security issues has evolved within the framework of its *Common Foreign and Security Policy* (CFSP), the *European Security and Defence Policy* (ESDP), the *European Security Strategy* (ESS) and its *Conflict Prevention and Crisis Management* programme, its *country and regional strategy papers*, and the policies of the EU with Neighbouring States through the *Stability Pact for the Balkans*, the *Euro-Mediterranean Partnership* (EMP) and the *EU Neighbourhood Policy* (ENP).²⁴ Goals of environmental security have also been part of the EU's environment and development policies and practices through a) the *Kimberley process*, the *EU Water Initiative* (EUWI), the *EU Action Plan for Forest Law Enforcement, Governance and Trade* (FLEGT), the *EU Energy Initiative for Poverty Eradication and Sustainable Development* and the *Global Monitoring for Environment and Security* (GMES).

As part of the Cardiff process environmental considerations must be mainstreamed into sectoral policies, which is being achieved with regard to EU development cooperation through its *Country Environment Profile* (CEF), in the *Country Strategy Paper* (CSP). For its preparation a tool box has been made available through the *Environmental Mainstreaming in EC Development Cooperation Support and Resource Panel* (Kingham 2006: 136–137).

According to Article 6 of the *EC Treaty*, “environmental protection requirements must be integrated into the definition and implementation of the Community policies and activities”... “in particular with a view to promoting sustainable development”. In im-

plementation of the EU Council decision of Thessaloniki (2003), the *Green Development Network* (GDN) of representatives of the foreign ministries dealing with international environment and sustainable development issues of the 27 EU member countries was set up to enhance the integration of environmental concerns into foreign policy.²⁵ The GDN focuses on the following themes: a) climate change; b) biodiversity; c) desertification; d) cooperation with third countries; e) sustainable development; f) forests; g) water; h) energy; i) waste management; and j) fisheries and marine resources. Among the tasks of the network are: “increasing the coherence, consistency and effectiveness of European actions in the field of environment”.

The EU's *Sustainable Development Strategy*, adopted in June 2006, lists among its goals the need for the EU to “actively promote sustainable development worldwide and ensure that the European Union's internal and external policies are consistent with global sustainable development and its international commitments.” The GDN performs these functions:

- To promote the use of the EU's extensive diplomatic resources (diplomatic missions, delegations, development cooperation offices) in support of environmental objectives, orchestrating campaigns and demarches....
- To exchange views and share experiences on how Member States (in particular Foreign Ministries) are integrating environmental concerns into their diplomatic efforts.

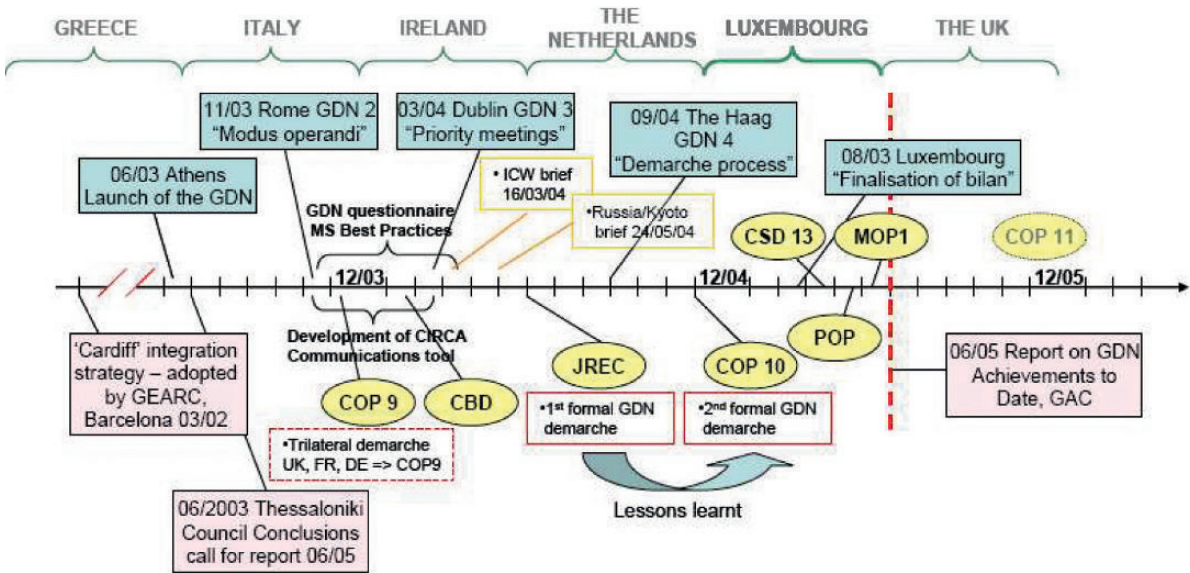
The Network started during the Greek presidency with the adoption of an initial action plan and work programme. Until December 2005 (under the Greek, Italian, Luxembourg, Dutch, and UK presidencies of the EU) several milestones were achieved (figure 1.1).

During the Austrian, Portuguese (2006), German, Finnish (2007), and Slovenian presidencies (2008), the *Green Diplomacy Network* (GDN) addressed an improved international environmental governance through a reform of UNEP; the implementation of several environmental conventions (CBD), the coordination of climate change negotiations prior to COP 12 and COP 13 of the UNFCCC and MOP_{2/3} of the Kyoto Protocol; and carried out demarches on climate change for the post-2012 climate architecture. The German presidency (2007) organized a conference on

24 See the chapters in vol. III of the Hexagon book series by: Mosca Moschini (2008); Hintermeier (2008); Maurer/Parkes (2008); Ekengren (2008); Katseli (2008); Biscop (2008) and Aydın/Kaptanolu (2008).

25 See the GDN website at: <http://ec.europa.eu/external_relations/env/gdn/index.htm>.

Figure 1.1: Green Diplomacy Milestones June 2003-June 2005. **Source:** European Commission; at: <http://ec.europa.eu/external_relations/env/milestones.pdf>.



Integrating Environment, Development and Conflict Prevention, highlighting the key role that the GDN can play in linking environmental concerns with matters of foreign policy, while the presidency of Portugal (2007) emphasized "Climate Change and Development Cooperation". Furthermore, it was agreed in July 2007 in Lisbon:

to further develop the Network by strengthening cooperation on the ground in third countries between environment correspondents in Commission delegations and Member State embassies. These Local Green Diplomacy Networks will act as in-country forums to share information, experiences and approaches and ensure close EU coordination on international environment policy priorities. In its pilot phase this process will commence in 5 key emerging economies (Brazil, Russia, India, China and South Africa).

On the future GDN objectives the Commission argued that GDN should amplify "consistency and effectiveness of the EU's line on International Environmental Matters" by: 1) organizing demarches; 2) further exchange of good practices for integrating environment and sustainable development in the external policies at European and national levels; 3) better information on positions of non member-countries; and 4) proactive dissemination of accurate and up-to-date environmental information.

At the operational level, the European Commission in cooperation with the *European Space Agency* (ESA) launched the joint programme on *Global Monitoring for Environment and Security* (GMES) that

aims at "combined ground and space-based observations to develop an integrated environmental and security monitoring capability" to provide with these data "a better understanding of the earth's land surface, its atmosphere and its oceans, and support emergency and security services" and thus to "allow for a better management of environmental and security crises".²⁶

But neither the GDN nor the GMES documents have referred to the environmental security concept although many issues of the EU's green diplomacy have addressed environmental security concerns. In the conceptual, analytical, and operational efforts of these international organizations on environmental security, so far human security concerns have played no role.

1.3.1.7 Environmental Security Initiatives in Latin America, Africa, and the Asia Pacific

Several developing countries interpreted the environmental security debate with suspicion, and repeatedly

²⁶ See European Commission, IP/08/346, 28 February 2008: "Security and the environment: new satellites to spur earth observation", at: <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/346&format=HTML&caged=0&language=EN&guiLanguage=en>>. More information on GMES, see at: <<http://www.gmes.info/>> and on ESA, at: <<http://www.esa.int/esaCP/index.html>>.

members of the Group of 77 (G 77) prevented references to environmental security issues in UN documents. Irrespective of these policy concerns, there has been a conceptual debate on environmental security concepts and issues by scholars from these regions (part VIII).

But this is changing. In Latin America the Committee on Hemispheric Security of the OAS Council in a “Framework Treaty on Democratic Security in Central America” of April 2008 emphasized that:

the Central American Democratic Security Model is based on the supremacy and strengthening of civil power, the reasonable balance of forces, the security of persons and of their property, the elimination of poverty and extreme poverty, the promotion of sustainable development, the protection of the environment, the elimination of violence, corruption, impunity, terrorism, drug trafficking, and arms trafficking. Also, the Central American Security Model will increasingly devote resources to social investments.²⁷

This Committee discussed on 12 February 2007 environmental security concerns of Small Island States with regard to the shipment of nuclear waste through the Caribbean.²⁸ While several references to environmental and ecological security in OAS documents exist, no specific operational project has been launched such as the ENVSEC initiative.

While environmental security issues have been discussed by African scholars (see chap. 68 by Ejigu and 69 by Moyo), no references to these themes could be found in the security debate of the African Union. But in several policy papers environmental degradation has been listed as a structural cause of conflict in discussions of the EU with ECOWAS.²⁹

Socio-ecological and environmental security concerns have been discussed in South Asia (chap. 62 by Ramakrishnan; Behera 2008), for North East Asia (chap. 63 Schreurs; Lee 2008; Hunter/Cheng 2008) and for the Asia Pacific (chap. 72 by Barnett; Clements/Foley 2008), but they have not resulted in multilateral environmental security initiatives.

27 See: Committee on Hemispheric Security of the Permanent OAS Council: “Framework Treaty on Democratic Security in Central America” (5 April 2008); at: <<http://www.oas.org/csh/english/docc&t%20CenAm.asp>>.

28 See: Committee on Hemispheric Security of the Permanent OAS Council, document OEA/Ser.G, CP/CSH-824/07, 26 February 2007; at: <http://scm.oas.org/doc_public/ENGLISH/HIST_07/CP1768tEo4.doc>.

29 See: “ECOWAS-EU-UNOWA Framework of Action for Peace and Security”, 18 May 2005; at: <<http://www.o.un.org/unowa/unowa/studies/eu-ecowas-unowa.pdf>>.

1.3.2 The Global Policy Debate on Human Security

The human security concept used by UNDP (1994) triggered a global scientific debate where the persons affected by environmental stress and its outcomes (hazards, migration, crises, conflicts) are the referent object (chap. 74 by Brauch).³⁰ For many states and the security studies community the ‘nation state’ remains the major referent object that is to be secured while the human security concepts deal with the protection of the individual, the citizen or humankind. Bogardi and Brauch (2005) suggested that human security should rest on four pillars:

- ‘*Freedom from want*’ (economic and societal security dimensions) by enhancing the implementation of the millennium development goals through active development and environment policies aiming at sustainable development by reducing *social vulnerability* through poverty eradication programmes (UNDP 1994; CHS 2003);
- ‘*freedom from fear*’ (political and military security dimension) by reducing the probability that people become victims of violence and conflict and by enhancing human rights;
- ‘*freedom to live in dignity*’ (human rights agenda; Annan 2005);
- ‘*freedom from hazard impacts*’ (environmental security dimension) by reducing vulnerability of societies confronted with natural and human-induced hazards and by enhancing resilience, disaster preparedness, and response (UNU-EHS 2005; Brauch 2005, 2005a).

Since the mid-1990’s several UN institutions (General Assembly, Security Council, UNDP, UNESCO, UNU) have widely used the human security concept. But so far only few researchers and policy initiatives have conceptually explored and politically developed the environmental dimension of human security (Barnett 2001; Brauch 2005, 2005a, 2006, 2008; chap. 98 by Oswald/Brauch/Dalby). Among them GECHS and the *United Nations University Institute on Environment and Human Security* (UNU-EHS 2005, 2008) have been most prominent.

30 See for a list of definitions of human security in the scientific literature at: <http://www.hsph.harvard.edu/hpcr/events/hsworkshop/list_definitions.pdf>; and at: <http://www.uncrd.or.jp/hs/doc/04a_10jun_mani_concept.pdf> for threats to human security, see at: <http://www.hsph.harvard.edu/hpcr/events/hsworkshop/comparison_definitions.pdf>.

According to the initial GECHS definition: “Human security is achieved when and where individuals and communities: have the options necessary to end, mitigate, or adapt to threats to their human, environmental, and social rights; actively participate in attaining these options; and have the capacity and freedom to exercise these options” (GECHS 1999: 29). Barnett, Matthew, and O’Brien (2008: 360) noted that “there has been little emphasis on the broader implications of global environmental change for human security, including how increased human security can potentially mitigate environmental change,” and they concluded that “despite growing international concern about climate change, biodiversity loss, ... these issues have not been identified as priority areas for human security research.” While both considerations “are central to the *Millennium Development Goals* (MDG), there is no explicit recognition of the implications of global environmental change for these goals,” the only “MDG that addresses the environment (Goal 7: ensure environmental sustainability) does not consider the challenges posed by environmental change.”

While GECHS has initially focused on the causes and impacts of GEC, UNU-EHS has focused on the *response* to its extreme outcomes, especially to floods and droughts aiming at ‘freedom from hazard impacts’, by reducing social vulnerability and enhancing the coping capabilities of societies confronted with environmental and human induced hazards. For UNU-EHS ‘human security as freedom from hazard impact’ is achieved when people who are vulnerable to and at risk of these manifold environmental hazards and disasters that are often intensified by other associated societal threats (poverty), challenges (food insecurity), vulnerabilities and risks (improper housing in highly vulnerable flood-prone and coastal areas) are better warned of impending hazards, prepared, and protected against these impacts and are empowered to prepare themselves effectively to cope with the ‘survival dilemma’ (Brauch 2004, 2005, 2008c). During the Greek presidency (2007/2008) the *Human Security Network* (HSN) explored the environmental dimension of human security (chap. 75 by Fuentes/Brauch).

While there has been an academic and policy-focused scientific debate on human security in Africa (chap. 80 by Poku/Sandkjær), Latin America (chap. 81 by De Lombaerde/Norton; chap. 82 by Rojas) and in Central, South, South East Asia, as well as in the Far East and Asia Pacific (see chap. 74 by Brauch; chap. 79 by Othman; chap. 88 by Wun’Gaeo), only two African

countries (Mali, South Africa), two Latin American countries (Chile, Costa Rica) and two Asian countries (Thailand, Jordan) have joined the *Human Security Network* (HSN). Except in Thailand where a Ministry on Human Security was set up that focuses on human development, the conceptual debate had so far few operational impacts on the bilateral, sub-regional, and regional security policies of Asian countries.

1.4 Mapping the Global Reconceptualization of Security and Environment Linkages in the Anthropocene

As a result of the emerging securitization of problems related to global environmental change and specifically of climate change, water, and soil these issues became problems of utmost importance that require extraordinary policy efforts by the international community (international organizations, societal groups and business organizations) where the use of both traditional and modern scientific and technological knowledge is needed to face these manifold new security dangers and concerns posed by the challenges of GEC (chap. 4 by Brauch).

This global scientific mapping project on the *reconceptualization of security* is designed as a multi-disciplinary and global ‘Security Handbook for the Anthropocene’ in three volumes:

- The first volume on: *Globalization and Environmental Challenges: Reconceptualizing Security in the 21st Century* (Brauch/Oswald Spring/Mesjasz/Grin/Dunay/Behera/Chourou/Kameri-Mbote/Liotta 2008) offered a conceptual assessment of the ‘widening’ and ‘deepening’ of security since the end of the Cold War.
- This volume on: *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts* reviews the application of the ‘widening’ (environmental security), ‘deepening’ (human and gender security) and ‘sectorialization’ (energy, food, health, and water security) during the transition to the Anthropocene.
- The third volume on: *Coping with Global Environmental Change, Disasters and Security – Threats, Challenges, Vulnerabilities and Risks* (Brauch/Oswald Spring/Mesjasz/Grin/Kameri-Mbote/Chourou/Dunay/Birkmann) conceptualizes the terms threats, challenges, vulnerabilities

Table 1.2: Vertical Levels and Horizontal Dimensions of Security in North and South

Security dimension ⇒ (referent objects)↓	Military	Political	Economic	Environmental	Societal
Sectoral security concepts	The sectoral security concepts cut across dimensions and referent objects				
Human security					
Village/Community/Society	▲ ▼ ◀ energy, food , health, water, and livelihood ▶ ▲ ▼				
National security					
International security					
Regional security					
Global/Planetary security					

and risks with regard to global environmental change, natural hazards and disasters, as well as security. It also reviews emerging policy responses for coping with these new security issues.

The debate on the reconceptualization of the security concept and the review of the securitization of global environmental change issues provide the conceptual and empirical context for this volume that breaks new ground by offering a comprehensive overview of the global, regional, and national conceptual debates and policy applications. These three volumes differ from the debates in political science, international relations, security studies and peace research literature³¹ by offering:

- a plurality of disciplinary approaches, aiming at *trans-* and *multidisciplinarity*;
- manifold national, regional and global perspectives from scholars from all five continents representing different cultures, religions, and scientific

traditions thus diversifying and enriching Northern approaches to security issues;

- overcoming the separation between the academic ivory tower and the political arena of international global and regional organizations and national, regional, and local governments.

These three volumes offer a comprehensive and innovative handbook mapping the global reconceptualization of security thinking and policy applications in the early 21st century.

1.5 Sectorialization of Security and Sectoral Security Concepts

While the Copenhagen school (Buzan/Waever/de Wilde 1998) has introduced the horizontal ‘widening’ (in five sectors or dimension) and the vertical ‘deepening’ (referring to different actors or referent objects), this volume includes a third process of ‘sectorialization’ of security that is linked to policy problems (e.g. energy, food, water, health and livelihood, and more recently also to climate) and that have been used by international organizations (e.g. the IEA, FAO, WHO) to describe and justify their policy mission and budgetary requests.

These sectoral security concepts of energy, food, health, and water security refer to and can be analysed for different dimensions and with different referent objects in mind (table 1.2).

Energy security has different meanings for the supplier (e.g. oil producing and exporting countries and oil companies are interested in good prices and in a steady demand, i.e. in energy demand security) while the consumers are interested in an uninterrupted supply at affordable prices (energy supply security). Energy security applies to all five dimensions and to all referent objects. Energy supply security is a precondition of military, political, and economic secu-

31 See e.g.: Kolodziej (2005) adhered to a narrow perspective of political and military security and did neither discuss environmental and human security concepts nor the process of securitization. Booth (2007: 321–336) offered a critical review of both concepts but he avoided a securitization of global environmental change issues, although he noted the impact of climate change. Thakur (2006, 2007: 71–155) offered four soft security perspectives on human security, human rights, international criminal justice, and international sanctions, but he ignored the environmental security debate and the environmental dimension of human security, and did not address global environmental change as a new security issue. Loader and Walker (2007) in “civilizing security” reviewed the role of the state as meddler, partisan, cultural monolith, and idiot with regard to the good and global public good of security, but they did not discuss the new security dangers posed by GEC.

ity, and it has impacts on the environmental and societal security dimensions.

A national or international energy security strategy that relies heavily on biofuels may have direct negative impacts on food security of food importing countries by reducing food supplies and thus increasing food prices. During 2007 and 2008 the declining food supplies in major crops (e.g. in cereals) and products (milk, butter, cheese, etc.) has resulted in food shortages and global food price increases that have resulted in spring 2008 in several countries (e.g. in Haiti, Egypt) both in peaceful protests, but also in an eruption of violence. Food security is a human, a societal, and a national security issue, and during natural hazards and in periods of food shortage it can become an international political and security problem.

Health security problems can be analysed both as issues of international security (e.g. major pandemics, SARS, Asian flu etc.) but also of national security (e.g. in the USA in the framework of the 'war on terror') but health security is foremost a problem of human security as it affects both the individual human being but may also face humankind. These different dimensions and referent objects will be addressed in chapters 23–59 in parts IV (energy), V (food), VI (health and livelihood), and VII (water) of this book.

1.6 Focus and Contribution of this Book

This volume is organized in ten parts that address these key themes of:

- global environmental change (part I: chap. 2–3) and its securitization (part II: chap. 4–14) and the securitization of extreme outcomes of GEC (part III: chap. 15–22);
- four sectoral concepts of energy security (part IV: chap. 23–32), food security (part V: chap. 33–35), livelihood and health security (part VI: chap. 36–40) as well as water security (part VII: chap. 41–58);
- the environmental dimension (part VIII: chap. 59–73) of a widened security concept;
- human and gender security approaches of a deepened security concept to many new security dangers and concerns (part IX: chap. 74–96); and
- concluding remarks and a policy outlook that offers a brief overview of the contribution of remote sensing to security analysis, a research manifesto for the fourth phase of environmental security re-

search and policy conclusions (part X: chap. 97–100).

1.6.1 Part I: Contextualization of Global Environmental Change

In the following two chapters the historian *John McNeill* (USA), School of Foreign Service at Georgetown University in Washington, DC, reviews the evolution of “The International System, Great Powers, and Environmental Change since 1900” (chap. 2), while *Rik Leemans* (The Netherlands), an environmental systems analyst at Wageningen University and chair of the international *Earth System Science Partnership* (ESSP), summarizes the results of “The Millennium Ecosystem Assessment: Securing Interactions between Ecosystems, Ecosystem Services and Human Wellbeing” (chap. 3).

1.6.2 Part II: Securitization of Global Environmental Change

The next eleven chapters start with a review of the emerging policy debate on securitizing GEC (chap. 4), address issues of climate history (chap. 5–6) and the impact of climate change for small island states (chap. 7), review security connotations of desertification (chap. 8–10), discuss the securitization of water (chap. 11), assess demographic trends and ageing as a security concern (chap. 12), and examine the linkages between urbanization and security (chap. 13–14).

Hans Günter Brauch (Germany), a political scientist who teaches at the Free University of Berlin and a fellow at UNU-EHS in Bonn, examines the conceptual discussion and policy debate on securitizing climate change, water, and desertification (chap. 4). *Wolf Dieter Blümel* (Germany), a physical geographer at the University of Stuttgart, offers an overview on: “Natural Climatic Variations in the Holocene: Past Impacts on Cultural History, Human Welfare and Crisis” (chap. 5), while *Arie S. Issar* (Israel), a hydrogeologist at the J. Blaustein Institute for Desert Research of the Ben Gurion University of the Negev, and *Mattanyah Zohar* (Israel), an archaeologist and assyriologist, summarize the results of a study on: “Climate Change Impacts on the Environment and Civilization in the Near East” (chap. 6). *Yannis Kinnas* (Greece), a former diplomat and international relations specialist from Athens, reviews the linkages between: “Human Security, Climate Change and Small Islands” (chap. 7).

The first of the three chapters on linkages between desertification and security that is co-authored by *Rajeb Boulharouf* (Algeria), the external relations and public information coordinator of the Secretariat of United Nations Convention to Combat Desertification (UNCCD) in Bonn, and *Douglas Pattie* (USA), coordinator of the Platform for the Promotion of Early Warning, United Nations International Strategy for Disaster Reduction (UN/ISDR) in Bonn, focuses on: “Redefining Sustainability: A Policy Tool for Environmental Security and Desertification” (chap. 8). *Andreas Rechkemmer* (Germany), the Executive Director of the International Human Dimensions Programme on Global Environmental Change (IHDP), discusses the “Societal Impacts of Desertification: Migration and Environmental Refugees?” (chap. 9), while *Ali Ghazi* (Algeria), Ministry of Town and Country Planning, Environment and Tourism in Algiers, examines “Desertification in Algeria: Policies and Measures for the Protection of Natural Resources” (chap. 10).

Úrsula Oswald Spring (Mexico), *Center for Multi-disciplinary Studies* (CRIM) of the National University of Mexico (UNAM) in Cuernavaca and MunichRE chairholder on social vulnerability at UNU-EHS in Bonn, and *Hans Günter Brauch* (Germany), review the conceptual and policy efforts of: “Securitizing Water” (chap. 11), while *Wolfgang Lutz* (Austria), who leads the World Population Programme of the International Institute for Applied Systems Analysis (IIASA) and directs the Vienna Institute of Demography (VID) of the Austrian Academy of Sciences, assesses the: “Changing Population Size and Distribution as a Security Concern” (chap. 12).

Ben Wisner (USA), Oberlin College, Ohio and research fellow at DESTIN, London School of Economics, and at the Benfield Hazard Research Centre, University College London, and *Juha I. Uitto* (Finland), United Nations Development Programme (UNDP), analyse: “Life on the Edge: Urban Social Vulnerability and Decentralized, Citizen-Based Disaster Risk Reduction in Four Large Cities of the Pacific Rim” (chap. 13). *Isabelle Milbert* (France/ Switzerland), Graduate Institute for International and Development Studies, who teaches development studies at the University of Geneva, discusses “Policy Dimensions of Human Security and Vulnerability Challenges: The Case of Urban India” (chap. 14).

1.6.3 Part III: Securitization of Extreme Natural and Societal Outcomes

The following eight chapters link the peace research with the hazard community (chap. 15), focus on HIV/AIDS (chap. 16, 17), deal with natural hazards (chap. 18) and environment-induced migration (chap. 19), summarize the results of the Toronto and the Swiss schools on environmental security (chap. 20 and 21), and deal with environmental conflict resolution (chap. 22).

Ben Wisner (USA) in his contribution on: “Interactions between Conflict and Natural Hazards: Swords, Ploughshares, Earthquakes, Floods and Storms” (chap. 15) suggests a cooperation between the peace and conflict research and the hazard communities. *Nana K. Poku* (Ghana/UK), University of Bradford, and *Bjorg Sandkjær* (Norway), African Centre for Gender and Social Development at the United Nations Economic Commission for Africa (UNECA in Ethiopia), co-authored: “AIDS as a Human Security Challenge” (chap. 16), while *Sophia Benz* (Germany), Institute of Political Science, University of Tübingen writes on: “Conflict and HIV/AIDS: Quantitative Analysis” (chap. 17).

This is followed by a co-authored chapter by *János J. Bogardi*, Vice-Rector of UNU in Europe and director of UNU-EHS in Bonn, *Jörn Birkmann*, *Niklas Gebert* (all from Germany), and *Neysa Jacqueline Setiadi* (Indonesia/Germany) on: “Preparing for Low-Frequency, Extreme Natural Hazards: Contributing to Human Security by Enhancing ‘Freedom from Hazard Impact’” (chap. 18). *Imtiaz Ahmed* (Bangladesh), University of Dhaka and executive director of the Centre for Alternatives, offers an empirical analysis of: “Environmental Refugees and Environmental Distress Migration as a Security Challenge for India and Bangladesh” (chap. 19).

Thomas Homer-Dixon (Canada), Chair of Global Systems at the University of Waterloo (Canada), and *Tom Deligiannis* (Canada), Department of Environment, Peace and Security at the University for Peace in Costa Rica, provide a succinct summary of the results on environmental security by the Toronto school on: “Environmental Scarcities and Civil Violence” (chap. 20). A team of five co-authors, representing a second generation of the Swiss school on environmental security studies: *Simon A. Mason* (Switzerland), Center for Security Studies (CSS), ETH Zürich, *Tobias Hagmann* (Switzerland), Department of Geography, University of Zürich, *Christine Bichsel* (Switzerland), Department of Geography, University

of Berne, *Eva Ludi* (Switzerland/UK), Rural Policy and Governance Group, *Overseas Development Institute* (ODI) in London, and *Yacob Arsano* (Ethiopia), Political Science and International Relations Department at Addis Ababa University, analyse the “Linkages between sub-national and international water conflicts: the Eastern Nile Basin” (chap. 21). Last but not least, *Saleem Ali* (USA), University of Vermont’s Rubenstein School of Natural Resources and Environmental Conflict Resolution, deals with: “Extractive Industries and the Environmental Aspects of International Security” (chap. 22).

1.6.4 Part IV: Energy Security for the 21st Century

Eleven chapters review the conceptual aspects and concrete policy problems of energy security with a special focus on renewable energy sources. *Klaus-Dietmar Jacoby* (Germany), a seconded national expert in the EU Commission, starts with a contribution on: “Energy Security: Conceptualization of the International Energy Agency (IEA)” (chap. 23). This is followed by two scenario analyses by *Leo Schrattenholzer* (Austria), International Resource Management (Vienna), on: “Scenarios of Energy Demand and Supply until 2100: Implications for Energy Security” (chap. 24); and by *Jörg Schindler* (Germany), *Ludwig-Bölkow-Systemtechnik* (LBST) and his colleague *Werner Zittel* (Germany) who analyse: “Projections of Fossil Energy Reserves and Supply until 2050 (2100): Implications for Longer-term Energy Supply Security” (chap. 25).

This is followed by three chapters on renewable energy sources by *Andre Faaj* (The Netherlands), Copernicus Institute for Sustainable Development of Utrecht University, who writes on: “Technical and Economic Potentials of Biomass until 2050: Regional Relevance for Energy Security” (chap. 26). *David Faiman* (Israel), Department of Solar Energy and Environmental Physics at Ben Gurion University’s Jacob Blaustein Institutes for Desert Research, in Sede Boqer, and director of Israel’s National Solar Energy Center, discusses the potential of: “Solar Energy on a Global Scale: Its Impact on Security” (chap. 27). *Franz Trieb*, *Wolfram Krewitt* from the Department of Systems Analysis and Technology Assessment, German Aerospace Center (DLR); and *Nadine May* (all from Germany), VDI/VDE-IT GmbH, write on: “Solar Energy as a Key for Power and Water in the Middle East and North Africa” (chap. 28).

Two chapters deal with oil in the Middle East. *Mohammad El-Sayed Selim* (Egypt), a political scientist from Cairo University and presently at Kuwait University, and *Abdullah Sabar Mohammad* (Kuwait), Political Science Department in Kuwait University, write on: “Energy Security in the Arab World” (chap. 29), while *Gareth Winrow* (United Kingdom), formerly with Bilgi University in Istanbul, analyses: “Turkey: Energy Security and Central Asia: The Politics and Economics of the So-called Great Game” (chap. 30).

Nogoye Thiam (Senegal), Energy, Environment and Development Programme of the NGO Enda-TM, offers an analysis on “Towards a Sustainable Energy System for Africa: An African Perspective on Energy Security” (chap. 31). *Rolf Linkohr* (Germany), president of CERES (Centre for European Energy Strategy) in Brussels and a former member of the European Parliament (1979–2004), discusses: “Energy Security: Economic, Environmental, and Societal Opportunity for the North - Potential of Renewables to Avoid Conflicts?” (chap. 32).

1.6.5 Food Security for the 21st Century

This part provides three analyses and case studies on food security from Latin American, African, and Asian perspectives. *Úrsula Oswald Spring* (Mexico), a social anthropologist and environmentalist, starts with a critical analysis on: “Food as a new human and livelihood security challenge” (chap. 33). *Mohamed Salih* (Sudan/The Netherlands), Institute of Social Studies, The Hague, and Department of Political Science, University of Leiden (The Netherlands), supplies a succinct analysis on: “Food Security and Democracy: from the perspective of governance” (chap. 34).

A team of five authors from Turkey including *Selim Kapur*, Faculty of Agriculture Department of Archaeometry, *Burcak Kapur*, Department of Agricultural Structures and Irrigation and *Erhan Akca*, Department of Soil Science and Archaeometry from the University of Çukurova in Adana in Turkey as well as *Hari Eswaran* (USA), Natural Resources Conservation Service of the US Department of Agriculture, and *Mustafa Aydin* (Turkey), TOBB-Economics and Technology University and National Security Academy, offer “A Research Strategy to Secure Energy, Water and Food via Developing Sustainable Land and Water Management in Turkey” (chap. 35).

1.6.6 Livelihood and Health Security for the 21st Century

The first chapter introduces the ‘livelihood security concept’ while the remaining four cover the debate on the health security concept and on selected health security problems. *Hans-Georg Bohle* (Germany), Geography Department, University of Bonn and MunichRE chairholder on social vulnerability at UNU-EHS in Bonn, discusses “Sustainable Livelihood Security. Evolution and Application” (chap. 36).

Guenael Rodier (France/Switzerland) and *Mary Kay Kindhauser* (USA/Switzerland) from the *World Health Organization* (WHO), Geneva review: “Global Health Security: The WHO Response to Outbreaks Past and Future” (chap. 37); while *Jennifer Leaning*, Department of Population and International Health, School of Public Health at Harvard University, offers a conceptual analysis of “Health and Human Security in the 21st Century” (chap. 38).

Then a team of four junior researchers offer case studies on Africa and Asia. *Fred Eboko* (France), a political scientist and sociologist with IRD-INSERM-Université de la Méditerranée and the Observatoire Régional de la Santé, and *Teresa Nemeckova* (Czech Republic), an economist with the Department of the World Economy, University of Economics in Prague, write on: “AIDS – Challenge to Health Security in Africa: Politics in Africa and a Case Study of Botswana” (chap. 39). *Isabel Fischer* (Germany), Institute of Agricultural Economics and Social Sciences in the Tropics and Subtropics, University of Stuttgart Hohenheim, and *Mohammad Musfequs Salehin*, Department of Rural Sociology, Bangladesh Agricultural University, examine: “Health and Poverty as Challenges for Human Security: Two Case Studies on Northern Vietnam and Bangladesh” (chap. 40).

1.6.7 Water Security for the 21st Century

This part includes 18 chapters by authors from many disciplines and countries. It starts with a theoretical and conceptual analysis by a geographer and water specialist. Eight chapters deal with water security issues in the international river basins of the Mekong, the Euphrates and Tigris, the Jordan and Nile, the Senegal, Volta and the Zambezi, four chapters deal with problems of water resource management and conflicts in Central Asia, while two review water security issues in India and Jordan, one offers a theoretical analysis for the Middle East, another on Sub-Saharan

Africa, and the last chapter provides a legal analysis of water security in armed conflicts.

J. A. [Tony] Allan (UK), a geographer at King’s College, University of London, introduces into the theme with: “Global trade: balancing existing and future regional water resource deficits” (chap. 41). This is followed by an ecofeminist perspective by *Vandana Shiva* (India), a physicist and environmental activist, on “Water Wars in India” (chap. 42). *Bastien Affentranger* (France), a geographer with the *Institute for Industrial Environment and Risks* (INERIS), writes on: “Sustainability of Environmental Regimes: The Mekong River Commission” (chap. 43), while *Mustafa Aydin* (Turkey) and *Fulya Ereker* (Turkey), Department of International Relations, Ankara University, deal with: “Water Scarcity and Political Wrangling: Security in Euphrates and Tigris Basin” (chap. 44).

The three chapters on water security issues in the Near East start with a country study by *Bassam Ossama Hayek* (Jordan), director of the Environmental Research Center, Royal Scientific Society in Amman, that deals with: “Water Resources in the Arab World: A Case Study on Jordan” (chap. 45). *Jan Selby* (UK), Department of International Relations at the University of Sussex, discusses: “‘New Security Thinking’ in Israeli-Palestinian Water Relations” (chap. 46), while *Anders Jägerskog* (Sweden), *Stockholm International Water Institute* (SIWI), writes on: “Functional Water Cooperation in the Jordan River Basin: Spill-over or Spillover for Political Security?” (chap. 47).

Two chapters deal with the Nile River Basin. *Emad Adly* (Egypt), chairman of the *Arab Office for Youth and Environment* (AOYE), and *Tarek Abdallah Ahmed* (Egypt), a water resource planner, write on “Water and food security in the River Nile Basin: Perspectives of the Government and NGOs in Egypt” (chap. 48), while *Patricia Kameri-Mbote* (Kenya), School of Law, University of Nairobi and Programme Director for Africa, International Environmental Law Research Centre (IELRC), Nairobi, and *Kithure Kindiki* (Kenya), School of Law, University of Nairobi, offer a legal perspective from an upstream country on: “Water and Food Security in the River Nile Basin: The Perspectives of Governments and NGOs of Upstream Countries” (chap. 49). Two senior water specialists from South Africa, *Peter Ashton*, *Council for Scientific and Industrial Research* (CSIR), and *Antony Turton*, CSIR and University of Pretoria, offer a profound theory-guided analysis on: “Water Security in Sub-Saharan Africa: Emerging Concepts and their

Implications for Effective Water Resource Management in the Southern African Region” (chap. 50).

Three chapters emerged from diploma theses from the French-German cycle at the Free University of Berlin by political scientists from Germany and France. *Martin Kipping* (Germany), Free University of Berlin, challenges present wisdom on: “Water Security in the Senegal River Basin: Water Cooperation and Water Conflicts” (chap. 51), while *Maëlis Borghese* (France), *Agence Française de Développement* (AFD), offers a theoretical and empirical analysis on: “The Centrality of Water Regime Formation for Water Security in West Africa: An Analysis of the Volta Basin” (chap. 52), and *Stefan Lindemann* (Germany), London School of Economics and Political Science (LSE), writes on: “Success and Failure in International River Basin Management – The Case of Southern Africa” (chap. 53).

Four chapters deal with water problems in Central Asia. Based on field research in Kyrgyzstan, *Martin Kipping* discusses the question: “Can ‘Integrated Water Resources Management’ Silence Malthusian Concerns? The Case of Central Asia” (chap. 54), while *Eva Patricia Rakel* (Germany), University of Amsterdam, reviews: “Environmental Security in Central Asia and the Caspian Region: Aral and Caspian Seas” (chap. 55), and *Julia Wunderer* (Germany), International Office of Humboldt University of Berlin, analyses: “The Central Asian Water Regime as an Instrument for Crisis Prevention” (chap. 56). *Christopher Martius* (Germany), *Center for Development Research* (ZEF), University of Bonn, *Jochen Froebrich* (Germany), Wageningen University in the Netherlands, and *Ernst-August Nuppenau* (Germany), University of Giessen, write on: “Water Resource Management for Improving Environmental Security and Rural Livelihoods in the Irrigated Amu Darya Lowlands” (chap. 57).

Finally, *Mara Tignino* (Italy), Graduate Institute of International Studies and Law Faculty of Geneva University, contributes a study on: “Water Security in Armed Conflicts” (chap. 58).

1.6.8 Environmental Security Concepts and Debates

Fifteen chapters review the environmental security discourse and environmental security debates in North America, in Russia, Belarus and Ukraine, in India, the Far East and in the Arab World, as well as on Israel and Palestine, on Uganda, Rwanda, Ethiopia and Burundi, in Sub-Sahara Africa, on Amazonia, the

Caucasus, the Asia Pacific, and the Arctic and Antarctic regions.

Simon Dalby (Canada), a geographer, environmental expert and political economist, Carleton University, Ottawa, *Hans Günter Brauch*, and *Úrsula Oswald Spring*, merge their experience from three disciplines on: “Environmental Security Concepts Revisited During the First Three Phases (1983–2007)” (chap. 59). *Richard Matthew* (USA), Schools of Social Ecology and Social Science at the *University of California at Irvine* (UCI), director of the Center for Unconventional Security Affairs, and *Bryan McDonald* (USA), UCI, review: “Environmental Security: Academic and Policy Debates in North America” (chap. 60), while *Alexander Sergunin* (Russia), Department of International Relations Theory and History, St. Petersburg State University, writes on: “The Debate on Ecological Security in Russia, Belarus and Ukraine” (chap. 61).

P. S. Ramakrishnan (India), School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, examines: “Linking Knowledge Systems for Socio-ecological Security” (chap. 62), while *Miranda Schreurs* (USA), Environmental Policy Research Centre, Free University of Berlin, discusses: “Environmental Security in Northeast Asia” (chap. 63).

Mohamad El-Sayed Selim (Egypt) starts the Middle East section with a contribution on: “Environmental security in the Arab World” (chap. 64), while *David Newman* (Israel), Department of Politics and Government at Ben Gurion University and editor of *Geopolitics*, offers a discourse analysis on: “In the Name of Security: In the Name of Peace’ – Environmental Schizophrenia and the Security Discourse in Israel-Palestine” (chap. 65). *Robin Twite* (UK/Israel), *Israel Palestine Center for Research and Information* (IPCRI) in Jerusalem, discusses: “Security and Environment and the Israel-Palestine Conflict” (chap. 66), while *Mohammed S. Dajani Daoudi*, American Studies Institute, Al-Quds University, Jerusalem reviews the: “Conceptualization and Debate on Environmental and Human Security in Palestine” (chap. 67).

In the next two chapters two authors from Africa discuss international and national environmental security issues in Eastern and Central Africa. *Mersie Ejigu* (Ethiopia), *Partnership for African Environmental Sustainability* (PAES) and *Foundation for Environmental Security & Sustainability* (FESS) analyses: “Environmental Scarcity, Insecurity, and Conflict: The Cases of Uganda, Rwanda, Ethiopia, and Burundi” (chap. 68), while *Sam Moyo* (Zimbabwe), executive director of the African Institute for Agrarian Studies

(AIAS) in Harare, discusses: “Environmental Security in Sub-Sahara Africa: Global and Regional Environmental Security Concepts and Debates Revisited” (chap. 69).

Alexander López (Costa Rica), Institute for International Affairs of the Universidad Nacional de Costa Rica, discusses: “The Brazilian Amazon in an Environmental Security and Social Conflict Framework” (chap. 70). This is followed by a contribution by *Vicken Cheterian* (Switzerland), a journalist with CIMERA in Geneva, who reviews the: “Politics of Environment in the Caucasus Conflict Zone: From Nationalizing Politics to Conflict Resolution” (chap. 71).

Jon Barnett (Australia), Department of Resource Management and Geography at the University of Melbourne, analyses: “Environmental Security in the Asia-Pacific Region: Contrasting Problems, Places, and Prospects” (chap. 72), while *Gunhild Hoogensen* (Norway), Department of Political Science at the University of Tromsø, writes on: “Security at the Poles: the Arctic and Antarctic” (chap. 73).

1.6.9 Part IX: Human and Gender Security Concepts and Debates

With 23 chapters, this part offers a conceptual introduction and an overview on the debates on human security in the social sciences and in international organizations (chap. 74-77), before it reviews the human security discourses in the Arab world, in Southeast Asia, in Sub-Saharan Africa, in Central and South America (chap. 78-82) and analyses human security as ‘freedom from fear’, ‘freedom from want’, ‘freedom to live in dignity’, and as ‘freedom from hazard impacts’ (chap. 83-88). This is followed by a controversial discussion on human and gender security approaches (chap. 89-93) and it concludes with three case studies on Afghanistan, Guyana, and on a human security based early warning and response system (chap. 94-96).

Introducing into the scientific and political debate on human security, *Hans Günter Brauch* (Germany) surveys the “Human security concepts in policy and science” (chap. 74), and *Claudia Fuentes Julio* (Chile), Josef Korbel School of International Studies (GSIS) at Denver University, and *Hans Günter Brauch*, discuss the: “Human Security Network: A Global North-South Coalition” (chap. 75).

The next two chapters offer conceptual discussions of the human security concept from a South Asian and European perspective. *A.K.M. Abdus*

Sabur (Bangladesh), International Studies Division at *Bangladesh Institute of International and Strategic Studies* (BIISS) and editor of the *BIISS Journal*, offers a: “Theoretical Perspective on Human Security: A South Asian View” (chap. 76). *Sascha Werthes* (Germany), Institute of Political Science at the University of Duisburg-Essen and fellow at its Institute for Development and Peace (INEF), and *Tobias Debiel* (Germany), Institute of Political Science and director of INEF, discuss the: “Horizontal and Vertical Extension of International Security: A Human Security Approach” (chap. 77).

This is followed by five chapters on the human security debate in the South. *Béchir Chourou* (Tunisia), University of Tunis-Carthage, writes on: “Human Security in the Arab World: A Perspective from the Maghreb” (chap. 78), while *Zarina Othman* (Malaysia), *Universiti Kebangsaan Malaysia* (UKM/National University of Malaysia), covers: “Human Security Concepts, Approaches and Debates in Southeast Asia” (chap. 79). *Nana Poku* (Ghana/UK) and *Bjorg Sandkjær* (Norway) analyse: “Human Security in Sub-Saharan Africa” (chap. 80). *Philippe De Lombaerde* (Belgium), *United Nations University - Comparative Regional Integration Studies* (UNU-CRIS) in Bruges, and *Matthew Norton* (UK), Sociology Department of Yale University, discuss: “Human Security in Central America” (chap. 81), while *Francisco Rojas Aravena* (Chile), Secretary General of the *Latin American Faculty of Social Sciences* (FLACSO), contributes on: “Human Security: a South American Perspective” (chap. 82).

Human security as ‘freedom from fear’ aiming at overcoming violence is discussed by *David Black* (Canada), Department of International Development Studies, Political Science, and International Development Studies at Dalhousie University, and *Larry Swatuk* (Canada), International Development Studies, Dalhousie University, and Departments of International Development Studies and Political Science, St. Mary’s University, Halifax, Nova Scotia, in: “Human Security in North America: A Canadian Perspective” (chap. 83).

Human security as ‘freedom from want’ is covered by *Hideaki Shinoda* (Japan), Institute for Peace Science, Hiroshima University, who reviews: “Human Security Initiatives of Japan” (chap. 84). *Max Schott* (Germany/USA), Human Security Unit at the Office for the Coordination of Humanitarian Affairs (OCHA) of the UN Secretariat in New York, presents a case study on what people in Mali consider as their key human security concerns, in: “Human Security:

International Discourse and Local Reality: The Case of Mali” (chap. 85).

Human security as ‘freedom to live in dignity’ is introduced by *Dieter Senghaas* (Germany), Institute of Intercultural and International Studies, University of Bremen, who writes on: “Enhancing human rights: a contribution to human security” (chap. 86). Human security as ‘freedom from hazard impact’ is conceptually introduced by *Fabien Nathan* (France), *Graduate Institute of Development Studies* (IUED, Geneva), National Centre for Competence in Research, North-South (NCCR/NS), in: “Vulnerability, Disaster and Human Security” (chap. 87). *Surichai Wun’Gaeo* (Thailand), Chulalongkorn University in Bangkok, offers a case study on: “Environment as an Element of Human Security in Southeast Asia: Case Study on the Thai Tsunami” (chap. 88).

Five chapters by seven women from Mexico, Vietnam/Netherlands, the Philippines and Sri Lanka conceptualize different approaches to human and gender security. *Serena Eréndira Serrano Oswald* (Mexico), UNAM, discusses: “The Impossibility of Securitizing Gender vis-à-vis ‘Engendering’ Security” (chap. 89), while *Úrsula Oswald Spring* (Mexico) develops her own concept of: “Human, Gender and Environmental Security: A HUGE Security Concept” (chap. 90). *ThanhDam Truong* (Netherlands/Vietnam), Institute of Social Studies (ISS) in The Hague, offers a theoretical analysis on: “Human Security and the Governmentality of Neo-Liberal Mobility: A Feminist Perspective” (chap. 91). This is followed by an empirical account by *Mary Soledad L. Perpiñan* (Philippines), a former secretary-general of the Asian-Pacific Peace Research Association (APPRA), *Maria Eugenia Villareal* (Mexico/Guatemala), a sociologist working on child protection and human security in Central America, and *Úrsula Oswald Spring* (Mexico) that focuses on: “Gender Security in South East Asia and Trafficking of Children for Sexual Exploitation in Central America: a HUGE Security Challenge” (chap. 92). *Madhavi Matalgoda Ariyabandu* (Sri Lanka), an expert on gender mainstreaming initiatives with UNDP and the *United Nations International Strategy for Disaster Risk Reduction* (UN/ISDR), and *Dilrukshhi Fonseka* (Sri Lanka), a freelance consultant and trainer with several NGOs in peacebuilding, human rights, discuss: “Do Disasters Discriminate? A Human Security Analysis of the impact of the Tsunami in India, Sri Lanka, and of the Kashmir Earthquake in Pakistan” (chap. 93).

The last three chapters offer case studies on specific discourses and issues. *Sharbanou Tadjbaksh*

(USA/France/Iran), director of the Programme for Peace and Human Security at the CERI (*Centre d’Etudes et de Recherches Internationales*), Sciences Po, Paris, offers an empirical case study on: “A Failed Narco-state or a Human Security Failure? Ethical and Methodological Ruptures with a Traditional Read of the Afghan Quagmire” (chap. 94). *Joseph Singh* (Guyana), chief executive officer of the Guyana Telephone and Telegraph Company, reviews the: “Relevance of Human and Environmental Security Concepts for the Military Services: A Perspective of a Former Chief of Staff” (chap. 95). A chapter by *Albrecht Schmabel* (Germany) and *Heinz Krummenacher* (Switzerland), swisspeace, suggests to move: “Towards a Human Security-Based Early Warning and Response System” (chap. 96).

1.6.10 From Knowledge to Action: Policy Outlook

In the concluding part, *Dirk H. Hoekman* (The Netherlands), Wageningen University and general director of SarVision, writes on: “Methods and Techniques of Remote Sensing to Contribute to Security in Tropical Rain Forests” (chap. 97). This is followed by a research manifesto by *Úrsula Oswald Spring*, *Hans Günter Brauch*, and *Simon Dalby* that suggests: “Linking the Anthropocene, HUGE, and HESP in a Fourth Phase of Human, Environmental, and Gender Security and Peace Research” (chap. 98). In a policy outlook on: “Towards Sustainable Peace for the 21st Century”, *Hans Günter Brauch* and *Úrsula Oswald Spring* suggest to move from ‘facing global environmental change’ to ‘coping’ with climate change, water scarcity and desertification in a proactive way. This requires an ‘anticipatory learning’ process to which both the natural and social sciences must contribute to move towards a ‘sustainable peace’ with ‘sustainable development’ strategies. This is a challenge humankind is confronted with in the 21st century. In the concluding chapter 100 *Hans Günter Brauch* summarizes key messages of the previous 99 chapters.

1.7 Multidisciplinary Perspectives for a Global Audience

This book – as the previous and the subsequent volumes – differs from many publications on security by aiming at a fourfold dialogue between the social and the natural sciences, among the different social science disciplines, programmes and schools, between

scholars from North and South, and scientists and policymakers. Therefore the editors pursue three goals:

- a.) to contribute to *problem awareness* for the different security concepts in North and South, on hard and soft security issues, on non-military and primarily environmental challenges and environmental security problems;
- b.) to stimulate and encourage multi-, inter-, and transdisciplinary scientific research and political efforts to resolve, prevent, and avoid that environmental factors may contribute to violent conflicts (both scientific and political *agenda-setting*); and
- c.) to contribute to a better understanding of the complex interactions between natural processes, nature, and human-induced regional environmental changes (*learning*).

While power has once been defined by Karl Deutsch (1963, 1966) as not having to learn, during the 20th century the resistance to any *anticipatory* learning by those who control the resources over outcomes has been significant. In history, it often required severe foreign policy and domestic crises (e.g. in the USA in the 1970's during the Vietnam war and in the former Soviet Union in the 1980's during the Afghanistan war) to stimulate major reassessments of existing foreign and security policies and to launch fundamental revisions.

Several scientists (E.U. von Weizsäcker 1989; E.O. Wilson 1998) have described the 21st century as the century of the environment. For this new century, Edward O. Wilson (1998a) has referred to a growing *consilience*, which implies that the interfaces of disciplines become as important as the disciplines. Ted Munn (2002), in his preface to the *Encyclopedia of Global Environmental Change*, argued based on Wilson:

that this interlocking amongst the natural sciences will in the 21st century also touch 'the borders of the social sciences and humanities'. In the environmental context, environmental scientists in diverse specialties, including human ecology, are more precisely defining the area in which that species arose, and those parts that must be sustained for human survival (Wilson 1998).

Anticipatory learning must acknowledge this need for a growing *consilience* that causal explanations across disciplines may contribute to new understanding and knowledge that will be needed to cope with the challenges of the 'international risk society' (Beck 1992, 1999, 2007).

This book intends to broaden the scope and to sensitize the reader to the thinking in different disciplines, cultures, and global regions, especially on nature and humankind. The editors have worked hard that these three related books on 'reconceptualizing security' will be of relevance for scholars, educators, students, and an academically trained audience in many scientific disciplines, such as: *political science* (international relations, security studies, environmental studies, peace research, conflict and war studies); *sociology* (security conceptualization and risk society); *economics*; *philosophy* and *culture* (security conceptualization); *international law* (water in conflicts), *geosciences* (global environmental change, climate change, desertification, water), *geography* (global environmental change, population, urbanization, food), as well as in *diplomacy* (diplomatic academies) and *military science* and practice (military academies).

The global thinking on security is also of importance for policymakers and their advisers on the national and international level in: a) foreign, defence, development and environment ministries and their policy-oriented think tanks; b) international organizations: NATO, European institutions, UN, UNESCO, FAO, WHO, UNDP, UNEP, IEA, UNU, et al.; c) for the *Human Security Network* as well as for the *Friends of Human Security*; d) for the green development network of the representatives of 27 EU foreign ministries; and in e) nongovernmental organizations in the areas of foreign and defence, development and environment policies; as well as for f) diverse social movements.

The thinking on security and on the specific security policies of countries, alliances, and international organizations, especially a people-centred security approach, may be of interest for educators (at all levels) and media specialists. The editors and authors hope that those colleagues who focus on the broader conceptual context of security will benefit from this unique global, multidisciplinary, and policy focused compendium.

2 The International System, Great Powers, and Environmental Change since 1900

J.R. McNeill

2.1 Introduction

This chapter examines an aspect of the relationship between the international system and environmental change. Political scientists have recently created a new sub-field, called 'environmental security', in which they argue that environmental stresses add to security risks. Without disputing the validity of that literature, indeed complementing it, this chapter puts the matter the other way around: security risks put added stress on the environment, thereby creating something of a vicious circle. In particular, the unusually high security anxiety of the 20th century helped drive unusually rapid and large-scale environmental change since 1900. The evidence offered in support of this argument concerns nuclear weapons programmes, pollution-intensive industrialization efforts, pro-natalism, among others.

One of the major influences upon modern environmental history has been, and remains, the struggle for survival and power in the international system. This chapter argues that historically international struggle has generally selected against ecological prudence in states and societies, and that the rigorous struggle of the 20th century selected rigorously against ecological prudence. Further, it argues that preparation for war and economic mobilization for war had stronger environmental consequences than did combat itself. After brief consideration of the scale and scope of environmental change and its causes (2.2) and of the evolution of the international system (2.3), the chapter focuses on environmental impacts of war and preparation for war (2.4).

2.2 Environmental Change and Its Causes in the 20th Century

Environmental change has always been part of the human experience. Since they first harnessed fire sev-

eral hundred thousand years ago, hominids and humans have changed the world's ecology. But in modern and contemporary times we have done so on a scale unprecedented in human history and with very few analogues in earth history. Humankind undertook a gigantic, uncontrolled experiment on the earth, altering land cover, atmospheric chemistry, biodiversity, biogeochemical flows, and much else (McNeill 2000; Steffen et al 2005, see table 2.1).

Why did this tremendous flux occur when it did and how it did? The reasons are many, complex, and overlapping. Population growth, often cited as the principal driving force behind all manner of environmental change, did indeed matter. The expansion of human numbers from about 1.5 billion in 1900 to about 6.3 billion in 2005 is obviously unprecedented, destined never to be repeated, and replete with environmental consequences. But the energy system mattered even more. First, because it was based on fossil fuels: after 1890 they provided more than half of the energy used around the world. Fossil fuels are dirty. The carbon dioxide they emitted into the atmosphere promoted climate change. The sulphur dioxide they emitted fell as acid rain, damaging the biota of rivers and lakes, and possibly damaging forests as well. But the pollution consequences of burning fossil fuels were only part of the larger picture. Digging coal, drilling for oil, and transporting oil were messy affairs too. Fossil fuels allowed new technologies that exponentially increased the volume and pace of mining, to the point where it became rewarding to shear off mountain tops in search of coal, or to crush millions of tons of rock in quests for a few grams of gold. Fossil fuels allowed the chain saw, without which tropical deforestation, so characteristic of our times, could not have taken place nearly so quickly. And of course fossil fuels are not the only component of the 20th century's energy system: hydroelectricity required dam building, often done on the gigantic scale; and nuclear energy, with its accidents

Table 2.1: Co-efficients of Change, from the 1890's to the 1990's.

Indicator	Coefficient of change
World population	4
Urban proportion of world population	3
Total world urban population	13
World economy	14
Industrial output	40
Energy use	13-15
Coal production	7
Oil production	240
Carbon dioxide emissions to atmosphere	15
Carbon dioxide concentration in atmosphere	1.3
Sulphur dioxide emissions to atmosphere	13
Lead emissions to atmosphere	8
Freshwater use	9
Marine fish catch	35
Cattle population	4
Pig population	9
Goat population	5
Sheep population	1.8
Horse population	1.1
Cropland	2
Pasture area	1.8
Irrigated area	5
Bird and mammal species	0.99 (1 % decrease)
Fin whale population	0.03 (97 % decrease)
Blue whale population (Southern Ocean only)	0.0025 (99.75 % decrease)

Source: McNeill 2000: 361-2; see: Dutch Ministry for the Environment (RIVM), at: <<http://arch.rivm.nl/env/int/hyde/index.html>>.

and waste storage problems, had significant ecological effects too, although so far rather less calamitous than often feared.

The ideological fixations of modern times have also contributed to the pattern of twentieth-century environmental history. Under the tutelage of the economists, and inspired by routine self-interest, pub-

lic servants and private individuals consistently sought to foment economic growth and secure monetary gain. They regarded the natural world as a storehouse of raw materials, without intrinsic worth. They saw little value in such abstractions as balance, stability, or resilience in ecosystems. The reigning ideas about appropriate individual and state behaviour promoted rapid environmental change, and justified it in the name of various higher goals: economic growth, political stability, social mobility. The environment changed so much because prevailing ideas changed so little.

These were the most important reasons why the 20th century had the environmental history that it did (McNeill 2000: 267-356). But there were others, among which was politics. It was conventional politics, not environmental politics that mattered most. Even after 1966, when countries began to create environmental agencies, departments, and even ministries, real environmental policy was made elsewhere, in the powerful branches of government: e.g. the ministries of finance, trade, industry, and defence. In every country at all times these were more powerful than the environment ministry (or department or agency), and they made de facto environmental policy as accidental by-products of their own affairs. One concern they all shared, to greater or lesser degrees, was 'state security'. It is this I shall focus on here, only a part of the overall picture.

2.3 The International System and Its Imperatives

The quest for 'state security' has been in force, and affecting ecology, since states were first organized.¹ Throughout most of the history of states, however, the rigour of state security concerns has been blunted by the success of large empires. Most people lived in circumstances either of imposed peace managed and maintained by the technocrats of a bureaucratic empire, or else in an anarchic world in which states can scarcely be said to have existed. Enduring systems of competing states – the international anarchy we tend to regard as normal – have been rare. Typically, they quickly collapsed into imperial unification or reunification. Notable and durable exceptions include the era of warring states in China (c. 770 BC to 221 BC) and Greece from the first *poleis* (ca. 800 BC) to Alex-

1 Westing (1980: 14) provides a list of 26 wars with a capsule description of their ecological cost.

under the Great's unification (336 BC). In these times and places interstate struggle doubtless took its toll on landscapes, although details are obscure.² But in these cases the scales of military and bureaucratic operations were comparatively small, and the technologies involved rudimentary. Consider the technology of destruction. Before 1800 the only powerful means of ecological damage were deliberate fire and the capacity to tear apart irrigation works, causing deliberate floods. So the ancient eras of anarchic competition in international systems were limited in their ecological impact. Modern times have seen the resurgence of international anarchy combined with ever-growing scales of operations and technological sophistication.

The current competitive international system has not yet collapsed or unified, but instead has evolved and grown so as to be effectively global. It originally emanated from the stalemate in sixteenth-century Europe among the Hapsburg, Valois, and Ottoman dynasties. None succeeded in re-establishing a pan-European empire, which eccentricity marked Europe off from the rest of the world. This extraordinary failure was codified by the Peace of Westphalia in 1648, and a self-consciously self-regulating system of competing states was born, ratcheting up the rigour of intersocietal and interstate struggle. The constant competition of this system obliged (surviving) European states to evolve ever more formidable political, fiscal, and military capacities, which by the nineteenth century created states more powerful than those anywhere else in the world.

But in the 19th century (1815–1910) the Great Powers managed their competition almost peacefully, thanks to diplomatic skill, a fairly stable balance of power, and British economic and naval hegemony. In effect they almost banished war to Asia and Africa (and various frontiers in the Americas), where it prevailed with heightened regularity in part because of colonial pressures from the Great Powers. These conflicts required minimal mobilization on the part of the Great Powers: colonial wars were cheap, mainly because of technological and organizational edges enjoyed by European states, but also because they often

were fought by colonial troops. But the situation changed with the rise of a united Germany after 1870, and acutely when German industrialization allowed greater German assertiveness after 1890. So the 20th century would be different, an era of high anxiety for great powers, beginning with the run-up to World War I.

In the 20th century the rigour of struggle ratcheted up on account of the mounting requirements of competitiveness and the heavy costs of defeat in an age of total war. By 1914, only an all-out effort gave any chance of survival in the European international system; by 1939–45, losers in the competition risked annihilation. Higher stakes brought forth more strenuous effort and greater disregard for goals other than immediate political and physical survival. By 1945–90 even peacetime seemed to require the utmost preparedness for war. The international system selected for those characteristics that promised power in the present moment: technological sophistication, mass industrial and agricultural production, and ideological conformity (on fundamental questions at least, and in some societies on more than that). The health of soils, waters, and air took a distant back seat.

2.4 International Struggle and Environmental Change

Intersocietal competition affected the environment directly through warfare and less directly through the preoccupation with military power: that is, through war and through preparation for war.

2.4.1 The Deeper Past

Until the 20th century, combat did not produce vast environmental consequences except in extraordinary circumstances. When men fought with clubs, spears, arrows, swords, lances, pikes or muskets, they could do little to landscapes. Indeed, the more destructive wars so disrupted agriculture that they produced a fallowing effect, as in Brittany in the 100 Years' War, or in Germany during the Thirty Years' War.³ Forests and wildlife recovered when and where farmers and herders could not conduct their daily business. So did fisheries when naval war, pirates, or privateers confined fishermen to port. The built environment, of course, has always been vulnerable to destruction in war, usually through fire. Victors have torched countless cities; retreating armies have scorched earth aplenty. The Mongols, in their thirteenth-century

2 In the Second Punic War the Roman efforts to defeat Hannibal led to ecological damage in southern Italy that, according to one observer, was visible more than 2,000 years later (Toynbee 1965, II: 11–35). Caesar's legions energetically burned the forests of Gaul (Demorlaine 1919; Corvol/Amat 1994). For the ecological consequences of political-military struggle in ancient China see Elvin 2004.

conquest of Iraq, devastated a flourishing irrigation network, flooding arable lands, creating (or re-creating) swamps. While the Mongols' efforts edged Iraq more nearly to a state of nature, from the cultivators' point of view – not initially shared by the Mongols – this was environmental damage on a large scale.⁴ From any point of view it amounted to vast and enduring environmental change. But such cases were quite rare, essentially confined to landscapes of irrigation.

Preparation for war, rather than combat, typically provoked more serious environmental changes. In Europe for instance, the navy-building programmes of Venice and Genoa in the 11th through 16th centuries, and then of Britain, France, and Spain in the 17th and 18th centuries severely depleted the supply of tall fir and spruce and stout oak in Mediterranean and Atlantic Europe. All states developed forest conservation programmes so as to save more specialized timber for navies, but this proved inadequate in every case. By the 18th century Europe's wooden navies sought ship timber in Indonesia, India, Brazil, Canada and elsewhere around the world (Appuhn 2000; Merino Navarro 1981: 181–267; Albion 1926; Bamford 1956; Lane 1965; Miller 2000).

2.4.2 Combat's Environmental Consequences in the Twentieth Century

In the 20th century, while the technology of destruction grew vastly more powerful, preparation for war, as in remoter times, wrought greater and more lasting environmental change than did war itself. The direct environmental effects of warfare since 1914 have been vast but usually fleeting. The battle zones of WWI's western front created small deserts, where little but rats, lice, and men could live – and few men lived for long. But these zones are hard to detect today, except where carefully preserved: elsewhere their recovery

and assimilation to the French and Belgian countryside is nearly complete. The more mobile campaigns of WWII produced less concentrated damage to landscapes (except for cities),⁵ although certain episodes were destructive enough. For example, in 1938 Chinese troops, in an effort to forestall Japanese advance, deliberately breached the dikes that held the Hwang Ho in place, flooding broad areas of North China and killing people (almost all Chinese), drowning crops, sweeping away bridges, roads, over 4,000 villages and millions of tons of soil: a disaster to be sure, but one soon made invisible by the careful labour of millions of Chinese peasants.⁶ By 1947 the Hwang Ho dikes were repaired. The 'war erosion' of the Russian and Ukrainian plains (1941–45) is perhaps the next greatest example of combat-derived environmental change (cities excepted) from WWII, and in the grand sweep of Soviet soil history it ought probably to be considered trivial (Sobolev 1947; Alayev/Badenkov/Karavaeva 1990). In general, the theatres of operations in World War I and II involved ecologically, economically, and socially resilient places, so the environmental impacts of combat lasted comparatively briefly. Bomb craters remain here and there, forests are still recovering, and the destabilizing effects of tank tracks on dunes in the North African desert linger, but very little of significance in the way of combat-derived environmental change will prove lasting.

The environmental impact of the 1991 Gulf War, a subject viewed with great alarm at the time because of its conspicuous oil fires and spills, now seems not as great as many first feared. It is too soon to comment on its durability, which for marine ecosystems at least may prove considerable. About 10 million barrels of oil flowed into the Gulf, the equivalent of 40 Exxon Valdez spills. The fires, despite initial alarms, appear to have had a negligible impact on the atmosphere and climate (Westing 2003; Hawley 1992; Hobbs/Radke 1992). In Kuwait the war enriched desert environments. So much lethal ordnance remained amid the shifting sands of the Kuwaiti desert that all prudent Kuwaitis refrained from pre-war pastimes of hunting and joyriding. Bird populations grew

3 See: Cintree (1992: 119–127). Between 1420 and 1440 the Breton marches lost 20–80% of their population, almost all settled land was abandoned for decades and returned to second-growth forest. See also: Duby (1968: 296–302), where he says the 100 Years' War led to a resurgence of forest in wide areas throughout France. On the Thirty Years War, see Makowski and Buderath (1983). I am grateful to David Blackbourn for this reference.

4 The Mongols did rebuild the water system in Baghdad and eventually saw the attractions of higher revenues from irrigated farming. Details can be found in Christensen (1993).

5 Hewitt (1983) reports that about 750 square kilometres of German and Japanese cities were flattened by aerial bombing in WWII.

6 The Dutch used a similar tactic to forestall a French invasion in the 1670's, inflicting great flood damage on their own country, and many marauding or occupying armies have purposely flooded other people's lands.

a hundred-fold after the war. Grasses flourished to the point where they reminded some observers of prairies. Similar, if temporary, consequences arose from the desert campaigns in Libya and Egypt in 1942-3.⁷ Thus, in exceptional cases the heavy use of explosive ordnance in conventional war has permitted more rapid recovery from environmental damage.

One perhaps durable effect of the 1991 Gulf War is the near elimination of the marshes that for several millennia had spread over the lower reaches of the Tigris-Euphrates. These were home to people disloyal to Saddam Hussein in his war with Iran in the 1980's, and who rose in revolt against him in 1991. They were crushed. As a coup-de-grâce, the Iraqi dictator ordered the draining of the marshes beginning in 1993 (based on a plan drawn up in 1989), a form of ecological warfare that destroyed birds, fish, reed beds and a way of life for a few hundred thousand people. Attempting to destroy the ecological and economic basis of life of one's enemies is a practice with a long pedigree. In the twentieth century, energy-intensive machinery made such projects far easier than in times past. In this case, with the fall of Saddam, it is possible that engineers will attempt to create the marshes anew. If they succeed, the episode of the Iraq marshes will be just another case of fleeting environmental damage from war (Nicholson/Clark 2002).

2.4.3 The Impacts of Guerrilla War

As a rule, more enduring environmental change came from the guerrilla wars of the 20th century. They were disproportionately important in environmental change because they invariably involved systematic attempts at habitat destruction, similar to that which Saddam Hussein undertook from 1993. Guerrillas inevitably sought to hide from the firepower of their enemies, and except in urban settings that meant hiding in forest and bush. After the dawn of air reconnaissance and bombing (the 1920's, practically speaking), hiding in remote areas proved insufficient: vegetation cover was required. Those fighting against guerrillas found it expedient to destroy that vegetation.

In some instances, this produced durable consequences for vegetation and soils, notably in drier, mountainous regions with high erosion potential, such as those around the Mediterranean. The anti-guerrilla campaigns in the Rif Mountains of Morocco (1921-26), in the mountains of north-western Greece (1942-49), and in the Algerian Tell (1954-61) all entailed widespread forest burning, often through air power. All these wars left scars still visible today, and reduced both the biomass and the economic potential of these districts (McNeill 1992). The consequences may last for centuries. The numerous wars in Africa since 1970, often intersocietal but not international, have led to heightened rates of desertification and ecological damage of many sorts. These too are likely to be durable in their effects, as for climatic, geological, economic, and social reasons the resilience of the affected ecosystems is weak. Ethiopia is perhaps the saddest example of this, but much the same situation prevails in Mozambique, Angola, Chad, and Somalia (Kreike 2004; Timberlake 1987: 162-173; Rubenson 1991). In Vietnam, where defoliation figured prominently in American tactics, the durable results of war are less conspicuous but no less real: geology, climate, and human agency have combined to permit quick repair of most but not all of the damage. Bomb craters (about 20 million all told) and deforested zones remain throughout the country, testament to the American anti-guerrilla effort (Westing 1976, 1984; De Koninck 1999). Guerrilla wars in Central America in the 1970's and 1980's also accelerated forest clearance and added to the chemical poisoning of waterways (Rice 1989; Faber 1992).

2.4.4 Impacts of War Refugees

Additionally, both conventional and guerrilla warfare routinely disrupted local ecologies through the mass migration of refugees. As thousands or millions left war zones, their impact in disturbing or managing their home environments was lost. This at times proved ecologically helpful, but in some cases, such as terraced mountains, mass emigration led to accelerated erosion because terraces fall apart without constant upkeep. Whatever the consequence of war refugees' departure, their arrival somewhere else almost always proved stressful, ecologically as well as in other respects. A careful study of the environmental effects of 3.5 million Afghan refugees in northwest Pakistan in the 1980's provides a grim picture. Suddenly heightened demand for arable land and fuel wood, and the Afghans' inevitable ignorance of local ecol-

7 Reported anonymously in *Environment* (35,4, May 1993: 22); on Egypt and Libya: Said 2003, who recounts tragic consequences of lingering landmines in Egypt; and Westing (1980: 110). Westing (1980: 154) also reports parallel events in the North Atlantic fisheries, where WWII temporarily halted harvesting, and so stocks flourished until peace permitted renewed fishing.

ogy, combined to devastate Pakistan's largest remaining forest zone (Allan 1987). Africa's decolonization and postcolonial conflicts since the 1950's created refugees in their millions, obliged to occupy landscapes which they often understood poorly and in which they hoped to have no long-term stake.

Previous centuries of course featured war refugees. But the twentieth century was distinctive for the number of refugees (~30 million in the 1990's), greater than in the past because human numbers grew so much greater, and because warfare became much more dangerous. Moreover, only rarely in the 20th century could war refugees find unoccupied lands into which to move; much more often they had to crowd into landscapes already thickly settled. Thus their impacts were probably greater because ecological buffers had already been worn thin in the lands obliged to accept them (Jacobsen 1994; Westing 1994).

2.4.5 Impacts of Preparation for War

Combat in general, whether guerrilla or conventional, even including refugee impacts, had a lesser impact than the business of war production and preparing for war. This was because more societies prepared for war than actually fought wars; because many societies saw fit to maintain their preparedness for decades on end, while wars themselves were (usually) comparatively brief; and because most of the big economies and populous societies were deeply involved in the geopolitical turmoil of the 20th century. It was also true because, with the transportation systems and integrated markets that had developed since 1870 or so, the demand for war materiel, and thus the impacts of economic mobilization for war, reached into nearly every nook and cranny of the globe.

Preparedness for war implied maximizing immediate production, putting much of it at the disposal of the state, and mobilizing as much labour as quickly as possible. Powers great and small sacrificed the quality of their soils, waters, and urban air in concentrated efforts to maximize production and stockpiles of food, rubber, oil, steel, uranium, soldiers, and other strategic substances. In the First World War the British government encouraged farmers to plough every imaginable acre. Labour shortage prevented farmers from caring for their lands as they would have wished. British grain production increased by 30 per cent in the course of the war, but much marginal land was damaged in the process (Horn 1984). Britain's

war efforts of course extended to the Empire, to Australian wheat fields, Canadian forests, and South African mines. During WWII in colonial Southern Rhodesia (now Zimbabwe), for example, the British revived the practice of forced African labour on white settlers' farms, trying to maximize production of food and tobacco, and bled the African farms of their labour supply. African farms thus lacked the labour needed to manage soils and wildlife, while settlers' farms extended cultivation at the expense of surrounding bush (Johnson 2000).

Fascist states regarded preparation for war during peaceful interludes as a sacred duty. In the 1920's, Mussolini, well informed about food shortages in Germany and Austria in the latter stages of World War I, thought that Italy needed to be self-sufficient in grain. He launched a 'Battle for Wheat', and did not care that this policy promoted forest clearance of sloping and otherwise marginal lands, accelerating the erosion of Italian soils over subsequent decades.⁸ He also tried, with scant success, to make Italy energy-independent, which involved promoting dam-building in the Alps for hydropower.

Crash programmes of economic mobilization proliferated in wartime and in times when war loomed on the horizon. Such programmes often amounted to a form of environmental roulette, but societies, whether fascist and militarist in orientation or merely anxious about war, played willingly because the ecological bills fell due much later than the political and military ones did.

2.4.6 Military Pro-natalism

International competition encouraged maximization not merely of food and energy harvests, but of the human crop as well. Emperors and kings for many centuries typically encouraged reproduction, in part because they wanted to ensure a ready supply of army recruits. Modern states sometimes made it a staple of policy. Fascist Italy, Third Republic France, Ceausescu's Romania, Mao's China and the Syria of Hafez al-Assad all sought to raise birth rates in order to provide more troops to fight possible enemies: military pro-natalism. Normally populations have responded desultorily to their leaders' efforts to get them to re-

8 Mussolini may have had an equally unintended impact, this time beneficial, upon Italian landscapes, by his campaign to reduce the populations of Italian goats. He regarded the goat as an unfascist animal (McNeill 1992).

produce more exuberantly. Romanians under the dictator Nicolae Ceausescu were the great exception, a product of special circumstances. In 1965 Romania was very much a Soviet satellite, but Ceausescu had in mind a rather more independent foreign policy than Moscow wished. He concluded that Romania needed more people, preferably 30 million by the year 2000, so he banned all forms of birth control and abortion. He set his secret police the task of ensuring that Romanian women were not shirking their reproductive duties. Romania's birth rate doubled in 1966, before tapering off. After Ceausescu's overthrow in 1989, women went on a reproduction strike, so Romanians fell well short of the population target he set (Kligman 1998; Chesnais 1995: 171-8).

Mao, like Ceausescu, usually thought more people meant more security. From the time of the Korean War (1950-53) he anticipated a nuclear attack by the Americans, which was not a far-fetched fantasy since General Douglas MacArthur in 1951 recommended just that. After the Sino-Soviet split in 1958, Mao also feared nuclear attack from the Soviets. He concluded that China's best defence lay in raising its population so that it could better withstand nuclear war. For Mao, a large population was China's way to combat technologically more advanced enemies. He surprised Nikita Khrushchev in 1957 with his views:

We shouldn't be afraid of atomic missiles. No matter what kind of war breaks out - conventional or thermo-nuclear - we'll win. As for China, if the imperialists unleash war on us, we may lose more than 300 million people. So what? War is war. The years will pass and we'll get to work producing more babies than ever before (Khrushchev 1974: 255 quoted in Shapiro 2001: 32).

Mao's successors were horrified by the rapid population growth Mao encouraged, and in 1976 turned to the most restrictive birth control programme ever implemented. The 20th century witnessed many other cases of military pro-natalism, a policy which, when successful, could lead to imbalance between population and environment, over-intensive resource exploitation, environmental degradation, and perhaps a higher probability of war.

2.4.7 Military Industrialization

Most states, however, recognized early in the 20th century that military power rested on industrial might more than upon massive population. Several shuffled their priorities accordingly, building military-industrial complexes. The British and Germans began this

policy in the 19th century, and were soon imitated by the Japanese. The lessons of WWI, in which the Russian army lacked the necessary armament to fight the Germans effectively, drove home the importance of having one's own heavy industry. So from WWI onwards all great powers, and some not-so-great, encouraged the emergence of metallurgical and armaments industries within their national territories, and their empires. These industries, inevitably, involved heightened levels of air and water pollution. Further, they intensified resource use, especially of coal and iron, with attendant environmental effects from mining.

The most dramatic examples came where the state enjoyed maximal latitude to direct economic development, as in Stalin's USSR and Mao's China. In both cases security anxiety helped to motivate heroic, overnight industrialization campaigns (which in both cases had other motives as well). The dirty industrialization of the USSR beginning in 1929 reflected Stalin's fear that his country would be crushed by its enemies if it did not become an industrial power within ten years. He was correct in this assessment, although it is certain that sufficient industrialization to resist Hitler could have been achieved at lower environmental (and human) cost than Stalin was prepared to exact.

After the defeat of the Germans in 1945 the Soviets embarked on grand plans for the harnessing of nature in the service of the state, formalized in the 1948 "Plan for the Transformation of Nature" (Josephson 2002: 28). The deepening Cold War made it seem necessary that no drop of water should flow to the sea unused; no forest should be left unharvested. Giant hydroelectric dams served as the centrepiece of this plan, but it involved a comprehensive restructuring of the USSR's ecology. Cost constraints prevented Stalin and his successors from realizing their most grandiose ambitions: The Soviets never managed to divert the Siberian Rivers to Central Asia, or reroute the Pacific Ocean's Japan Cold Current. But they built a sprawling military-industrial complex with very few checks on pollution, and kept secret the environmental and health consequences of their efforts (Josephson 2002; Weiner 1999; Feshbach/Friendly 1992).

In 1958 the Chinese embarked on an industrialization that was even dirtier than the Soviet effort. Mao had become fixated on the idea of surpassing British steel production, and encouraged Chinese peasants to make steel in their backyards. They made plenty of steel, most of it useless, and in the process acceler-

ated the deforestation of China in their quest for fuel for their tiny smelters (Shapiro 2001). After Mao's death in 1976, China continued its industrialization programme, although in more conventional forms.

Meanwhile, South Korea and Taiwan proceeded apace with their own pollution-intensive industrializations, nurtured by the Americans, whose interest in economic development in East Asia was mainly geopolitical. The American security agenda required the rapid industrialization of its East Asian allies to counter the emergence of China. All of these efforts, capitalist or communist, were notably successful except for Mao's Great Leap Forward. In every case, pollution levels and other environmental concerns carried a very low priority until about 1990. And in every case, especially the Great Leap Forward, the environmental consequences proved unfortunate.

In the United States a military-industrial complex emerged in the 20th century too, although there top-down state planning played a much smaller role. And domestic, non-military demand was so strong that the steel mills of Pittsburgh and Gary, along with the coalmines of West Virginia and Wyoming would have thrived even without security anxiety. Nonetheless, tentatively and temporarily in WWI, and exuberantly from 1942 onward, the American state subsidised and otherwise encouraged military industry, adding a filip to the demand for steel, coal, bauxite, nickel, electricity and other enterprises, all of which carried profound ecological consequences.

2.4.8 Militarily Useful Transportation Infrastructure

Beyond the more or less direct environmental impacts of industrialization and weapons programmes, there are indirect environmental consequences of state actions driven, at least in part, by security anxiety. Consider transport infrastructure. German railroads, the trans-Siberian railroad, Brazilian Amazonian highways, the Karakoram Highway connecting Pakistan and China, and even the U.S. Interstate system were built partly or entirely for military reasons.⁹ Each investment in rails or roads led to rapid economic change (generally regarded as beneficial),

9 See: The Economist, 10 October 1992, recounts the story of Eisenhower's 1919 cross-country convoy drive and his role in establishing the federal interstate highway programme in 1956. He also admired the military potential of Germany's autobahns in the campaigns of 1945.

rapid social change (often controversial), and unanticipated environmental change (normally ignored). People and businesses flocked to the new roads and railroads, almost like iron filings to a magnet. The U.S. Interstate system strongly affected land use, population distribution and densities, and, through promoting trucking and automobile travel at the expense of rail transport, air quality and energy use. It is true, of course, that highways and railroads also exist in places where military motives played no role in their construction. In light of this it is fair to say that, in contrast to nuclear weapons, the world's networks of roads and railroads would exist approximately as it is even absent security anxiety. The point here is a limited one: the extent, location, and timing (of construction) of much of the 20th century's transport infrastructure had military motives, and that in myriad ways transport infrastructure affects the environment.

2.4.9 Nuclear Weapons Industry

The starkest illustration of how security anxiety propelled the great powers to indulge in reckless environmental change comes from the nuclear weapons programmes of the U.S. and USSR. No component of the world's military-industrial complexes could rival nuclear weapons for state support, for freedom of action with respect to environmental consequences, and for protection from public and press scrutiny.

The American nuclear weapons complex was born in 1942 and by 1990 involved some 3,000 sites in all. The U.S. built some 70,000 nuclear warheads, and tested more than a thousand of them, mainly in Nevada and on small Pacific atolls.¹⁰ The jewel in the nuclear weapons crown was the Hanford Engineering Works, a sprawling bomb factory on the Columbia River in the bone-dry steppe of south-central Washington State. It built the bomb that flattened Nagasaki in 1945. Over the next 50 years, Hanford engineers intentionally released billions of gallons of low-level radioactive wastes into the Columbia River, and accidentally leaked some more into groundwater. In 1949, shortly after the Soviets had exploded their first atomic bomb, the Americans conducted a secret experiment at Hanford. The fallout detected from the Soviet test prompted questions about how quickly the Soviets were able to process plutonium. In response, American officials decided to use 'green' uranium, less than 20 days out of the reactor, to test their hy-

10 Figures from: Brookings Institution, see at: <<http://www.brook.edu/FP/PROJECTS/NUCW/COST/50.HTM>>.

potheses about Soviet activities. The 'Green Run', as it was known to those in on the secret, released nearly 8,000 curies of iodine-131, dousing the downwind region with radiation at levels varying between 80 and 1,000 times the limit then thought tolerable. The officially tolerable limit has been lowered since then. The local populace learned of these events in 1986, when Hanford became the first of the US nuclear weapons complexes to release documents concerning the environmental effects of weapons production. The 'Green Run' shows the environmental liberties the Americans took under the influence of Cold War security anxiety.¹¹

That was the tip of the iceberg. More environmentally serious were the wastes, which in the heat of the Cold War were left for the future to worry about. A half century of weapons production around the U.S. left an archipelago of contamination, including tens of millions of cubic meters of long-lived nuclear waste. More than half a ton of plutonium is buried around Hanford alone. No one has yet devised a technically feasible and politically acceptable solution to the environmental problems posed by the American nuclear weapons industry (Fioravanti/Makhijani 1997; US Department of Energy 1995).

The Soviet nuclear program began with Stalin, who wanted atomic weapons as fast as possible, whatever the human and environmental cost. The Soviet command economy was good at such things: a large nuclear weapons complex arose from nothing in only a few years. Soviet engineers built about 45,000 warheads and exploded about 715 between 1949 and 1991, mostly at Semipalatinsk (in Kazakhstan) and on the Arctic island of Novaya Zemlya. They also used nuclear explosions to create reservoirs and canals, and to open mine shafts. In 1972 and 1984 they detonated nuclear bombs to try to loosen ores from which phosphate (for fertilizer) was derived. They experimented with nuclear explosions as a means of salt mining. They dumped much of their nuclear wastes at sea, mostly in the Arctic Ocean, some of it in shallow water. They scuttled defunct nuclear sub-

marines at sea. Most of the world's known reactor accidents befell the USSR's Northern Fleet, based at Archangel.

The Soviets had only one centre for reprocessing used nuclear fuel, at Mayak in the upper Ob basin of south-western Siberia, now easily the most radioactive place on earth. It accumulated 26 metric tons of plutonium, 50 times Hanford's total. From 1948 to 1956 the Mayak complex dumped liquid radioactive waste into the Techa River, an Ob tributary, and the sole source of drinking water for 10,000–20,000 people. Some 124,000 people in all were exposed to heightened radiation in this way. After 1952, storage tanks held some of Mayak's most dangerous wastes, but in 1957 one exploded, raining 20 million curies down onto the neighbourhood – equivalent to about 40 per cent of the radiation released at Chernobyl. About 270,000 people lived in the contaminated territory. After 1958 liquid wastes were stored in Lake Karachay, a shallow pond some 45 hectares in area. In 1967 a drought exposed the lakebed's radioactive sediments to the steppe winds, sprinkling dangerous dust, with 3,000 times the radioactivity released in the 1945 bombing of Hiroshima, over an area the size of Belgium and onto a half million unsuspecting people. By the 1980's, anyone standing at the lakeshore for an hour received a lethal dose of radiation (600 roentgens/hour). A former chairman of the USSR's Supreme Soviet's Subcommittee on Nuclear Safety, Alexander Penyagin, likened the situation at Mayak to 100 Chernobyls. No one knows the extent of contamination in the former USSR because the nuclear complex was so large and so secret. Much of the complex was shut down in the last years of the USSR, but the mess remained and post-Soviet Russia and Kazakhstan could not afford to clean it up even if the technical and political obstacles to doing so were overcome (Egorov/Novikov/Parker/Popov 2000; Yablokov 1995; Bradley 1997; Josephson 2000; Cochran/Norris/Suokko 1993).¹² The lethal residues of the British, French, Chinese, Indian, Pakistani, Israeli, South African (and perhaps a few other) nuclear weapons programmes were, mercifully, not on the superpower scale (Danielsson/Danielsson 1986; Makhijani/Hu/Yih 1995).

Taken as a whole, the nuclear programmes of the great powers left a remarkable legacy. They burdened

11 Details of this episode are in Caufield (1990) and Gerber (2002). In arguing that the U.S. ought not to adhere to radiation guidelines approved by the International Commission on Radiological Protection, one American nuclear mandarin in 1958 said, "the nation's security may demand the exposure of people to higher levels of radiation than those just established by the International Commission" (Caufield 1990: 130). See also Gephart (2003) for a detailed discussion of Hanford.

12 A useful general study of the Soviet nuclear weapons program to 1956 is Holloway (1994). The latest general report on Russian nuclear issues is Kurdrik, Digges, Nikitin, Bohmer, Kuznetsov and Larin (2004)

posterity with an apparently intractable long-term waste-management obligation. They exploded about 400 atomic devices above ground after 1945, sprinkling some 200 million tons of radioactive material around the earth. Underground testing irradiated chambers in the earth's crust. Moreover, undersea testing, practiced by the French in Polynesia, leaked plutonium into the Pacific (Danielsson/Danielsson 1986). The magnitude of these leaks remains secret, but their durability is well-known: plutonium's half-life is 24,000 years. Nuclear weapons programmes also gobbled up nearly a tenth of the commercial energy deployed worldwide after 1940 (Smil 1994: 185). The environmental changes resulting from nuclear weapons production and testing, which will persist long after the wars and tensions of the 20th century are forgotten, were driven exclusively by international security concerns.

2.5 Conclusion

In most societies, politics, institutions, and mentalities have evolved so as to provide security as their foremost goal. This has been truer since about 1910 than at most times in the deeper past. Hence, our politics and institutions are ill-adapted to the complex demands of ecological prudence, in which everything is connected to everything, and everything is always in flux. In Darwinian terms, the international security anxiety of the 20th century selected for states and societies that emphasized military power and industrial strength over all else: survival of the dirtiest.

When the ecology movement gathered force, in the 1970's, it did so in a moment of detente, which provided an opening for other items on political agendas. Since then it has flourished best in societies with minimal risks of war. Ecological concern on the part of states remained hostage to fortune.¹³

In 1990 when the war clouds were gathering over the Persian Gulf, President George Bush asked the American Congress to exempt the military from all environmental laws, and Congress complied. After 2001, his son asked that oil companies be allowed to drill for oil in the Arctic National Wildlife Refuge in Alaska, on the grounds that in time of war Americans cannot let caribou get in the way of strategic require-

ments. And in March 2003, as the U.S. prepared to attack Iraq, the President and Secretary of Defense pressed Congress for a permanent, blanket exemption from environmental regulations for the American military. The 20th century's pattern, in which great power security anxiety put a ceiling on environmental preservation and actively fomented ecological change, bids fair to hold in the 21st as well.

13 Britain relaxed its air and water pollution regulations during WWII in hopes of spurring industry to greater production levels; indeed coal smoke over cities served military purposes because it made it harder for German bombers to see their targets.

3 The Millennium Ecosystem Assessment: Securing Interactions between Ecosystems, Ecosystem Services and Human Well-being

Rik Leemans

3.1 Introduction

During the past millennia the human impact on natural systems has only gradually increased. In the 20th century the impacts have accelerated and increased exponentially. For example, humans now appropriate about 20 per cent of global Net Primary Production (NPP). In Western Europe and south Central Asia, humans consume even more than 70 per cent of their regional NPP (Imhoff/Bounoua/Ricketts/Loucks/Harriss/Lawrence 2004). Up to 50 per cent of the land surface is in some way modified by humans. This fragmented the habitats of many species. For an even larger area, humans are altering the functioning of ecosystems through emissions and deposition of nitrogen and other substances (Vitousek/Aber/Howarth/Likens/Matson/Schindler/Schlesinger/Tilman 1997). Additionally, through emissions of greenhouse gases due to the burning of fossil fuels, cement production and land-use change, humans are altering the composition of the atmosphere and changing the climate (IPCC 2001). The consequent climate change is illustrated by the observed rise in the global-mean surface-air temperature by 0.8 °C since the late 19th century (e.g. Moberg/Sonechkin/Holmgren/Datsenko/Karlén 2005).

Ecologists have shown that all these environmental changes together (depicted by the term 'global change') have a noticeable impact on present-day ecosystems in widely dispersed ecological zones (e.g. Parmesan/Yohe 2003, Root/Price/Hall/Schneider/Rosenzweig/Pounds 2003, van Vliet/Leemans 2006). Species extinction levels are estimated to be a magnitude larger than natural background levels (e.g. Jablonski 2004), coral bleaching by the increased pollution and frequency of high-temperature events in surface waters are abundant (Knowlton 2001), and glaciers and permafrost disappear rapidly all over the world (Arctic Climate Impact Assessment 2004).

These increasing human pressures on the Earth's functioning have been studied intensively over the last few decades (e.g. Steffen/Sanderson/Tyson/Jäger/Matson/Moore/Oldfield/Richardson/Schellnhuber/Turner/Wasson 2004). Many now recognize that we live in an era that for the first time in the Earth's history is dominated by one single species: *homo sapiens*. Crutzen (2002) therefore named the current era the 'Anthropocene'. All these studies indicate one important feature. The biosphere and the ecosystems, landscapes and species (including humans) that are part of it, play an important role in the functioning of the Earth. This role involves the cycling of water, energy and nutrients, it involves the provision of many different ecosystems, goods, and services to humanity, and it ultimately regulates many parts of the earth system (Lovelock 1992). The diversity of life or biodiversity (e.g. Wilson 1989, e.g. Wilson/Peter 1988) strongly supports this role and emphasizes that ecosystems thus are capital assets. Threats to ecosystems and biodiversity are thus direct threats to the functioning of ecosystems and (indirectly) human well-being.

Although the changes that have been made to ecosystems have contributed to large gains in human well-being and economic development, the corresponding degradation of ecosystems and their services limit the benefits that future generations obtain from ecosystems. This can cause significant harm to human well-being and represents a loss of a natural asset or wealth of a country. Global environmental change has therefore become a major issue in discussions on environmental security (O'Brien 2006). I use the term 'environmental security' in the broadest possible sense, similar to the pragmatic definitions promoted elsewhere (e.g. the Copenhagen School: Buzan/Wæver/De Wilde 1997; Wæver/Buzan/De Wilde 2008; De Wilde 2008 and Dalby 2002, 2008).

Global environmental change, together with the concerns about the socio-economic consequences of these changes and the costs associated with the pro-

Box 3.1: The Millennium Ecosystem Assessment. **Source:** Millennium Ecosystem Assessment (2005).

The Millennium Ecosystem Assessment (MA) is an international work programme designed to meet the needs of decision-makers and the public for scientific information concerning the consequences of ecosystem change for human well-being and options for responding to those changes. The MA was launched by U.N. Secretary-General Kofi Annan in June 2001 and was completed in June 2005. It will help to meet assessment needs of the Convention on Biological Diversity, the Convention to Combat Desertification, the Ramsar Convention on Wetlands, and the Convention on Migratory Species, as well as needs of other users in the private sector and civil society. If the MA proves to be useful to its stakeholders, it is anticipated that it will be repeated every 5–10 years and also that such integrated ecosystem assessments will be regularly conducted at national or sub-national scales.

The MA focuses on ecosystem services, how changes in ecosystem services have affected human well-being, how ecosystem changes may affect people in future decades, and response options that might be adopted at local, national, or global scales to improve ecosystem management

and thereby contribute to human well-being and poverty alleviation. The specific issues being addressed by the assessment have been defined through consultation with the MA users.

The MA synthesizes information from the scientific literature, datasets, and scientific models, and includes knowledge held by the private sector, practitioners, local communities, and indigenous peoples. All of the MA findings undergo rigorous peer review. More than 1,350 authors from 95 countries have been involved in four expert working groups preparing the global assessment, and hundreds more continue to undertake more than 20 sub-global assessments.

The MA was conducted as a "multi-scale" integrated assessment, consisting of interlinked assessments undertaken at local, watershed, national, regional and global scales. The MA sub-global assessments were designed to meet needs of decision-makers at the scale at which they are undertaken, strengthen the global findings with on-the-ground reality, and strengthen the local findings with global perspectives, data, and models.

posed measures to cope with them, have attracted the attention of the general public, decision-makers, the press, and interest groups from industry and NGOs (non-governmental organizations). Concerns about global change have already led to national and international actions. Several international treaties and conventions deal with ecosystems, biodiversity, and species. The *Convention on Biological Diversity* (CBD) that originated at the second UN *Conference on Environment and Development* (UNCED) in Rio de Janeiro in 1992, for example, directly targets biodiversity. Its objective is to “conserve biodiversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of its utilization”. This objective does clearly recognize that humans are dependent on the sustainable use of biodiversity. It therefore does not solely focus on conservation. Additionally, the equitable or fair sharing of benefits is a strong political statement targeting (sustainable) development. Much scientific and policy attention has already focused at the conservation of biodiversity (Heywood/Watson 1995), but little on how to manage the use of biodiversity.

This chapter reports on the background and findings of an international assessment, the *Millennium Ecosystem Assessment* (MA)¹, which was concluded

in 2005 (box 3.1). This MA explicitly linked ecosystems and biodiversity through ecosystem services to human well-being. The MA also evaluated the biodiversity target “to significantly reduce the decline of biodiversity by 2010”, and the *Millennium Development Goals* (MDGs) to eradicate extreme poverty and hunger, to achieve universal primary education; to promote gender equality and empower women; to reduce child mortality; to improve maternal health; to combat HIV/AIDS, malaria and other diseases; to ensure environmental sustainability; and to develop a global partnership for development. These were agreed upon by the world’s leaders at the *World Summit on Sustainable Development* (WSSD) in Johannesburg in 2002.

3.2 Defining Important Concepts

3.2.1 Ecosystems and Biodiversity

Central in the discussion on biodiversity is the *ecosystem* concept. An ecosystem is a complex of communities, consisting of plants, animals and micro-organisms and their non-living environment. Ecosystems exhibit different kinds of dynamics: the species involved are important in the cycling of energy (e.g. CO₂ and carbohydrates), water, and nutrients. Through time species can replace each other as a response to changes in the environment or succession. All these

1 Reports and additional information can be found at: <<http://www.maweb.org>>.

processes interact and make the ecosystem a functional unit. Humans are an integral part of ecosystems. Ecosystems are often defined broadly and range from coarse biomes (large-scale landscapes determined by major climate patterns, such as boreal, temperate and tropical forests, grasslands and deserts) to relatively small patches (e.g. bogs and forests groves). A well-defined ecosystem has strong interactions among its own components and weak interactions across its boundaries. Summarizing, an ecosystem is not a well-defined unit but behaves as a functional unit integrating the living and non-living environment.

Biodiversity is the variability among living organisms. It includes diversity within and among species, within populations of a single species and communities of multiple species, and of populations and communities within landscapes. The levels involved thus ranges from genes, through species to landscapes. However, in defining biodiversity, the non-living environment is never considered.

3.2.2 Ecosystem Services

Biodiversity contributes to the way that we explore, use, and manage ecosystems. Different species or combinations of species, for example, are used to provide products (e.g. milk from cows transformed by bacteria to yoghurt or the fermentation of barley by yeasts for beer), rich wildlife in a landscape provides value for tourism (e.g. bird watching: Wall 1998), wetlands species provide clean water (e.g. Catskills Mountains: Sagoff 2002) and mangrove forests protect coastal areas (e.g. Sundarbans in India: Singh 2003). Biodiversity is thus a source of many ecosystem services. *Ecosystem services* are the benefits people obtain from ecosystems (Millennium Ecosystem Assessment 2003). These include (figure 3.1):

- provisioning services such as food, fuel, fibre, and fresh water;
- regulating services such as slope stabilization, flood protection, detoxification, and disease control;
- cultural services such as spiritual, aesthetic, recreational, educational or cultural benefits; and
- supporting services such as pollination and nutrient cycling.

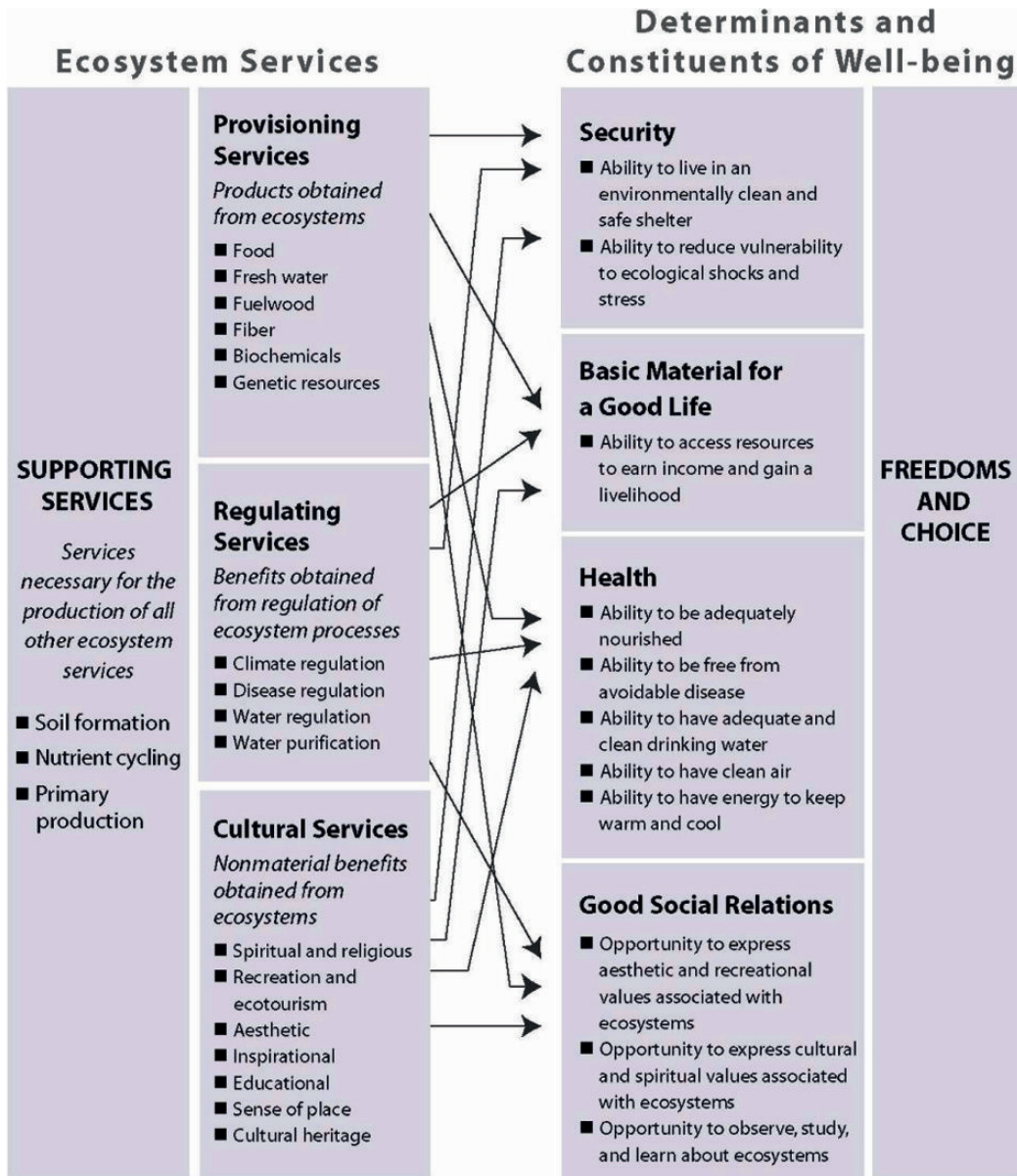
The first three types of services all provide direct utility to humans. Provisioning services consists of all different goods that are generally traded in local and international markets. They are priced and therefore often carefully managed by their owners. The regulat-

ing services are the benefits of regulation of ecosystem processes, while the cultural services involve the non-material benefits obtained from ecosystems. Both are still of direct use to people and society, but rarely traded with proper market prices. They are part of the commons, sometimes strongly regulated but often not regulated at all. The supporting services are rarely of direct utility to people and society, but maintain the conditions for life (e.g. soil formation and pollination).

The dependence of humans on ecosystem services reflects directly the profound co-evolutionary processes that underlie the origins of the Earth's biosphere and human society. The effects of adverse ecosystem changes on human well-being can be classed as direct and indirect. *Direct effects* occur with some immediacy, through locally identifiable biological or ecological pathways. For example, impairment of the water-cleansing capacity of wetlands may adversely affect those who drink that water. Building dams can increase mosquito-breeding and thus the transmission of malaria. The deforestation of hillsides can expose downstream communities to the hazards of flooding. *Indirect effects* take a toll on well-being through more complex chains of causation, including through social, economic, and political routes. Some may take decades to have an impact. For example, where farmlands under irrigation become saline, crop yields are reduced; this in turn may affect human nutritional security, child growth and development, and susceptibility to infectious diseases. Beyond threshold points, limited or degraded supplies of fresh water may exacerbate political tensions and impair local economic activity and livelihoods. These dynamic, interacting processes can jeopardize various aspects of human well-being.

The impacts of adverse ecosystem change do not fall evenly on human populations. Indigent, poorly resourced, and otherwise disadvantaged communities are generally the most vulnerable. Further, many poor rural populations rely disproportionately on the integrity and functions of local ecosystems, and are likely to lack the means to import ecosystem services. Impoverishment as a result of adverse ecosystem change may sometimes lead to a downward spiral for such people. In all instances, the ability to achieve well-being is reduced by the diminished availability of ecosystem services.

Figure 3.1: The linkages between ecosystem services and human well-being. **Source:** Millennium Ecosystem Assessment (2005). Reprinted with permission of WRI.



3.2.3 Human Well-being

There have been many formulations and definitions of human well-being (Alkire 2002). There is widespread agreement that well-being and poverty are the two extremes of a multidimensional continuum. The World Bank, for example, defined poverty as “the pronounced deprivation of well-being” (World Bank 2002).

Most agree that the constituents and determinants of human well-being includes a necessary material

minimum for a good life (i.e. having access to resources and gaining a livelihood), the experience of freedom, personal and societal security, good social relations, good health, and the conditions for physical, social, psychological, and spiritual fulfilment. The determinants of human well-being are sometimes expressed as commodities, many of which are provided by ecosystem services. Enabling physical, environmental, and social conditions and access to resources and space are also relevant as means to well-being.

How well-being or poverty are expressed and experienced is context- and situation-dependent, reflecting local social and personal factors such as geography, ecology, age, gender, and culture (Prescott-Allen 2001). Although these concepts are recognized as complex and value-laden, some elements are nevertheless widespread – if not universal. This was evident in the ‘voices of the poor’ research (Narayan/Chambers/Shah/Petesch 2000), in which poor people from many countries were asked to reflect, analyse, and express their ideas of the bad and the good life. The respondents stressed many aspects, including the importance of secure and adequate livelihoods, cultural and spiritual activities, and the ability to raise their children. They stressed five components (figure 3.1):

- *security*, including safety of person and possessions, secure access to natural and other resources, and living in a predictable and controllable environment with security from natural and human-made disasters. This means security in the broadest sense and in a very pragmatic interpretation;
- *a basic material minimum for a good life*, including secure and adequate livelihoods, income and assets, enough food at all times, shelter, furniture, clothing, and access to goods;
- *health*, including being strong, feeling well and looking good, and having a healthy physical environment;
- *good social relations*, including social cohesion, mutual respect, good gender and family relations, and the ability to help others and provide for children;
- *freedom and choice*, including having control over what happens and being able to achieve what a person values doing or being.

These five dimensions reinforce each other, either positively or negatively. A change in one often brings about changes in the others. In this multidimensional formulation, there are many webs of interactions. For example, poor people are vulnerable to sickness, which in turn makes them poorer; bad social relations make people vulnerable to shocks, which in turn deepen material poverty and so on; and all of these contribute to powerlessness. On the side of well-being and the good life, having materially enough facilitates physical strength, enabling a better livelihood, while good social relations can provide security against stresses and shocks. In turn, security is likely to increase material well-being and so on. And all of these enhance freedom of choice and action.

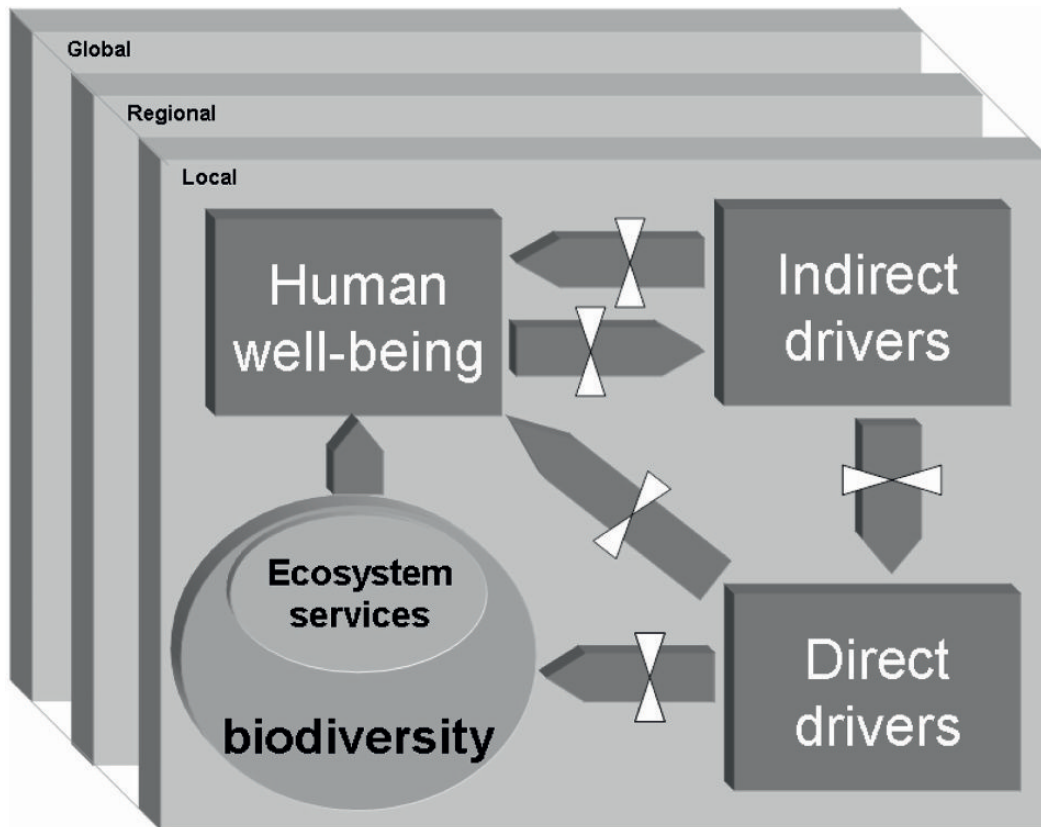
The well-being of present and future human populations depends on ecologically sustainable and socially equitable ways of living in the world (Figure 3.1). Distinguishing ecosystem services and their obvious link to human well-being helps to communicate the role of ecosystems and biodiversity to policymakers and the broader public (Millennium Ecosystem Assessment 2003).

Security is thus a major constituent of human well-being but it has not been a major focus of the assessment. The conventions that asked for the assessment (e.g. box 3.1) stressed the need for a clear assessment of the consequences of ecosystem change for the MDGs (and thus poverty). In the final synthesis reports, social and environmental security was therefore not separately addressed. However, security issues became a major issue in developing the scenarios (Carpenter/Pingali/Bennett/Zurek 2005). Differences in equity and security were major drivers in differentiating the four scenarios. In one of the scenarios, the lack of equity and security (in the broadest meaning) led to major barriers between regions and conflict, resulting in additional degradation of ecosystem services.

3.2.4 Assessments

The ability of ecosystems to deliver services and contribute to human well-being can be assessed by a variety of qualitative and quantitative methods, developed by different natural, economic, and social science disciplines. Such assessments thus require integrated approaches. All assessments mine scientific information and synthesize it into policy relevant information. Assessments are not just consensus reports because they clearly report on uncertainties, ongoing debates, and controversies. They also are responsive to changing policy needs and do not prescribe solutions. Assessments help decision-makers to determine which service or set of services is valued most highly, which trade-offs emerge in developing or selecting specific services, and how to develop approaches for sustainable management of all the necessary services. Selecting and implementing appropriate response strategies is the responsibility of the policymakers. An assessment thus can only provide guidance.

Figure 3.2: The conceptual framework of the Millennium Ecosystem Assessment. **Source:** Millennium Ecosystem Assessment (2005). Reprinted with permission from WRI.



3.3 Guiding Questions and Concepts of the MA

The goal of the MA was stimulating and guiding action to conserve ecosystems and enhance their contribution to human well-being, and simultaneously build the necessary capacity to undertake integrated ecosystem assessments and to act on their information. Core questions, which are all addressed in detail in the MA reports, to the assessment were:

- What are the current conditions and trends of ecosystems and their associated human well-being?
- What are the plausible future changes in ecosystems, ecosystem services, and the associated human well-being?
- What can we do to enhance well-being and conserve ecosystems?
- What are the most robust findings and key uncertainties?
- What tools and methodologies can strengthen capacity to undertake integrated assessments of ecosystems and human well-being?

These questions stress understanding change. This means that the underlying causes of these changes have to be identified and quantified. Additionally, the assessment should also provide an evaluation of possible responses and response strategies.

The integrated approach that was developed by the MA recognized the importance of dynamically linking biodiversity, ecosystem services, and human well-being on local, regional, and global levels (as explained in much more detail in: Millennium Ecosystem Assessment 2003: #15200). These links were illustrated by elaborating on the different types of ecosystem services and constituents of human well-being as depicted in figure 3.1. The linkages, however, do not emphasize the changes over time or space. To depict this, a comprehensive Conceptual Framework (CF, figure 3.2) was developed early in the assessment

process. The function of this CF was to ease communication of cause and effect, and to illustrate that policies mainly influence drivers, which are factors that alter the behaviour or dynamics of the elements of the CF (biodiversity, services, human well-being and drivers). Policies targeted at one element (e.g. biodiversity) will have (unintended) impacts on other elements (e.g. drivers, services or human well-being).

The CF uses broad definitions of ecosystems and biodiversity, which represents life on earth that provides all the ecosystem services required to sustain human well-being. Changes in biodiversity, ecosystem services, and human well-being are caused or triggered by one or more drivers. Responses (e.g. measures or policy strategies) try to influence these drivers. Two different types of drivers are distinguished in the CF: *direct* and *indirect drivers*. The indirect drivers operate from a distance (exogenous) and involve the larger scale causes of change. The direct (endogenous) drivers influence the system in an explicit way. Indirect drivers are, for example, increased food demand because of growing population. This leads to expansion or intensification of agricultural land activities, which involve a series of direct drivers.

Such a classification of drivers is not rigid. Actually, drivers are scale dependent. At local scales, many drivers are indirect and can only be influenced by larger scale actors (e.g. trade policies by national governments), but the consequences of the direct drivers and those that govern them can be assessed much more easily and precisely. One of the major challenges was not only to include cause and effect but also decision-making processes into the framework. As an economist stated during the discussion on the CF: "People are not driven, they make choices". By recognizing the actual actor or institution (e.g. an individual, a municipal, a nation, an international company, or a multilateral agreement) that can influence a driver and its specific domain of influence, decision-making processes were accommodated in the CF as well. The CF was therefore a major harmonizing effort to facilitate integration across the many disciplines involved in the assessment.

3.4 Main Findings of the Millennium Assessment

The main finding of the MA is that over the past 50 years humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing

demands for food, fresh water, timber, fibre, and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth.

The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems. The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the biodiversity target and the Millennium Development Goals.

The challenge of reversing the degradation of the ecosystem while meeting increasing demands for services can be partially met under some scenarios considered by the MA, but will involve significant changes in policies, institutions, and practices that are not currently under way. Many options exist to conserve or enhance specific ecosystem services in ways that reduce negative trade-offs or that provide positive synergies with other ecosystem services.

The bottom line of the MA findings is that human actions are depleting the Earth's natural capital, putting such strain on the environment that the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted. At the same time, the assessment shows that with appropriate actions it is possible to reverse the degradation of many ecosystem services over the next 50 years, but the changes in policy and practice required are substantial and not currently underway.

The MA synthesized at the most basic level information that has previously been available, and do not present new research findings. Nevertheless, three aspects of the MA do represent important new contributions. *First*, the findings of this assessment are the consensus view of the largest body of social and natural scientists ever assembled to assess knowledge in this area. Like the IPCC, the availability of this broad view of scientists from multiple disciplines is an important 'value added' part of the process and an important contribution to decision-makers. The assessment identifies not only where broad consensus exists on findings, but also where the information is insufficient to reach firm conclusions.

Second, the focus of this assessment on ecosystem services and their link to human well-being and development needs is unique. By examining the environ-

ment through the framework of ecosystem services, it becomes much easier to identify how changes in ecosystems influence human well-being and to provide information in a form that decision-makers can weigh alongside other social and economic information. The MA framework of ecosystem services and links to human well-being is already being adopted by other institutions and incorporated into other processes.

Third, the assessment identified a number of ‘emergent’ findings, conclusions that can only be reached when a large body of existing information is examined together. Four of them stand out:

- *The balance sheet.* Although individual ecosystem services have been assessed previously, the finding that 60 per cent of a group of 24 ecosystem services examined by the MA are being degraded is the first comprehensive audit of the status of the Earth’s natural capital.
- *Nonlinear changes.* Nonlinear (accelerating or abrupt) changes have been previously identified by a number of individual studies of ecosystems. Examples of such changes include disease emergence, abrupt alterations in water quality, the creation of ‘dead zones’ in coastal waters, the collapse of fisheries, and shifts in regional climate. The MA is the first assessment to conclude that ecosystem changes are increasing the likelihood of nonlinear changes in ecosystems, and the first to note the important consequences of this finding for human well-being.
- *Drylands.* Because the assessment focuses on the linkages between ecosystems and human well-being, a somewhat different set of priorities emerge from it. While the MA does confirm that major problems exist with tropical forests and coral reefs, from the standpoint of linkages between ecosystems and people, the most significant challenges involve dryland ecosystems. These ecosystems are particularly fragile, but they are also the places where human population is growing most rapidly, biological productivity is least, and poverty is highest.
- *Nutrient loading.* The MA confirms the emphasis that decision-makers are already giving to addressing important drivers of ecosystem change such as climate change and habitat loss. But the MA finds that excessive nutrient loading of ecosystems is one of the major drivers today and will grow significantly worse in the coming decades unless action is taken. The issue of excessive nutrient loading, although well studied, is not yet receiving

significant policy attention in many countries or internationally.

The MA further established that progress towards achieving the 2015 MDG targets will need to be accelerated dramatically. In particular sub-Saharan Africa, Central Asia, parts of South and South-East Asia, as well as some regions in Latin America, are currently off track with respect to meeting these goals. Here human well-being and thus security is jeopardized by the degradation and loss of ecosystems and ecosystem services that can be slowed or reversed through improved ecosystem management. In many places the sustainability and continuity of particularly agro-ecosystems is threatened by structural shortage of measures to maintain their services and productivity. By restoring those functions there is more room for other less productive systems, but that requires clear choices at the local, regional, national, and international level. Particular emphasis needs thus to be placed on the sustainable intensification of existing cultivated ecosystems to satisfy growing demand for food and other ecosystem services.

The evidence synthesized by the MA underlines that ecosystem services can only be sustained in the long term if the integrity and completeness of ecosystems are maintained or restored. This information and the tools for improved management of ecosystems need to be integrated more systematically into development strategies, such as poverty and hunger reduction strategies. This is a particularly important prerequisite for achieving the targets relating to poverty, hunger, gender equality, water and sanitation and health.

Finally, modified ecosystem management as part of a strategy to achieve the MDGs in 2015 has to consider that many drivers effect ecosystems and their services (figure 3.2). Therefore policies, institutions, and reorientation acting at local, regional, and global scales need to address several drivers at the same time. Particular attention needs to be placed on improving ecosystem management and the capacity for policymaking at the national and local level, as well as addressing global challenges including long-term climate change, nutrient depositions, and the depletion of international fisheries.

3.5 Concluding Remarks

Sufficient information now exists to enhance decision-making in support of biodiversity conservation and sustainable development at all scales. However,

many research needs and information gaps were identified in the MA, and actions to address those needs could yield substantial benefits in the form of improved information for policy and action. For example, relatively limited information exists about the status of many ecosystem services, and even less information is available about the economic value of non-marketed services. The costs associated with the depletion of these services are rarely tracked in national accounts. As a consequence, models used to project future environmental and economic conditions have also limited capability for incorporating ecological and societal feedbacks, such as nonlinear changes in ecosystems, or behavioural feedbacks such as learning that may take place through adaptive management of ecosystems.

Assessments also play a useful role in clarifying where scientific uncertainties remain. While uncertainties can be used to argue for a 'wait and see' approach, they can equally well be used to argue for a precautionary approach. Among the MA findings, the certainty or robustness of the global findings is generally high. Perhaps the greatest uncertainty associated with a critically important feature of ecosystem change surrounds the knowledge of the extent of land degradation in drylands. Even so, using relatively conservative estimates of land degradation (10–20 per cent degraded), the area and the number of people involved is still large. Here, and in many other places, there is typically insufficient information on the full economic costs and benefits of alternate uses of ecosystems to fully inform decisions.

While the MA findings do identify significant problems related to the management of ecosystems, these problems need to be viewed in the context of the MA finding that *the changes people have made to ecosystems have contributed to substantial net gains in human well-being* (including many aspects of security; see figure 3.1) and economic development. The problems identified in the MA – including growing costs in the form of degradation of ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty and security for some groups of people – are serious, and the MA shows that these problems could grow much more serious in the coming decades. At the same time, the assessment shows that the future really is in our hands. People can reverse the degradation of many ecosystem services and improve human well-being further over the next 50 years, but the changes in policy and practice required are substantial and not currently under way.

4 Securitizing Global Environmental Change

Hans Günter Brauch

4.1 Introduction¹

The thesis of this chapter is that the year 2007 has been a turning point in the process of *securitization*² of questions of *global environmental change* (GEC) and especially of *global climate change* (GCC) when several of the highest national policy-makers and high-level fora (UN Security Council) and officials of international organizations addressed global warming (cause) and climate change (effect) as a major objective security danger and subjective security concern that may lead to internal displacements, forced distress migration, as well as crises and conflicts. Other elements of GEC, such as water, have previously been sectorialized (as ‘water security’) or discussed as security issues (desertification, drought, famine) resulting from ‘water’ insecurity and leading to ‘food’ and ‘health’ insecurity.

This emerging scientific discourse, policy debate and political process of *securitization* of GEC and GCC focuses on the environmental dimension of security, especially on the complex interaction between human beings and humankind as causes, triggers, and victims of the societal consequences of this anthropogenic change. Thus, the *securitization* of GEC and GCC issues is also closely linked to different referent objects of international, national, and human security.

With the *securitization* of GEC and GCC the focus of analysis is on the process of scientific and political agenda-setting, and prioritization of nature-societal issues during the past 20 years. While in 1987, both GEC and GCC were still primarily emerging scientific problems for a small group of water, soil, and

climate specialists, by 2007 after intensive processes of *politicization* and *securitization* global warming and climate change have moved to the top of the policy agenda as the most urgent security dangers and concerns that require both urgent, stringent, and long-lasting policy responses with a fundamental transformation of the global energy system (decarbonization), but also of human values and consumer patterns.

Why has this turning point towards a securitization of GEC and GCC occurred in 2007? Why did the most important and influential policy-makers, e.g. the heads of states and governments of the G-8 and the European Union, in key policy statements (‘speech acts’), declare climate change as an international and national security issue? What purpose is this securitization of climate change to achieve, and who will be empowered to address and to respond to this new urgent security concern?³

In responding to these questions, this chapter will first introduce GEC and GCC as a security issue in the Anthropocene, and briefly outline the theory and method to be used below in the context of different models on the complex nature-society interactions (4.2) before the emerging process of securitization of water, climate change, and desertification (4.3), and the indirect role of the IPCC as a new ‘securitizing actor’ (4.4.) are examined. It will then review the emerging policy debates on GEC and especially GCC issues since 1990 that have resulted first in a *politicization* and in the early 21st century in a progressive *securitization* that are addressed for climate change in the context of international, national, and human security scientific discourses and policy debates (4.5.). So far this *securitization* of GEC and GCC has been largely policy driven. (4.6).

1 The author is grateful to two reviewers for their useful comments and suggestions that have been implemented in this text and have helped the author to condense the empirical evidence.

2 The theory of securitization has been developed by Ole Wæver (1995, 2008, 2008a) and the Copenhagen school (Buzan/Wæver/de Wilde 1998; Wæver/Buzan/de Wilde 2008). For details see below in part 4.2.2.

3 The author is grateful to Ole Wæver, University of Copenhagen, for his useful comments to a presentation of an earlier version at the 49th ISA convention in San Francisco on 26 March 2008.

The analysis of the *securitization* of GEC and GCC does not imply a causal analysis of the complex interrelationship of these factors in the past (climate, environmental history), presence and future (in the 21st century) nor a probability assessment of the relevant importance of these factors as causes, drivers, triggers or as independent, intervening or depending variables.

4.2 Global Environmental Change as a Security Issue in the Anthropocene: Theory, Methods, and Models

The securitization of GEC issues occurs on the background of a third major cause for a reconceptualization of security that fundamentally challenges the prevailing Hobbesian security thinking in international relations and in security studies, and the contending security theories of (neo)realism, liberal institutionalism, economic liberalism or Marxism (Kolodziej 2005), and also of some representatives of critical security studies (Booth 2007; Booth/Wheeler 2008) but also of people-centred approaches (Thakur 2006; Picciotto/Olonisakin/Clarke 2007) that have either ignored or downgraded the environmental dimension of international, national, and human security. The causes of GEC and GCC pose fundamentally different security threats, challenges, vulnerabilities, and risks for the international community, the nation state, and humankind (Brauch 2005, 2005a).

The enemy is us, not ‘they’ (the rival social class, religious or ethnic group, nation or alliance), it is ‘us’, ‘our consumptive behaviour’ and ‘our use of fossil fuels’ (coal, oil, gas) and that of previous generations since the outset of the Industrial Revolution (ca. 1750) that has been accumulated in the atmosphere and has become the cause of a rapid anthropogenic climate change (figure 4.1, 4.2). For this new security issue traditional military strategies and power as well as armaments offer no credible policy response. As it is impossible to declare a ‘war against climate change’, in analogy to the ‘war on terror’, a ‘militarization’ of GEC and GCC to maintain ‘our way of life’ and indirectly to prevent others to achieve our per capita greenhouse gas emission levels or to enforce emission reduction targets with military means will be counterproductive. Booth (2007: 412–413) warned “unless the rogue states that constitute the axis of pollution agree collectively, then the tipping point will surely have arrived by mid century. ... The outcome for world secu-

rity would then be highly unpredictable”. While the ‘Hobbesian fear’ (Butterfield 1950) of global warming may generate the “constraints and incentives for collective action” in order to diminish “fear and insecurity and receiving increased cooperation and international aid” (Cerutti 2007: 202), the Hobbesian logic of power to enforce the goals and strategies of the Leviathan offers no solution for a proactive security policy in the Anthropocene to cope with the impacts of GEC and GCC. The new security dangers in the Anthropocene posed by GEC and GCC differ fundamentally from that posed by nuclear weapons during the Cold War (Cerutti 2007), although there have been similarities in both worst case analyses with authors who operate with the same mindset (Sunstein 2007). But the Hobbesian logic of ‘mutual assured destruction’ (MAD) doctrines has become totally obsolete for a new security and peace policy for the Anthropocene era.

According to the IPCC (2007: 2) greenhouse gases have increased from 280 ppm (parts per million) in the atmosphere in the year 1750 to 379 ppm in 2005. The projected increase until the year 2100 for six scenarios (SRES B1, AIT, B2, A1B, A2 and A1FI) is according to the Synthesis Report of the IPCC’s (2007: 45) Fourth Assessment Report (AR4) “about 600, 700, 850, 1250 and 1550 ppm, respectively.” This projected increase is far above the natural variation in temperature changes that has been measured for the changes in climate for the past ten millennia. The IPCC (2007c: 72) lists as robust findings on the observed changes in climate and their effects, and their causes:

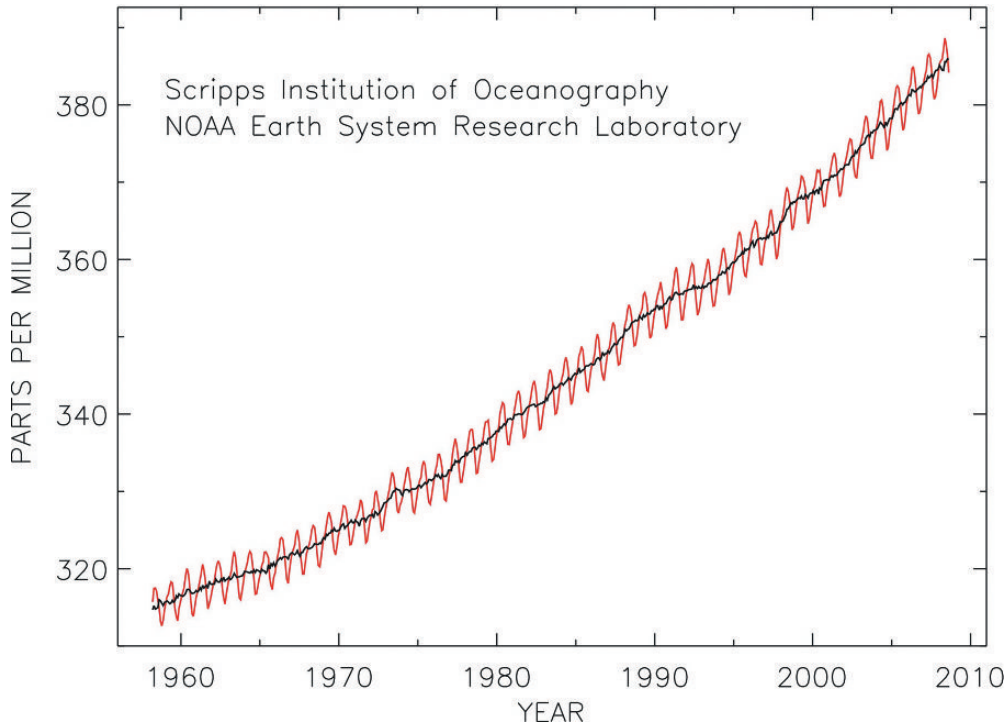
Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level. {WGI 3.9, SPM}

Many natural systems, on all continents and in some oceans, are being affected by regional climate changes. Observed changes in many physical and biological systems are consistent with warming.

As a result of the uptake of anthropogenic CO₂ since 1750, the acidity of the surface ocean has increased. {WGI 5.4, WGII 1.3}

Global total annual anthropogenic GHG emissions, weighted by their 100-year GWPs, have grown by 70 per cent between 1970 and 2004. As a result of anthropogenic emissions, atmospheric concentrations of N₂O now far exceed pre-industrial values spanning many thousands of years, and those of CH₄ and CO₂ now far exceed the natural range over the last 650,000 years. {WGI SPM; WGIII 1.3}

Figure 4.1: The new security danger in the Anthropocene posed by changes in atmospheric CO₂ measured at the Mauna Loa Observatory in Hawaii (1958-2007). **Source:** Pieter Tans, NOAA/ESRL, 12 May 2008; at: <http://www.esrl.noaa.gov/gmd/ccgg/trends/co2_data_mlo.html>. Reprinted with permission.



Most of the global average warming over the past 50 years is *very likely* due to anthropogenic GHG increases and it is *likely* that there is a discernible human-induced warming averaged over each continent (except Antarctica). {WGI 9.4, SPM}

Anthropogenic warming over the last three decades has *likely* had a discernible influence at the global scale on observed changes in many physical and biological systems. {WGII 1.4, SPM}

The US *National Oceanic and Atmospheric Administration* (NOAA) has compiled the measurements at the Mauna Loa Observatory in Hawaii for the past fifty years. Figure 4.1 documents that two thirds of the increase since 1750 has occurred since 1958, and that the average increase in global warming has further accelerated since the year 2000.⁴ According to the IPCC this has resulted in an increase of the average temperature over land during the 20th century of 0.8 °C (figure 4.2).

The security danger posed by hydro-meteorological hazards has killed ca. 1.5 million people and affected more than 5 billion people between 1974 and 2003 (Guha-Sapir/Hargitt/Hoyois 2004), and the trend has been rising both in number and intensity, although not exclusively due to anthropogenic climate change, and it has been projected that such events will

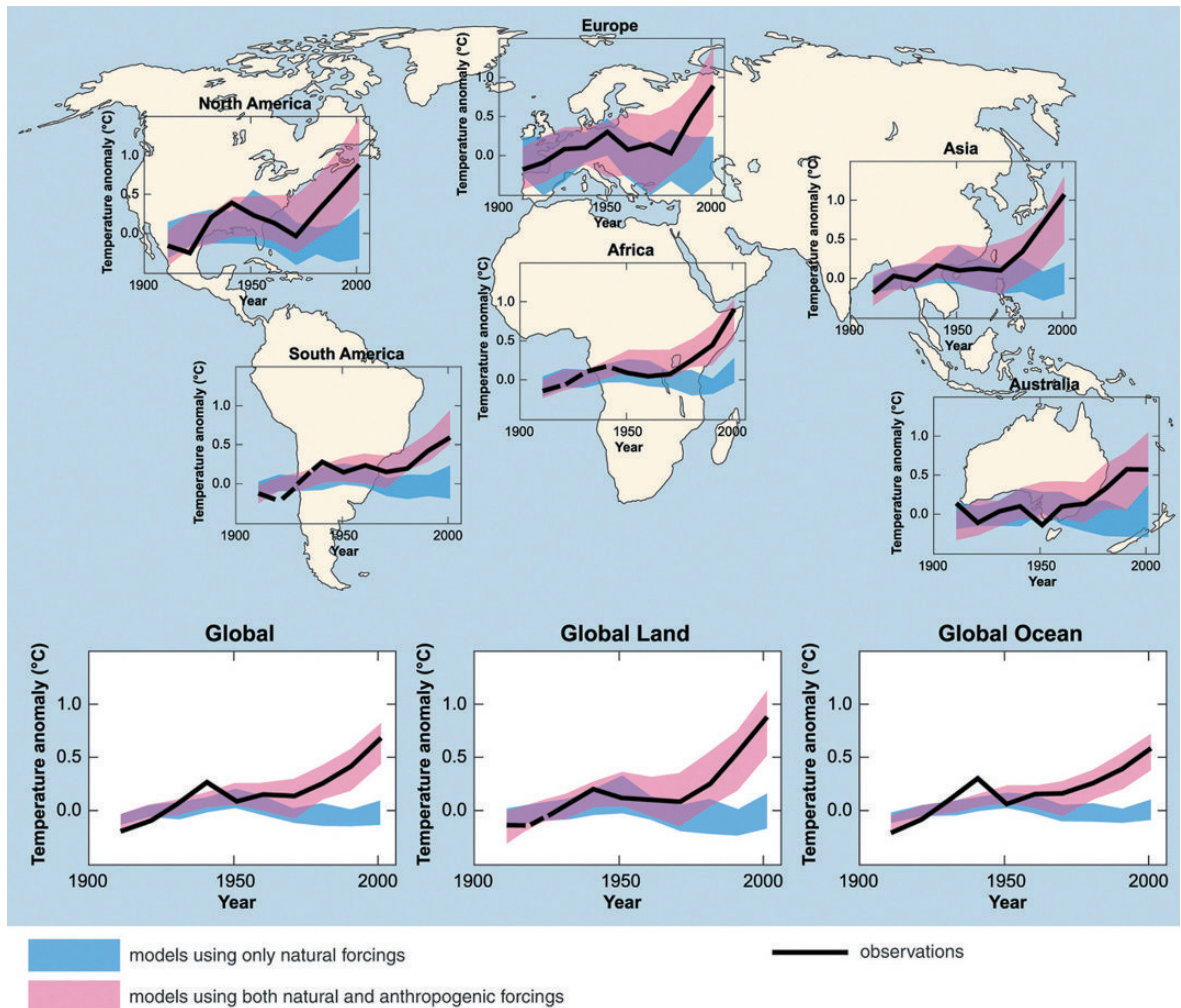
be very likely during the 21st century (IPCC 2007: 8). In Bangladesh between 1947 and 2001 about 1 million people died due to cyclones, floods, and drought (Brauch 2002: 83).⁵

But these hazards have also caused severe damages in OECD countries. The heat wave that hit Western Eu-

4 According to the US *National Oceanic and Atmospheric Administration* (NOAA) the annual mean growth of CO₂ based on measurements at the Mauna Loa Observatory in Hawaii for 2005 was 2.53 ppm, for 2006, 1.76 ppm, and for 2007 2.14 ppm (figure 4.1), reaching 387 ppm in May 2008. “From 1970 to 2000, the concentration rose by about 1.5 ppm, but since 2000 the annual rise has leapt to an average of 2.1 mm.” See: David Adam: “World CO₂ level at record high, scientists warn”, in: *Guardian*, 12 May 2008; at: <<http://www.guardian.co.uk/environment/2008/may/12/climate-change.carbonemissions>>. Most of this growth has occurred during the past 50 years since 1958 when it rose from 315 ppm (1958) to 387 ppm at the end of 2007 according to NOAA measurements, or twice as fast than during the previous 200 years.

5 These data have been displayed in many presentations by this author, e.g. in a talk to the Union of Concerned Scientists in Washington, on 21 April 2008; at: <http://www.afes-press.de/pdf/Brauch_UCS_a.pdf>.

Figure 4.2: Global and continental temperature change (1900-2000). **Source:** IPCC (2007: 11); at: <<http://www.ipcc.ch/graphics/graphics/ar4-wg1/ppt/spm.ppt#262,5>, Figure SPM.4>. Reprinted with permission under IPCC rules.



Explanation by the IPCC. Comparison of observed continental- and global-scale changes in surface temperature with results simulated by climate models using either natural or both natural and anthropogenic forcings. Decadal averages of observations are shown for the period 1906–2005 (black line) plotted against the centre of the decade and relative to the corresponding average for the 1901–1950. Lines are dashed where spatial coverage is less than 50%. Blue shaded bands show the 5 to 95% range for 19 simulations from five climate models using only the natural forcings due to solar activity and volcanoes. Red shaded bands show the 5 to 95% range for 58 simulations from 14 climate models using both natural and anthropogenic forcings. Source: IPCC (2007c: 40),

rope in August 2003 killed more than 72,210 persons⁶ and caused an economic damage of ca. 10 billion Euros for agriculture due to a major decline in food yield (Scheffran 2008: 19 based on Stern 2007: 151). Hurri-

cane Katrina that touched land on 29 August 2005, killed according to official statistics some 1,833 persons, and became thus the fourth most deadly hazard in the USA since 1900. It affected about 500,000 people and caused economic damages amounting to about US\$ 125 billion, thus becoming the most costly natural hazard in US history until 2008 (Brauch 2008d).

However, in many contemporary security analyses (e.g. Kolodziej 2005; Thakur 2006), the environment,

⁶ See: CRED: “Extreme temperature disasters”, in: *CRED Crunch*, No. 9, June 2007; at: <<http://www.em-dat.net/documents/Cred%20Crunch%209.pdf>>. According to Munich Re 35,000 people died and agricultural losses reached 15 billion (Stern 2006: 150–151).

GEC issues, and hydro-meteorological hazards have not been discussed as security dangers and concerns, and have thus been excluded from 'securitization'.

4.2.1 Security Policy in and for the Anthropocene

According to Clark, Crutzen, and Schellnhuber (2004: 1): "we live today in what may appropriately be called the 'Anthropocene' - a new geologic epoch in which humankind has emerged as a globally significant - and potentially intelligent - force capable of reshaping the face of the planet" (Crutzen 2002). The recognition of the role of humans as global transformers of the earth has gradually evolved since Alexander von Humboldt (1808) and was systematically developed by the Russian geochemist, V. I. Vernadsky (1926, 1945, 1998) in his lectures on the 'biosphere' delivered at the Sorbonne in the 1920's.

Clark, Crutzen, and Schellnhuber (2004: 2) argued that "the last half century witnessed an accelerating program of scientific studies (e.g. Thomas 1956; Steffen/Sanderson/Tyson/Jäger/Matson/Moore/Oldfield/Richardson/Schellnhuber/Turner/Wasson 2004) that have broadened and deepened our understanding of what Turner, Clark, and Kates et al. (1990) have convincingly characterized as an 'Earth transformed by human action'." In response to the gradual understanding of the anthropogenic contribution to GEC and climate change in the Anthropocene the normative concept of 'sustainable development' (Brundtland 1987) has been adopted in Rio de Janeiro in 1992 at UNCED and become a key policy goal of UN Secretary-General Kofi Annan's *Millennium Report* (2000), and at the WSSD in Johannesburg (2002) where "the need for harnessing science and technology in support of efforts to achieve the goal of environmentally sustainable human development in the Anthropocene was generally recognized" (Clark/Crutzen/Schellnhuber 2004: 3).

At the Dahlem Conference in May 2003 these three scientists assessed the state of this transformation and called for an 'earth system science' that requires a second Copernican revolution or a new scientific paradigm of a 'science for global sustainability'. The Amsterdam Declaration (2001) that established the *Earth System Science Partnership* (ESSP) contributed to a comprehensive earth system science research programme by formulating 23 basic analytical, normative, operational, and strategic questions (Leemans/Rice 2009).⁷ Clark, Crutzen, and Schellnhuber (2004: 19) argued that efforts to synthesize the work

on the resilience of ecological systems and on the vulnerability of social systems

have highlighted the importance of incorporating multiple stresses, teleconnections, explicit pathways of exposure, the possibility of threshold responses, explicit treatment of scale, and attention to the components of adaptive capacity in frameworks for the analysis of vulnerability and resilience (Turner/Kasperson/Matson et al. 2003). ... Needed now for management is problem-driven research that utilizes these conceptual vulnerability/resilience framework to illuminate the kinds, rates, and magnitudes of specific disturbances beyond which the 'ability of society to advance human well-being' can no longer be sustained.

Therefore, a proactive security policy in the Anthropocene that addresses the *Global Challenges for Leviathan* (Cerutti 2007) must be science- and knowledge-based, and requires a different knowledge from what national intelligence agencies and the military establishment have offered policy-makers, and it calls also for different goals, strategies, and means than traditional security experts trained in the Hobbesian tradition of security studies can offer.

Such a new security policy in and for the Anthropocene necessitates for the new security dangers posed by GEC a new policy framework that integrates both the experience of past nature-human interactions as well as the scenario- and model-based projections of the probable societal outcomes of future trends. This emerging security policy makes a conceptual thinking for a new peace policy in the early 21st century necessary that combines the goals of 'sustainable development' with a 'sustainable peace' to cope with the 'survival dilemma' of humankind (Brauch 2008c; Oswald 2008; chap. 100 by Brauch/Oswald).

4.2.2 Securitization Theory

So far, the emerging policy debate on the security implication of GEC has not been guided by these fundamental scientific considerations on a sustainability science for the Anthropocene. The 'securitization theory'⁸ developed by Wæver (1995, 1997) and the Copenhagen school (Buzan/Wæver/de Wilde 1998) of

7 Thereof four are relevant for security studies, as e.g. 7: Which are the most vulnerable regions under global change? 8: How are abrupt and extreme events processed through nature-society interactions? 14: What are the most appropriate methodologies for integrating natural science and social science knowledge? and 23: What is the structure of an effective and efficient system of global environment and development institutions?

fers a theoretical approach for a conceptual mapping and analysis of the policy declarations ('speech acts') on the security impacts of climate change.

Wæver (1995; 1997: 221) argued that by declaring a development a security problem, or as an existential threat to sovereignty, the 'state' has been the major securitizing actor. "By saying 'security' a state-representative moves the particular case into a specific area; claiming a special right to use the means necessary to block this development." Wæver (1997: 224) suggested

"that a major focus of 'security studies' should be the process of securitization and de-securitization: when, why and how do elites label issues and developments as 'security problems'? when, why and how do they succeed and fail respectively? What attempts are made by other groups to press securitization on the agenda? And what are the cases of attempts to keep issues off the security agenda, to move below the security threshold or even to securitize issues that have been securitized?"

This first presentation was further developed by Buzan, Wæver and de Wilde (1998: 23-26) when they introduced 'securitization' as being "above politics" and as a "more extreme version of politicization." They argue that any public issue could be located in a spectrum between *nonpoliticized* (no state action is needed), *politicized* (requiring government decision and resources), and *securitized* (existential threat that requires emergency measures). They state that the *securitization* e.g. of environmental issues could also be enacted by non-state actors in declaring an issue as an existential threat that requires utmost priority that entitles an actor to use extraordinary means. "'Security' is thus a self-referential practice, because it is in this practice that this issue becomes a security issue - not necessarily because a real existential threat exists because the issue is presented as such a threat." They argue that 'securitization' is the result of an "intersubjective establishment of an existential threat with a saliency sufficient to have substantial political effects." This could be studied by focusing on "discourse and political constellations." But a discourse that presents "something as an existential threat to a referent object does not by itself create securitization - this is a securitizing move, but the issue is securitized only if and

when the audience accepts it as such." Securitization is fulfilled "by existential threats that legitimize the breaking of rules."

According to Buzan, Wæver, and de Wilde (1998: 26) a "successful securitization thus has three components: existential threats, emergency action, and effects on interunit relations by breaking free of rules." This implies for the analyst not "to assess some objective threats" but to "understand the shared processes of constructing a shared understanding of what is to be considered and collectively responded to as a threat." More recently, Wæver (2008a: 582) summarized securitization as:

the discursive and political process through which an intersubjective understanding is constructed within a political community to treat something as an existential threat to a valued referent object, and to enable a call for urgent and exceptional measures to deal with the threat. Other central concepts in the theory are 'referent object', 'securitizing actor', and 'audience'. The central idea of the theory is, that it is not up to analysts to try to settle the 'what is security?' question - widening to include the environment or narrowing to only military security - but more usefully one can study this as an open, empirical, political and historical question: who manages to securitize what under what conditions and how? And not least: what are the effects of this? How does the politics of a given issue change when it shifts from being a normal political issue to becoming ascribed the urgency, priority and drama of 'a matter of security'.

This securitization theory and the approach of the Copenhagen school on the widening of the security agenda and the deepening of the referent objects and actors has either been totally ignored (Kolodziej 2005) or critiqued by both representatives of narrow traditionalist and critical schools.

Booth (2007: 163-169) considered the concept of securitization "seriously flawed" and he described it as a "curious theoretical mixture of liberal, poststructural, and neorealist assumptions." He considered the approach of the Copenhagen school primarily state-centric and elitist and conservative with its emphasis on the audience that has to be convinced by a speech act. Booth (2007: 269) concludes that these ideas "do not advance the cause of a more progressive security studies," and he conceived security instead "as political theory, and understood in relation to emancipation." Contrary to Booth, Dannreuther (2007: 42-44) applauds the "implicit democratization of the field of security studies" by the Copenhagen school by analysing "how the general public, and their leaders, 'construct' security threats and challenges." He argues that "the securitization approach has provided the new 'se-

8 Much of the elaboration of this theory (Wæver/Buzan/Kelstrup/Lemaitre 1993; Buzan/Wæver/de Wilde 1998; Wæver/Buzan/de Wilde 2008) has occurred through exploring the particular dynamics and characteristics of security within different 'sectors' of security: economic, environmental, political, military, and societal. Brief introductions to the theory can be found at: <<http://polforsk.dk/download/securitytheory2006/homepage>>."

curity agenda' with a good potential theoretical base." But he also pointed to several shortcomings of the securitization approach, its subjective epistemology, its separation of the realism of politics and security, and the Eurocentric focus of its research agenda.

Below the 'securitization approach' will be used to structure and analyse the emerging policy debate on global environmental and climate change as a new subjective international, national, and human security concern whereby the 'securitizing actor' that produces the 'speech act' is not solely the nation state (government representatives, politicians) but also a transnational epistemic community of primarily natural scientists (IPCC). The referent objects are not only the state and the international community but primarily individual human beings and humankind who are both the cause of global warming and the victims of climate change. However, both actors are not identical, what has created major new equity problems (Adger/Paavola/ Huq/Mace 2006).

From a narrow and 'state-centred' national security perspective the 'securitizing actor' and the 'referent object' remains the nation state (its top government officials, policy-makers and the political elite), while from a wider environmental and deeper 'people-centred' societal or human security outlook the scientific community has become a new securitizing actor, and the referent object are not any longer the state but the vulnerable people that will be hurt most by these newly emerging security issues.

4.2.3 Conceptual Mapping

Three methods for the analysis of the word, term and concept of security, and for its 'reconceptualization' have been distinguished: a) *etymology* (word, term, concept) of security, b) *conceptual history* (Koselleck 2006), and c) *conceptual mapping* (Brauch 2008: 34; 2008a: 65-67). The third method of a 'conceptual mapping' was introduced as "the use of the concept of security in different countries, political systems, cultures and religions and scientific disciplines, in national political processes, within civil society and social movements, but also as a guiding and legitimating instrument within international organizations. Any conceptual mapping has to reflect the specific context in time and space that influence the meaning and the use of concepts." It was further argued that "in the social sciences, especially ... in security studies, the meaning of the concept of security is theory-driven." Therefore, "the 'conceptual mapping' of security ... is a task of political science that requires the knowledge

of other disciplines (linguistics, history, philosophy) with a specific focus on the theoretical approaches prevailing in the social and political sciences" (Brauch 2008a: 67).

In this chapter, this method is not used to 'map' the diversity of the manifold contemporary uses of this contested concept but to document how this concept has been applied - both in scientific discourses and policy debates - to issues of GEC and GCC to 'move' a scientific issue to the top policy agenda thereby legitimating extraordinary measures for coping with this new danger, and to document how this 'securitizing move' has been convincing a rapidly growing global audience to recognize and to approve the high costs of proactive adaptation and mitigation measures. Thus, this method is used to analyse the evolution of policy declarations (or 'speech acts') by scientists, policy analysts, and representatives of states and international organizations that have referred to the regional security impacts of GEC and global climate change (GCC), especially in highly vulnerable regions (hotspots) with a high exposure, high social vulnerability, and a limited coping capacity being confronted with three impacts of global climate change: i) temperature increase, ii) sea level rise, and iii) increase in the number and intensity of natural hazards.

With this *securitization* of GEC and GCC, these security dangers and concerns have been given highest priority on the policy and security agenda to legitimate extraordinary and costly measures that require a progressive increase in energy efficiency and a decarbonization of the energy system by increasing renewable energy sources but without creating serious food security challenges that have already resulted in spring 2008 in several poor and food importing countries in violent food riots (e.g. in April 2008 in Haiti). The *securitization* of issues of GEC and GCC has thus become a policy tool for the justification of the allocation of significant public funds in terms of 'international' (in most EU countries), or 'national security' (primarily in the USA) but also of 'human security' (in countries of the Human Security Network, see chap. 75 by Fuentes/Brauch).

4.2.4 Models for Nature – Human Interactions

The conceptual mapping of the *securitization* of issues of GEC and GCC documents the scientific discourse and the policy debate on the security impacts of climate change. It does not argue whether past cli-

mate history reflecting the impacts of natural variability and not yet of anthropogenic climate change (chap. 5 by Blümel; chap. 6 by Issar/Zohar) resulted in violent conflicts and in the climate-induced collapse of civilizations, nor does it assess the probability of extreme societal outcomes: internal displacements, forced migration, crises and conflict constellations from anthropogenic climate change in the 21st century (Fagan 2000; 2004; Diamond 2005; Linden 2006; Zhang/Brecke/Lee/He/Zhang 2007; Scheffran 2008).

Various models have been developed to analyse the nature-human interactions. Below five such models will be briefly introduced. *First*, three pressure-state-response models will be sketched for the analysis of environmental issues (e.g. of pollution); *second*, the models used by the Toronto and Swiss schools on linking environmental scarcity, degradation, and stress with potentially violent societal outcomes will be noted (4.2.4.2), and *third*, this author's PEISOR model⁹ will be outlined (4.2.4.3) that integrates elements of the two previous models; *fourth*, different vulnerability frameworks for dealing with natural hazards and societal disasters will be reviewed (4.2.4.4), and *fifth* a model for analysing the linkages between climate change and armed conflicts as a new security danger will be reproduced (4.2.4.5).

4.2.4.1 Pressure-State-Response Models of OECD, UNCSO, and EEA

Instead of a simple stress-response model that claims direct links between stress factors and societal responses, the *Pressure-State-Response* (PSR) model of OECD (1994; 1998; 1999; 2001; 2001a) assumes that human activities put pressure on nature that leads to environmental changes (climate change, water and soil degradation, biodiversity loss) to which the government and society respond with ecological and economic measures and programmes.

The OECD's PSR model distinguished between 'pressure' (P), 'state of the environment' (S), and 'response' (R) indicators. Among 'pressure' key factors are listed (population growth, consumption, poverty), while 'state' refers to the environmental conditions that emerge from this pressure (air pollution, defor-

estation, degradation) that influence human health and well-being, and 'response' points to the manifold activities of society to avoid, prevent, and reduce negative impacts on the environment, and to protect natural resources from these effects. Among the *pressures* are human activities in the energy, transport, industry, and agricultural sector on natural resources (air, water, soil, organisms) to which the state, society, business, and international actors respond. Between these three elements of the PSR model there are many complex interactions (resource transfers, information, decisions)¹⁰.

The UN Commission for Sustainable Development (UN-CSD) used with its DSR (*Driving Force-State-Response*) model a slightly modified framework.¹¹ The *European Environment Agency* (EEA 1998) has developed a framework that distinguishes "Driving Force - Pressure - State - Impact - Response (DPSIR)"¹² that offers a mechanism for the analysis of environmental problems and for the development of environmental indicators (figure 4.3).¹³

A different model was used as a framework for the *Millennium Ecosystem Assessment* (MA 2003, 2005) that distinguished between direct and indirect drivers of change that directly affect human well-being and ecosystem services. In this framework besides the material minimum for a good life, health, and good social relations, security is considered as one of the key elements of human well-being that influence freedom of choice (figure 3.1). Security has been defined as: a) the ability to live in an environmentally clean and safe shelter, and b) the ability to reduce vulnerability to ecological shocks and stress (MA 2005; chap. 3 by Lee-mans). In the words of the *Human Security Commission* (CHS 2003) this refers to two basic principles: 'protection' and 'empowerment'. These four models have served a specific purpose: to develop environ-

9 The PEISOR model is still in the process of development and has been discussed for the first time at the 6th Open meeting of IHDP in Bonn in October 2005 (Brauch 2005b). The evolution is documented in this author's download section at: <http://www.afes-press.de/html/download_hgb.html>. This section draws on Brauch (2007h: 26–29).

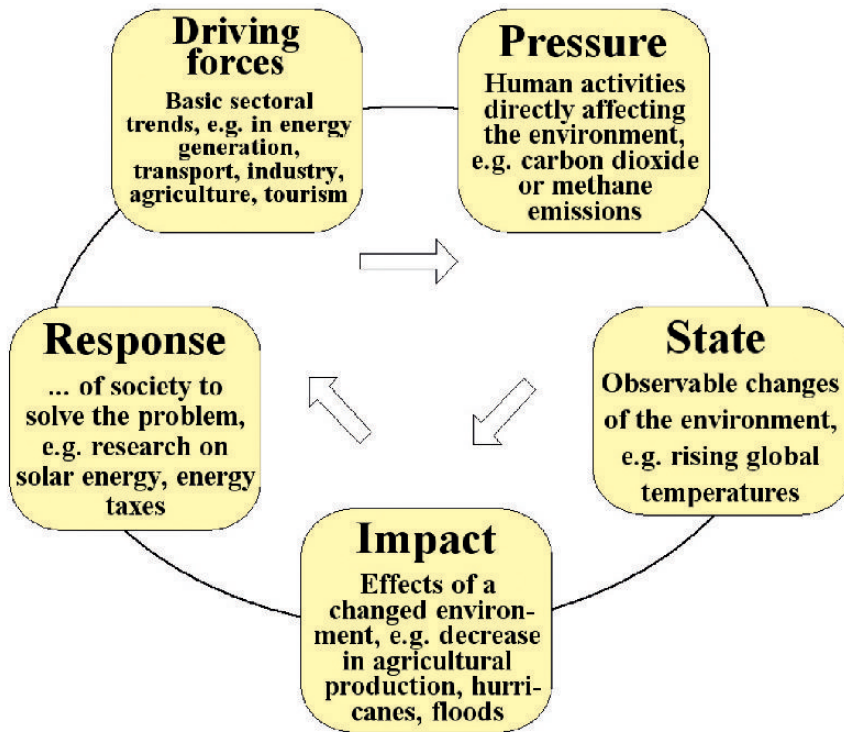
10 Jesinghaus (n.d.), at: <http://esl.jrc.it/envind/theory/handb_03.htm>: The PSR model was developed in the 1970's by the Canadian statistician Anthony Friend, and subsequently adopted by the OECD's *State of the Environment* (SOE) group; for an illustration see at: <<http://www.virtualcentre.org/en/dec/toolbox/Refer/EnvIndi.htm>>.

11 UN Commission for Sustainable Development: "Indicators of Sustainable Development", at: <<http://www.un.org/esa/sustdev/isd.htm>>.

12 Jochen Jesinghaus: "European System of Environmental Pressure Indices"; at: <http://esl.jrc.it/envind/theory/handb_03.htm>.

13 European Commission: "Towards Environmental Pressure Indicators for the EU", at: <<http://www.e-m-a-i-l.nu/tepi/firstpub.htm>>.

Figure 4.3: DPSIR model of EEA. **Source:** Jesinghaus (n.d.), at:<http://esl.jrc.it/envind/theory/handb_03.htm>. Reprinted with permission.



mental indicators and to guide the ecosystem assessment. But they did not focus - from a security perspective - on the linkages between processes of GEC, GCC and natural hazards and their socio-political consequences.

4.2.4.2 The Models on Environmental Scarcity, Degradation, and Stress

The Toronto Group analysed assumed linkages between environmental stress factors and conflicts (Homer-Dixon 1991, 1994). Homer-Dixon (1994: 39) argued: “that environmental scarcity causes violent conflict. This conflict tends to be persistent, diffuse, and sub-national.” He assumed that “global warming will probably not have a major effect for several decades, and then mainly by interacting with already existing scarcities” (see figure in Homer-Dixon, 1994: 31). Levy (1995: 35-62) commented that it “is of very little importance” that environmental problems constitute security risks for the USA, and he argued “that ozone depletion and climate change are the only significant environmental problems that currently pose a direct physical harm to US interests” (61-62). In reply, Homer Dixon (1995: 189) argued that climate change “could endanger core American values” and thus

could become “direct threats to US security interests,” but not in the near-term.

A second project analysed the links between environment, population, and security based on case studies (Homer-Dixon/Blitt 1998) that focus on the social consequences of renewable resource scarcity. They argued that under certain circumstances scarcity of these resources may cause violent conflict. They focused on six types of environmental change: water and land degradation, deforestation, decline in fisheries, and to a lesser extent global warming and ozone depletion that can produce scarcities of vital renewable resources. They distinguished among “supply-induced” (environmental change), “demand-induced” (population growth, per capita consumption); and “structural” scarcity (unequal social distribution of a resource).

They discussed two patterns of interaction among these three types: *resource capture* by powerful groups, and *ecological marginalization* resulting in a lack of access for the poor segments of the society that are often forced to migrate to ecologically fragile and vulnerable regions. Such environmental scarcity is not determined to result in social disruption and violent conflict. But different adaptation failures, such as market failure, social friction, and the lack of capital

availability may produce five types of social effects: “constrained agricultural productivity, constrained economic productivity, migration, social segmentation, and disruption of legitimate institutions.” They considered environmental scarcity as a cause that interacts with various contextual factors ranging “from the nature of relations among ethnic groups to the state’s degree of autonomy from outside pressure groups.”

Homer-Dixon (1999: 5) pursued the linkages between environment, scarcity, and violence, looking to five future types of likely violent conflicts that third world countries will be less able to prevent: 1) disputes from local environmental degradation; 2) ethnic clashes arising from population migration and deepened social cleavages; 3) civil strife (insurgency, banditry, coups d’état); 4) interstate war (on water), and 5) North-South conflicts over global environmental problems (global warming, ozone depletion, biodiversity). He considers the first and last type unlikely, and interstate scarcity wars as least likely. He discussed the scarcity’s causal role between: *Environmental Scarcity* → *Social Effects* → *Violent Conflict*. While he admits that scarcity as such is neither a necessary nor a sufficient cause of conflict, he claims “that environmental scarcity is an important cause of these conflicts” (Homer-Dixon 1999: 8). Among the major determinants of supply-induced environmental scarcity that contribute to the depletion and degradation of renewable resources, Homer-Dixon (1999: 50) referred to a) *ideational factors* (social relations, preferences and beliefs), b) *physical availability* of natural resources, and c) *ecosystem sensitivity* that impact on population and resource consumption (energy → global warming; cropland scarcity → deforestation; fresh water). With continued population growth, the decrease in quality of renewable resources can either result in a) *resource capture* (via unequal resource access) or b) *unequal resource access* (figure 20.4).

After a decade of research, Homer-Dixon (1999: 177) concluded: “that scarcity of renewable resources ... can contribute to civil violence, including insurgencies and ethnic clashes” and he predicted that in the future “such violence will probably increase as scarcities of cropland, freshwater, and forests worsen in many parts of the developing world,” where the role of scarcity will be “often obscure and indirect,” interacting with political, economic, and many other factors. He further predicted that continued population growth and rising resource demand and persistent inequalities will affect environmentally sensitive regions.

The *Environment and Conflicts Project* (ENCOP), co-directed by Günther Bächler and Kurt R. Spillmann (Bern and Zürich group), started from the premise that environmental transformation does not directly result in conflicts but that it impacts on existing socio-economic conflict potentials that violently escalate. According to its working definition:

environmental conflicts manifest themselves as political, social, economic, ethnic, religious or territorial conflicts over resources or national interests, or any other type of conflict. They are traditional conflicts *induced by environmental degradation*. Environmental conflicts are characterized by the principal importance of degradation in one or more of the following fields: a) overuse of renewable resources; b) overstrain of the environment’s sink capacity (pollution); c) improvement of the space of living (Libiszewski 1992: 13; Bächler 1998: 24).

According to ENCOP’s analytical framework (Bächler 1993; Libiszewski 1992, 1996: 339–340) the analysis of environmental conflict followed four steps: 1) to describe the environmental situation on the background of human activities; 2) to deduce the social and economic effects of environmental transformation and degradation; 3) to analyse the political implications of these socio-economic effects and conflicts arising from them; and 4) to evaluate approaches to peaceful management and resolution on different levels of analysis. ENCOP concluded that besides resource degradation other contextual factors were decisive for conflicts,¹⁴ and “while conflict and environmental change are related in many ways, conflict is more likely to be linked directly to the disruptions of modernity” (Dalby 2002a: 97). In a study on Rwanda, Bächler (1999) clarified the ENCOP model and stressed “that violence was to occur in more remote areas, mountain locations, and grasslands – places where environmental stress coincides with political tensions and unjust access to resources” (Dalby 2002: 97).¹⁵

Bächler (1998: 24–44) examined “the critical role of transformation regarding causation on environmental conflicts in certain areas of developing countries.” To do so one has “to build on prepared empirical ground to highlight the different patterns of causation, to select types of environmental conflicts in terms of different pathways leading to violence, as well as to stress the socio-political characteristics of environmental conflicts”. Bächler (1998: 24) concluded

14 Bächler 1998, 1999. For reviews at: <<http://www.uni-bonn.de/iwdp/gechssp.htm>>: 13–14; Dalby 2002: 97.

that neither apocalyptic scenarios of environmental catastrophes nor alarmist prognoses of world environmental wars are tenable. Environmentally-caused conflicts escalate across the violence threshold only under certain conditions. Human-induced environmental change can be either a contributing or a necessary factor for both the emergence and/or the intensification of violent conflicts. On one hand, violent conflicts triggered by environmental disruption are due in part to socio-economic and political developments. On the other, social and political maldevelopment, due in part to degradation of natural resources, has become an international peace and security challenge. *Development and security dilemmas* are connected to a syndrome of problems which produces environmental conflicts of varying intensity and nature.

Bächler (1998: 40–44) provided a typology of 40 environmental conflicts with different conflict intensity he categorized as: 1) *intrastate* a) ethnopolitical, b) centre-periphery, and c) regionalist migration/displacement conflicts; 2) *intrastate* conflicts with a trans-boundary dimension, caused by a) migration, b) demographic pressure, and c) water/river basin conflicts (28–39); and 3) *international* global environmental conflicts.

Both approaches had a significant impact by developing an empirical basis for the primarily policy-oriented discourse that added an environmental dimension to the US national security agenda in the post-Cold War era which succeeded during the Clinton administration but was discontinued during the administration of George W. Bush (chap. 60 by Matthew/McDonald).

Why a critical socio-economic constellation escalated into violent conflict, and when and why they could be avoided by bilateral and multilateral cooperation of states, experts, and representatives of civil society could not yet be explained by these studies.¹⁵ After a decade of research a consensus emerged that

“environmental stress is rarely considered to be the sole factor in precipitating conflict” both within and between nations. Schwartz (2002: 137) stated:

In many cases environmental stress is a relatively distant factor, acting in combination with other economic and social factors such as poverty and weak governments. In other cases, conflict breaks out when rival nations, or rival groups within a nation, battle for diminishing supplies of environmental resources. Although environmental stress is usually only one cause of conflict among many, the evidence suggests that it can play an important role, and that violence may be avoided by addressing environmental problems.

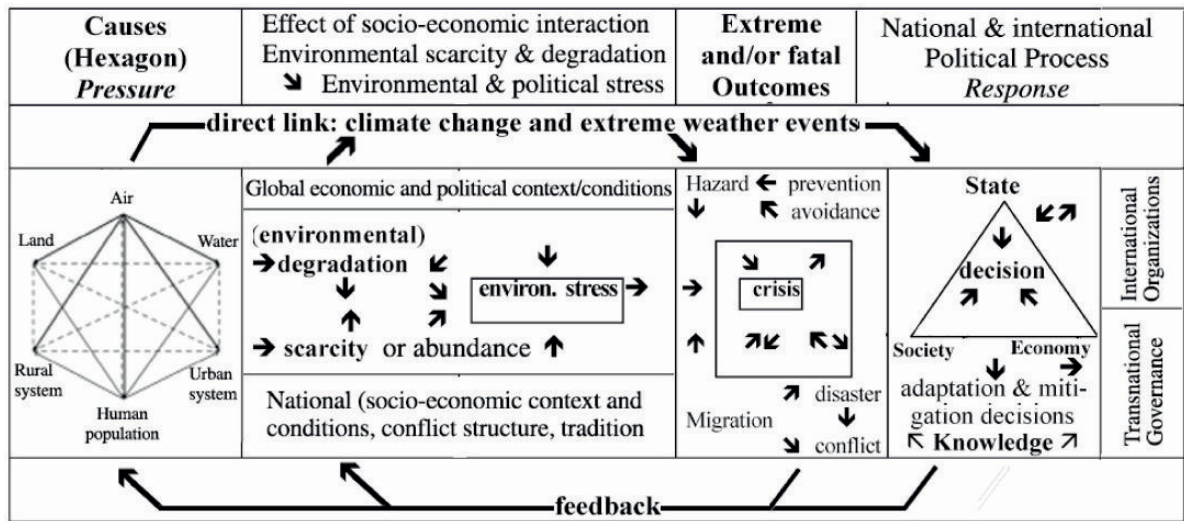
Schwartz considers population growth as closely linked with environmental stress. Among the wide-ranging environmental factors he includes ozone depletion and global warming, and among the localized ones those environmental factors that affect small areas at different times (desertification, water pollution). He points to “five pathways to indirect internal conflict that involve environmental stress: economic decline, migrations, social fragmentation, erosion of civil society, and curtailment of the state.” A major effect of several types of environmental stress is economic decline that will affect the poor more than the rich strata of society and countries. A second pathway from environmental stress to conflict is through migration that may be caused by floods, droughts or locusts, or by a lack of arable land that again is often the result of environmental stress, but also by water and air pollution, or shortage of fuel wood. The complex interaction of environmental stress and its social, economic, and political ramifications has often resulted in increasing urban violence.

Global and localized environmental stress may in some cases contribute to conflicts. Gleick (1989) noted that global warming could affect freshwater availability and food productivity, and that this would have severe impacts on poorer nations. Some argued that environmental stress coupled with rapid population growth could induce large-scale migration pressures from South to North, and that this may increase tensions between host countries and immigrants. Direct internal conflict has occurred as a result of environmental stress, e.g. in the Sahel (due to drought) where many nomads clashed with farmers in less affected zones. Schwartz argues that causal linkages be-

15 The results of the ENCOP project were published in three volumes, of which the first volume (Bächler/Böge/ Klötzli/Libiszewski/Spillmann 1996) examined the environment as a topic of conflict research, environmental degradation through over-development (*wealth-driven*) and underdevelopment (*poverty-driven*) focusing on actors, on key environmental factors of soil, rivers, and mining. It offered a synthesis on environmental degradation as a cause of war and how environmental conflicts can be solved peacefully. The second volume contains eight case studies on Bangladesh, Sudan and Darfur, Nigeria, Central Asia, the Jordan Basin, Rwanda and on mining in the South Pacific (Bächler/Spillmann 1996a). The third volume includes thirteen country studies by external experts (Bächler/Spillmann 1996b).

16 This approach was criticized by Diehl/Gleditsch (2001); Peluso/Watts (2001); Hartmann (2001: 39–62); Bannon/Collier (2003); see overview in Brauch (2003, 2007) EOLSS [Four Phases of Research].

Figure 4.4: PEISOR-Model. Source: Brauch (2005a: 16, 2007h: 28).



tween environmental stress and conflict could be shown in individual case studies, but that future research is needed “to estimate the causal effects of environmental stress.” Kawashima and Akino (2001), Strippel (2002), and Brauch (2002) discussed possible longer-term security implications of climate change.

Hauge and Ellingsen (1998) integrated environmental degradation (soil erosion, deforestation) into a model of civil war. They concluded: “that environmental degradation does stimulate the incidence of conflict, but less so than political, economic, and cultural factors, or previous conflict history.” Saltnes (1998) found that “there was indeed a bivariate relationship between the spread of deserts and internal armed conflicts in the period 1980–1990”, Gleditsch (2002) suggested that resource and environmental aspects of conflict “should be examined within the context of a broader view of armed conflict” with a special focus on politics, economics, cultural factors, and the conflict history.

4.2.4.3 The Emerging PEISOR Model

The PEISOR model was stimulated by the pressure and response models and by the debates on environmental security (chap. 20: by Homer-Dixon/Deligianis; chap. 21 by Mason/Hagmann/Bichsel/Ludi/Arsano) and on natural hazards. The PEISOR model (Brauch 2005, 2006) combines five stages:

- P (pressure) refers to six drivers of global environmental change (survival hexagon);
- E to the effects of the linear, non-linear or chaotic interactions within the ‘hexagon’ on environmental scarcity, degradation, and stress;

- I to extreme or fatal impacts of human-induced and climate-related natural hazards (storms, flash floods, flooding, landslides, drought);
- SO to societal outcomes: internal displacement, migration, urbanization, crises, conflicts, state failure, and
- R to response by the society, the business community, the state where both traditional and modern technological knowledge can make a difference.

While hazards cannot be prevented, their impact in terms of deaths, affected people, economic and insured damages can be reduced by a combination of policies and measures that link protection with empowerment of the people to become more resilient.

Figure 4.4 refers in the first column under causes or pressure to six key factors contributing to GEC, three supply or environmental factors (land, air, and water) and three demand or human factors (population living and working in rural or urban systems). These six factors interact in a non-linear or sometimes chaotic way, and pose pressure on the political and societal context where they may trigger, impact or affect socio-economic interactions either causing or contributing to anthropogenic environmental degradation (of water, soil, air) or scarcity (of water and soil). The interaction among these two processes may result in environmental stress that can cause various extreme and in a few cases even fatal impacts.

However, there may also be a direct impact of climate change resulting in an increase in hydro-meteorological hazards. This aspect has only marginally been addressed in the initial stages of environmental security research (chap. 59 by Dalby/Brauch/Oswald) but

it is key to the debate on the *securitization* of climate change. Environmental stress may increase the impact of hazards (especially for those with a high degree of social vulnerability) and cause or contribute (with natural hazards and conflicts) to internal displacement, urbanization, and to transboundary forced migration.

Whether these factors result in domestic crises, disasters, and in a few worst cases in violent conflicts, or whether these can be avoided, depends on many specific factors and activities resulting from the interaction between the three actors representing the state, the society, and the business community, but also on the use of both traditional and modern technical and organizational knowledge and knowledge-based response strategies by governments and international organizations and transnational societal and economic organizations (governance).¹⁷

4.2.4.4 Vulnerability Frameworks for Hazards and Disasters

For natural hazards and societal outcomes, complex vulnerability frameworks were developed. Bohle (2001) distinguished a dual structure of vulnerability by referring to ‘external’ or ‘environmental vulnerability’ that points to exposure and is influenced by political economy approaches, human ecology perspectives and theories of entitlement, and to ‘internal’ or ‘social vulnerability’ that highlights coping and is dealt with in crisis and conflict theory and influenced by approaches from action theory and models of access to assets. On this conceptual background Bohle (2002) illustrated the conceptual relationship between globalization, contributing to social vulnerability, and GEC resulting in environmental vulnerability, and how both impact on human security.¹⁸ Clark, Crutzen, and Schellnhuber (2004: 18–19) relied on a framework for vulnerability analysis in sustainability science (figure 4.5)

whose basic architecture consists of:

(i) linkages to the broader human and biophysical (environmental) conditions and processes operating on the coupled system in question; (ii) perturbations and stressors/stress that emerge from these conditions and processes; (iii) the coupled human-environment system of concern in which vulnerability resides, including exposure and responses (i.e., coping, impacts, adjustments, and adaptation). These elements are interactive and scale dependent, such that analysis is affected by the way in which the coupled system is conceptualized and bounded for study. The full framework is illustrated in figure [4.5] by way of spatial scale, linking place (blue) to region (yellow) to globe (green). ... The coupled human-environment system ... constitutes the place of analysis.

These two vulnerability frameworks and the BBC model (chap 18 by Bogardi, Birkmann, Gebert, and Setiadi, figure 18.1) cannot be used for the analysis of the causal path of the security issues posed by GEC and GCC via (i) temperature increase, (ii) sea-level rise, and (iii) growth in the number and intensity of hydro-meteorological hazards and the manifold extreme and in some cases even fatal societal outcomes, such as internal displacements, forced migration, as well as domestic and transborder small-scale conflicts, and in the least likely event even wars (Brauch 2002, 2002a).

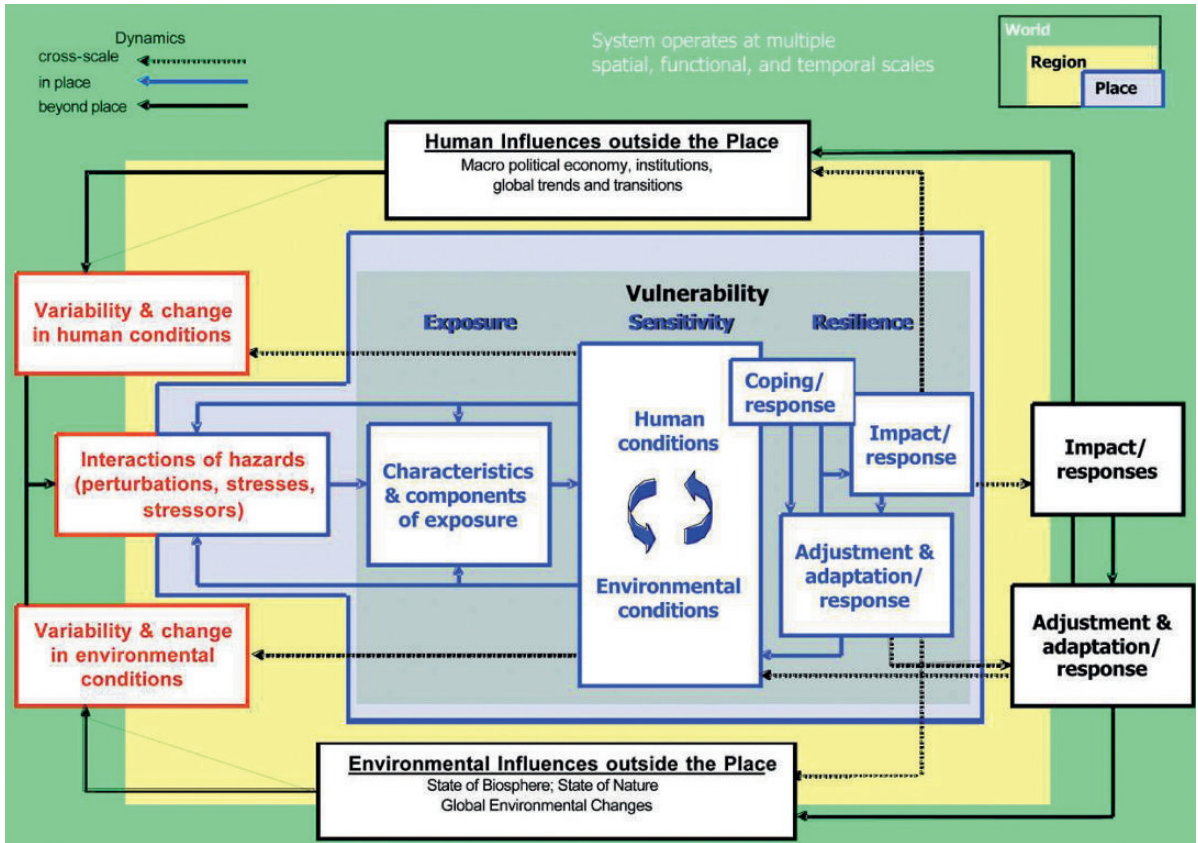
4.2.4.5 Model for the Analysis of Climate Change and Armed Conflict

For a World Bank conference, Bulhaug, Gleditsch, and Theisen (2008) assessed the peer-reviewed primarily statistical literature on “Implications of Climate Change for Armed Conflict.” They distinguished among three physical effects causing a reduction in livelihood and several catalysts (migration, political and economic instability, social fragmentation, and inappropriate response) that may lead to armed conflict. They point to possible pathways to conflict, referring to migration as the first outcome that is influenced by population pressure, political (bad governance, societal inequalities, bad neighbours) and economic factors (food insecurity, reduction of livelihood) that lead to five intermediary factors of political and economic instability, social fragmentation, inappropriate response (policy failure), and to migration. These factors may offer an increased opportunity for organizing and instigating violence resulting in armed conflict where at least one party is the government of a state and at least 25 battle related deaths occur within a year. This conflict definition excludes small-scale violence, e.g. tribal clashes between

17 The PEISOR model was illustrated for the impacts of the six factors of global environmental change on the environmental dimension of human security for the Mediterranean space during the 20th and 21st century with regard to the repercussions on landscape ecology by posing new challenges to environmental and human security. See especially: Brauch (2001; 2006; 2007h); see also for speeches by the author in Lecce (2004), Bonn (2005), Israel, Mexico and Thailand (2006), at: <http://www.afes-press.de/html/download_hgb.html>.

18 This argument by Bohle (2001, 2002) has been summarized in Brauch (2003: 132–133) where the figure on the conceptual linkages between globalization, GEC and human security is reproduced.

Figure 4.5: Vulnerability framework. Components of vulnerability identified and linked to factors beyond the system of study and operating at various scales. **Source:** Turner/ Kasperson/Matson/McCarthy/Coell/Christensen/Eckley/Kasperson/Luerse/Martello/ Polsky/Pulsiphera/Schiller 2003: 8076). Reprinted with permission.



herders and resident farmers, mass protests, and food riots.

Bulhaug, Gleditsch, and Theisen (2008: 30) concluded that “in contrast to the rich causal stories presented in the case literature, statistical comparative studies on the subject tend to model the scarcity-conflict relationship in rather simplistic ways.” They claim that the available statistical literature has so far produced little convincing evidence of a direct link between climate change and armed conflict, and that no study has tested links between natural hazards and conflicts. A major limitation of previous research has been that it addressed only the most severe forms of organized violence, and has excluded violent clashes between herders and resident farmers, e.g. in the Sahel zone to which many case studies refer (Kahl 1988, 2002, 2003, 2006; Martin 2005; Suliman 1993, 1999, 1999a).

At the same conference Raleigh, Jordan, and Salehyan (2008) addressed the impact of climate change on migration and conflict by analysing the migration potential of droughts and famines, floods and land-

slides, cyclones, hurricanes and waves, extreme temperature and sea level rise. They offered a typology of direct and indirect environmentally induced migrants leading to internal and distress migration resulting in local displacement, in some cases in permanent relocation and resettlement. They argued that government policies can influence the vulnerability and coping through resilience building. This paper dismissed the ‘securitization’ of the issue and called for “a focus on the development component of vulnerability to climate change” (Raleigh/Jordan/Salehyan 2008: 40). They based their judgement on previous comments (Levy 1995; Gleditsch 1998; Barnett 2000) on the environmental security debate that had not addressed climate change as a cause of conflicts.

In their extensive bibliography, Bulhaug, Gleditsch, and Theisen (2008: 41–49) did not include scientific reports commissioned by governments (BMU 2002), by scientific advisory groups of governments (Stern 2006; WBGU 2007, 2008), and by international organizations (IPCC 2001a, 2007; UNDP 2007/2008; OECD 2008) that according to the IPCC

rules may be included in its assessment along with peer-reviewed research. They argued that “the public debate on the security implications of climate change have been dominated by NGO reports, national security, and statements by national and international public officials”. They noted an overlap between present conflict-ridden countries and regions with serious projected climate change impacts (figure 4.7) that also partly overlap with the hotspots with projected climate change impacts on conflict constellations (WBGU 2008: 4; figure 4.7).

Given the lack of both structured, focused, and comparable cases studies (George/Bennett 2005) addressing the complex causal chain (figures 4.4) and non-existing statistical research based on a large number of cases, it is premature to conclude whether and which causal linkages have existed between physical and social effects of climate change and their impacts on internal displacement, distress migration, domestic crises, and conflicts.

But neither comparative case studies nor statistical research can analyse potential conflict constellations in vulnerable hotspots and in a world where the average annual temperature has increased by 2 °C (virtually certain), or 4 °C (still probable) or even 6 °C (possible under business as usual scenarios) by the end of this century.

This requires both different methods (modelling, simulation, and scenario analysis) of nonlinear interactions that may lead to tipping points of the climate system.¹⁹ “In response to anthropogenic climate forcing, a small perturbation at a critical point could qualitatively alter the future fate of the system. Such changes could be triggered this century and would undergo a qualitative change within this millennium.” Lenton, Held, Kriegler, Hall, Lucht, Ramstorf, and Schellnhuber (2008: 1186) pointed to the melting of

the Arctic sea-ice, rapid changes in the Greenland and in the West Antarctic ice sheet, a shutoff of the Gulf Stream (Atlantic Thermohaline Circulation), changes in the El Niño-Southern Oscillation (ENSO), in the Indian summer monsoon, in the Sahara/Sahel and West African monsoon, a drying of the Amazon basin and changes in boreal forests. These possible abrupt climate changes could trigger serious consequences for international and national security (Schwartz/Randall 2003).

While the regions where presently conflicts cluster (figure 4.7) and the hotspots with significant security impacts of climate change (figure 4.9) partly overlap, the regional impacts of possible tipping points (figure 4.8) in the climate system may seriously affect all parts of the globe, especially also the North Atlantic region, including Northern and Central Europe.

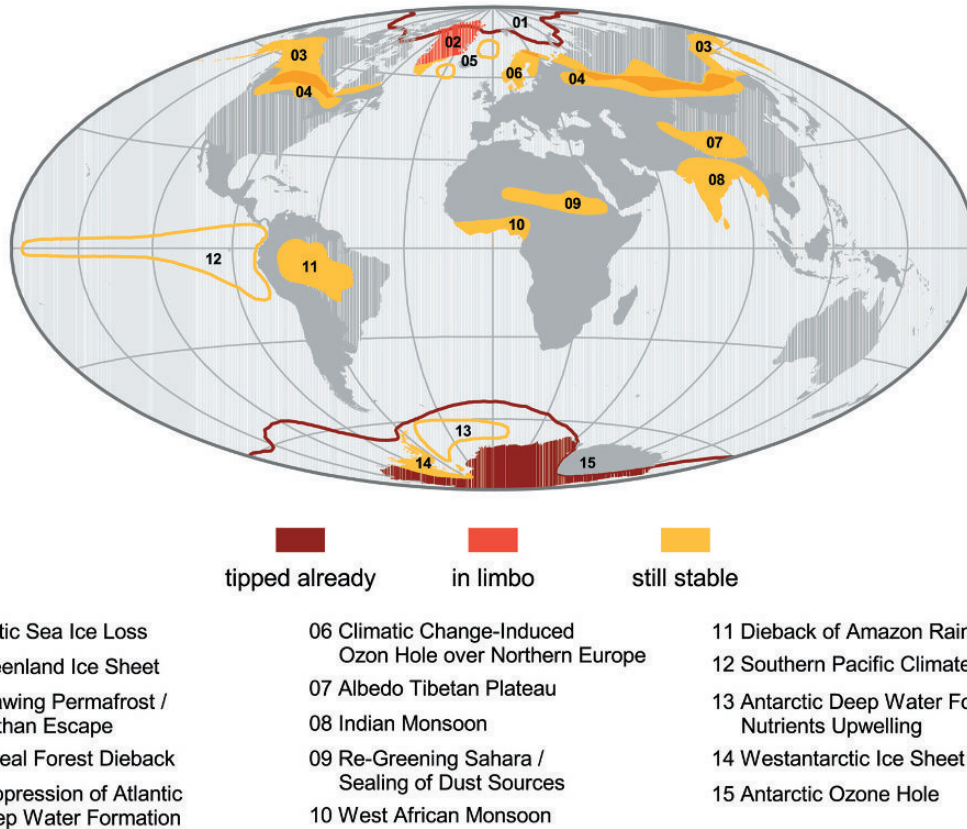
4.2.5 Securitization of Societal Outcomes and Policy Response

While the PEISOR model (figure 4.4) focuses on a sequence of *pressures* resulting from the interaction of natural and social system components, their *effects* on the socio-economic-political context, as well as on their *impacts*, *societal outcomes* and *policy responses*, the vulnerability framework (figures 4.5) systematically couples the nature-society systems from the perspective of hazard impacts (relationship between exposure, vulnerability, and resilience). In the interaction between the state, society, and the economic sector, multidisciplinary knowledge creation and application for sustainability and for coping with climate change impacts plays a key role for supporting the coping activities of state, societal, and economic decision-makers.

The model suggested by Bulhaug, Gleditsch, and Theisen (2008) on possible pathways between climate change impacts and an increased risk of armed conflict reduces the analysis of GEC and GCC to two physical effects of sea level rise and increase in hydro-meteorological hazards, and it includes an increasing resource scarcity. Their model does not discuss the security impacts of different temperature increase scenarios, of different climate conflict constellations (WBGU 2008), and nor does it reflect on geographic hotspots and tipping points. The complex interactions between the six components of the ‘survival hexagon’ (figure 4.4) are beyond the scope of their analysis, nor are the complex interactions between climate change, desertification, and biodiversity loss (MA 2005) being addressed.

19 Lenton, Held, Kriegler, Hall, Lucht, Ramsdorf, and Schellnhuber (2008: 1186) argued that the term ‘tipping point’ has been used in discussions of global change “to describe a variety of phenomena, including the appearance of a positive feedback, reversible phase transitions, phase transitions with hysteresis effects, and bifurcations where the transition is smooth but the future path of the system depends on the noise at a critical point”. They offered “a formal definition, introducing the term ‘tipping element’ to describe subsystems of the Earth system that are at least subcontinental in scale and can be switched - under certain circumstances - into a qualitatively different state by small perturbations. The tipping point is the corresponding critical point - in forcing and a feature of the system - at which the future state of the system is qualitatively altered”.

Figure 4.6: Map of potential policy-relevant tipping elements in the climate system. **Source:** Lenton, Held, Kriegler, Hall, Lucht, Ramstorf and Schellnhuber (2008: 1187). Reprinted with permission.



According to Clark, Crutzen, and Schellnhuber (2004: 19) the synthetic efforts of the vulnerability framework:

have also drawn attention to the parallels between climatic and chemical ‘life-support systems’ long discussed by Earth science researchers, the elements of ‘livelihood security’ (e.g. access to and use of resources) stressed by development practitioners, and the newer emphasis by ecologists and resource economists on ‘ecosystem services’.

In their view “management systems for a sustainability transition need to be systems for adaptive management and social learning that require information, incentives, and institutions that must mobilize the right knowledge, integrate different sources of knowledge, balance flexibility and stability, and to build up an infrastructure and capacity.” To achieve this ambitious goal they suggested a “new contract for planetary stewardship” between the scientific and political sector (Clark/Crutzen/Schellnhuber 2004: 19–24).

For the analysis of the process of *securitization* of GEC and GCC, the models reviewed above are not of less importance, nor had the claims that were made

during the ‘securitizing move’ to be supported by peer-reviewed social science research. But the *securitization* of GEC and GCC has already triggered a political demand for systematic multi-, inter-, and transdisciplinary research, and monitoring of these claimed causal or probabilistic linkages to build up knowledge that will support policies to recognize (early warning of climate related security risks) and to cope with these security dangers in a proactive way before they lead to violent conflicts. Thus, the claimed linkage between climate change and conflicts has been an additional legitimating component or the ‘securitizing move’ with regard to GEC and GCC.

4.3 Securitizing Global Environmental Change

The year 2007 was a turning point in the reconceptualization of security debate when the *Intergovernmental Panel on Climate Change* (IPCC) released its *Fourth Assessment Report* (AR4) in four parts in February in Paris (WG I on the *Physical Science Basis*,

IPCC 2007), in April in Brussels (WG II on the *Impacts, Adaptation and Vulnerability*, IPCC 2007a), in May in Bangkok (WG III report on *Mitigation of Climate Change*, IPCC 2007b), and in November in Valencia (*AR4 Synthesis Report*, IPCC 2007c).²⁰

These four reports – whose ‘Summary for Policy-makers’ had to be approved by government representatives – set the stage for a global debate on the security implications of three different climate-induced worlds: a) of a global average increase of temperature up to 2°C by 2100 which the European Union hopes to achieve; b) of a global average increase of temperature up to 4°C by 2100; or c) of a global average increase of temperature up to 6°C by the end of this century which would seriously impact on the well-being and survival of humankind, and thus also on security policy. In addition, the projected increase in the sea level will seriously threaten delta and coastal regions, while the projected increase in the number and intensity of hydro-meteorological hazards may result in an increase of human victims, persons affected, and in economic damages. The projected impacts of temperature increase, sea level rise, and natural hazards will pose severe societal and political challenges for the affected regions and countries that can possibly lead to multiple security threats, challenges, vulnerabilities, and risks that can force people to migrate, to protest and rebel, and in the worst cases may lead to small-scale violence and possibly also to armed resource conflicts.²¹

On 17 April 2007, the United Nations Security Council addressed for the first time climate change as an international security issue²² and from 29 July to 2 August 2007 the UN General Assembly held a special thematic debate on *Climate Change as a Global*

Challenge.²³ In June 2007, at the G-8 meeting in Heiligendamm (Germany) the heads of states and/or governments agreed ... “in setting a global goal for emissions reductions” that they will “consider seriously the decisions made by the European Union, Canada and Japan which include at least a halving of global emission by 2050.”²⁴ Thus, climate change, as an aspect of global environmental change, was increasingly addressed as a new objective security danger and subjective security concern for the livelihood and survival of humankind in this century.

On 12 October 2007, the Norwegian Nobel Committee awarded the Nobel Peace Prize to both the IPCC and to Al Gore “for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change” (figures 1.1). In a press release the Committee justified its choice:

Extensive climate changes may alter and threaten the living conditions of much of mankind. They may induce large-scale migration and lead to greater competition for the earth’s resources. Such changes will place particularly heavy burdens on the world’s most vulnerable countries. There may be increased danger of violent conflicts and wars, within and between states. ... By awarding the Nobel Peace Prize for 2007 to the IPCC and Al Gore, the Norwegian Nobel Committee is seeking to contribute to a sharper focus on the processes and decisions that appear to be necessary to protect the world’s future climate, and thereby to reduce the *threat to the security of mankind*. Action is necessary now, before climate change moves beyond man’s control.

On 10 December 2007, in his acceptance speech for the IPCC, its chairman, Rajendra Pachauri noted that this award is

an acknowledgement of three important realities, which can be summed up as:

1. The power and promise of collective scientific endeavour, ...

20 These meetings have been documented on the IPCC website; at: <<http://www.ipcc.ch/press/index.htm>>.

21 See BMU 2002; WBGU 2007, 2008; Buhaug/Gleditsch/Theisen 2008; Raleigh/Jordan/Salehyan 2008.

22 See: “Press Conference by Security Council President, 4 April 2007”; at: <http://www.un.org/News/briefings/docs//2007/070404_Parry.doc.htm>; Bloomberg news: “UN attacks climate change as threat to peace”, in: *International Herald Tribune*, 18 April 2007: 2; UN Security Council, SC/9000, 5663rd meeting, 17 April 2007: “Security Council holds first-ever debate on impact of Climate change on peace, security, hearing 50 speakers”; at: <<http://un.org/news/press/docs/2007/sc9000.doc.htm>>; Reuters: “UN Council Hits Impasse over Debate on Warming”, in: *New York Times*, 18 April 2007; Edith M. Lederer: “Security Council Tackles Climate Change”, in: *Washington Post*, 18 April 2007.

23 See: Chris Spence, edited by Pamela Chasek: “Summary Of The Informal Thematic Debate Of The UN General Assembly on Climate Change as a Global Challenge”; at: <<http://www.iisd.ca/climate/unga/UNGA%20Climate%20Change%20briefing%20note.pdf>>

24 For the documents of the G 8 Meeting in Heiligendamm, Germany on 8 June 2007; at: <<http://www.g8.de/Webs/G8/EN/G8Summit/SummitDocuments/summit-documents.html>> and the chair’s conclusions; at: <http://www.g8.de/nsc_true/Content/EN/Artikel/g8-summit/anlagen/chairs-summary,templateId=raw,property=publicationFile.pdf/chairs-summary>.

2. The importance of the role of knowledge in shaping public policy and guiding global affairs for the sustainable development of human society.
3. An acknowledgement of the threats to stability and human security inherent in the impacts of a changing climate and, therefore, the need for developing an effective rationale for timely and adequate action to avoid such threats in the future.

He referred to the complex linkage between climate change and its severe impacts on some of “the poorest and the most vulnerable communities in the world” that “see a decline in their economic condition, with a loss of livelihoods and opportunities to maintain even subsistence levels of existence.” But due to its mandate, the IPCC did not assess “how conflicts inherent in the social implications of the impacts of climate change could be avoided or contained.” Pachauri suggested that “it would be particularly relevant to conduct in-depth analysis of risks to security among the most vulnerable sectors and communities impacted by climate change across the globe.” He defined peace “as security and the secure access to resources that are essential for living” where climate change affects some populations to access a) clean water (*water security*), b) sufficient food (*food security*), c) stable health conditions (*health security*), d) ecosystem resources (*environmental* or *ecological security*), and e) security of settlements (*urban security*). The knowledge – assessed by the IPCC – provides a basis for the analysis in the social sciences as to how “climate change will affect peace” and whether its impacts could become a source of conflict. Pachauri argued that “human ingenuity and strength are capable of meeting this challenge” by acknowledging “the importance of sustainable development as the path to peace and prosperity.”

These three related events: a) the publication of the fourth IPCC Assessment Reports, b) the debates in the United Nations (Security Council and General Assembly), and the c) awarding of the Nobel Peace Prize to the IPCC have given climate change and its impacts a high political visibility to which Germany actively responded during its dual presidency of the EU and of the G-8, while the UK took the lead in putting this challenge on the agenda of the UN Security Council. Based on a report on *Security Risk Climate Change of the German Advisory Council on Global Change* (WBGU 2007, 2008) that was released to the G-8 summit, the German government proposed an EU strategy paper on the security impacts of climate change. In June 2007 the European Council instructed Javier Solana and the European Commission

to draw up a report on the security side of climate change that was submitted on 10 March 2008 to the EU Council of Ministers, and to the European Council on 13–14 March 2008.

Thus, during 2007 climate change has been addressed by a few governments and experts as a major security issue, and in this process of ‘*securitization*’ of problems of GEC the IPCC has indirectly become a major ‘*securitizing actor*’ by upgrading climate change to an ‘*existential threat*’ to different referent objects from the international community (*global, international* and *regional security*), the state (*state* or *national security*), and humankind (*human* and *gender security*). Addressing GEC and GCC as a new security danger and concern reflects the fundamental reconceptualization of security in the Anthropocene.

4.4 IPCC: Epistemic Community and Securitizing Actor?

A theoretical linkage between the burning of hydrocarbons and global warming was first postulated in 1896 by the Swedish physicist and chemist Svante Arrhenius (v. Weizsäcker/LovinsLovins 1995: 249; Bolin 2007: 3–8). But it took the scientific community until 1979 to recognize this linkage when the first world climate conference was organized by the *World Meteorological Organization* (WMO). Several scientific meetings followed in 1983, 1985, and 1987 in Villach (Austria) and Bellagio (Italy) that were carried out by the WMO in cooperation with the *United Nations Environment Programme* (UNEP) and the *International Council of Scientific Unions* (ICSU), and in 1985 participants from 29 countries warned for the first time of the danger of an anthropogenic climate change. After the publication of the Brundtland Commission Report (WCED 1987) UNEP and WMO added climate change to the agenda of the UN General Assembly (Bolin 2007: 40).

In the autumn of 1988, the US Reagan Administration put climate change on the policy agenda of the G-7 in Toronto where in June 1988 some 300 scientists and policy-makers at the “World Conference on the Changing Atmosphere, Implications for Global Security” suggested in their final declaration a reduction of CO₂ emissions by 20 per cent between 1988 and 2005 (Oberthür 1993). In November 1988, UNEP and WMO established the *Intergovernmental Panel on Climate Change* (IPCC) and in December 1988, at the suggestion of Malta (Bolin 2007: 49–51), the UN General Assembly declared the atmosphere as being “a

common heritage of mankind” (GA/43/53), and two years later on 21 December 1990 the General Assembly set up the *International Negotiating Committee on Climate Change* (INC) with a mandate to negotiate the *United Nations Framework Convention on Climate Change* (UNFCCC) that was approved in June 1992 at the Rio Earth summit (UNCED). Five years later with the adoption of the *Kyoto Protocol* (KP), the first binding quantitative emissions reductions were adopted that will be replaced by an emerging post-2012 climate change regime (Ott 2007; Aldy/Stavins 2007; Zedillo 2008).

Thus, since 1988 climate change has increasingly become an urgent policy issue and was thus ‘politicized’, and since the turn of the century climate change has gradually been perceived and discussed as an international (BMU 2002; WBGU 2007/2008), national (Schwartz/Randall 2003), and human security issue (Adger/Barnett 2005; Wisner/Fordham/Kelman/Johnston/Simon/Lavell/Brauch/Oswald Spring/Wilches-Chaux/Moench/Weiner 2007). In a similar vein, issues of water scarcity, degradation, stress, soil degradation, and desertification have first been politicized and then also securitized. Thus, facing global environmental change has increasingly been perceived and addressed as an emerging soft security issue.

During the past two decades, *global environmental challenges* have created an intensive public awareness to *face* this global environmental change and to *cope* with its consequences (Brauch/Oswald Spring/Mesjasz/Grin/Kameri-Mbote/Chourou/Dunay/Birkmann 2009). Since then, both the scientific discourse and the policy debates on GEC and on the reconceptualization of security were pursued by different scientific and policy communities.

4.5 Securitizing Global Environmental and Climate Change

Since the *UN Conference on Environment and Development* (UNCED) in Rio de Janeiro (1992) and the *World Summit on Sustainable Development* (WSSD) in Johannesburg (2002) the GEC posed by climate change, water stress, and soil erosion and desertification have been added to the international policy agenda, and since the turn of the millennium they have increasingly been addressed and perceived as new security issues.

4.5.1 Securitizing Water or ‘Water Security’

The concept of ‘water security’ was introduced in the Ministerial Declarations of the second *World Water Forum* (WWF) in The Hague (2000), and developed further at the third WWF in Kyoto (2003) and at the fourth WWF in Mexico City (2006).²⁵ The meeting in The Hague launched the *The African Water Vision* that “seeks to address the water paradox of the continent (floods and droughts, water scarcity and under-exploited water resources).”²⁶ The ‘Mexico Ministerial Declaration on Water’ of 17 March 2006 emphasized the goal of achieving water security stating that “African countries need to invest in water infrastructure ..., in order to achieve a self-sustaining auto-induced growth to eradicate poverty and achieve sustainable development.” Among the water security challenges the first *African Water Week* in March 2008 addressed the sanitation gap and the strategies for closing it, as well as the infrastructure for water security. Similar strategies have been developed for Latin American and Asian countries. Since 2000, the water security concept has been widely used by water specialists in the natural and social sciences, by policymakers and international organizations (chap. 11 by Oswald/Brauch, 18 chapters in part VII).

4.5.2 Securitizing Climate Change

Since the early 21st century climate change has increasingly been perceived as a security problem. Climate change has gradually been ‘securitized’ in government reports and in statements of government officials in the UK, in Germany, in the USA, and in many other countries.²⁷ It got on the US national policy agenda in February 2004 when a Pentagon contract study by Schwartz and Randall (2003) was leaked that stimulated a policy discussion that was further fuelled by a documentary “The Day After Tomorrow: Could it Really Happen” on a very dramatized impact of an abrupt climate change (NRC 2001). Since 2007 many

25 See “Ministerial Declaration of The Hague on Water Security in the 21st Century”; at: <http://www.worldwatercouncil.org/fileadmin/wwc/Library/Official_Declarations/The_Hague_Declaration.pdf>; see also at: <http://www.thewaterpage.com/hague_declaration.htm>; Ministerial Declaration, Third World Water Forum, Kyoto, 23 March 2003, para.11; at: <<http://www.mofa.go.jp/policy/environment/wwf/declaration.html>>.

26 See the African Development Bank; at: <http://www.afdb.org/pls/portal/docs/PAGE/ADB_ADMIN_PG/DOCUMENTS/NEWS/CONCEPT%20NOTE-ENG.PDF>.

policy studies have securitized climate change as: a) an *international security* issue (4.5.2.1); b) a *national security* threat for the United States (4.5.2.2), and c) as a *human security* challenge affecting socially vulnerable and poor population groups (4.5.2.3).

4.5.2.1 Climate Change as an International Security Danger and Concern

At the “World Conference on the Changing Atmosphere – Implications for Global Security” in June 1988 in Toronto, the Norwegian Prime Minister Brundtland stated that “the impact of world climate change may be greater than any challenge mankind has faced, with the exception of preventing nuclear war.”²⁸ She thus launched the process of *politicization* and *securitization* of climate change that reached a political criticality during the year 2007.

In autumn of 1988, during its 30th anniversary meeting in Brighton, the IISS addressed non-military aspects of strategy and invited Neville Brown to explore potential avenues for future research on “climate, ecology and international security.” Brown (1989, 2001)²⁹, a trained meteorologist and historian and a professor of international security affairs, reviewed the growing ecological awareness, climate history and its impact on politics, and the possible impacts of the greenhouse effect. He argued that “the challenge begins to look like ‘the moral equivalent of war’, not least because a failure to meet it would have catastrophic consequences for international security.” Brown (1989: 531) called for a paradigmatic shift in strategy and the “adoption of a new corpus of knowledge and ideas,” and that strategists will find themselves confronted “with a large, diverse and unfamiliar

agenda. But it will be one informed by the precept that if doom can be foreseen, it may be thwarted. Such a self-defeating prophecy is what good strategy has always been about.”

In the United States, Peter Gleick (1989, 1989a) addressed the links between climate and international security arguing that “global climate change will potentially alter agricultural productivity, freshwater availability and quality, access to vital minerals, coastal and island flooding, and more.” These impacts “will be challenges to political relationships, realignment of energy markets and regional economies, and threats to security.” When the national security discussion on the environment started in the United States (Mathews 1989, 1991, 1992, 1993; Myers 1989), Gleick pointed to a

debate about the extent to which resource constraints or environmental problems alone can lead to conflict. However, it is widely acknowledged that resource constraints can lead to economic pressures and tensions or as triggers to conflicts when other tensions exist between states or political actors. These challenges, together with the long history of political frictions and disputes worsened by environmental stresses, suggests that global climatic changes have the potential to exacerbate international and subnational tensions and conflicts.³⁰

27 The first conceptual and empirical studies addressed “climate change, worst-case scenarios of climate change in the Southwest Pacific” (Edwards 1996, 1999), “climate change and world food security” (Parry/Rosenzweig/Iglesias/Fischer/Livemore 1999), “climate change and violent conflicts” (Rahman 1999), “linking climate change research with food security and poverty reduction in the tropics” (Sanchez 2000), “from climate risk to climate security” (Wiman/Stripple/Chong 2000), “security and climate change” (Barnett 2001), “climate change as a security issue” (Stripple 2002), and “climate change, environmental stress and conflict” (Brauch 2002).

28 Philip Shabecoff, “Norway and Canada Call for Pact to Protect Atmosphere”, in: *New York Times*, 28 June 1988; at: <<http://query.nytimes.com/gst/fullpage.html?res=940DE0DA163BF93BA15755C0A96E948260&sec=&spn=&pagewanted=print>>.

29 In his book on *History and Climate Change. A Eurocentric perspective*, Brown (2001) analysed major turning points of European history on the background of climate history. He carefully reviewed the intellectual debate among historians on the opposite views of the climate determinist Huntington and the climate sceptic Gibbon, pointing to the persisting uncertainties and to short-term climate fluctuations. He suggests that during the next two to three decades “a combination of research fieldwork and modelling should reveal considerably more about historical climatology on these last two millennia.” For the 21st century he argued that it cannot be ruled out that climate change could well become “a prime generator of instability and conflict.” Brown sees several reasons “that a climate crisis could induce a fundamentally irrational response.” He concluded with a critique of the “poverty of strategy” that failed “to adapt to the strategic revolution of 1989–91.” In his balanced assessment Brown argued that the impact of climate change appeared more local and regional than continental.

30 See the testimony of Peter H. Gleick to the United States Congress, Committee on Government Reform Subcommittee on National Security, Emerging Threats, and International Relations, Hearing on Energy as a Weapon: Implications for U.S. Security: “The Implications of Global Climatic Changes for International Security”, 16 May 2006.

Thirteen years later, a report for the German environment ministry (BMU) focused on the causes of climate change and their complex interactions with other drivers of GEC, on those environmental factors that contribute to environmental stress as a driver that may cause or trigger potential conflictual or cooperative outcomes. This BMU-study discussed the results of these considerations in five case studies on small island states, Mexico, Bangladesh, Egypt, and for the Mediterranean, and drew conceptual conclusions for scientific considerations and strategies aiming at conflict prevention (Brauch 2002).

From a state-centred international security perspective, the *German Advisory Council on Global Change* (WBGU 2007/2008) reviewed *Climate Change as a Security Risk* arguing that “without resolute counteraction, climate change will overstretch many societies’ adaptive capacities within the coming decades. This could result in destabilization and violence, jeopardizing national and international security to a new degree.” But also a positive development is possible if the international community “recognizes climate change as a threat to humankind and soon sets the course for the avoidance of dangerous anthropogenic climate change by adopting a dynamic and globally coordinated climate policy.”³¹

The report refers to probable new conflict constellations due to sea level rise, storms, and floods that may threaten coastal cities and industrial regions. The melting of the glaciers may jeopardize water supply in the Andean and Himalayan regions. The disappearance of the Amazon Forest and the loss of the Asian monsoon “could cause large-scale changes in the Earth System” and “incalculable consequences for the societies concerned.” While the WBGU considered “climate-induced inter-state wars” unlikely, it argued that “climate change could trigger national and international distributional conflicts and intensify problems already hard to manage such as state failure, the erosion of social order, and rising violence. In the worst-affected regions, this could lead to the proliferation of destabilization processes with diffuse conflict structures. These dynamics threaten to overstretch the established global governance system, thus jeopardizing international stability and security.”

The WBGU identified four conflict constellations “as typical causal linkages at the interface of environment and society, whose dynamic can lead to social destabilization and, in the end, to violence:” a) Climate-induced degradation of freshwater resources; b) Climate-induced decline in food production; c) Climate-induced increase in storm and flood disasters; and d) Environmentally-induced migration. The WBGU identified several regional hotspots in North Africa, the Sahel zone, in Southern Africa, in Central Asia, India, Pakistan and Bangladesh, in China, Caribbean and the Gulf of Mexico and in the Andean region and Amazonia (figure 4.7).

The WBGU referred to “six key threats to international security and stability which will arise if climate change mitigation fails”: 1) possible increase in the number of weak and fragile states as a result of climate change; 2) risks for global economic development; 3) risks of growing international distributional conflicts between the main drivers of climate change and those most affected; 4) the risk to human rights and the industrialized countries’ legitimacy as global governance actors; 5) triggering and intensification of migration; and 6) overstretching of classic security policy.

Whether these conflict constellations and social crises will occur depends on the increase of global average temperature by the end of this century. Thus, in the WBGU’s view, “climate policy ... becomes preventive security policy, for if climate policy is successful in limiting the rise in globally averaged surface temperatures to no more than 2°C relative to the pre-industrial value, the climate-induced threat to international security would likely be averted.”

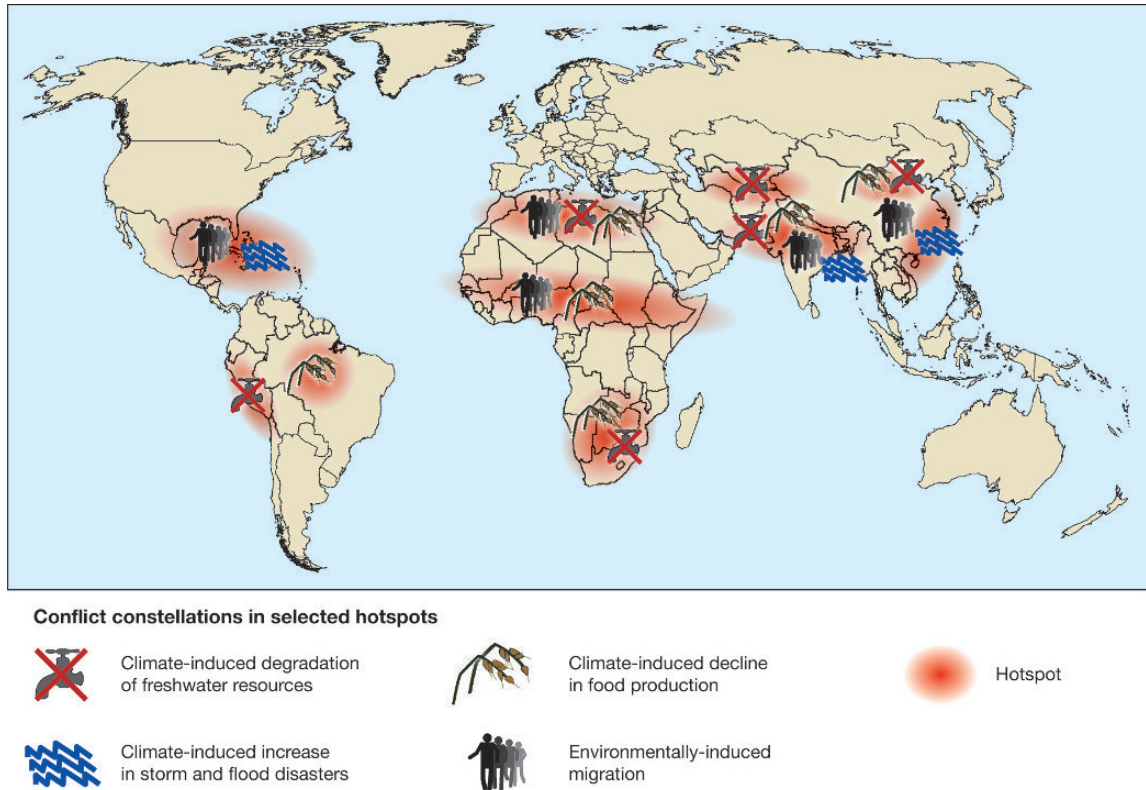
But – the WBGU Report further argued – if the mitigation efforts fail,

climate-induced security risks will begin to manifest themselves in various regions of the world from around 2025–2040. The key challenge is to take resolute climate policy action within the next 10–15 years, in order to avert the socio-economic distortions and implications for international security that will otherwise intensify in subsequent decades.

A week after the G-8 summit in Heiligendamm (Germany), the WBGU report was discussed in the German Foreign Office with representatives of civil society. In his concluding remarks Foreign Minister Steinmeier argued that an effective global climate policy is “decisive for stability and peace in the world.” The German foreign minister called for a preventive environmental diplomacy and a resource-oriented industrial policy also in the Near and Middle East

31 See for details the WBGU website at: <http://www.wbgu.de/wbgu_jg2007_engl.html>, where several expert studies are also available for download at: <http://www.wbgu.de/wbgu_jg2007_kurz_engl.html> and the full report is at: <http://www.wbgu.de/wbgu_jg2007_engl.pdf>.

Figure 4.7: Regional hotspots and security risks associated with climate change. **Source:** WBGU (2008: 4). Reprinted with permission.



“where ecological questions have become issues of survival and security.” He called for a European diplomacy to cope with the security challenges posed by climate change, and he announced that this preventive approach would be discussed in a meeting of foreign ministers of the G-8 and G-5 in late 2007 in Berlin.³²

Key arguments of this study are reflected in a paper of the European Commission and of the Secretary-General of the European Council that was approved by the European Council on 14 March 2008. Thus this scientific agenda setting has resulted within nine months in a policy document of the 27 countries of the European Union. The book was introduced to COP 13 of UNFCCC in December 2007 in Bali in a joint side event by UNEP and the WBGU³³.

A background paper for the ‘International Women Leaders Global Security Summit’ in November 2007 in New York³⁴ put forward “a new security agenda that views the safety of people as inseparable from the security of the state” focusing on “four important themes of global security: climate change, the respon-

sibility to protect, the economics of insecurity, and preventing terrorism(s).” This report stated that:

Climate change poses significant security risks due to an increased occurrence of severe weather patterns, degradation of vital natural resources and threats to the livelihoods and safety of populations on every continent. Pressure on resources, natural disasters and humanitarian crises - including flooding, drought, desertification and loss of arable land, massive and rapid migration and refugee flows - have the potential to threaten economic, political and social stability while increasing the risk of internal civil unrest.

33 At the 13th conference of parties to the UNFCCC in Bali on 10 December 2007, the security links of climate change were addressed in a side event by UNEP and WBGU; see: UNEP News Centre: “Climate Change and Conflict - New Report Weighs the Risks and Pinpoints Likely Hotspots”; at: <<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=523&ArticleID=5720&cl=en>>.

34 See for details at: <<http://womenandglobalsecurity.org>>. A summary report of this event is at: <<http://womenandglobalsecurity.org/docs/IWLGSS%20Report.pdf>>.

32 This meeting on “Sicherheitsrisiko Klimawandel” is fully documented in German in: Auswärtiges Amt (2007).

The report of the International Women Leaders Global Security Summit further argued that

Women's leadership must help increase political will at the national and global level, guide the private sector away from voluntary initiatives and toward legally required changes in practice, give voice to affected communities in setting priority targets and legal standards, and identify and prioritize the communities most in need of assistance to mitigate and cope with the effects of climate change.

The report suggested that "an integrated human, gender and environmental security approach is needed for dealing with the growing threat of climate change, in order to develop appropriate adaptation and mitigation strategies."³⁵ This summit concluded that "the road to real security requires women leaders to integrate state, global and human security in a mutually reinforcing way that builds upon currently existing theoretical frameworks of security policy". Women leaders must "use existing mechanisms to enforce global standards and existing international law, and create new methods where needed." It argued that "women leaders bring a new perspective to the security policy dialogue ... that can make a difference in both government and civil society. Building an inclusive process, persistence, consensus-building, considerations of short- and long-term implications and a talent for negotiation are some of the cornerstones of traditional women's leadership". Women leaders can "create practical change and apply a human face to security".

These national and international efforts to securitize climate change and its projected societal impacts have been complemented by many reports for NGOs and national governments (e.g. in Sweden for SIDA and FOI) that share the goal of making climate change an issue of utmost political importance that requires extraordinary policy responses and coping measures.

The links between climate change, peace and war were analysed in a report by International Alert (Smith/Vivekananda 2007) that highlighted four key

elements of risk - political instability, economic weakness, food insecurity, and large-scale migration, and it made twelve recommendations for addressing climate change in fragile states. It discussed the climate change impacts for Algeria, Darfur, Peru, Bangladesh, and for Karachi, governance matters for Mali and Chad, as well as linking for Liberia peacebuilding and climate adaptation efforts and developing social resilience for Nepal. The report supplied two lists of states at risk: a) facing a high risk of armed conflict as a consequence of climate change (46 states); and b) states facing a high risk of political instability as a consequence of climate change (56 states). An extended version of *A Climate of Conflict* was published by SIDA (Smith/Vivekananda 2008) that offers case studies on Kenya, Bangladesh, Mali and Chad, as well as on Sudan and Darfur, Liberia, Nepal, Colombia and Rwanda.³⁶

In a study for the *Swedish Defence Research Agency* (FOI), Peter Haldén (December 2007: 4) analysed "The Geopolitics of Climate Change" by focusing on: "whether and in what way climate change may alter the conditions of international security." He argues that "organized violence is more likely in regions with weak states and conflictual inter-state dynamics than in those characterized by co-operative relations," and he concludes that "in the short- to medium term, climate change is unlikely to alter the constitutive structures of international security," but that "a long-term development marked by unmitigated climate change could very well have serious consequences for international security."³⁷

In December 2007 Ecopeace/Friends of the Earth Middle East in a report on *Climate Change: A New Threat to Middle East Security* (Freimuth/Bromberg/Mehyar/Alkahteb 2007) argued that "the climate crisis and its potential physical and socio-economic impacts are likely to exacerbate this cross-border instability" and that "climate change is likely to act as a 'threat multiplier' - exacerbating water scarcity and tensions over water within and between nations linked by hydrological resources; geography; and shared political boundaries". However, this crisis of

35 Úrsula Oswald Spring: "Climate Change: A Gender Perspective on Human and State Security Approaches to Global Security"; a summary is at: <http://womenandglobalsecurity.org/index.php?option=com_content&task=view&cid=22&Itemid=33>; the full text is at: <http://www.afes-press.de/pdf/Oswald_Climate_Change_gender_perspective_abs.pdf> and her powerpoint presentation to the International Women Leaders Global Security Summit is at: <http://www.afes-press.de/pdf/Oswald_Climate_Change_gender_perspective.pdf>.

36 The study of International Alert is for download at: <<http://www.international-alert.org/publications/322.php>>; the version for SIDA is at: <http://www.envirosecurity.org/activities/diplomacy/gfsp/documents/A_Climate_of_Conflict>.

37 See for download at: <<http://www.foi.se/upload/projekt/Climatools/Rapporter/FOI-R-2377-SE.pdf>>; and for a summary of a symposium in Brussels on 23 April 2008; at: <<http://www.envirosecurity.org/news/>>.

fers opportunities “for local, cross-border and international cooperation to ameliorate the problems that are already occurring and that are projected to intensify.”³⁸

The impacts of “climate change as the ‘new’ security threat for Africa” (Brown/Hammill/McLeman 2007) have been discussed since 2007 and several contract studies for European ministries of development also for subregions (e.g. for West Africa) and countries (Ghana, Burkina Faso, e.g. by Brown/Crawford 2008) and provinces (Darfur, e.g., by UNEP 2007). Several African leaders have called climate change as an ‘act of aggression’ (President Museveni of Uganda in 2007).

For the *securitization* of climate change impacts by policy-makers in North and South, Brown, Hammill and McLeman (2007: 1143–1154) pointed to two reasons a) that climate change “threatens to exacerbate drivers of conflict in a way that could roll back development across many countries,” and b) that this debate is “part of a clear process to invest the international debate with a greater sense of urgency.” They argue that this debate presents both risks (if it creates a sense of hopelessness, search for military solutions, and results in a distraction of resources from development) and opportunities if it encourages politicians to reduce emissions, to invest in adaptation, and speed efforts for implementing both climate and conflict resolution policies.

The security aspects and implications of climate change have been considered by government representatives within the environment directorate of the OECD, and informally discussed between the British Foreign Office (FCO) and the German Environment Ministry (BMU) since 2001. The public policy debate on the *securitization* of climate change has been most intensive in the UK since 2004 in which successive secretaries of defence and foreign affairs, as well as high level policy advisers, leading scientists, and retired diplomats actively participated at conferences and in the media.

Sir Crispin Tickell (2003), a former UK diplomat, pointed to environmental factors behind societal collapse. John Mitchell, chief scientist at the UK Met Office, forecasted that the coming decades will see a 30

per cent increase in severe drought, and that Africa will experience increased desertification, water stress, and disease. On 9 January 2004, David King, the UK Government’s chief scientific adviser, was quoted as saying that climate change is a far greater threat to the world than international terrorism.³⁹ In February 2004, John Reid MP, then British Secretary of State for Defence and later Home Secretary, argued that climate change may spark conflict between nations. He claimed that violence and political conflict would become more likely in the next 20 to 30 years with climate change, he listed among the major threats in future decades, “uncertainty about the geopolitical and human consequences of climate change. ... Impacts such as flooding, melting permafrost and desertification could lead to loss of agricultural land, poisoning of water supplies and destruction of economic infrastructure. ... More than 300 million people in Africa currently lack access to safe water; climate change will worsen this dire situation.”⁴⁰

In October 2006, the *Stern Review* on the *Economics of Climate Change* by the Prime Minister’s Special Adviser, Sir Nicholas Stern (2006), reviewed the scientific basis, impacts of climate change on growth and development, the economics of stabilization, the policy responses for mitigation and adaptation and international collective action to cope with the consequences of GCC. The *Stern Review* notes among the societal impacts of GCC:

- Greater resource scarcity, desertification, risks of drought and floods, and rising sea levels could drive many millions of people to migrate – a last-resort adaptation for individuals that could be costly to them and to the world.
- Drought and other climate-related shocks may spark conflict and violence, as they have done already in many parts of Africa.

Stern (2006: 128–131) listed both future risks in West Africa and in the Nile River Basin, and past national

38 This study is for download at: <http://www.foeme.org/index_images/dinamicas/publications/publ78_1.pdf>.

It took up an argument presented by Brauch (2004a, 2006a, 2007f, 2007g) at an Israeli-Palestinian conference in Antalya in October 2004, and at a NATO conference in the Negev in February 2006.

39 See: Goklany and King: “Climate Change and Malaria”, in: *Science*, 1 October 2004: 55–57; BBC (2007): “Global Warming ‘Biggest Threat’”; at: <<http://news.bbc.co.uk/1/hi/sci/tech/3381425.stm>>; see also BBC: “Scientist urges US climate help” on 10 March 2004; at: <<http://news.bbc.co.uk/1/hi/sci/tech/3498830.stm>> and on 31 March 2004; at: <http://news.bbc.co.uk/1/hi/uk_poli-tics/3584679.stm>.

40 See: Ben Russell and Nigel Morris: “Armed forces are put on standby to tackle threat of wars over water”, in: *Independent*, 28 February 2006; at: <<http://news.independent.co.uk/environment/article348196.ece>>.

and cross-border conflicts. This report assessed the costs of climate change and the economic benefits of proactive climate policies: It contributed to a further *politicization* of GCC, and enhanced the perception of ‘urgency’ and of a need for ‘extraordinary measures’ to cope with GCC, two essential components of Britain’s political strategy of *securitization*.

In October 2006, then Foreign Secretary Margaret Beckett considered climate change as a “serious threat to international security” that “must not be dealt with using guns and tanks, but through dialogue and the sharing of new technologies between developed and developing countries”.⁴¹ John Ashton, her Special Representative for Climate Change, repeatedly argued: “Climate change is a security issue because if we don’t deal with it, people will die and states will fail.” And he added that “there is no hard power solution to climate change – you cannot force your neighbour to change its carbon emissions at the barrel of a gun.”⁴²

This British ‘*securitization move*’ culminated in April 2007 in a debate in the UN Security Council. This followed UNSC Res. 1625 of 14 September 2005 that called for promoting sustainable development as part of a broad strategy of conflict prevention. This linkage was explicitly stressed in the UK concept paper that put climate change on the agenda of the UN Security Council on 17 April 2007, when this body addressed for the first time climate change as a security issue.⁴³ In her opening statement UK Foreign Secretary Margaret Beckett listed among new causes of conflicts: “fights over water, changing patterns of rainfall, fights over food production, land use.”⁴⁴ She ar-

gued that “an unstable climate will exacerbate some of the core drivers of conflict, such as migratory pressures and competition for resources.” Japan’s Ambassador Kenzo Oshima said that “it is clear that climate change can pose threats to national security ... [and] in the foreseeable future climate change may well create conditions or induce circumstances that could precipitate or aggravate international conflicts.” On behalf of the EU countries, the German Development Minister, Heidemarie Wiecek-Zeul, argued:⁴⁵

that the scarcity of water, food and fertile land can be a contributing factor to drive conflict, [and] the vulnerability of people ... can increase the potential for instability and conflict. ... A wide range of interacting factors such as ethnic tensions, trans-border disputes, inequalities in societies, population movements and failed states can contribute to armed conflict. But climate change will become an ever more important factor among root causes for conflict as the climate will continue to change at a faster rate.

From this political analysis, the representative of the EU presidency argued that

we are in need of a global framework of risk management to address the challenge of climate change. ... The security dimension should be duly reflected in future research and reports on the effects of climate change. ... An overall framework of preventive diplomacy is needed in order to alleviate the worst consequences.... As other challenges to humankind like hunger, disease, poverty, water scarcity or migration, climate change should be addressed in a holistic and preventive manner.

Among the countries that supported this ‘*securitizing move*’ Sindico (2007) distinguished three groups, a) those wanting to raise global awareness for climate change (UK), b) those focusing on conflict prevention (Germany, France), and c) the most vulnerable small island states. The opponents argued that climate change as a sustainable development issue should not be considered by the UNSC (China, Russia, India, South Africa, Brazil, Indonesia, and Qatar) but by the UNGA, ECOSOC, and UNCSD, while Mexico and Singapore acknowledged that climate change could lead to future security concerns but that the UNSC should not interfere into state energy policies. For UN Secretary General, Ban Ki-moon “projected changes in the earth’s climate are thus not only an environmental concern. ... Issues of energy and climate

41 See: British Embassy Berlin: “Speech given by Foreign Secretary, Margaret Beckett, at the British Embassy, Berlin, 24 October 2006”; at: <<http://www.britischebotschaft.de/en/news/items/061024.htm>>; the quotes are from “Climate change ‘serious threat to global security’”; at: <<http://www.politics.co.uk/news/foreign-policy/international-development/debt-and-debt-relief-in-developing-world/climate-change-serious-threat-global-security-5455615.htm>>.

42 Quoted in: Ben Vogel (2007) “Climate change creates security challenge ‘more complex than Cold War’”, in: *Janes.com*; at: <http://www.janes.com/security/international_security/news/misc/janes070130_I_n.shtml>; quoted by Chris Littlecott (2007) “Climate Change: The Global Security Impact” 5 February; at: <<http://www.e3g.org/index.php/programmes/climate-articles/climate-change-the-global-security-impact/>>.

43 “Press Conference by Security Council President, 4 April 2007”; at: <http://www.un.org/News/briefings/docs//2007/070404_Parry.doc.htm>.

44 Bloomberg news: “UN attacks climate change as threat to peace”, in: *International Herald Tribune*, 18 April 2007: 2.

45 For the text see at: <http://www.europa-eu-un.org/articles/en/article_6953_en.htm>.

change can have implications for peace and security.”⁴⁶ By taking climate change to the UNSC, it has been upgraded from an environmental and development to a security issue. But the debate on climate change at the UNSC has also shown two different approaches to security. A broad concept of international security promoted by developed countries that embraces climate change, and a narrow concept favoured by developing countries, which tends to exclude climate change from the global security agenda. ... Developing countries rightly fear that some developed countries wish to securitize climate change in order to impose their own climate policy (Sindico 2007: 34).

In May 2007, in a speech at RUSI on “the case for climate security,” Foreign Secretary Margaret Beckett argued that climate security “requires a whole new approach to how we analyse and act on security. The threat to our climate security comes not from outside but from within: we are all our own enemies. And what is at stake is not the relatively narrow national security of individual states but our collective security in an interdependent world.” She further stressed that “the traditional tools of hard security – in simple terms bombs and bullets – are not going to be able to solve that problem.” Guaranteeing this new security requires a “commitment to non-military options: to international diplomacy; to leveraging international finance and markets; to building coalitions between governments, business and consumers.” The new objective “in the fight against climate change ... is not to defend a way of life but to change it.” This implies “nothing less than to shift the foundations upon which the global economy is built.”⁴⁷ But Ms. Beckett also hinted to a tactical component of her *securitization move*:

Flagging up the security aspects of climate change has a role in galvanizing those governments who have yet to act. And, for all of us, it has a role in setting the level of ambition – the political and financial commitment – that is needed. Second, the security community has a very direct role to play. The analytical framework – the sce-

nario building – ... was developed ... in the security community. ... For a problem with the complexity of climate change, that ability to construct a vision of the future and to draw the links between a wide variety of physical impacts and possible consequences to our security is invaluable.

Since January 2004, when Sir David King claimed that climate change was a more urgent security threat than terrorism, in many interviews, speeches, and reports (‘speech acts’) high British government officials launched a ‘securitizing move’ addressing GCC as a new danger for global, international, and collective security that succeeded to stir a public debate in the UK that rapidly proliferated abroad, and to put climate change on the agenda of the UNSC. Already in 2001, officials in the German Environment Ministry commissioned a report on *Climate Change and Conflict* (BMU 2002) that was intended to put the security dimension of GCC on the agenda of the IPCC for its fourth Assessment Report, and on the agenda of OECD. In 2007, the *German Advisory Council on Global Change* (WBGU)⁴⁸ focused its flagship report on *Climate Change as a Security Risk* (WBGU 2007/2008) that was tabled in June 2007, just prior to the G-8 meeting in Heiligendamm (Germany).

The climate change issue has been discussed at the G-8 meetings in August 2005 in Gleneagles⁴⁹ in the UK and in June 2007 in Heiligendamm in Germany where the heads of states and/or governments of the G-8 agreed ... “in setting a global goal for emissions reductions” that they will “consider seriously the decisions made by the European Union, Canada and Ja-

46 UN Security Council, SC/9000, 5663rd meeting, 17 April 2007: “Security Council holds first-ever debate on impact of climate change on peace, security, hearing 50 speakers”; at: <<http://un.org/news/press/docs/2007/sc9000.doc.htm>>; Reuters: “UN Council Hits Impasse over Debate on Warming”, in: *New York Times*, 18 April 2007; Edith M. Lederer: “Security Council Tackles Climate Change”, in: *Washington Post*, 18 April 2007.

47 See text at: <<http://www.fco.gov.uk/en/newsroom/latest-news/?view=Speech&cid=1892973>>.

48 See on the mission of the WBGU, at: <http://www.wbgu.de/wbgu_auftrag_en.html>. Among the WBGU’s tasks are to: a) analyse global environment and development problems and report on these, b) review and evaluate national and international research in the field of global change, c) provide early warning of new issue areas, d) identify gaps in research and to initiate new research, e) monitor and assess national and international policies for the achievement of sustainable development, f) elaborate recommendations for action and research, and g) raise public awareness and heighten the media profile of global change issues. Its nine members are jointly appointed by the Federal Ministry for Education and Research and the Federal Ministry for Environment, Nature Conservation, and Nuclear Safety, in agreement with other ministries for a period of four years.

49 At the G-8 meeting in Gleneagles the *Gleneagles Plan of Action* on “Climate Change, Clean Energy and Sustainable Development” was adopted; see at: <http://www.fco.gov.uk/Files/kfile/PostG8_Gleneagles_CCChangePlanofAction.pdf>.

pan which include at least a halving of global emission by 2050.”⁵⁰ In a joint statement of the German G-8 presidency with the heads of states and/or governments of Brazil, China, India, Mexico and South Africa, the goal of fighting climate change was endorsed, including the “crucial role of economic incentives,” “climate friendly investments in large scale,” and improved means of adaptation for developing countries “with enhanced technology cooperation and financing.”

On 31 July to 2 August 2007, the UN General Assembly held an “informal thematic debate” on “climate change as a global challenge” (Spence/Chasek 2007). On 24 September 2007, United Nations Secretary-General Ban Ki-moon convened a high-level event on climate change “to advance the global agenda on climate change when he me[t] with heads of state and other top officials from more than 150 countries at United Nations Headquarters.”⁵¹

In November 2007 the *Human Development Report 2007/2008: Fighting climate change: Human solidarity in a divided world* (UNDP 2007/2008) suggested that the world should focus on the development impact of climate change. The *Human Development Report 2007/2008* argues that climate change poses challenges for political leaders and people in rich nations to acknowledge their historic responsibility and to initiate significant cuts in greenhouse gas emissions, and for the entire human community to undertake prompt and strong collective action. Climate change also poses major obstacles to progress in meeting the MDGs and maintaining progress raising the HDI.⁵²

On 14 March 2008, the Council of the European Union released a paper on “Climate change and international security” (SII3/08)⁵³ from the High Representative and the European Commission to the European Council that reflected key arguments of the 2007 WBGU report. This EU policy paper sees “Cli-

mate change ... as a threat multiplier which exacerbates existing trends, tensions and instability” that “threatens to overburden states and regions which are already fragile and conflict prone.” They include “political and security risks that directly affect European interests.” It further claims that “in line with the concept of human security, it is clear that many issues related to the impact of climate change on international security are interlinked requiring comprehensive policy responses.” It “focuses on the impact of climate change on international security and considers the impact of these international security consequences for Europe’s own security, and how the EU should respond”. And it “concludes that it is in Europe’s self interest to address the security implications of climate change with a series of measures: at the level of the EU, in bilateral relations and at the multilateral level, in mutually supportive ways”.

The EU paper lists seven major international security threats posed by climate change: i) conflict over resources; ii) economic damage and risk to coastal cities and critical infrastructure; iii) loss of territory and border disputes; iv) environmentally-induced migration; v) situations of fragility and radicalization; vi) tension over energy supply; and vii) pressure on international governance. It discusses several geographical examples where these threats may materialize: a) Africa, b) Middle East, c) South Asia, d) Central Asia, e) Latin America and Caribbean, and f) Arctic. Based on this analysis the EU policy paper concluded that:

The active role of the EU in the international climate change negotiations is vital and must continue. The EU has demonstrated leadership both in international negotiations ... with its far-reaching decisions on domestic climate and energy policies. ... In the EU’s response, special consideration needs to be given to the US, China and India and what the implications mean for the EU’s long-term relations with Russia. The recommendations below should be complemented by further studies and followed up by coherent EU action plans, aiming at addressing the different dimensions of the responses required to address the impact of climate change on international security in a comprehensive and effective manner. The upcoming examination of the implementation of the European Security Strategy ... should take account of the security dimension of climate change.

50 For the documents of the G-8 Meeting in Heiligendamm, Germany on 8 June 2007; at: <<http://www.g-8.de/Webs/G8/EN/G8Summit/SummitDocuments/summit-documents.html>> and the chair’s conclusions; at: <http://www.g-8.de/nsc_true/Content/EN/Artikel/_g8-summit/anlagen/chairs-summary,templateId=raw,property=publicationFile.pdf/chairs-summary>.

51 See: “Background note by the Secretary-General”; at: <<http://www.un.org/climatechange/2007highlevel/background.shtml>>.

52 UNDP (2007/2008); at: <<http://hdr.undp.org/>>; see also: UNDP/UNEP/World Bank/ADB/AfDB/GTZ/DFID/ OECD/EC (2003).

53 Joint paper by the Commission and the Secretary-General/High Representative concerning “Climate change and international security” to the European Council, Brussels, 3 March 2008; Source: <http://euractiv.com/29/images/SolanaCCsecurity%20reportpdf_tcm29-170886.pdf>.

The report recommended specifically: a) *to enhance capacities at the EU level* (build up knowledge, assess the EU's own capacities, improvement in the prevention of, and preparedness for early responses to, disasters and conflicts). Possible actions could include:

- To intensify EU capacities for research, analysis, monitoring and early warning and Watch Lists including the Institute for Security Studies, the EU Satellite Centre (EUSC), the EU Joint Situation Centre (SITCEN), the EU Network of Energy Correspondents (NESCO), the Global Monitoring for Environment and Security and Joint Research Centres. Monitoring and early warning needs to include in particular situations of state fragility and political radicalization, tensions over resources and energy supplies, environmental and socio-economic stresses, threats to critical infrastructures and economic assets, border disputes, impact on human rights and potential migratory movements.
- To further build up EU and Member State planning and capabilities including civil protection and the use of crisis management and disaster response instruments (civil and military) to contribute to the response to the security risks posed by climate change.
- To commission further work to look, region-by-region, in more detail at what the security implications are likely to be and how they will affect EU interests.

For the international level the EU should use its “*multilateral leadership to promote global climate security*”, what may “become a positive driver for improving and reforming global governance.” It lists among possible actions:

- Focus attention on the security risks related to climate change in the multilateral arena; in particular within the UN Security Council, the G-8 as well as the UN specialized bodies (among others by addressing a possible need to strengthen certain rules of international law, including the Law of the Sea).
- Enhance international cooperation on the detection and monitoring of the security threats related to climate change, and on prevention, preparedness, mitigation, and response capacities. Promote the development of regional security scenarios for different levels of climate change and their implications for international security.
- Consider environmentally-triggered additional migratory stress in the further development of a comprehensive European migration policy, in liaison with all relevant international bodies.

With regard to the “*cooperation with third countries*” the paper calls for “revisiting and reinforcing EU cooperation and political dialogue instruments, giving

more attention to the impact of climate change on security.” The paper argued that “this could lead to greater prioritization and enhanced support for climate change mitigation and adaptation, good governance, natural resource management, technology transfer, trans-boundary environmental cooperation (inter alia water and land), institutional strengthening and capacity building for crisis management.” The paper recommends as possible actions:

- Further integrate adaptation and resilience to climate change into EU regional strategies (for example Northern Dimension, European Neighbourhood Policy, EU-Africa Strategy, Barcelona Process, Black Sea Synergy, EU-Central Asia Strategy, Middle East action plan). Special attention should be given to the most vulnerable regions and potential climate security hot-spots. The Global Climate Change Alliance between the EU and the most vulnerable developing countries should be built upon.
- Develop an EU Arctic policy based on the evolving geo-strategy of the Arctic region, taking into account i.a. access to resources and the opening of new trade routes.
- Examine the security implications of climate change in dialogue with third countries including through the sharing of analyses.

Thus, the European Union has taken up the conceptual and political debate on the *securitization* of climate change in the UK and in Germany, and thus the European Council has become a major *securitizing actor* in translating the scientific messages into concrete policy proposals that will lead to action in the years to come.⁵⁴

During the meeting of the European Council, on 13 March 2008 the British Foreign Secretary David Miliband and the German Foreign Minister Frank-Walter Steinmeier argued in a joint article that climate change “threatens our prosperity and well-being, not just in Europe but beyond. Moreover, it will reshape the geopolitics of the world in which we live, with important consequences for peace and security.”⁵⁵ They diagnosed:

54 Andrew Bounds: “Climate change poses ‘security risk’”, in: *FT.Com.* 3 March 2008; Ian Traynor: “EU told to prepare for flood of climate change migrants”, in: *The Guardian*, 10 March 2008.

55 British Embassy Berlin: “Europe has to rise to the security challenges of climate change. Joint contribution by Foreign Secretary David Miliband and German Foreign Minister Frank-Walter Steinmeier, 13 March 2008”; at: <<http://www.britischesbotschaft.de/en/news/items/080313a.htm>>.

Climate change will act as a stress multiplier. ... Competition for scarce resources threatens to fuel migration. The impact is likely to be most acute in regions such as the Sahel, the Middle East and South and Central Asia, where people are already socially and economically vulnerable and which are prone to instability. Rising sea-levels and melting ice caps also risk triggering new conflicts over shifting maritime borders. This is not an apocalyptic scenario. It is the assessment of increasing numbers of security experts based on the findings of climate scientists. Their conclusions demand a clear and coherent foreign and security policy response.

Both foreign ministers referred to their joint and coordinated efforts to securitize climate change by putting

the security implications of climate change on top of the international agenda. In 2007, the UK initiated a debate in the UN Security Council on the impacts of climate change on peace and security. During her EU Presidency in 2007, Germany initiated a report on a European response to the new security risks. ... Both UK and Germany support a European response to the emerging security challenges of climate change. We want to help implement an effective European and multilateral strategy to address the new threats. What are the important elements of such a strategy?

They pointed in this regard to three key initiatives within the EU and globally:

First, we should intensify our efforts to meet the new security risks triggered by climate change. With the European Union's strategy for Central Asia and the new EU-Africa partnership, we have groundbreaking policy frameworks which will allow us to mainstream climate security into the EU's regional policies. In Central Asia, transboundary water management is an important pillar within our strategy. By helping build capacity, fostering regional dialogue, and setting up more efficient water infrastructure we are promoting water as focus of regional co-operation ... The same is true for Africa, where the effects of food insecurity, water shortages and extreme weather are likely to be severe. The EU-Africa Partnership gives priority to more cooperation to address land degradation and increase aridity. Promoting food security through initiatives like the "Green Wall for the Sahara" is a key element for political stability and crisis prevention in Africa.

Second, we will have to address an increasing number of global natural disasters such as storms, floods, and droughts in the future. There is a strong case for closer monitoring of climate related developments in crisis-prone areas. But we also need to prepare for increased demand for European-led disaster management and humanitarian relief.

Third, we need to consider now how climate change will affect the strategic context of European foreign and security policy in the years to come. For instance the shrinking Arctic ice cap could raise questions about

resources, delimitation of maritime zones and sea lanes in the far North. To avoid new tensions, the EU report on climate security proposes a European Arctic policy. It is vitally important for European security to implement governance structures for the Arctic region based on international law, aiming at a cooperative and peaceful management of resources and preserving the ecological heritage of mankind.

In the view of the British and German Foreign Ministers:

Anticipating new foreign policy challenges and reinforcing the climate security and conflict prevention aspects of our regional strategies are important steps in defining a joint EU response. These efforts will help us to avoid growing resentment between those most responsible for climate change and those most affected by it. A potential stand-off between 'polluters' - both in the North and among the emerging economies - and 'victims', who will be predominantly in the South, would put the already burdened international security architecture under increasing pressure.

Ultimately, there is no hard power option for tackling the causes of the climate threat or for dealing with its direct impacts. You cannot use military force to build a low carbon global economy; no weapon system can halt the advance of a hurricane bearing down on a city, or hold back the rising sea. But what the emerging analysis on climate and security tells us is that we can be sure that there will be hard power consequences if we fail to rise to the challenge.

Since 2007, many international organizations have made climate change a priority of their activities. Several divisions of the World Bank are now working on climate change issues. In March 2008 the Division on Social Development in a workshop addressed the "Social Dimensions of Climate Change."⁵⁶ On 27 March 2008, the Environmental Division released a concept and issues paper on: "Addressing a Strategic Framework on Climate Change and Development for the World Bank Group." The World Bank plans a *World Development Report 2010 on Climate Change*.

While many of these policy studies for government agencies and NGOs discuss a variety of potential security dangers and concerns posed by climate change impacts, many high-level policy-makers and policy ad-

56 See for the workshop programme, presentations and background papers; at: <<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/0,,contentMDK:21659919~pagePK:210058~piPK:210062~theSitePK:244363,00.html>>. Bulhaug/Gleditsch/Theisen (2008: 41-42) recommended to assess also the security effects of countermeasures to climate change and to include security issues in the next round of IPCC assessments.

visers have also claimed such links between climate change and conflict. These policy documents and statements ('speech acts') illustrate the manifold policy efforts, especially since 2007, to securitize climate change by addressing it as a key security concern for the survival of humankind and for the affected states that require proactive extraordinary measures to reduce the probability that the impacts of political baseline scenarios become a conflictual reality.

Thus, the year 2007 has been the turning point in the *securitization* of problems of global environmental change, and especially of climate change. During 2007, the IPCC, as a knowledge-based epistemic community, has indirectly become a major *securitizing actor* although its mandate has so far excluded security issues, and in the fourth assessment report no single reference to security can be found in the index of the first three volumes. But the scientific messages of the IPCC, due to its high scientific and political reputation and their instant and wide global coverage and dissemination, have reached a global audience that has increasingly become receptive to the sense of urgency what again has made it attractive for national policy makers to stress the need for proactive and massive action even though the lobbyists of affected industrial sectors have tried to delay and to weaken responses that would be costly for them.

Both Britain and Germany – during its dual presidency of the G-8 and the EU – have taken the lead in putting the security implications of climate change impacts on the agenda of the UN Security Council, on the agenda of the meetings of the G-8 and of the G-5 in June 2007 in Germany and tabling this question on the agenda of the European Union. Two women leaders who were trained in the natural sciences (physics and metallurgy) played a key political role in the *securitization* of climate change, German Chancellor Angela Merkel and UK Foreign Secretary Margaret Beckett, who both had previously been engaged in climate change policies and negotiations as former environment ministers (Merkel 1994–1998; Beckett 2001–2006).

In the meantime, the *securitization* of climate change has also reached the traditional *securitizing actors*, the national defence ministries, the military establishments, and the intelligence community that have started to address climate change as a new national security threat.

4.5.2.2 Climate Change as a National Security Danger and Concern

The *securitization* of climate change as a national security issue has started in the USA in February 2004 when a contract study by Schwartz and Randall (2004) for the US Department of Defense on the impact of *Abrupt Climate Change on US National Security* was leaked to the press. Three years later, Gilman, Randall, and Schwartz (2007) discussed the *Impacts of Climate Change on US National Security* as did a report on *National Security and the Threat of Climate Change* by the US Center of Naval Analysis (CNA 2007).

This study addressed three questions: a) on the conditions climate change is likely to produce globally that represent security risks for the USA; b) how they may affect the US national security interests; and c) what actions should the USA launch to address its national security consequences. The study concluded that the predicted consequences of climate change include: “extreme weather events, drought, flooding, sea level rise, retreating glaciers, habitat shifts, and the increased spread of life-threatening diseases,” that may add “new hostile and stressing factors” and that have the potential “to create sustained natural and humanitarian disasters” whose consequences “will likely foster political instability where societal demands exceed the capacity of governments to cope” and it “will add to the tensions even in stable regions of the world.”⁵⁷

The study suggested that the climate change impacts “should be fully integrated into national security and national defense strategies,” that the USA should help “stabilize climate changes at levels that will avoid significant disruption to global security and stability,” and “help less developed nations build the capacity and resiliency to better manage climate impacts.” It proposed that the US Department of Defense should “enhance its operational capability by accelerating the adoption of improved business processes and innovative technologies that result in improved US combat power through energy efficiency,” and “conduct an assessment of the impact on US military installations worldwide of rising sea levels, extreme weather events and other projected climate change impacts over the next 30 to 40 years.”

⁵⁷ This report was discussed at a meeting on “National Security and the Threat of Climate Change”, by the *Environmental Change and Security Program* (ECSP) of the Wilson Center on 14 May 2007.

On 29–31 March 2007, the Strategic Studies Institute and the Triangle Institute for Security Studies conducted a colloquium on “Global Climate Change: National Security Implications,”⁵⁸ that reached the following key insights that climate change is underway and that its national security implications “are proportional both to the speed of change and the extent,” that “threats to national survival stemming from catastrophic change must be anticipated, evaluated, and neutralized to the greatest degree possible,” and that this will “require multinational, multi-agency cooperation on a scale heretofore unimaginable and could provide no-fault ground for global cooperation.” The first impact would come from displaced people and their malnutrition and disease that “could aggravate or spark displacement and border security issues.”⁵⁹

In November 2007, the *Center for Strategic and International Studies* (CSIS) and the *Center for a New American Security* (CNAS) released a report on: *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change* (Campbell/Lennon/Smith 2007) by a group of high-level US security experts and climate specialists that discussed three future worlds with climate change impacts during the next 30 and 100 years that

are based on *expected*, *severe*, and *catastrophic* climate cases. The first scenario projects the effects in the next 30 years with the *expected* level of climate change. The *severe* scenario, which posits that the climate responds much more strongly to continued carbon loading over the next few decades than predicted by current scientific models, foresees profound and potentially destabilizing global effects over the course of the next generation or more. Finally, the *catastrophic* scenario is characterized by a devastating ‘tipping point’ in the climate system, perhaps 50 or 100 years hence. In this future world, global climate conditions have changed radically, including the rapid loss of the land-based polar ice sheets, an associated dramatic rise in global sea levels, and the destruction beyond repair of the existing natural order.

58 Other co-organizers included the Army Environmental Policy Institute, The Center for Global Change (Duke University), Creative Associates, The Nicholas Institute for Environmental Policy Solutions (Duke University), The Environmental Change and Security Program (The Woodrow Wilson International Center for Scholars), and the Department of Environmental Sciences at the University of North Carolina-Chapel Hill.

59 U.S. Army War College and Triangle Institute for Security Studies, Strategic Studies Institute, Colloquium Brief, compiled by Douglas V. Johnson II; at: <<http://www.strategicstudiesinstitute.army.mil/pdffiles/PUB779.pdf>>.

The authors drew several policy conclusions from the discussion of these three scenarios:

- Historical comparisons from previous civilizations and national experiences of such natural phenomena as floods, earthquakes, and disease may be of help in understanding how societies will deal with unchecked climate change.
- Poor and underdeveloped areas are likely to have fewer resources and less stamina to deal with climate change – in even its very modest – and early manifestations.
- Perhaps the most worrisome problems associated with rising temperatures and sea levels are from large-scale migrations of people – both inside nations and across existing national borders.
- The term ‘global climate change’ is misleading in that many of the effects will vary dramatically from region to region. A few countries may benefit from climate change in the short term, but there will be no ‘winners’.
- Climate change effects will aggravate existing international crises and problems.
- We lack rigorously tested data or reliable modelling to determine with any sense of certainty the ultimate path and pace of temperature increase or sea level rise associated with climate change in the decades ahead.
- Any future international agreement to limit carbon emissions will have considerable geopolitical as well as economic consequences.
- The scale of the potential consequences associated with climate change – particularly in more dire and distant scenarios – made it difficult to grasp the extent and magnitude of the possible changes ahead.
- At a definitional level, a narrow interpretation of the term ‘national security’ may be woefully inadequate to convey the ways in which state authorities might break down in a worst case climate change scenario.

Also in November 2007, the *Council on Foreign Relations* (CFR) released a report on: *Climate Change and National Security* that proposed several policy options to reduce the vulnerability of the United States and other countries to the predictable effects of climate change. Bushby (2007) argued that sharp GHG reductions in the long run are essential to avoid unmanageable security problems.

These studies were picked up by members of the US Congress. In March 2007, Senators Richard J. Durbin (D-IL) and Chuck Hagel (R-NE) introduced the “Global Climate Change Security Oversight Act” (S.1018) requesting a national intelligence estimate to assess whether and how climate change might pose a

national security threat (Scheffran 2008: 22). A similar “Global Climate Change Security Oversight Act” (H.R.1961) was submitted in the House by Congressman Edward Markey (D-MA).⁶⁰ However, none has so far been adopted by both Houses of the US Congress.

While the CIA had ignored climate change in its projection of the world by 2020 (CIA 2004), it would now have to pinpoint “the regions at highest risk of humanitarian suffering” and assess the “likelihood of wars erupting over diminishing water and other resources.” Furthermore, the Pentagon would have to determine how global climate change could affect US security, including “direct physical threats to the United States posed by extreme weather events such as hurricanes.”

The securitization of climate change as a US national security threat followed the example of AIDS “that was long seen as exclusively a health issue until intelligence officials warned that it could ravage military forces across Africa and draw the United States into conflict.” Retired Air Force General Charles Wald voiced support for bringing the national security bureaucracy into the debate over global warming and John J. Hamre, a deputy secretary of defence in the Clinton administration, said “global warming couched in security terms would make it far more difficult for politicians to ignore.”⁶¹

In the framework of the Quadrennial Defense Review of 2006, Ackerman (2008) argued that in response to climate change, the US “must recognize this long-term threat, operationalize a new strategy, reorient capabilities and forces, reshape the defense enterprise, develop a twenty-first-century total force, achieve unity of effort, and create a roadmap to victory aimed at coping with climate change.” He analysed the long-term traditional, irregular, disruptive and catastrophic threats posed by climate change.

60 See: Congressional Record: March 28, 2007 (Senate), p. S4059-S4061; at: <http://www.fas.org/irp/congress/2007_cr/s1018.html>; see also at: <GovTrack.us. H.R. 1961-110th Congress (2007): Global Climate Change Security Oversight Act, *GovTrack.us (database of federal legislation)*>; at: <<http://www.govtrack.us/congress/bill.xpd?bill=h110-1961>> (16 May 2008). For an overview of other bills on this issue submitted to the US Congress; see at: <<http://www.pewclimate.org/federal/congressional-proposals/110/National%20Security%20and%20Climate%20Change>>.

61 Bryan Bender: “Bill ties climate to national security seeks assessments by CIA, Pentagon”, in: *The Boston Globe*, 9 April 2007.

Ackerman (2008: 75) argued that the simultaneous occurrence of these climate change threats could lead to a perfect storm that “would overwhelm the ability of US forces to respond in a timely and effective manner.” As part of a new sustainable national security strategy he suggested a fundamental reorientation of US military capabilities and forces that should be oriented at the triple goals of “economics, equity, and environment.”

In the aftermath of Hurricane Katrina (2005), the most costly natural hazard in US history, US public opinion and the sentiment in the US Congress on climate change have been changing since 2007 when the Democrats regained the majority in both houses. The high scientific reputation of the IPCC’s Fourth Assessment Report (2007, 2007a, 2007b, 2007c) and the self-discrediting of the military threats used by the Bush Administration for the justification of its intervention into Iraq⁶² have created a credibility gap, the IPCC could temporarily fill as an alternative *securitizing actor* supplementing the Pentagon as the single most important national *securitizing actor*. On the background of these international developments, for the USA the year 2007 has also become a turning point when climate change was increasingly perceived as an urgent security concern for US national security and its military establishment.

Since 2006 climate change has also become an urgent security issue in Australia. In *Heating up the Planet* Alan Dupont and Graeme Pearman (2006) analysed the linkages between climate change and security, arguing that climate change will complicate Australia’s security environment due to temperature increase, sea level rise, and an increase in natural hazards by exacerbating “food, water and energy scarcities in a relatively short time span,” by contributing to “destabilizing, unregulated population movements in Asia and the Pacific,” by triggering “short-term disease spikes but also have more enduring health security consequences.” The cumulative effect of these causes and consequences on:

agriculture, fresh water and energy could threaten the security of states in Australia’s neighbourhood by reducing their carrying capacity below a minimum threshold, thereby undermining the legitimacy and response capabilities of their governments and jeopardizing the security of their citizens. Where climate change coincides

62 See: “Commission on the Intelligence Capabilities of the United States Regarding Weapons of Mass Destruction” (Washington: White House, 31 March 2005); at: <<http://www.wmd.gov/report/index.html>> .

with other transnational challenges to security, such as terrorism or pandemic diseases, or adds to pre-existing ethnic and social tensions, then the impact will be magnified. However, state collapse and destabilizing internal conflicts is a more likely outcome than interstate war. For a handful of small, low-lying Pacific nations, climate change is the ultimate security threat, since rising sea levels will eventually make their countries uninhabitable.

Dupont and Pearman argued that climate change poses fundamental questions of “human security, survival and the stability of nation-states” that must dictate fresh judgments about political and strategic risk as well as economic cost. In October 2007, an opinion survey – conducted by the US Studies Center at the University of Sydney in July 2007 – “showed that 40 per cent of Australians thought that global warming was a greater threat to security than Islamic fundamentalism. Only 20 per cent thought it was less serious.” According to Alan Dupont, “climate change has moved from the environmental field to the security sphere.” Also the Australian Police Commissioner Mick Keelty argued that climate was a growing security concern. “We could see a catastrophic decline in the availability of fresh water. ... Crops could fail, disease could be rampant and flooding might be so frequent that people, en masse, would be on the move. Even if only some and not all of this occurs, climate change is going to be the security issue of the 21st century.”⁶³ In this emerging debate the implications for Australian internal and external security were discussed.⁶⁴

In the UK, the British Ministry of Defence (MoD) and its Development, Concepts and Doctrine Centre have identified climate change as a key strategic trend.⁶⁵ The UK’s Chief of Defence Staff suggested in a speech on 25 June 2007 that climate change is a threat to global security that military planners must in-

clude into their calculations.⁶⁶ In September 2007, the MoD awarded a £12 million research contract to the UK Met Office, Hadley Centre that calls for identifying those world regions “where global warming could spark conflict and security threats, as well as predict the likely conditions in which British forces may have to deploy in the future.”⁶⁷ In Germany, the link between ‘climate change and security’ was discussed at a workshop by the German Command and Staff College (FüAk) in cooperation with the Centre for Transformation of the German Armed Forces (*Bundeswehr*) and the German Development Institute (GDI) in Hamburg in autumn 2006 (Jopp/Kaestner 2008).

4.5.2.3 Climate Change as a Human Security Danger and Concern

Climate change also poses severe security impacts for human security and its referent objects: human beings and humankind. From a human security perspective, climate change has been addressed by the GECHS programme of IHDP in June 2005⁶⁸ and was the focus of the Greek Presidency of the Human Security Network (2007–2008)⁶⁹ that aimed “to raise the international community’s awareness of the impact of climate change and global warming on human security, with regard to vulnerable groups, particularly women, children and persons fleeing their homes due to climate change.”⁷⁰

A policy memorandum on ‘*Climate Change and Human Security*’⁷¹ (Wisner/Fordham/Kelman/John-

63 Commissioner Mick Keelty: *Inaugural Ray Whitrod Oration* (Adelaide, September 2007); at: <<http://tinyurl.com/2mndhl>>.

64 See: Chris Abbott: *An Uncertain Future. Law Enforcement, National Security and Climate Change*. Briefing paper (London: Oxford Research Group, January 2008); Anthony Bergin, Jacob Townsend. *A Change in Climate for the Australian Defence Force* (Barton, ACT: Australian Strategic Policy Institute, July 2007); at: <http://www.aspi.org.au/publications/publication_details.aspx?ContentID=133&pubtype=10>.

65 See Abbot (2008: 10); Development, Concepts and Doctrine Centre: *The DCDC Strategic Global Trends Programme, 2007-2036* (Ministry of Defence, December 2006); at: <www.dcdc-strategictrends.org.uk>.

66 See at: <<http://www.mod.uk/DefenceInternet/About-Defence/People/Speeches/ChiefStaff/ClimateChangePoliticsVsEconomics.htm>>.

67 See Abbot (2008: 10); “Met Office climate change study could help identify future security threats”, in: *Defence News* (11 September 2007); at: <<http://tinyurl.com/3yrsqe>>.

68 On 21–23 June 2005, *The Global Environmental Change and Human Security* (GECHS) project of IHDP organized a workshop in Oslo on ‘climate change and human security’; at: <<http://www.cicero.uio.no/humsec/>>; papers are at: <http://www.cicero.uio.no/humsec/list_participants.html>. Six papers have been published in a special issue on “Climate Change and Human Security”, of: *Erde*, 137, 3: 155–270; other peer reviewed papers were published in a special issue of *Political Geography*, 26, 6.

69 See the Greek concept paper on: “Human Security and the Climate Change Impact on Vulnerable Groups” of 8 May 2007; at: <<http://www.humansecuritynetwork.org/docs/2007-ministerial-meeting-04-greek%20paper.doc>>.

ston/Simon/Lavell/Brauch/OswaldSpring/Wilches-Chaux/Moench/Weiner 2007) pointed to manifold impacts for international, national, and human security for selected direct, indirect, and slow-onset linkages. Some effects are already evident and will become very clear in the short run (2007–2020). They will increase and others will manifest themselves in the medium term (2021–2050); whilst in the long run (2051–2100), they will all be active and interacting strongly with other major trends. Africa is very likely to suffer very damaging impacts and has the least resources for coping and adapting to these stresses (IPCC 2007: 10). Livelihood and human security interact with ‘hard’ security issues because of the national and regional upheavals that climate stress may put on livelihood systems already vulnerable and incapable of adapting.⁷² The rural and urban poor are already under stress, and for some groups such as women-headed households in Africa, adaptation to climate-induced stress will be very difficult indeed. Some major climate changes may actually occur rapidly.

Besides the *Human Security Network* (HSN), the *Friends of Human Security* (FHS) that are coordinated by Japan and Mexico also discussed issues of climate change and human security based on a symposium on 31 July 2007 that reviewed the impact of climate change in developing countries, the challenges of disaster risk reduction, and the linkages between development and security.⁷³ For the Mexican co-chair

human security should be understood as a multidimensional concept, which would overcome the existing polarization among the three pillars of the UN: peace and security, development, and human rights.

The conceptual debate on climate change and human security is just starting. Barnett and Adger (2005: 1) discussed how climate change may undermine human security, and how human insecurity may increase the risk of violent conflict as well as the role of states in human security and peace building. Schnabel (2007) addressed the linkages between climate change, human (in-)security and stability because anthropogenic “climate change ... poses a risk to economic development and social and political stability” but will also act as a “powerful amplifier of existing threats.”

4.5.2.4 Impact of the Securizing Move on the Audience

The framing of climate change impacts in terms of international, national, and human security has succeeded to raise public awareness and to reach a global audience. With the presentation of the Fourth Assessment Report in 2007 the IPCC – as a scientific epistemic community – has evolved as an undeclared *securizing actor*. Several EU countries (UK, Germany, Sweden) took the lead in declaring climate change an existential threat to international security and survival that required urgent and exceptional measures to deal with this threat to which policy-makers and international organizations have responded (G-8, EU, UNFCCC, UNDP, UNEP, World Bank, OECD). These manifold *securizing moves* have convinced a majority of the people in many countries (‘the audience’) that climate change has become a major threat or challenge to their own security and survival.⁷⁴

In Britain, in 2006 in an Ipsos MORI poll, 48 per cent of all respondents named climate change as the most serious threat to the planet, compared with 20 per cent who said terrorism, what has been a fundamental change since 2004 when terrorism topped the list. In late 2007, in the wide-ranging global analysis of threats and challenges published by the Swedish Defence Commission, climate change and environmental impact were referred to as the most serious global threat to people’s security.

According to a poll conducted by GlobeScan Inc. between October 2005 and January 2006 with 33,237

70 See Greece, Foreign Ministry at: <http://www.mfa.gr/www.mfa.gr/Articles/en-US/tst8052007_KL2115.htm>.

On this official website all activities during the Greek presidency of the HSN and during the Ministerial in Athens on 29–30 May 2008 are documented.

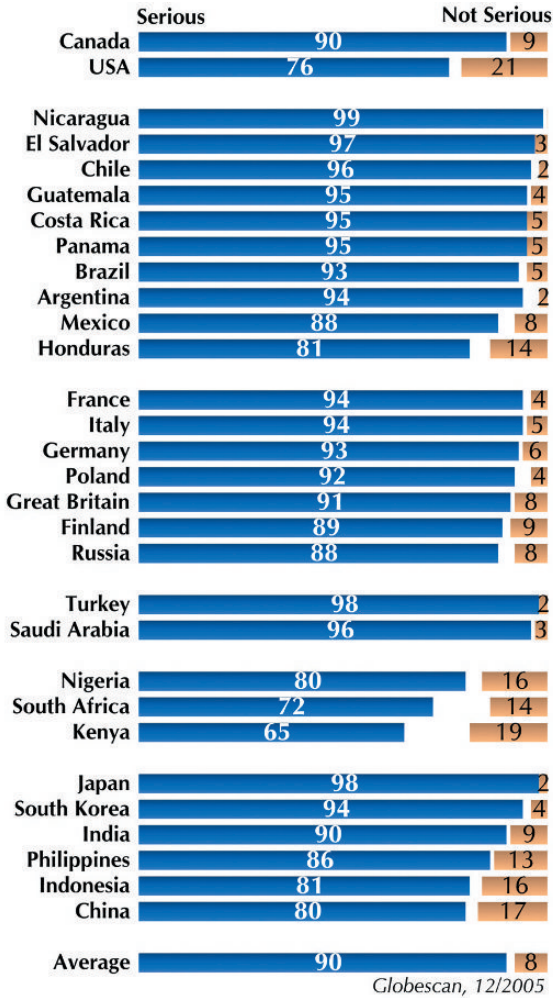
71 See the memorandum written by: Wisner, Fordham, Kelman, Rose Johnston, Simon, Lavell, Brauch, Oswald Spring, Wilches-Chaux, Moench and Weiner (2007).

72 On the definition of “vulnerability” at the scale of household livelihoods and its linkage with macro-scale processes, see Wisner/Blaikie/Cannon/Davis (2004).

73 See: Workshop on “Climate Change from the Perspective of Human Security”; at: <<http://ochaonline.un.org/WhatsNew/ClimateChangeandHumanSecurity/tabid/2106/Default.aspx>>; see the presentation by Under-Secretary-General John Holmes’ on: “Human security and disaster reduction.” In the view of John Holmes, Under-Secretary-General for Humanitarian Affairs and Emergency Relief Coordinator, “it has become obvious that climate change is the biggest threat the planet faces, especially to the poorest and the most vulnerable among us. Climate change, and the natural hazards and extreme weather events that are associated with it, are not some distant, future threat. The threat to human security is here, it’s real, and it’s today.”

74 See: Goska Romanowicz: “Climate change is biggest global threat, say Britons” (14 September 2006); at: http://www.edie.net/news/news_story_printable.asp?id=11993;

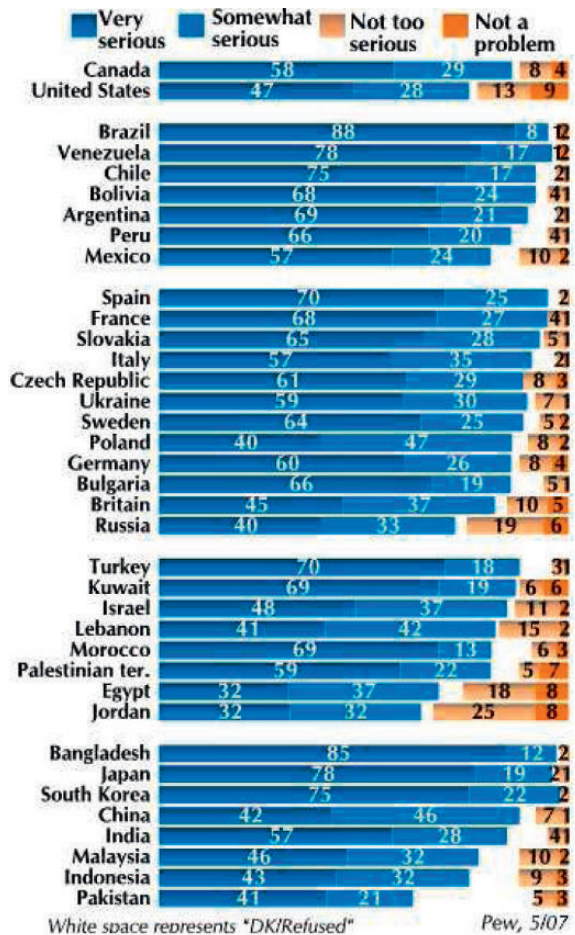
Figure 4.8: Poll by GlobeScan Incorporated: “Climate change: A serious problem or not?” 25 April 2006. **Source:** <<http://www.worldpublicopinion.org/pipa/articles/btenvironmentra/187.php?nid=&id=&pnt=187>>. Reprinted with permission.



people from 30 countries, majorities in every country said that climate change is a problem. In 24 countries the problem was seen as very serious by a majority (in 23 countries). Eighty per cent of the Chinese rated the problem as serious, with 39 per cent calling it very serious. Eighty per cent of Americans said the problem was serious, with 49 per cent calling it very serious (figure 4.8). According to a Pew poll published on 27 June 2007 (figure 4.9)

majorities in all 37 countries named ‘global warming’ as a serious problem. Majorities in 25 and pluralities in 6 rated the problem as ‘very serious’. With just a few exceptions the percentage saying that the problem is ‘not too serious’ fell under one in five. The two largest

Figure 4.9: Pew poll of 27 June 2007: “Is Global Warming a problem?” **Source:** <<http://pewglobal.org/reports/display.php?ReportID=256>>. Reprinted with permission.



producers of greenhouse gases - the United States and China - had large majorities saying the problem was serious but relatively lower numbers saying that it was very serious. Seventy-five per cent of Americans rated the problem as serious with 47 per cent rating it very serious. In China, 88 per cent considered global warming a very serious problem, while 42 per cent called it very serious.⁷⁵

75 For a list of opinion polls on climate change as a security threat or concern; see at: <<http://www.worldpublicopinion.org/pipa/articles/btenvironmentra/435.php?nid=&cid=&pnt=435>>.

The *Chicago Council on Global Affairs* (CCGA) in a poll published in 2007 asked respondents in 10 countries to evaluate the threat posed by 'global warming' in the next 10 years. In six of the ten countries majorities called it a critical threat, as did pluralities in another three. Pluralities saw the threat as critical in China (47–33 per cent important) and the United States (46–39 per cent important). Only small minorities in all countries called it unimportant. In 2007 the *German Marshall Fund* (GMF) found that majorities in 12 European countries plus the United States believed they would probably "be personally affected by the effects of global warming." On average across the 12 European countries, 85 per cent said it was likely (very likely 54 per cent, somewhat 31 per cent); and in no country did less than 77 per cent say this. Slightly fewer believed this in the United States; 70 per cent said it was likely (very likely 43 per cent, somewhat 27 per cent).

In an analysis published on 5 December 2007, the World Public Opinion.Org stated that the the "concern about climate change appears to be growing":

GlobeScan surveys have documented the world's increasing concern about climate change. In polls conducted across 16 countries in 2006 and 2003, the percentages calling climate change/global warming a 'very serious' problem increased an average of 16 points. In only one country was there a significant decline in the perceived severity of the problem of climate change. GMF has also found signs of increasing concern. In 10 European countries polled in 2005 and 2007, the average percentage saying that global warming is an extremely important threat went up 5 points (from 51 to 56 per cent). In the United States, this number went up 5 points (from 41 to 46 per cent). In most countries, majorities say that they have heard a significant amount about climate change. Not surprisingly, willingness to take action in regard to climate change rises with greater awareness.⁷⁶

Thus, by the end of 2007, climate change was not only addressed by scientists, governments, and international organizations as an urgent security danger, it was also perceived by a majority of the people in many countries as a major new international, national, and human security concern. Since 2008, the impact of climate change on security in developing countries is also increasingly being addressed by the

76 "International Polls Find Robust Global Support For Increased Efforts to Address Climate Change", 5 December 2007; at: <<http://www.worldpublicopinion.org/pipa/articles/btenvironmentra/435.php?nid=&cid=&pnt=435>>.

security community both for national security (e.g. by IDSA⁷⁷ in India) and from a human security perspective (by ISS in Pretoria).⁷⁸

4.5.3 Securitizing Soil Erosion and Desertification

While the linkage between problems of soil erosion and degradation and desertification with food security has been addressed since the 1990's, the systematic securitization of desertification started with a NATO-sponsored conference on 'desertification as a security issue in the Mediterranean' in December 2003 in Valencia (Kepner/Rubio/Mouat/Pedrazzini 2006).⁷⁹ Subsequent meetings in Almería (2006) discussed the links between desertification and migration as a major national and regional security issue for the states of North and West Africa and Southern Europe.⁸⁰ These links have also been addressed by UNCCD during the CRIC 3 meeting in Bonn in May 2005.⁸¹

On 26 June 2007, in a workshop on "Desertification: A security threat? - Analysis of risks and challenges", the German development (BMZ) and foreign ministries (AA) in cooperation with the UNCCD Secretariat tried "to facilitate debate about the linkages between security and the degradation of land resources." The state secretary of the foreign ministry,

77 See: Institute for Defence Studies and Analyses (IDSA): "Workshop on Security Implications of Climate Change for India: A Report" (New Delhi, 6 April 2008).

78 See the workshop by ISS (Pretoria) with IDRC (Canada) on: "Climate change and human security in Africa" (Pretoria, South Africa, 27–28 February 2008);

79 At the Valencia conference Brauch (2003a, 2006) provided a systematic overview of the manifold conceptual linkages between processes of desertification and their impacts in terms of water, food, and health security that may have repercussions for national and regional security. Other contributions by Kepner (2006), Rubio/Recatala (2006); Yousef/Hegazi (2006); Safriel (2006) discussed security aspects from the perspective of the natural sciences, while López-Bermúdez/García-Gómez (2006) referred to the links with food security.

80 See for the conference documents at: <http://www.sidym2006.org/eng/eng_ponencias_conclusiones.asp>.

81 See for a brief report at: <http://www.afes-press.de/pdf/UNCCD_journal_050511.pdf> and a documentation of the CRIC-meeting at: <http://www.afes-press.de/pdf/Earth_negot_bulletin_04_175.pdf>; see also the speech by Oswald/Brauch; at: <http://www.afes-press.de/pdf/Oswald_Brauch_lang.pdf>.

Georg Boomgaarden, used an extended security concept for discussing environmental threats:

'If we ask ourselves who the enemy is in climate change, using the concepts of classic security policy, we must conclude that we are turning nature itself into an enemy'. ... 'And with this enemy, neither deception nor deterrence is going to be of any use. The later we adapt, the greater the cost will be'. ... Avoiding security-relevant cataclysms of global extent required the course to be set today. The time window for possibly irreversible processes to occur as a result of global temperatures rising by more than two degrees compared to pre-industrial days was about to close.

Pekka Haavisto, a former Finnish Minister for the Environment and Development and a former EU Special Representative for Darfur, referred to the manifold linkages of desertification to global, regional, national, and human security:

Desertification and security has many aspects, and indeed there are many securities. ... When we speak about climate change and desertification, we are referring to global security instead of only looking at security from a regional or national point of view. Climate change and desertification have local and regional security aspects as well as international ones. Then there is the issue of human security, affecting individual people and their human rights. First of all, people must have security in those places that they have traditionally been living in. If they have to go elsewhere for reasons of security, we have to provide security to those people under new circumstances. Human security is linked to the risks of migration.

Michelle Leighton referred to the dual security aspects with regard to migration triggered by desertification that "International migration can raise security issues in countries of origin, transit and destination, both in terms of human security and national security." Fausto Pedrazzini argued that "environmental security, food security, and desertification are very much related to the overall concept of security because they affect human and societal dynamics, they may lead to migration, and they have a strong influence on political stability and possible conflicts at all levels." During the *International Year to Combat Desertification* (2006) the security linkage was occasionally addressed⁸², but contrary to the intensive securitization of climate change no similar policy debate has so far emerged on desertification.

4.6 Conclusions

Environmental issues have also been framed as security issues since the Brandt (1980) and Brundtland Commission Reports (WCED 1987). A chapter in *Our Common Future* on the conceptual quartet of "Peace, Security, Development, and the Environment" set the stage for a policy debate on the widening of the security concept and agenda during the past two decades (Dabelko 2008). In June 1988, at the first world conference on climate change and global security in Toronto, as the first political leader, Norwegian Prime Minister Gro Harlem Brundtland addressed the linkage between both issues. In the scientific world, Neville Brown (1989) and Peter Gleick (1989, 1989a) were among the pioneers of the *securitization* of climate change during the global turn (Oberdorfer 1992).

In this chapter, Wæver's theory of *securitization* and the approach of the Copenhagen school of critical security studies was applied to selected GEC issues, in particular to GCC. For this *securitization move* many *speech acts* have been conceptually mapped that have convinced a growing 'audience', especially in Europe, that climate change along with water stress and desertification pose existential security dangers in the framework of international, national, and human security. Extraordinary measures are needed to respond to these new security issues in a proactive and timely way, and to prevent that the projected policy consequences will become a catastrophic reality during the 21st century.

Especially since the year 2000 the above review has documented a progressive *securitization* of major issues of GEC, starting with the adoption of the 'water security' concept at The Hague in spring 2000. But the turning point in the *securitization* of climate change has occurred in 2007. UK Foreign Secretary Margaret Becket and the the German state secretary in the foreign office, Georg Boomgaarden, argued that the nature of security threats have fundamentally changed. The threat analysis focuses no longer on missiles and nuclear weapons of the other bloc but on the growing concentration of greenhouse gases in the atmosphere (figure 4.1), on the increase in average global and regional temperature (figure 4.2), and on the increase in the number, intensity, and economic damage from climate related hydro-meteorological hazards.

The response to this new security danger is no longer provided by the Hobbesian logic guiding military establishments, but it relies on a common concerted global effort based on the ingenuity of engi-

82 See the presentations of this author in Cairo and in Rome in 2006, in Florence and Fuerteventura in 2007 that can be accessed at: <http://www.afes-press.de/html/download_hgb.html>.

neers enhancing energy efficiency and reducing greenhouse gases through a fundamental transformation of the energy and transportation sectors. As the IPCC, as a knowledge-based epistemic community, has indirectly become a new *securitizing actor*, the response to this new security danger must be knowledge-based but it must be backed with the policy commitment and the financial resources of the states but also of societal and economic actors.

This emerging *securitization* process has been instrumental for mobilizing political support and public and private funds for the post 2012 climate change regime. Since the release of the fourth IPCC report (AR4) many international organizations have upgraded their climate change activities (e.g. World Bank, UNDP, UNEP, OECD), and their results will further improve our knowledge base and they may further enhance the public concern on the urgency of these new security threats, challenges, vulnerabilities, and risks posed by GEC and GCC.

Desertification has so far primarily been discussed in the framework of food, water, and health security but this discussion did not yet lead to an increasing understanding of the sense of urgency of the security repercussions of eroding and degrading soils, and their impacts on agriculture and rural livelihoods.

On the assumed, claimed, and projected linkages between climate change and conflicts so far the knowledge base has been limited. Bulhaug, Gleditsch, and Theisen (2008) have pointed to a lack of systematic statistical data (on small-scale conflicts between nonstate actors) and of statistical analyses in the social sciences based on a high number of cases on past linkages. Many case studies – referred to above – resulted from commissioned studies for ministries, international organizations, and environmental and development NGOs, and were to satisfy specific policy needs. But in most cases they are not comparable and have not yet contributed to an accumulation of systematic knowledge.

The European Union in its paper on climate change and international security of 14 March 2008 proposed to “intensify EU capacities for research, analysis, monitoring and early warning”. The British MoD has funded a major research project at the Hadley Centre to study these issues. The World Bank has launched a huge effort in preparation of its annual report that is planned to address *Climate Change and Development* by 2010, and in the USA members of both Houses of Congress have requested by the US National Intelligence Council (CIA) and the US Department of Defense to assess the geopolitical im-

pacts of climate change for US national security. It has also been suggested (Brauch 2002; Bulhaug/Gleditsch/Theisen 2008) to add the security dimension of climate change to the mandate of the IPCC and to its agenda for its fifth assessment report.

Whether the *securitization* of GEC and climate change issues – having succeeded to add the security dimension of climate change on the top priority list of governments in OECD and in some developing countries – will galvanize the extraordinary policy measures that are needed to reverse the direction of global warming depends on the outcome of the negotiations on the post 2012 global climate regime, whether substantial and legally binding agreements can be achieved at the COP 15 of the UNFCCC in Copenhagen (2009), and also on the willingness of the countries not only to approve radical goals and measures but to fully implement them nationally. This raises many new issues of global equity but also of compliance.

The conceptual rethinking on security – both on the concept and even more on the substance – in the Anthropocene (Dalby 2008) has been spurred by the *securitization* of GEC and GCC. It remains a challenge both for policy relevant and theory guided conceptual thinking on security and peace but even more so for a new ‘peace policy in the Anthropocene’ that aims at responding proactively to the new security dangers posed by GEC and GCC (Conca/Dabelko 2002; Dabelko 2008; chap. 100 by Brauch/Oswald) to assist *Our Common Journey* (US National Research Council 1999) toward sustainability.

But the needed proactive policy responses that have been suggested by the *Millennium Ecosystem Assessment* (MA; chap. 3 by Leemans) require a new multi-, inter-, and transdisciplinary research agenda (Oswald/Brauch 2008) with qualitative and quantitative, historical and sociological methods, as well as modelling, simulation, and scenario-building motivated by the policy goal to develop early warning indicators and models to address the probable conflict constellations that may under certain societal and political conditions result in conflicts, and to develop strategies for *resolving* them peacefully, and *avoiding* such constellations from occurring and *preventing* an escalation into violent conflicts.

5 Natural Climatic Variations in the Holocene: Past Impacts on Cultural History, Human Welfare and Crisis

Wolf Dieter Blümel

5.1 Introduction: Climate Change – Past and Future¹

Since the late 20th century, research efforts have increasingly focused on past, present, and future climatic changes, and on global environmental change. Their consequences for humankind are still uncertain, but they pose many dangers for human beings, societies and states, including for security. Scientists and non-governmental organizations are concerned as to how humankind could be affected by climatic mutations and could mitigate and adapt to some impacts. This refers to a change of paradigms: The last decades were characterized by a certain ignorance of natural determinations on cultural development (Issar/Zohar 2004).

This chapter reviews how even minor climatic fluctuations might have triggered sensitive environmental changes, and how they affected human activities and civilizations either positively or negatively. Highly industrialized societies are not protected from these natural challenges, but all societies are dependent on solid food and water supplies. Finally it will be discussed whether a retrospective view of (pre-)historic climate events may be helpful for predicting future developments.

During earth history the climate has never been constant – no matter what time scale is used or for whatever reasons. This chapter deals with the young Quaternary period, i.e. the past 20,000 years. It in-

cludes parts of the last glaciations, especially the *Last Glacial Maximum* (LGM), and especially the so-called *Holocene* of the past ten thousand years. This period is most important for the cultural development of humankind.

The Holocene as the post-glacial warm period has been perceived as the most stable climatic period of the past 130,000 years. Based on this unusual climatic stability during the past 10,000 years, many researchers and laymen assumed that the present global warming – indicated e.g. by the retreat of the glaciers since 1850 – has been caused by anthropogenic effects. Thus, global warming was interpreted as a catastrophe for humankind.

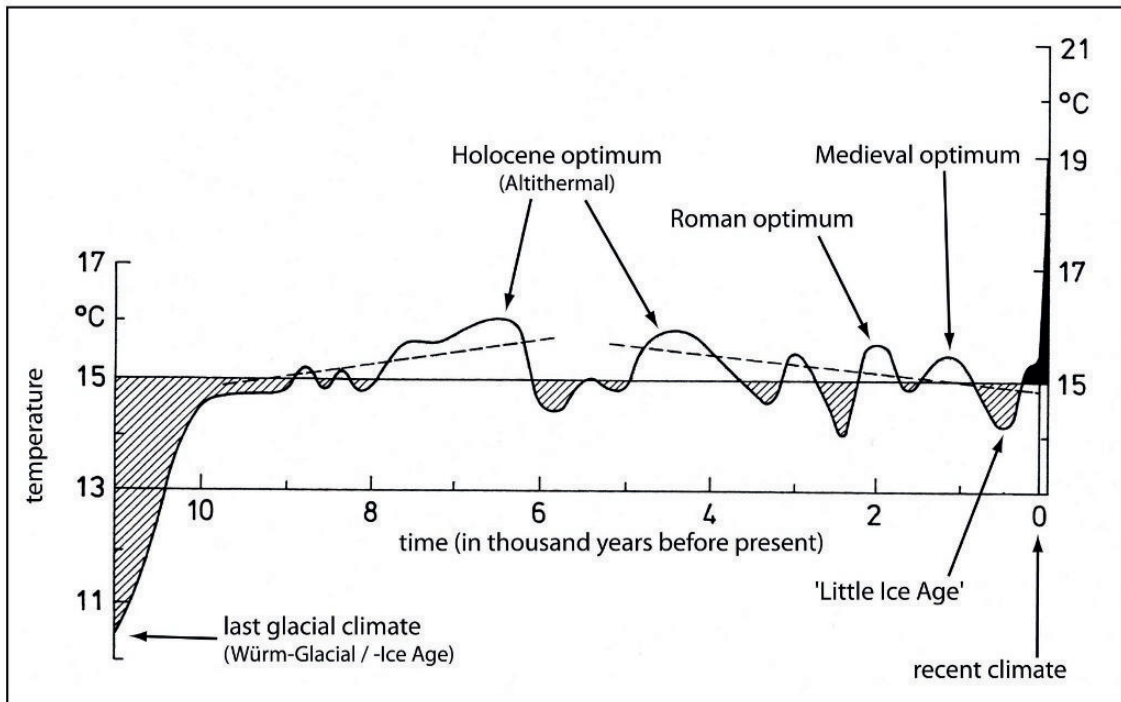
A series of natural climatic fluctuations could be reconstructed (see figure 5.1), using archives like pollen, moors, fossil soils, lake sediments, archaeological remnants, artefacts, etc. In prehistoric and historic times, warming was normally accompanied with various advantages for humankind. Warming increased the agricultural effectiveness and extended the arable land to higher latitudes or higher up into the mountains. Simultaneously, air humidity was also enhanced and the tropical monsoons brought more rainfall for larger areas in dry regions. With regard to climate history the following trends may be briefly summarized:

- climatic variations belong to the natural system and have different, partly complex causes;
- in the past periods of warming these mostly led to welfare and cultural progress;
- atmospheric cooling usually coincided with famine, drought, disasters, and cultural decline.

The following chronological references offer selected examples for these linkages and permit some conclusions on future developments. This chapter distinguishes between *climatic optima* and *pessima*. ‘Climatic optima’ are periods with mostly favourable conditions for human societies; while ‘climatic pes-

1 This chapter partly relies on earlier German publications by Blümel (2002, 2006) and it is based on a lecture presented to a workshop. It does not aim at representative and comprehensive insights on the manifold aspects of the topic. It reflects the lead editor’s invitation to offer an overview regarding past climate impacts on human welfare and on crises. It has been revised taking many valuable recommendations of anonymous reviewers from other disciplines into account.

Figure 5.1: Reconstruction of the Holocene climatic fluctuations. **Source:** Adapted from Schönwiese (1995) with permission by the author.



simas are cooler periods with unfavourable, and often precarious living conditions.

Table 5.1: Stratigraphic Table of the Late Glacial and Holocene. **Source:** Blümel (2006: 18) adapted from the National Atlas of the Federal Republic of Germany 2003.

Stratigraphy	Stadial and inter-stadial period	Calendar years before present (cal BP)
Holocene (post glacial period)	Subatlantic	2,800 - 0
	Subboreal	5,100 - 2,800
	Atlantic	8,200 - 5,100
	Boreal	9,800 - 8,200
	Preboreal	11,590 - 9,800
Late Glacial Period	Younger Dryas	12,680 - 11,590
	Alleröd	13,370 - 12,680
	Elder Dryas	13,535 - 13,370
	Bölling	13,670 - 13,535
	Oldest Dryas	13,810 - 13,670
	Meiendorf	14,446 - 13,810
Last Glacial Maximum > 14446		

Reconstructing past climates resembles a difficult jigsaw puzzle: Meteorological measuring started in the 18th century. All climatic information on older periods must be gained from different indicators and archives. Those 'archives' can be e.g. descriptions, paintings, registered dates like grain prices, wine qualities, or crop quantities - they can be interpreted and 'translated' in climatic terms. Going further back into the past fossil soils, pollen and macro-biotic relicts, dendro-ecological or ice-core analysis, lake deposits, eolian sediments, or other geomorphological remnants deliver indirect climatic records. Only several such indicators can contribute to a more precise estimate of past conditions. Absolute datings (radio carbon) or archaeological findings may help to fix the time period concerned.

The author's scientific interest has focused on hot and polar deserts, landscape development and paleoecology. It was attempted to control, if even minor climatic variations or fluctuations have been expressed in peripheral and extreme regions of the globe. One additional method to identify climatic fluctuations is the behaviour of regional populations. Crop failure, starving, migrations, abandoning of settlements, etc. can be compared with references in so-called 'correlated or contemporary sediments' to obtain more reliable information on the attributes, impacts, and geo-

graphical range of climatic variations. Those (minor) fluctuations in the Holocene (table 5.1) have been overlooked for a long time in the previous paleo-climatic discussions.

5.2 Pleistocene Immigration – America’s Early Inhabitants

During the Late Stone Age, periods of migration and distribution of human groups were directly influenced by paleo-climatic conditions. The global average temperature was about 11°C, or 4 to 5°C lower than today. In higher latitudes, huge ice domes covered the continents. In so-called peri-glacial areas in the middle latitudes, like in Central Europe, the annual average temperature was several °C below zero and the land was covered with tundra and cold steppe vegetation.

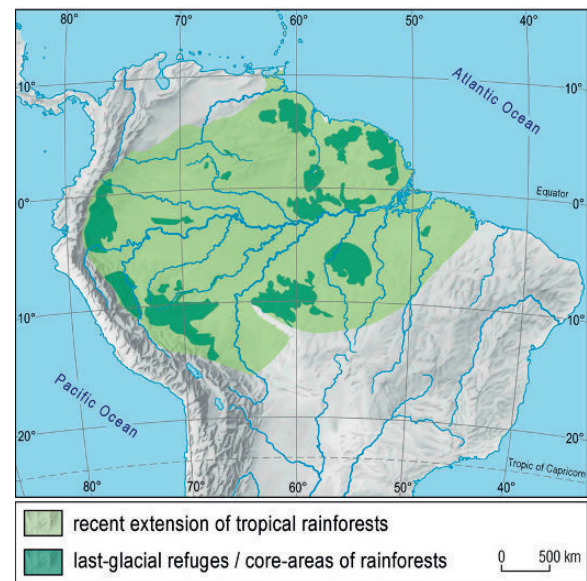
During the *last glacial maximum* (LGM) the sea level was about 130 metres lower. The bottom of shallow ocean floors dried up in some parts of the world. Thus, people could move even by foot between islands of the Asian archipelago and even to Australia. For the population in both Americas the drying of the Bering Strait between Siberia and Alaska had been crucial: about 25,000 years before the present (BP), main stream theories assume that Mongolian groups immigrated to North America – the posterior ‘indigenous’ Indian population²). Anthropologists investigated the population and settlement history of South America. They were surprised that the Monte Verde culture in southern Chile originated already 13,000 years BP (Blümel 2002).³ How could this fast distribution be explained across huge distances, irrespective of immense obstacles like rain forests, mountain barriers, and rivers?

Paleo-geography offers an answer: The global atmospheric conditions in those periods of glacial maximum and late glacial periods were much cooler and had lower humidity. The vegetation cover all over the globe totally differed from today. In Middle and South America, the rainforest in the Amazon Basin had disappeared and remained only in small island-like patches (figure 5.2; Veit 2007; Whitmore 1993, 1990). Areas in between were savannahs, steppes or

even deserts. Thus, the collector and hunter populations could migrate and spread rather quickly. These open landscapes offered abundant prey and vegetable food. Thus, this cool and precarious climate had favoured the early migration processes.

This example illustrates how climatic change really occurred: The margins of ecosystems shifted to a distinct alteration or even to a complete transformation of pre-existing ecosystems (for later developments in the Sahara see Kröpelin/Kuper 2007; Pachur/Altmann 2006; part 5.4.1 below). These integrative and structured natural systems work simultaneously as human habitats. Changes in natural conditions had automatically influenced the land-use pattern and mode, as well as productivity, etc.

Figure 5.2: Refuges of the Amazonian rainforest during the last glaciation, compared with the present situation. **Source:** Adapted from Haffer (1969) and Veit (2007) with permission of both authors.



5.3 North Atlantic Current: The First European Crisis

The transition from the conditions of the Ice Age to the next interglacial period (*Holocene*) was accompanied by periods of warming and cooling. The most effective intersection – the ‘*Younger Dryas Event*’ about 13,000–11,560 yBP (years before present; table 5.1) – was caused by the outburst of huge quantities of melting water from North-America’s collapsing ice shields into the Atlantic Ocean. This light sweet water

2 Other theories of the migration to America by boat (e.g. by Thor Heyerdahl, Norway and by Santiago Genovéz, Mexico) are neglected here. It is shown how climate variations affected and altered the global vegetation cover – the main source of human food.

3 See: G. Forster: “Wandertrieb im Blut”, in: *Der Spiegel*, No. 3 (1997): 152–153.

interfered with the thermohaline convection and interrupted the North Atlantic Current (Gulf Stream) and its heating effect for the north Atlantic surroundings. Thus, large parts of Europe returned to a cold periglacial climate. Living conditions of the stone-age populations deteriorated, because woodlands disappeared again and the food supply with game, fruits and firewood became scarce. People had to move to more pleasant landscapes, i.e. to South-eastern Europe. The last impact of the ending glaciation in North-America occurred 8200 yBP, at the end of the Boreal period (table 5.1). Melting water once more affected the Gulf Current and led to a remarkable cooling in the North Atlantic, and possibly to a disturbance of the thermohaline circulation (Weiss/Bradley 2001). Many researchers are still looking for the geographical range and the ecological effects of the Younger Dryas, and the 8200 BC event. Those ‘natural experiments’ may teach what will happen if the Gulf Current is disturbed: Contemporary global warming with its melting of glaciers and Arctic sea ice has caused fears of a weakening or collapse of the North Atlantic Current. The present discussion on the future of the Gulf Current has been controversial (Bryden/Longworth/Cunningham 2005: 655; Lund/Lynch-Stieglitz/Curry 2006; Rahmstorf 2000; Rahmstorf/Schellnhuber 2006).⁴

5.4 Holocene Climatic Fluctuations During the Past Ten Millennia

According to the reconstruction of the Holocene climatic ‘swing’, some simplified and obvious correlations between climatic milieu and human welfare or crisis will be discussed. The aim is to signal the importance of the climatic environment for human behaviour in general. Favourable climatic conditions may support welfare, cultural rise, and social stability. On the other side: Fixed political or societal organizations may experience chaos, collapse or launch migrations. Looking back may give some picture of what will possibly happen in parts of the world if the global climatic change proceeds.

5.4.1 Postglacial ‘Megathermal’ - Global Welfare and the Neolithic Revolution

Caused by astronomic parameters like the inclination of the earth’s axis and its gyroscoping, barging rotation (precession), the so-called postglacial thermal optimum (‘*megathermal*’ or ‘*altithermal*’) occurred. Between 10,000 and 5000 yBP a global climatic change took place. It was the warmest period since the *late glacial maximum* (LGM) until now, with increased rainfall in dry lands (shrinking of deserts, expansion of savannahs and woodlands). The Saharian desert nearly disappeared (Claussen/Kubatzki/Brovkin/Ganopolski 1999; Claussen/Gayler 1997) and changed into a grassland and bush savannahs with lakes, periodic rivers and lots of game like antelopes, elephants or crocodiles (Kröpelin/Kuper 2007; Pachur/Altmann 2006). Numerous artefacts and fossils documented an abundant environment. The domestication of different animals and pastoral nomadic life emerged. The metamorphosis of the Saharian ecosystem is an impressive and amazing example for the ecological consequences of climatic variations.

This climatic optimum with regard to temperature, rainfall, and seasonal conditions led to the ‘neolithic revolution’ or a settled way of life: Agriculture developed in the Near East (and maybe simultaneously in other regions). Jericho is one of the oldest towns (9000 BP) and counterpart of Çatal Höyük in Anatolia (Issar/Zohar 2004 and chap. 6 below). From the ‘fertile crescent’ (Mesopotamia and adjacent regions) settlements spread to Europe (Müller-Beck 1983; Waterbolk 1968; Issar/Zohar 2004: 557ff). Impressive megalithic cultures settled also in higher latitudes (e.g. in Scotland, Orkney Islands) referring to optimal agricultural conditions and abundant food production to create stone circles like the Ring of Bodgar, Stonehenge, or large megalithic tombs. Astronomic functions and calendars that were integrated into these monuments point to the importance and the perception of the climatic framework within the Neolithic civilization.

It is obvious to recognize the Megathermal period of the Holocene as the mystic ‘paradise’, or the ‘garden of Eden’ or the famous ‘golden era’. It seems to have been a time of easy living and of a surplus of ‘human energy’. All this can be explained by a high and reliable landscape potential, caused by optimal climatic parameters. The impressive megalithic monuments correspond with the social and economic opportunities of those times. This mega-architecture seems to belong to advanced civilizations, and it evi-

4 Susanne Donner: “Viele Modelle - eine Tendenz: Ergebnisse aus Klimasimulationen unterscheiden sich nur im Ausmaß des Klimawandels”; at: <<http://www.wissenschaft.de/wissenschaft/hintergrund/271519.html?Page=2>> (3 November 2006).

dently evolved in favourable warm climates. Similar conclusions may also be allowed for later climatically optimal periods, e.g. concerning the famous Gothic architecture in Europe or the Maya sites in Yucatán, Mexico (see fig. 5.9, 5.10, 5.11).

5.4.2 Cooling Climate - The End of Paradise

The 'end of paradise' occurred immediately. A famous witness of a climatic jump was the well-known 5,300 years old snow-mummy named 'Ötzi'. This member of the Neolithic groups living in the North Italian Alps (South Tirol) was found on a ice free yoke in the Austrian Ötztal Alps. Ötzi probably died in a blizzard, remained permanently buried, and became mummified in the hard snow until 1991 (Blümel 2002). During the altithermal period of the Holocene, the glaciation of the Alps was less expanded than today. The tree line reached 200–300 metres further up. Neolithic summer camps (seasonal grazing) have been found in the high alpine region (e.g. close to the village of Obergurgl in North Tirol). Ötzi's death documents the rapid end of the postglacial Altithermal in Central Europe. The beginning of the following cold Bronze Age was an extreme time of deterioration and of agricultural crisis (crop failure) in Europe, accompanied by frequent famines and loss of population ('Piora-oscillation', Schönwiese 1995). The atmospheric cooling that was accompanied by strongly diminished precipitation ended the 'green Sahara' and the desert expanded again (see 5.5.1). Similar processes could also be reconstructed in eastern Chinese drylands: up to 3400 yBP, these regions have been humid woodlands. Documents prove that in about 2200 yBP the northeast showed a dry climate with steppes and desert conditions (Tarasov/Wagner/Guiyun 2007). Concerning the Mediterranean, Issar/Zohar (2004: 101) stated:

In detail the proxy-data from the Soreq Cave show that a warm and dry period starting around 3500 BCE and lasting a few decades to a century, a cold and extremely humid climate followed, continuing until 3300 BCE. Then came an extreme dry period, peaking around 3200 BCE, followed again around 3000 BCE by a cool and humid period that lasted, with some interruptions, for about seven centuries.

This statement makes clear that contemporary climatic variations express their individual dynamics and features within the different regions and landscapes of the globe. Another example from Mesopotamia also stresses this aspect:

By 3500 BC, urban Late Uruk society flourished in southern Mesopotamia But these colonies and the expansion of Late Uruk society collapsed suddenly at about 3200–3000 BC. ... Now there are hints in the palaeoclimatic record that it may also be related to a short (less than 200 years) but severe drought (Weiss/Bradley 2001).

Have these two examples been an incidental parallel to Ötzi's death?

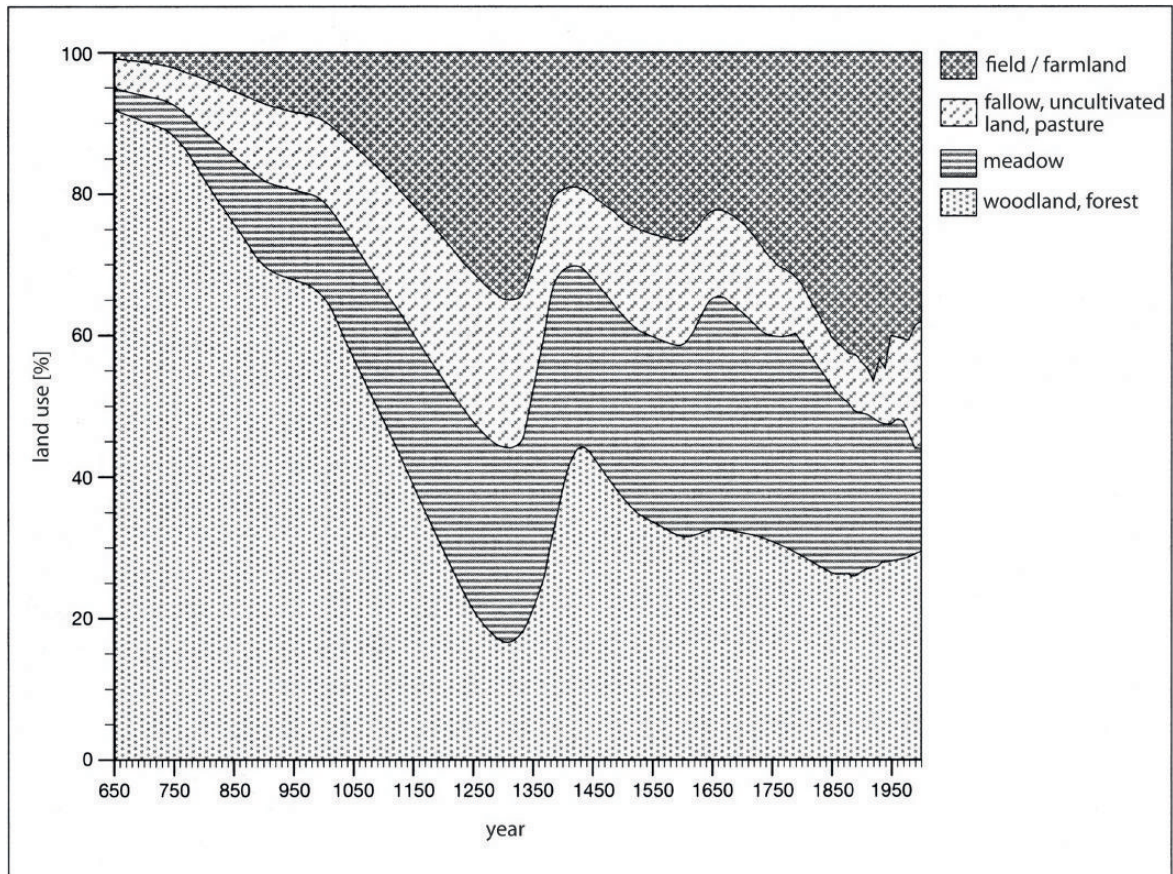
5.4.3 Celtic Culture and Roman Empire: A New Warm Period

The Celtic period (during the Iron Age) started around 700 or 600 BC with the Hallstatt culture and was supported by an appreciable improvement of the climate. Since the 7th century BC the population was growing, the society became complex and hierarchically structured. Centralization occurred steadily and towns emerged. Widespread connections in trade and cultural exchange flourished (e.g. with Greece and other Mediterranean regions). Since the 4th century BC, climatic deterioration stopped this cultural development and Celtic society collapsed. Large migrations started to Southern Europe, the Balkans, and Asia Minor.

A revival of Celtic culture took place in the La Tène era. During the following times the Roman Empire expanded and occupied Celtic and Teutonic territories. Roman cities were founded in *Germania*, supported by an abundant agricultural production. The impressive architectural remnants point to welfare, civilization, and surplus. The administration of these northern territories was facilitated as the Alps could be crossed even in winter. Indicators hint to stable climatic conditions with only low variability – the so-called *Roman climatic optimum*. The warmer climate allowed the growth of grapes even in Britain. Successful trade could be maintained from north to south. More humid conditions supported intensive west-east trading and cultural exchange along the Silk Road to China. Yang, Braeuning, Shi, and Chen (2004) reconstructed a warm and humid period in the arid zones of northwest China between 2200 and 1800 yBP.

The rise and fall of the Roman Empire was evidently accompanied and partly steered by climatic circumstances, which are also reflected in other parts of the world. It can be regarded as a model for expansion and growth, supported by favourable climatic conditions (Lamb 1982, 1989; Schönwiese 1995). To mention only one military aspect: A huge army oper-

Figure 5.3: Development of the land use expansion in Germany since the European peoples' migration. The medieval climatic optimum caused an increase in population and a wave of foundations of towns. Woodlands were cleared and transformed into fields, pasture and fallow. During the 13th century woodlands declined below 20 per cent of the total area. With the beginning of the next climatic crisis after about 1330 (Little Ice Age) the agricultural land shrank and forests spread again. **Source:** Adapted from Bork/Bork/Dalchow/Faust/Piorr/Schatz (1998) with permission of the authors.



ating distant from home must be supported by the occupied lands. Insufficient crops and livestock slow down or prevent military gains. The fall may have been accelerated by disturbances, social crises, and migration movements that were triggered by precarious circumstances. (For a detailed discussion of the Roman fate see: Gibbon 1776–1788, 1983; Huntington 1915, 2001; Lamb 1982, 1989; Brown 2001, Bradley/Jones 1992).

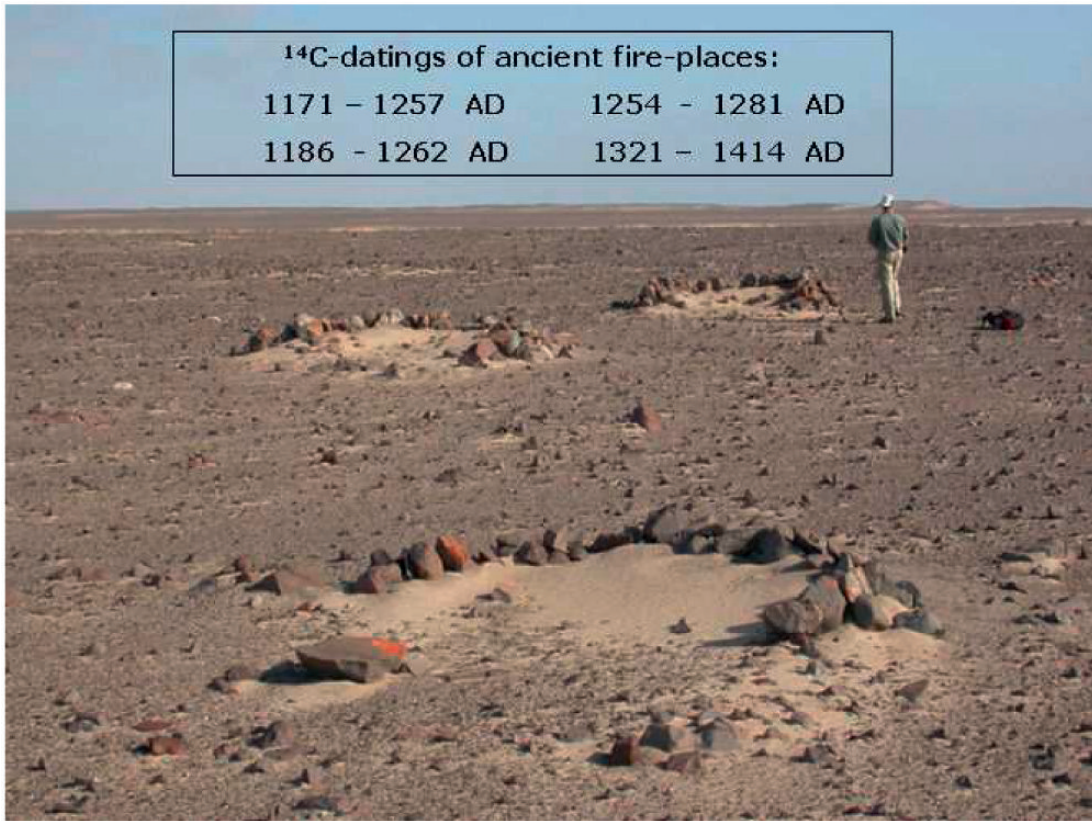
5.4.4 The Climatic Crisis: European Peoples' Migration

Between antiquity and the Middle Ages an evident climatic crisis took place. Climate deteriorations triggered population movements. The most well-known consequence was the European mass migration from the 3rd to the 6th century. The beginning of this 'mys-

terious' process – fraught with consequences – can be explained with crop failure and famines caused by the worsening (or cooling) of the climate. Especially tribes living in Northern or North-western Europe were affected. Malnutrition and social unrest may have been responsible for the mass migrations and conflicts in Europe which contributed to the collapse of the Roman Empire. The famous 'Silk Road' was abandoned due to water shortage and lack of supplies. Increasing aridity in the Asiatic steppes may have been one climatically determined cause for the advances of the Huns (Brown 2001).

The lack of impressive architectural sites was a typical outcome of hardship: There was no surplus or time for demanding cultural activities under those circumstances. On the contrary, destruction and chaos determined life more than development. Social turbulence, collapse of social structures, migrations, and

Figure 5.4: The hyper-arid Skeleton Coast Desert (Namibia): Numerous stone settings of wooden-made wind-shelters, charcoal, bone-remnants of antelopes or lions and ostrich-pearls refer to a former savannah-ecosystem in the present desert. **Source:** photo by Blümel (2006).



conflicts determined the way of life. The scenario of the European migration of people could point to a scenario for regional processes that may be triggered by future climatic changes, especially in less developed countries.

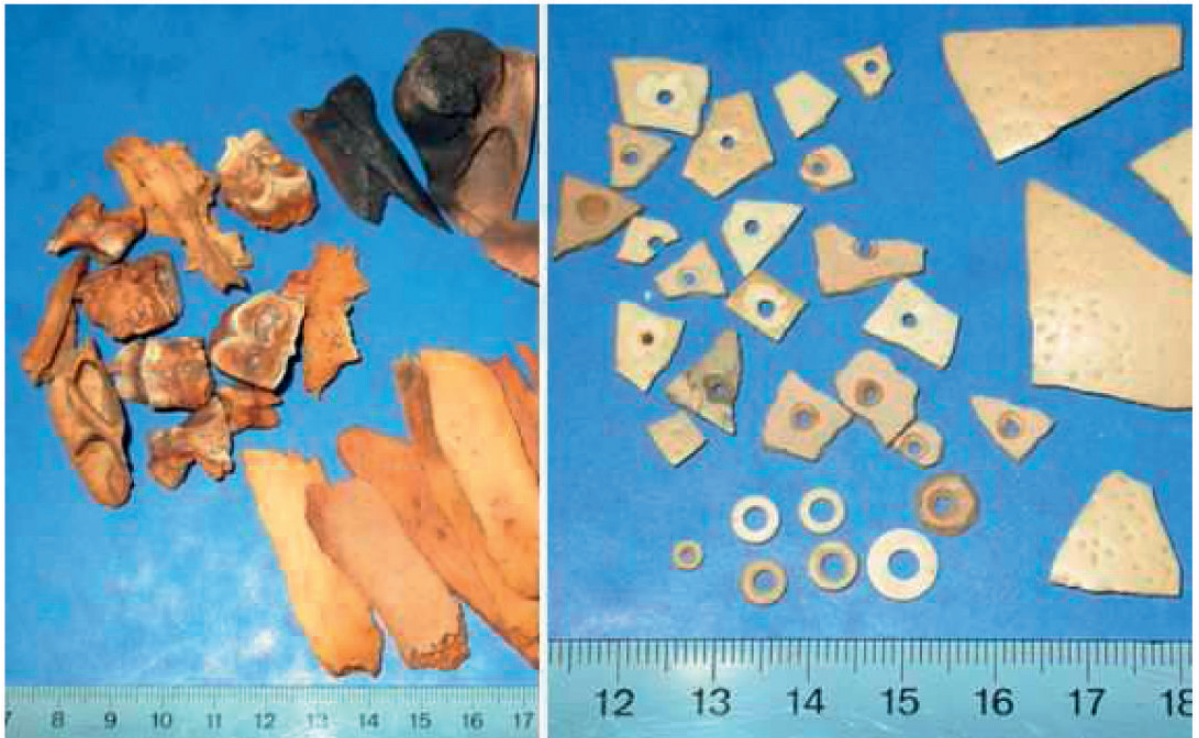
5.4.5 Medieval Warming: Population Growth and Urban Life

Based on the hypothesis that climatic warming contributed to cultural development, a persuasive proof can be found in the European middle and higher latitudes (Bradley/Jones 1992; Brown 2001, Glaser 2001; Hsü 2000; Lamb 1982, 1989). The medieval times (between 1000 and 1330 AD) are marked by a warming and climatic stability, which resulted in high agricultural productivity and a surplus of food, and thus caused an immense population growth. In Central Europe, thousands of cities and villages were founded, establishing the present settlement network. Agricultural production spread out again into the low mountains, more than 200 metres higher than today. La-

bour-sharing, manufacturing, trading, and services developed, supported by the productive rural surrounding. With regard to future effects of climatic change the stable weather and seasonal conditions were important as a guaranty for abundant crops. Thus large wooden areas had to be cleared. The woods dropped to less than 18 per cent of the German surface (Bork/Bork/Dalchow/Faust/Piorr/Schatz 1998; figure 5.3)

The fascinating Gothic architecture symbolizes until today the prosperity and surplus of those times. The medieval period is another example for the dynamic of climatic optima: Reliable and high agricultural productivity was the indispensable prerequisite for creating social and political structures, and it led to a distinct diversity of techniques and cultural development. This climatic framework has been the basis of welfare during all times, irrespective of the systems of rule. The medieval warming also benefited higher latitudes: Grain production was possible in Scandinavia north of the 65° latitude; vineyards grew in Southern Scotland. The polar pack ice retreated considera-

Figure 5.5: ^{14}C -radiocarbon dated by B. Kromer proves the medieval age of these archaeological findings. **Source:** photo by Blümel (2006).



bly. The Normans (or Vikings) settled in Greenland and Iceland, where even grain could be produced (Brown 2001; Lamb 1982). Starting from there, America was discovered prior to the Spanish Conquest.

In *lower latitudes*, the deserts partly shrank in some periods due to increasing humidity (Namib, Atacama). Indigenous southwest African cultures like hunters or pastoral nomads profited from these hydrologic fluctuations. The higher (global) temperatures have been evidently correlated with a greater monsoonal reach and augmented rainfall. These conditions were instrumental for stone-settings belonging to former huts or wind shelters dating back into the medieval period (Blümel/Hüser/Eitel 2000; figures 5.4, 5.5). The present deserts must have been tropical savannah (grassland with bushes or smaller trees).

The shifting margins of the desert depending on the reach of monsoonal precipitation are among the most common problems of people living in semi-arid regions. It is the small and large-scale climate variability. Times of warming strengthened the monsoon reach and triggered human activities, enlarging their territory and welfare. On the other hand, atmospheric cooling caused aridity and increased short-time variability followed by retreat, migrations or collapse of civilizations.

5.4.6 Climatic Pessimism: The Little Ice Age with Famines, Social Crisis and Emigration

The so-called 'Little Ice Age' was the last pessimism in the Holocene see-saw of climatic fluctuations. It lasted from about 1330 up to 1850 AD (see figure 5.1). In the early 14th century, climatic conditions deteriorated again: Seasons proceeded irregularly, the vegetation period suffered, ending up in frequent crop failures (Brown 2001; Glaser 2001; Lamb 1982). The greatest disaster in Central Europe within the last thousand years was caused in 1342 AD by a long and heavy rainfall with cloud bursts and thunderstorms (Bork et al. 1998). It is assumed that half of the total soil loss by erosion since the introduction of agriculture is due to this single event. People starved and abandoned the settlements in the lower mountains due to cooling and various unfavourable conditions. The concentration of rural refugees in urban areas led to increasing hygienic problems. Plague spread and killed a high number of victims. The German territory lost about 50 to 60 per cent of its population.

The climax of this crisis was reached between the 16th and 18th centuries. Glaciers advanced, symbolizing periods of distinct cooling with all consequences such as malnutrition. Storms, floods, and

Figure 5.6: Albrecht Dürer's (1525): *Apocalyptic Riders* symbolizes the horrors of the 'Little Ice Age'.
Source: Internet.



other natural hazards threatened the population. A differentiated documentation of the 'climate downturn' is provided by Brown (2001) and Glaser (2001). Distress and deprivation destabilized the social and political system. The farmers - under severe pressure from their rulers - started rebellions and attacks (1525 AD), but lost their struggle. An additional consequence for the following centuries was that the farmers fell by the wayside, were extremely exploited, and had no rights (especially during the period of absolutism). Overseas emigration took place in waves, triggered by starving, social crises and armed hostilities or wars (especially during the Thirty Years War from 1618 to 1648). Hundreds of thousands of people lost their lives in these decades. Parts of the country were totally devastated. Albrecht Dürer painted his famous 'Apocalyptic Riders' or 'Knights, Death, and Devil' as symbols of the complex horrors of those times (figure 5.6).

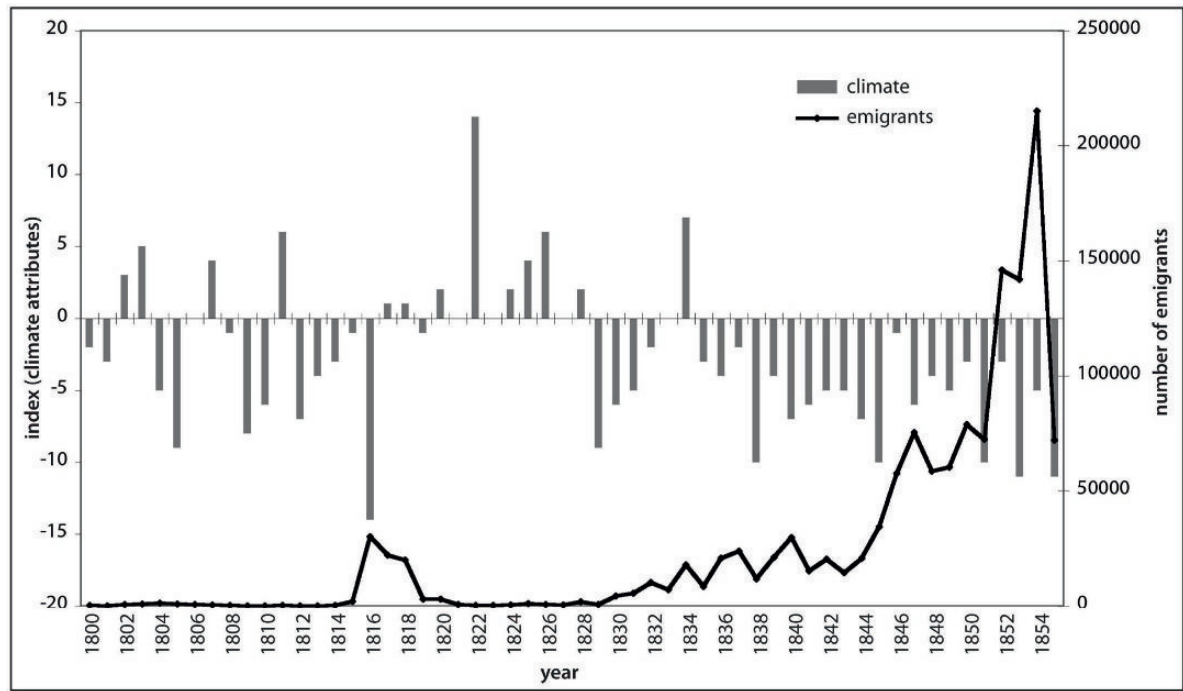
Another famous rebellion and radical social change was presumably also triggered by the results of a pernicious climatic constellation, which prevented sufficient food supply for the majority of the popula-

tion: The French Revolution of 1789 can be regarded as symptomatic: unfavourable climatic conditions (pessimism) have often caused or contributed to the destruction of the political and social systems, sometimes under chaotic and anarchic circumstances (Stock 1996: 38).

Many people tried to find a way out of the troubles by emigrating, especially to the 'New World'. The last huge emigration wave left from Ireland and Scotland immediately prior to the end of the 'Little Ice Age' (1845-1850; Ruess 2005). Several years with dramatic crop failure (esp. rotten potatoes) were the main reason. Emigration was not only pushed by desperate situations, but there were also pull factors. The close causal correlation between negative climatic consequences and emigration overseas is illustrated in figure 5.7.

The title 'Little Ice Age' is not really proper: There have been also warm periods in these five hundred years. Ice was not a real problem for the people. As mentioned above, glaciers advanced temporarily but remained in the inner Alps. On the other side, these 'dark centuries' yielded very warm or respectively hot periods. The natural reasons for these internal changes can be found in less solar radiation (Spörer and Maunder minimum; Rahmstorf/Schellnhuber 2006) and solar variability, partly in volcanism (deMenocal 2001: 668). The latest hypothesis to explain the Little Ice Age period was published by Lund, Lynch-Stieglitz, and Curry (2006: 601): Relating to isotope analyses in marine organisms, the North Atlantic Current (Gulf Stream) should have been ten per cent weaker than today. West and Middle Europe received less warmth during the Little Ice Age. One effect was that connections between Denmark and the Normans on Greenland were interrupted. The Inuit population pushed away the weak Vikings and took over their settlements (Lamb 1982, 1989). In general, the atmospheric cooling was connected with a distinct uncertainty and irregularity concerning the course of seasons - the basis for agricultural production (Hummler 1994). Figure 5.8 shows for the 16th century several years in a row with bad weather conditions for sufficient yields. Agrarian societies are very sensitive and vulnerable to such events. Even short series of small or missing yields can evoke an existential food crisis, especially when trade connections or food imports were undeveloped. This simple scenario still applies to many less developed countries. Highly industrialized countries with food reserves can also be affected. These factors should be taken into account when con-

Figure 5.7: The last phase of the ‘Little Ice Age’: Climate indices above the axis symbolize favourable years for agricultural production etc, indices below (-x) represent precarious years with insufficient crops. The correlation between bad years and the number of emigrants becomes clear. **Source:** Adapted from Ruess (2005) with permission of the author.



temporary global environmental changes are being discussed.

5.5 Climate Change: A Trigger for Growth and Collapse of High Civilizations

After this rapid and cursory excursion through 20,000 years of climatic ‘ups and downs’, three additional examples will be discussed to emphasize the evident correlation or interaction between climatic environmental conditions and cultural as well as social reactions. The simple hypothesis is that to establish and maintain a structured and culturally highly developed society requires an efficient and reliable primary sector.

5.5.1 Egypt

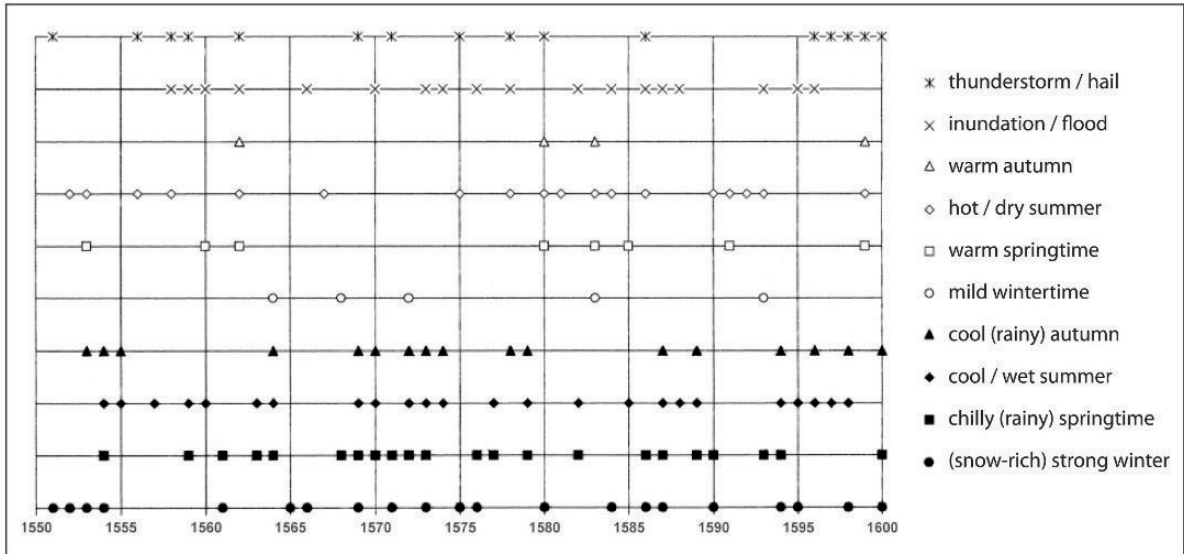
The famous Nilonian culture was a ‘child of the desert’. During the postglacial Alithermal with its luscious rainfalls (see section 5.4.1 above), the Saharian neighbourhood was a green open savannah – full of animals and people. The River Nile and its opulent valley oasis were only scarcely inhabited in those

times. The abundance of water seems to have been less important or even a disadvantage for settlers. Maybe the giant seasonal floods threatened the people. Anyway, the livestock in the ‘green Sahara’ apparently seems to have attracted people (Kröpelin/Kuper 2007; Pachur 2006).

This changed when the postglacial Alithermal ended around 5300 yBP (3200 BC) and the savannah dried out, and became a desert again (Kröpelin/Kuper 2007). People retreated and, as ‘desert refugees’, they discovered the oasis of the river Nile and its potentials. Its floods diminished, could be controlled, and served since then as the base of a new agriculture. Irrigation was the technique and a guaranty for crops during the whole year. Abundant fertility and high productivity led to an immense population growth. A feudal regime arose, supported by the surplus (the Old Empire 2620–2100 BC). The famous pyramids symbolize the welfare of the leadership and of the upper class. On the other side, without an abundant food supply and of slaves and workers, the enormous buildings and tombs could not have been realized. (See Issar/Zohar 2004, 2007 on Egypt, and Bolle 2003 on the Mediterranean in general).

In Egypt, climatic worsening (i.e. expanding desert conditions) led to the depopulation of the former sa-

Figure 5.8: Reconstruction of weather and seasons in the 16th century: Germany often suffered during the Little Ice Age under several year-long phases of bad weather conditions. The seasons strongly varied, were incalculable, and prevent a successful sowing and crops. Famines and social crisis occurred frequently. **Source:** Hummler (1994).



vannahs, but it also contributed to innovative cultures and civilizations outside these regions. This example demonstrates the importance of a reliable access to water. In times with declining rainfall and drought in the width of land, waters from distant humid catchments (Ethiopia, Uganda) formed the basis for a new high culture. Such ‘exotic rivers’ like the Nile occur rather often in dry lands and act as ‘arteries’ of rural and urban life. Facing global environmental change, even these opulent hydrological systems may change, causing scarcities and conflicts (see the chap. 48 by Adly/Ahmed and chap. 49 by Kameri-Mbote/Kindiki in this vol. on water security in the Nile River Basin; and chap. 68 by Ejigu on environmental conflicts in the upper Nile Basin countries).

5.5.2 Nasca Civilization: Shifting Desert Margins

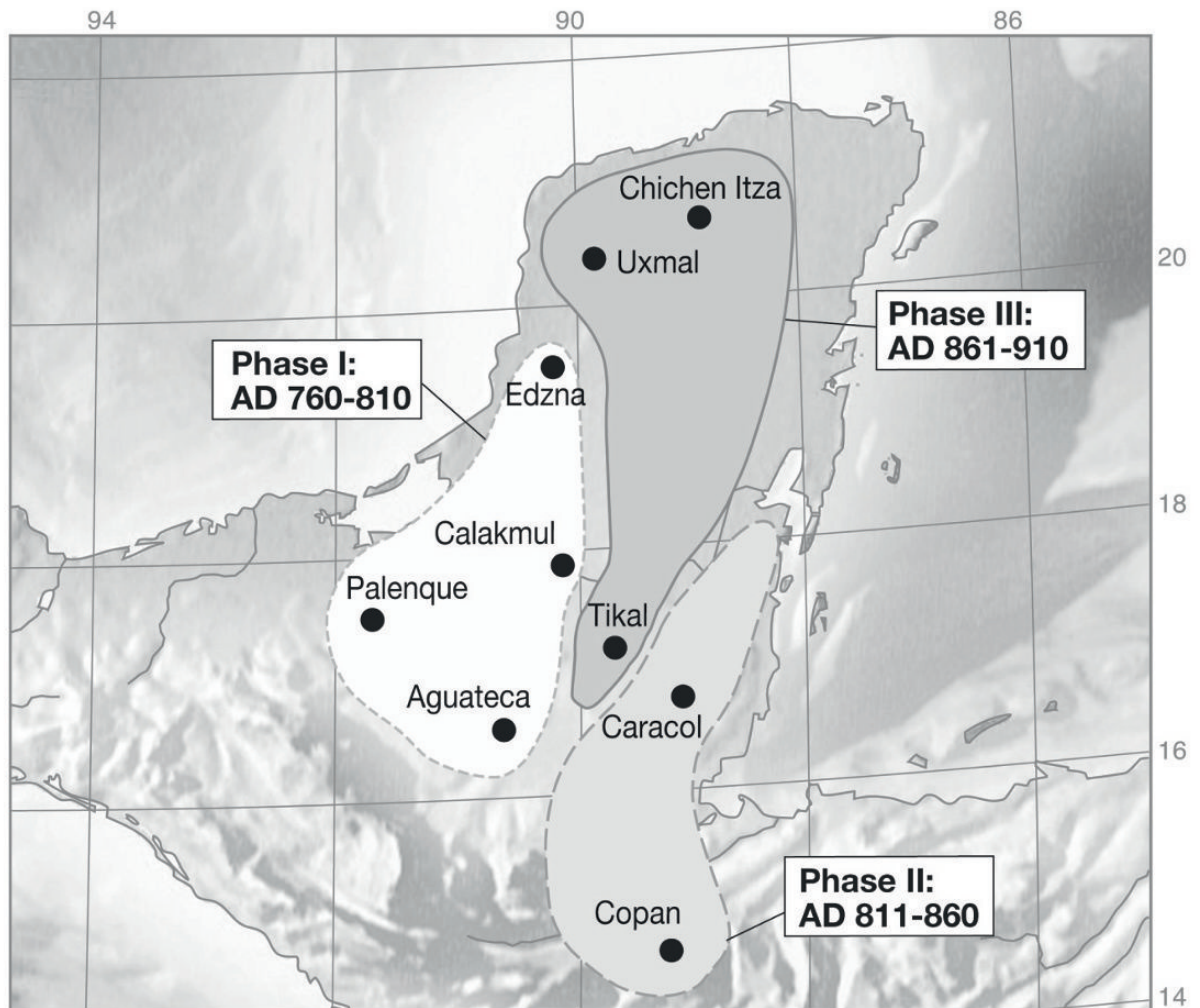
Mysterious engravings – giant ‘geoglyphs’ – are the most well-known characteristics of the Peruvian Nasca civilization. Its fate can serve as an icon to demonstrate the integrative relationship between human beings, climate, and the topographic environment. The previous Paracas culture developed between 800 and 200 BC, followed by the Nasca people. They lived from 200 BC in the fertile river oasis in the Atacama Desert close to the Pacific.

In the Middle of the Nasca Period (after 250 AD) people suffered under increasing aridity. The effec-

tiveness of monsoonal rainfall decreased and the desert margin shifted eastward. Nasca settlements subsequently moved upstream into the mountains. Culminating aridity about 600 AD probably caused the collapse of the Nasca civilization (and of adjacent cultures like the Moche further north). Geomorphological and paleo-ecological investigations support the hypothesis that climatic drought (aridification) and not – as hitherto assumed – El Niño events brought the Nasca culture to collapse (Eitel/Hecht/Mächtle/Schukraft/Kadereit/Wagner/Kromer/Unkel 2005).

Four hundred years later, the eastern Atacama was reoccupied (during the late intermediate period between 1000 and 1400 AD), what coincided with the climatic optimum in Europe and in other parts of the world. The desert then shrank into a small strip of about forty kilometres. *Ciudad Perdida* or the ‘Lost City’ (Unkel/Kadereit/Mächtle/Eitel/Kromer/Wagner/Wacker 2006) is a giant archaeological witness for the medieval comeback of the rainfall into the lower parts of the western Peruvian Andes. Archaeologists could document that this community – situated elevated on a mountain saddle – had great importance in trade and could supply itself from local rainfall and nearby field terraces (Unkel/Kadereit/Mächtle/Eitel/Kromer/Wagner/Wacker 2006).

Figure 5.9: Phases of the Maya collapse during early medieval times: The main reason is to be seen in droughts and in a great variability in rainfall. **Source:** Adapted from Arz/ Haug/Tiedemann (2007) with permission of the authors.



5.5.3 The Mayan Collapse: Natural Causes for Cultural Decline

The discussions and hypothesis about the collapse of the Maya civilization (Yucatán Peninsula) are rather old and contradictory.⁵ New investigations on sedi-

⁵ There are different positions to be found in the literature: e.g. Webster (2002) argues with the disproportion between population and resources. In Culbert (1973) different opinions are presented. Demerest/Rice/Rice (2004) hint at the complicated findings in different archaeological sites and neglect uniform ecological interpretations. Huntington (1915), as famous representative of deterministic explanations presumed, that an increasing precipitation was responsible for the Mayan collapse

mentary cores taken on the shelf north of Venezuela prove that climatic changes - increasing drought and great variability in rainfall - diminished the agrarian productivity and water resources between 810 and 910 AD. Haug/ Günther/ Peterson/ Sigman/ Hughen/ Aeschlimann (2005) succeeded in reconstructing the exact time schedule of the proceeding decline. Increasing aridity caused the collapse (figure 5.9). At first, the region around Palenque (figure 5.10) and Calakmul was abandoned (AD 760-810), followed by Copan and Caracol (AD 811-860), and finally in the north with Uxmal (figure 5.11) and Chichén Itzá (AD 861-910; figure 5.12; Arz/Haug/Tiedemann 2007; deMenocal 2001; Peterson/Haug 2005; Curtis/Hodell 1996).

Figure 5.10: The Mayan Archaeological Site of Palenque, in Chiapas (Mexico) experienced its climax between the 7th and 10th centuries AD and was deserted by 950 AD. **Source:** photo by H. G. Brauch (January 2007).



Figure 5.11: The Mayan Archaeological Site of Uxmal, Yucatán (Mexico) that was suddenly deserted without any signs of destruction from wars. **Source:** photo by H. G. Brauch (January 2007).



Before the decline of the highly civilized Mayas started, an impressive growth in population and cultural development took place. Living conditions were supported by favourable agricultural conditions,

including reliable seasons, access to abundant water resources and fertile soils. This climate triggered a cultural development: A distinct subdivided social structure originated, comparable with other civilizations. It

Figure 5.12: The Mayan Archaeological Site of Chichén Itzá, Yucatán (Mexico). **Source:** photo by H. G. Brauch (January 2007).



is significant that high civilizations have often constructed impressive buildings with integrated astronomical observatories: Priests and political leaders tried to keep control over their people – by ‘observing’ the climate as a basis of subsistence.

The dramaturgy of the cultural decline of the Mayas, caused by worse climatic conditions, seems to be similar in different times and regions, and may also be a model for future developments: The basis of the food supply deteriorated. The environment was stressed, soils were overused and eroded, and water became scarce. The starving and suffering people were forced to abandon old values like solidarity and common sense, and they became rebellious. Social disturbances overthrew the hierarchic system and this civilization lost its basic structure. Campaigns against neighbours or emigration have often been a loophole in critical situations.

5.6 Outlook on Present Global Warming – Learning Lessons from Climatic History?

Natural climatic fluctuations and variations were quite common during the past millennia. Humankind has

definitely been influenced in its cultural development, regardless of the type of political regime. Can one draw lessons from 20,000 years of climate history for the 21st century? How dramatic might the projected change be (Rahmstorf/Schellnhuber 2006; IPCC 2007)? It may be assumed that natural warming – the next climatic optimum after the precarious Little Ice Age pessimism – is further enhanced by human activities.

The natural system was clearly influenced and damaged by human activities since the beginning of human settlements, but especially during the past 150 years (IPCC 1990, 1990a, 1992, 2007). The present situation has never existed before in world history: More than 6 billion people (causing an enormous change of land cover) and huge emissions of carbon dioxide from the burning of fossil fuels.

The effect of CO₂ emissions cannot be directly determined, but to release fossil energy – i.e. of stored solar radiation – within a short period and in enormous quantities, undoubtedly will have an effect on the atmospheric dynamic. In addition, there is an increasing, accelerated consumption of the global land surface and biosphere. The altered earth surface (parameters of albedo/= proportion of reflected solar radiation, of vegetation cover, transpiration, surface

water run-off, etc.) has also influenced the climate. In total, the recent quality and quantity of the anthropogenic impact on the climate does not have any ancient parallels. In Europe, the Near East and North Africa, Antiquity and the Medieval period already caused enormous landscape damages with climatic effects. In both Americas and in Asia, the anthropogenic impact on the earth's surface was enforced in and since the Renaissance by the immigration of Europeans.) Probably all these impacts have an additional lasting and altering effect. As a result, from the perspective of this author, the (pre)historic experiences and comparisons seem to be rather worthless – facing ‘totally’ new atmospheric parameters (see Claussen/Brovkin/Ganopolski/Kubatzki/Petoukhov 2003 who argued that “the past is not the future”).

But many physical rules will remain effective. Warming will lead to more precipitation in some regions. All global ecosystem margins will be on the move. Especially some of the dry-land areas will profit from the shifting desert margins, others will be the losers. Kröpelin and Kuper (2007) remarked on their expeditions that parts of the eastern Sahara have received more rainfall during the last few years. Nomads graze their camels now, where a hyper-arid desert existed during living memory. It is to be expected that the border of arable land and the timber line will shift towards the Polar Regions and higher into the mountains, similar to the post-glacial Megathermal (chapter 5.4.1).

Looking backward and reconstructing ancient climatic conditions can teach us general aspects of complex interactions between environmental conditions and human activities. This is indispensable for understanding the natural system, for prognostic, modelling purposes, and even for the comprehension of social behaviour or reactions. But what really will happen in the macro- and meso-scale dimension depends on the variable borders of air and water masses, chaotic reactions, or very complex feedbacks and synergetic processes. Micro-scale changes and developments depend on the specific geographical situation of the regional features (on topography, drainage systems, settlements and infrastructure, etc.).

Most likely there will be more disadvantages than gains: The synergetic processes caused by the greenhouse effect and the projected progressive warming may have other consequences than the natural fluctuations in the past. Frequency and magnitude of gales, thunderstorms, or flooding are expected to increase (IPCC 2007). The gradient between the cold arctic air masses and warmer mid-latitude or tropical air may es-

calate. Permafrost will disappear in high mountains and cause more mass movements (rock falls, landslides). Torrential rain will lead to a flooding of lowlands or alluvial plains and landslides. A rising sea level will threaten the areas along the coastline as well as flat islands. Energy and water supply will be affected by diminishing glaciers – there are many additional aspects to be considered.

Undoubtedly humankind with its more than six billion people has changed the global ecosystem in different ways, not only the atmosphere. Together with all synergies and feed-backs, humankind has become much more vulnerable than in the past. We must face these challenges: Stop the emissions and take actions to guard against the hazards and risks mentioned above. Growing damages must be faced because an overcrowded earth is much more put at risk. There is no doubt about increasing social and economic damages because even precarious sites have been settled by the poor and vulnerable people.

Already now there are conflicts on the distribution and use of scarce water resources. The expected shifts in the ecosystem margins due to altering rainfall conditions, new types of conflicts may arise or intensify. The productivity of the arable land and pastures underlies altering conditions, too. The social conflict potential in large cities or in overcrowded areas and the youth bulge especially in less developed regions is another fact to be taken into account: Migrations with all their consequences will be triggered and possibly lead to violent conflicts. The spectre of human reactions on changed natural conditions is widespread and multiple.

The review of (pre-)historic interactions between climatic fluctuations, evolving environmental changes and human societies can be helpful for general assessments and prognoses. But very simple deductions, models, or parallels will be false – the world has become too complex, as roughly described above. The Nobel laureate in chemistry, Paul Crutzen, coined a proper term by changing the name of the most recent period in earth history – the late Holocene – into the ‘Anthropocene’. This term expresses very well the creative and pernicious human influences on the natural global system (see below chap. 98 by Oswald/Brauch/Dalby).

The quality and quantity of inputs have reached new dimensions. Modern man is able to damage fundamentally or even destroy his basic living conditions. Ancient cultures were adapted to natural milieus. They profited or perished when climatic changes occurred. Nature often constrained the society and de-

terminated the opportunities of human beings. Now, humankind is able both to control the natural system and to lose control. According to a report by the British economist Nicholas Stern (2006), the costs of not acting will be much higher than early adaptation and mitigation methods in coping with global and climate change (Brauch/Oswald/Mesjasz/Grin/Kameri-Mbote/Chourou/Dunay/Birkmann 2009).

6 Climate Change Impacts on the Environment and Civilization in the Near East

Arie S. Issar and Mattanyah Zohar

6.1 Shifting Paradigms: From a Determinist to an Anthropogenic Model¹

During the late 19th and early 20th century, political geography or 'geopolitics' was dominated by a deterministic paradigm that was launched by a group of geographers in *Germany* (Friedrich Ratzel; Karl Haushofer), in *Sweden* (Rudolf Kjellén) and the *United Kingdom* (Halford J. Mackinder) as well as a navy strategist in the *United States* (Alfred Mahan).² This approach experienced a revival during the 1980's and 1990's as 'new geopolitics'³, and since the 1990's also as 'critical geopolitics'⁴ that challenged many of assumptions of their predecessors or as ecological geopolitics or 'political geo-ecology' (Brauch 2003, 2005, 2005a).

1 This text is based on a summary of the book by Issar and Zohar (2004/2007) published by Springer. This original text was used with the permission of the publisher and modified and extended reflecting the detailed comments and suggestions of two anonymous reviewers.

2 See i.a. Ratzel (¹1897, ²1903, ³1923, 1882, ³1909, 1898, 1969); Haushofer (1928, 1932); Kjellén (1915, 1916, 1917, 1924); Mackinder (1890, 1895, 1904, 1905, 1907, 1918); Mahan (1897, 1900, 1900a, 1907, 1957). These references were added by the lead-editor with the consent of the authors.

3 See in *France* (Claval 1996; Chauprade 1999; Defarges 1994; Dussouy 1998, 2000; Gallois 1990; Lacoste 1976, 1980, 1984, 1987, 1993, 1996, 1997; Laid 1998); *Germany* (Brill 1993, 1994, 1998), *Italy* (Ferro 1993; Jean 1995), *Spain* (Vincens 1955, ³1981), *Israel* (Bernstein 2000; Biger 1990; Kimmerling 1983; Kliot/Newman 2000; Newman 1999), in the *UK* (Dodds/ Atkinson 2000; Gray 1977, 1985, 1986, 1988, 1999; Parker 1985, 1988, 1988a) and in the *U.S.* (Agnew (1993, 1993a, 1995, 1998, 2000); Agnew/Corbridge 1989; Cohen 1963, 1982, 1991, 1991a, 1993). These references were added by the lead-editor with the consent of the authors.

With regard to climate issues its main proponent was the American geographer Elsworth Huntington (1876-1947). The essence of this paradigm was that the geographical-physical conditions, which are determined mainly by the climate and climate changes, decide the character of the people, as well as their history (Huntington 1915).

Since the 1930's this paradigm was replaced by the anthropogenic model, which placed all blame for the emergence and collapse of civilizations (including the improvement and degradation of the natural systems supporting them, such as water, soil, and vegetation) on human mal-practice.⁵

The impact of the Sahelian droughts (1968-1984) on the people of this region, the paleo-environmental research as a function of the research concerned with the greenhouse-effect, and the development of objective research tools, especially environmental isotopes, bring an increasing number of geographers, archaeologists and historians to start shifting a significant part of the blame back from man to climate changes and other natural causes.⁶

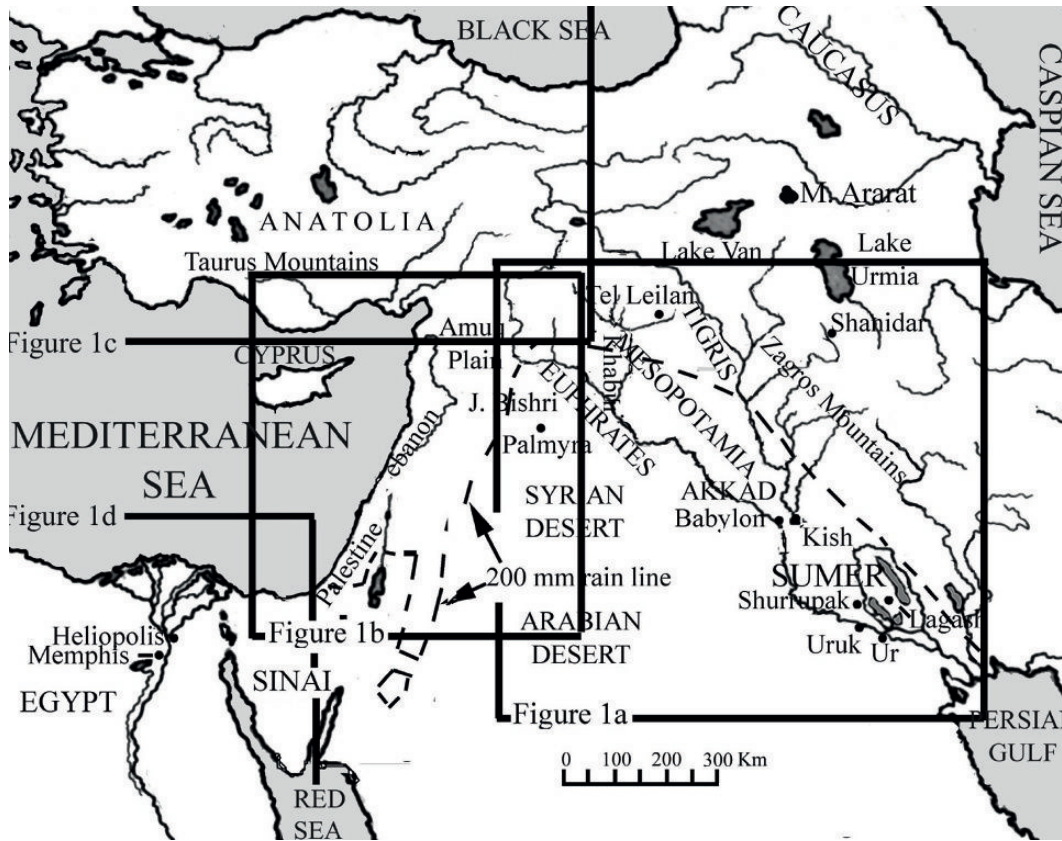
In some aspects it is a revival of the deterministic paradigm, but it can better be described as the emergence of a new neo-deterministic paradigm. This emphasizes the dynamic interaction between the natural

4 See e.g. Dalby (1991, 1999); Ó Tuathail (1989, 1996, 2000); Ó Tuathail/Agnew (1992); Ó Tuathail/Dalby/Routledge (1998). These references were added by the lead-editor.

5 Representatives of the anthropogenic school are: Woolley/Lawrence 1936; Albright 1949, Glueck 1968; Lowdermilk 1946; Worster 1982; Evenari/Shannon/Tadmor 1971.

6 The major representatives of this school are: Carpenter 1966; Braudel 1972; Le Roy Laudrie 1971; Lamb 1977, 1982, 1985; Issar 1990; Angelakis/Issar 1996; Issar/Brown 1998; Brown 2001; Yoshino/Domrös/Annick/Douguédroit/Paszyski/Nkemdirin 2006 (1997); Issar 2003; Issar/Zohar 2004, 2007.

Figure 6.1: Overall Map of the Near East and Maps of Sub regions. **Source:** Issar/Zohar 2004/2007 reprinted with permission of Springer Verlag.



environment as decided by the geographical position, climate, water, soil, vegetation, etc. and the human society supported by that environment. This interaction oscillates within the endurance capacity of both systems dictated by their sustainability, as well as by the flexibility of the natural system and the agility of the human mind.⁷

Issar and Zohar (2004, 2007) have shown that human society responds to change in the environment by inventing new ways to cope with shortage. Yet, once the changes were extreme, continuous and beyond the resilience capacity, catastrophe is imminent. Moreover, each human society tends to overexploit the natural resources and thus accelerate the collapse of both systems. The recuperation may come when an amelioration of the natural conditions occurs, or by adopting new subsistence technologies or strategies or the influx of new societies better adapted or more innovative, enabling the development of a new level

of tolerance and interaction between the systems. Recently computerized models were introduced in order to simulate the interaction between the various components of the natural and human systems (Daily/Ehrlich 1990; Roson 2003; Mendelsohn 2005).

This chapter concentrates on the major climate changes, which have affected the Near East (figures 6.1, 6.2, 6.3, 6.4 and 6.5) during the last ten thousand years, and will show that indeed these were concurrent with major transformations in the history of the people of this region. In other words, the impact of climate changes on the history and culture of the region along equi-chrono-zones (iso-time slices) will be discussed.

The specific research question concerns the shift of the pendulum of paradigms, from the extreme deterministic in the beginning of the 20th Century to the extreme anthropogenic since the mid of that century, to the neo-deterministic paradigm. This paradigm acknowledges the primary importance of climate changes in shaping the history of human communities, especially in regions along the margins of the deserts (warm and cold), but takes into consideration

⁷ The neo-deterministic paradigm is obvious in the work of: Dalfes/Kukla/Weiss 1997; Issar 2003; Issar/Zohar 2004, 2007.

the role of human intelligence and innovation to ameliorate the impact of climate changes.

In order to answer this question the proto-history and history of the Near East, from the establishment of the first agricultural communities to the present will be surveyed and the impact of climate change will be discussed, for each change and for each region.

6.2 Constructing the Jig-Saw Puzzle of Paleo-Climates of the Last Ten Millennia

In their detailed analysis Issar and Zohar (2004, 2007) have used the following methods, which enable scientists to reconstruct the climates of prehistoric and historical times. These include geomorphologic observations such as ancient sea, lake, and river levels, environmental isotopes ratios (like oxygen 18/16, deuterium/hydrogen, carbon 12/13) in deposits of stalagmites and shells, tree rings, and pollen assemblages. Some case-studies like that of the sea levels of the Dead Sea, the stalagmites of the Soreq cave near Jerusalem (figure 6.6.), and the trees from the Roman siege ramp of Masada have been discussed in the book in detail (Issar/Zohar 2004: 30–33; 2007: 27–30). In the attempt of portraying the causes and effects of climate changes on Near Eastern societies, the results of recent archaeological, historical, and socio-economical field work have been interwoven with the picture obtained by the geo-physical methods.

They distinguished among the following major theories, which try to explain the reasons for these changes. In the first place the *deterministic paradigm* focusing only on climate changes and as already mentioned this was the leading paradigm since the end of the 19th century up to the 1930's. The opposing opinion was that suggesting the *anthropogenic paradigm*, according to which all blame was put on the human society for its failures. One of the major blames was the humans' interference with the natural processes and thus causing environmental, economic and political crises.

The region is located along the northern margins of the desert belt of the Sahara and Arabia (figure 6.1). Because the borderline moved considerably a few times during the last ten thousand years, this region is an optimal area for studying the reverberating counteraction between the natural and the cultural human systems. The fact that in this region writing and thus documentation was first invented enables to explore its history to greater depth (Neumann/Sigrist 1978;

Neuman/Parpola 1987; Hallo/Simpson 1998; Kramer 1963; Weiss 1986).

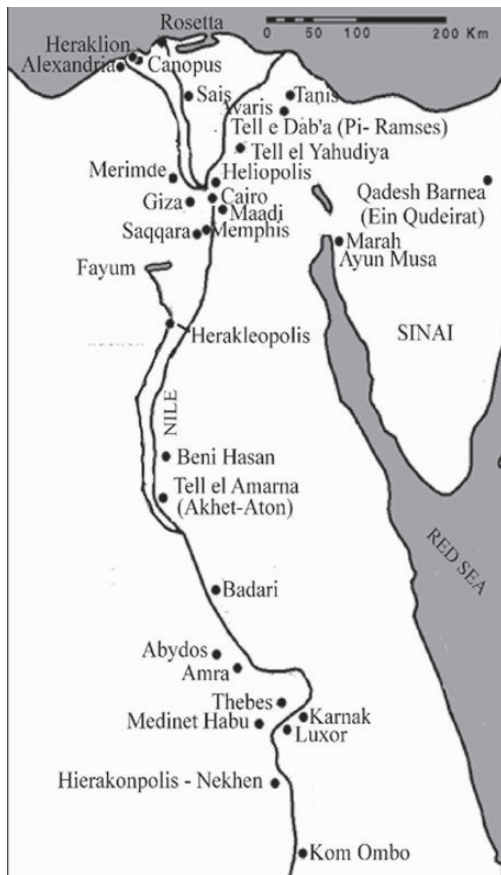
Figure 6.2: Map of Mesopotamia. **Source:** Issar/Zohar 2004/2007 reprinted with permission of Springer Verlag.



As the availability of water in a semi-arid region is seasonal and random the storage of water, on a seasonal and multi-annual basis is essential. Natural storage of water is provided either by sub surface water bearing rocks, or by rains falling on neighbouring areas where the climate is more humid. From this point of view the Middle East has a five-fold pattern. The most easterly fold, the Iranian plateau, depends on the storage of ground water in its alluvial fans. The valley of Mesopotamia (figure 6.2) depends on the subsurface storage of the Tauride and Zagroide mountain chains, from which the big springs feeding its big rivers emerge. The most south-western river valley of the Nile (figure 6.3) depends on the humid and semi humid climate system of the tropics and subtropics. The central mountainous terrain, in which the Judean-Syrian arch (figure 6.4) interconnects with the Taurides and Zagroides arches (figure 6.5), the storage is provided by ground water aquifers, built mostly of karstified limestone rocks (Shuval/Dweik 2007).

Artificial storage is either by irrigation, when water available during the rainy season is stored in the soil, or by cisterns and dams. The history of the spread and survival of human societies in this region was interrelated with his capacity to invent new methods of storage (Issar 2007a).

Figure 6.3: Map of Egypt. **Source:** Issar/Zohar 2004/2007 reprinted with permission of Springer Verlag.



Through the long history of this region, the two great rivers flood plains of the Euphrates and Tigris (figure 6.2) as well as of the Nile (figure 6.3) have been the locales of big water projects, contrived by states and empires while the mountainous regions have typically been subdivided into small ethnic and often political entities, each drawing an independent water supply from springs and wells, plus rainwater collected in cisterns.

Historically, the low-land empires repeatedly endeavoured to exploit the diversity of resources available in the adjoining hills and the mountains to widen their own imperial domains (table 6.1, figure 6.6). Thus, warfare with neighbouring native tribes or nations and collisions with similar aspirations of another power were unavoidable: examples were the Akkadian empire of the third millennium BCE, the Egyptians and Hittites of the second, or the Assyrian and Persian Empires the latter emerging from the irrigated plains of their dissected plateau joined the contest. Later on, Hellenistic dynasties and Rome extended

Figure 6.4: Map of the Levant. **Source:** Issar/Zohar 2004/2007 reprinted with permission of Springer Verlag.



their rule over the whole region. Roman dominance cannot be understood without appreciating the efforts invested in civil engineering, such as aqueducts and roads. The conquest of the entire area by the Arabs under the banner of Islam, with the exception of the northern highlands, concurred with one of the warmest and driest periods in recorded history (Issar 1990, 2003; Issar/Zohar 2004, 2007).

Special sections dedicated to various important topics are appended. The first deals with the technological evolution of means of harvesting, storage, transportation, and lifting of water. Irrigation methods, from simple ditches and canals bringing water from the outlets of springs to diversion dams on small rivers and the large-scale irrigation systems of Mesopotamia and Egypt, to the Roman aqueducts are described and their history discussed. Water wells as a system to draw water from subsurface storage since the Neolithic period to modern times include the Iranian Qanats (i.e. chain of wells), the deep rock-cut wells and galleries of the Canaanite and Israelite walled cities, the storage systems of reservoirs and cisterns, as well as the evolution of devices for lifting water (Issar 1976, 2007a, 2007b).

Figure 6.5: Map of Anatolia. **Source:** Issar/Zohar 2004/2007 reprinted with permission of Springer Verlag.

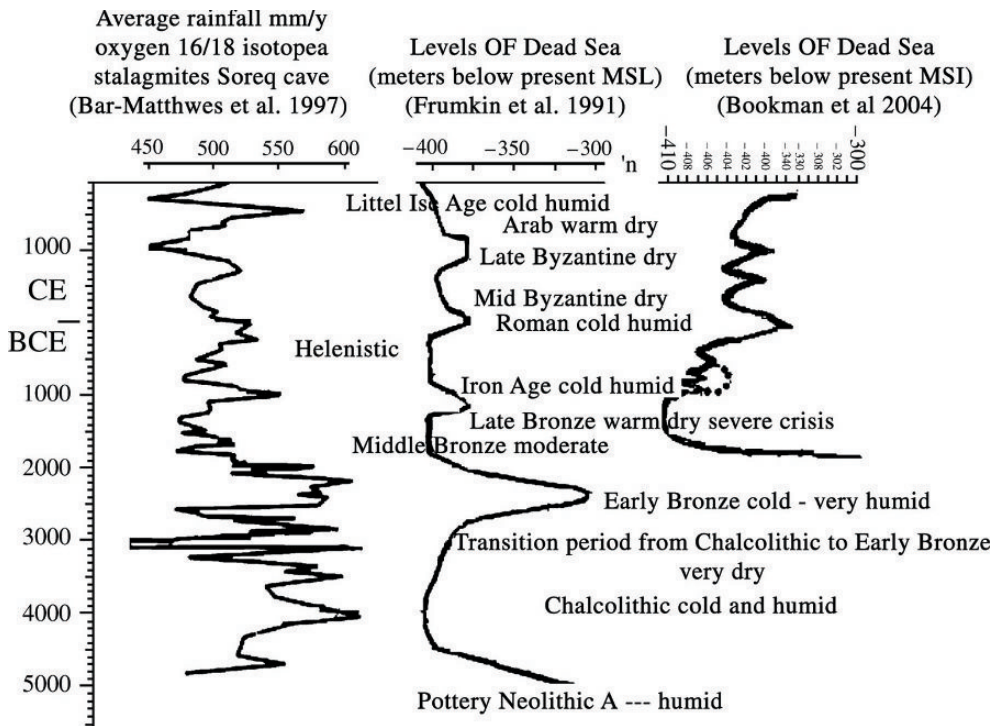


Table 6.1: General historical archaeological timetable for the past ten millennia in the Near East. **Source:** Issar/Zohar (2004: 14, 2007: 12) reprinted with permission of Springer Verlag.

	EGYPT	SYRIA-PALESTINE	MESOPOTAMIA	ANATOLIA
2000	Mamluk/Ottoman	Mamluk/Ottoman	Seljuk/Ottoman	Seljuk/Ottoman
1000	Early Arab Period	Early Arab Period	Early Arab Period	Roman/Byzantine P.
C.E	Roman/Byzantine P.	Roman/Byzantine Period	Parthian/Sassanian	Persian/Hellenistic
B.C.E	Ptolemaic Period	Persian/Hellenistic Period	Persian/Hellenistic	Iron Age
1000	Late Period	Iron Age II	Assyrian/Neo-Babylon	Iron Age
1000	New Kingdom	Middle/Late Bronze Age	Old/Middle Babylonian	Middle/Late Bronze
2000	Middle Kingdom	Intermediate Bronze Age	Akkad/Ur III/Isin	Middle/Late Bronze
3000	Old Kingdom	Early Bronze Age II/II	Early Dynastic I-III	Early Bronze Age
4000	Archaic Period	Early Bronze Age I	Jemdet Nasr	Early Bronze Age
4000	Pre Dynastic Period	Mature Chalcolithic	Gawra (N)/Uruk (S)	Late Chalcolithic
5000	Neolithic Period	Early Chalcolithic	Ubaid (N & S)	Middle Chalcolithic
6000	Neolithic Period	Pottery Neolithic A/B	Halaf (N)/Ubaid (S)	Early Chalcolithic
7000	Neolithic Period	Pre-Pottery Neolithic A/B	Hassuna/Samarra (north only)	Ceramic Neolithic
7000	Various Epi-Palaeolithic Cultures	Pre-Pottery Neolithic A	Pre-Pottery Neolithic (north only)	Early Ceramic Neolithic
		Pre-Pottery Neolithic A	Pre-Pottery Neolithic (north only)	Early Ceramic Neolithic
		Natufian		Aceramic Neolithic
		Epi-Palaeolithic:Kebaran		Epi-Palaeolithic Period

Other appendices deal with isotopes, pastoral nomadism, languages, and problems of the Egyptian chronology.

Figure 6.6: Main Climate Changes During the Past 7,000 Years. **Source:** Bar-Matthews/Ayalon/Kaufman 1998; Frumkin/Magaritz/Carmi/Zak 1991 Bookman/Enze/IAgnon/Stein 2004.



6.3 From the Palaeolithic to the Pre-Pottery Neolithic Period (from 2 Million to 8000 Years Ago)

During the last glacial period, the Fertile Crescent went through a series of cold and mainly humid phases during which many lakes spread out over wide areas. For example, the Dead Sea was about 200 meters above its present level and its precursor, the Lisan Lake, extended to the Sea of Galilee. Flint tools found in deposits of dried up lakes and springs in what is now the desert bear evidence to the fact that the presently arid lands were once hospitable to vegetation and life. When the glaciers in the higher latitudes melted due to the warming climate and reduced precipitation, the lakes and springs in the middle latitudes dried up. As a consequence, the vegetation and animal or human life retreated to refuge areas along perennial rivers and spring outlets emerging from water bearing rocks fed by rains falling on more humid terrain. The apparently earliest known sedentary settlements, such as Natufian Jericho and Mureybet in northern Mesopotamia as well as many other sites along the inner flank of the Fertile Crescent, bear witness to the initiatory steps of its peoples to become

settled. It was during this period of steady desiccation that in some refuge areas the first attempts of sowing of grain outside its natural habitat took place (preceded or concurrent with the domestication of animals) and ushered in the agricultural revolution of the Neolithic Period (Flannery 1973; Ovadia 1992; Zohary/Hopf 1994, Zohary 1999).

It is thus argued that the inhabitants of the Near East were among the first to respond to the post-glacial warm and dry climate conditions by developing agriculture and herding as a way of life. However, the warming and increasingly arid climate brought more randomness in the availability of water and thus fluctuations in the supply of food growing naturally and without human help. In order to overcome this new state of affairs, agricultural settlements were established near perennial sources of water allowing irrigation of the crops. For instance, a well from the Neolithic period was discovered in the coastal plain of Israel. The domestication of the goat enabled the dispersal of human societies into the desert fringe. The herders overcame the randomness of the natural system by thinning out their herds over large territories and moving from one grazing ground and water resource to another: Throughout human evolution mo-

Table 6.2: Historical archaeological timetable of the Near East, from 10,000 to 3,000 BCE. **Source:** Issar/Zohar (2004: 43, 2007: 41) reprinted with permission of Springer Verlag.

years B.C.E	EGYPT	SYRIA-PALESTINE	MESOPOTAMIA	ANATOLIA
3000	Archaic	E.B. I (Transitional)	Jemdet Nasr	Early Bronze IA
4000	Gerzean (Naqada II & III)	Mature Chalcolithic (Ghassulian/Beer Sheva)	Gawra I-III (N)/ Early Late Uruk (S)	Late Chalcolithic
	Amratian (Naqada I)	Early Chalcolithic	Ubaid III & IV (South & North)	Middle Chalcolithic
5000	Badarian	Late Pottery Neolithic (Wadi Rabah)	Halaf (N) Ubaid 0, I, II (S)	Early Chalcolithic
6000	Neolithic: Fayum A	Munhatta	Samarra	Late Ceramic Neolithic
	Merimde	Early Pottery Neolithic (Yarmukian)	Hassuna	Early Ceramic Neolithic
7000	Beni Salame	Pre-Pottery Neolithic B	Proto-Hassuna	Pre-Pottery Neolithic B
	?			
8000	Fayum B/ Qarunian?	Pre-Pottery Neolithic A	Pre-Pottery Neolithic A	Aceramic Neolithic
9000	?	Natufian	Natufian	Hallan Çemi Phase
10,000	Epi-Palaeolithic	Geometric Kebaran A and B/ Harifian		Epi-Palaeolithic

bility was a primary tool of survival which by now had acquired a new dimension (Muzzolini 1983; Zohar 1992).

In conclusion, the peoples of the ancient Near East overcame the constraints caused by the warmer climate by modifying the natural environment and fitting it to its own rhythm and requirements. By around 6000 BCE the shift from a summer and winter rain regime to the present Mediterranean system of wet rainy winters and warm dry summers caused a severe crisis which coincided with the end of the Natufian-PrePottery Neolithic cultural traditions of the Near East. At that time, the first agrarian villages appeared throughout the Mediterranean islands and countries and southern Europe, whether by diffusion or by acculturation, but probably both, is still an open question. Meanwhile, foraging, fishing, hunting, and incipient cattle herding continued in the subtropical parts of the Sahara and the Arabian peninsula, an area influenced by the subtropical rain systems which had moved northward. Many lakes covered vast areas of the Sahara as well as central Arabia and were surrounded by subtropical vegetation (Petit-Maire 1980, 1987; Kuper/Kroepelin 2006).

6.4 The Great Transition - From Farming Villages to Urban Centres

Oxygen and carbon isotope ratios in cave and lake deposits show that around 4500 BCE the climate became colder and thus more humid all over the Fertile Crescent. Agricultural settlements re-appeared in areas which were not settled during past millennia.

In the eastern part of the Fertile Crescent, people had descended from the highlands to settle in the lower part of the valley along the rivers of the Euphrates and Tigris and began to build the first agricultural urban centres in the lower Mesopotamia. In order to ensure the success of their crops, irrigation methods based on diversion dams and canals from the big rivers had to be developed which needed an ever growing complex of engineering, organization and control (Lloyd 1978).

The interaction between human society and a basically hostile local nature in need of harnessing promoted organization of labour, hierarchy of society, complex administration, and conceptualization of authority by installing cult institutions. In the western end of the Fertile Crescent, terraces for controlling flash floods were built in the desert of the Negev, and

Table 6.3: Historical archaeological timetable of the Near East, from 3,000 to 1,500 BCE. **Source:** Issar/Zohar (2004: 100, 2007: 104) reprinted with permission of Springer Verlag.

years B.C.E.	Egypt	Syria-Palestine	Mesopotamia	Anatolia
1500		Middle Bronze Age		Middle Bronze Age
1600	2 nd Intermediate Period, 13 th -16 th Dynasty	IIC	Old Babylonian and Old Assyrian Period	III (Old Hittite Period)
1700		IIB		II (Assyrian Trade)
1800	Middle Kingdom	IIA (Canaanite Period)		Middle Bronze Age I
1900	11 th -12 th Dynasty		Isin-Larsa Period	
2000		Intermediate Bronze Age (M.B. I)	Ur III Period	Early Bronze Age IIIB
2100	1st Intermediate Period, 8 th -11 th Dynasty			Early Bronze Age IIIA
2200		(Syria E.B. IV)	Akkad Period	
2300				
2400	Old Kingdom	Early Bronze Age IIIB/C	Early Dynastic Period IIIB	
2500	3 rd -6 th Dynasty		Early Dynastic Period IIIA	Early Bronze Age II
2600		IIIA	Early Dynastic II	
2700	Proto-Dynastic	Early Bronze Age II	Early Dynastic I	Early Bronze Age IB
2800				
2900				
3000	1 st -2 nd Dynastic		Jemdet Nasr	

copper metallurgy was introduced, probably by people originating in the northern highlands of Anatolia and Caucasia (Ilani/Rosenfeld 1994).

In northern Africa the subtropical rain belt eventually retreated southward and caused the Sahara to dry out; some of its former inhabitants moved into the Nile Valley and adopted an agricultural way of life laying the foundations of the Egyptian civilization (Caton-Thompson/Gardner 1934).

The magnificent Chalcolithic cultures of the Levant with their artistic tradition and technical knowledge lasting for about thirteen centuries disappeared towards the end of the 4th millennium BCE. Its disappearance was explained in various ways, either by way of invasion of other peoples and/or by the devastations at the hand of the Egyptian armies who had invaded the southern parts of the Levant. Yet, archaeological remains do not reveal any indications of warfare or destruction. The examination of the isotope and paleo-environmental data, on the other hand, shows that the whole region underwent another severe dry climate phase, which lasted for about 200 to 300 years (Helms 1981). It is probable that during this period specialized pastoral nomadism (Khazanov 1984; Zohar 1992) began to spread in the wake of the Secondary Product Revolution (dairy products,

sheep wool, and using animals for traction, transport, and riding.

6.5 The Early Bronze Age - The Urban Revolution and the Dawn of History

After a relatively short warm and dry period and a retreat of the front line of agriculture, a colder and wetter climate affected again the Fertile Crescent. For the Mesopotamian plain it brought in its wake not only surplus of food and unprecedented population growth but also great floods which destroyed many cities, a commonplace experience which was apparently memorialized in the ancient Babylonian myths and the Biblical story of the Flood (Khazanov 1984, Speiser 1969).

The myths of creation and elaborate cults were canonized, and codes of laws were established in order to explain randomness of nature as well as to safeguard laws guaranteeing the structure of organized society: Civilization was born.

Going west, people, whose only remains consist of stone built tombs and tumuli, settled the grasslands bordering the Fertile Crescent. In the Levant, fortified

Table 6.4: Historical archaeological timetable of the Near East, from 1,500 to 100 BCE. **Source:** Issar/Zohar (2004: 154, 2007: 158) reprinted with permission of Springer Verlag.

years B.C.E	EGYPT	SYRIA PALESTINE	MESOPOTAMIA	ANATOLIA
100	Roman	Period	Parthians	Roman Period
200	Ptolemies	Hasmonaeans	Seleucids	Kingdom of Pergamon
300	Hellenistic Period Near East Unified by Macedonian-Greek Civilization			Miletos Destroyed
400	"Return to Zion"			
500	Persian Period Near East Unified by Achaemenid Empire			
600	Late (Saitic) Period 26th-30th Dynasty	Neo-Babylonian Empire		Iron Age: Lydian, Archaic
700	3rd Intermediate Period 21st-25th Dynasty	Iron Age II	Assyrian Empire	Greek, Phrygian and Urartian Periods
800	(Libyan & Kushite Period)	Israelite, Neo-Hittite and Aramean Period	Neo-Hittite (or Luwian) and Aramean Kingdoms	Neo-Hittite (or Luwian) Kingdoms
900	Ramesside Period 19th-20th Dynasty	Iron Age I	Middle Babylonian (Kassite), Middle Assyrian and Mitannian Period	"Dark Age"
1000		Late Bronze III		Late Bronze Age
1100		Late Bronze II		Hittite Empire
1200		Late Bronze I (Canaanite Period)		Middle Hittite Period
1300	New Kingdom 18th Dynasty			
1400				
1500				

towns and later cities were built, the largest centres of population this area has seen until the modern period.

The early pre-Pharaonic kingdoms of the Nile valley were united during the Old Kingdom to form the land of Egypt, its most famous legacy being the pyramids erected as royal tombs. In the coastal lands and on the islands of the Mediterranean Sea megalithic tombs and temples mushroomed. For instance, on Malta colossal temples were built, allegedly to worship the Great Goddess of Fertility (Zohar 1996).

In the Indus valley the first signs of what was to become the later Harrapan civilization were seen, its cities founded towards the end of this period. In China's Yangzi River flourished the Liangzhu culture, famous for its jade and sumptuous royal tombs containing dozens, sometimes hundreds, of slaughtered human victims. The organization of human societies into river agglomerates of kingdoms on one hand and towns or city-states in the intermountain valleys on the other hand seems now to have been well established (Adams 1981; Maisels 1993, chaps. 5-8; Kenoyer 1998).

6.6 Dark Age, Renaissance and Decay – The Intermediate to the End of the Late Bronze Age

A variety of evidence from all over the globe shows that towards the end of the 3rd millennium BCE the climate became warmer on a global scale. Again, it caused the glaciers to melt and the oceans' level to rise flooding coastal areas. In the Near East, by contrast, the levels of the lakes dropped and the deserts expanded. Mesopotamia dried up and its soils became increasingly salinized (Jacobsen/Adams 1958; Jacobsen 1957-1958).

The drying up of the semi-arid regions triggered the movement of its inhabitants towards the remaining greener areas. According to Mesopotamian historical sources, the semi-nomadic Amorites invaded the plains of the Euphrates and the Tigris. A related aggregate of warring folks of the northern part of the Fertile Crescent moved southward, dominated Canaan by building fortified cities, and subsequently even penetrated and ruled parts of Egypt, to the Greek historians known as Hyksos (Redford 1993; Josephus Flavius 1960).

As the plains of central Asia and the Iranian plateau became drier, its inhabitants migrated west and south. It could well be that among them we could have found the first groups of speakers of Proto-Indo-Europeans infiltrating into Europe, Anatolia, Iran, and India (Mallory 1989). The coastal territories of many Mediterranean islands were lost. Malta's temples' culture and its sophisticated art vanished. Immigrants from Anatolia (fleeing the Luwians and Hittites?) settled in Crete and founded the Minoan 'palace' civilization (Zohar 1996; Trump 1990).

Once the climax of climate change was over, the societies in those areas which were most affected developed new methods to cope with scarcity of water and food. The inhabitants of the new Middle Bronze Age cities of Canaan developed their sub-surface water systems to irrigate land and withstand siege in their fortified cities. In Mesopotamia and Egypt new and impressive water projects on a wide regional basis were built. Eventually, the climate ameliorated and a more humid climate followed (figure 6.6). Egypt benefited most and was able to expel the 'Asiatics'. By pursuing them into their homeland, the Egyptian New Kingdom established its hegemony over most parts of the Fertile Crescent and eventually collided with the powers of northern Mesopotamia and Anatolia.

6.7 Migrations and Settling (The Early Iron Age)

After a short period of a mild climate, another short but marked warm phase around 1300 BCE hit central Eurasia and triggered a complicated domino-like movement of various peoples, among them the so-called Sea Peoples. Some of these populations may have originated in the Balkan peninsula or Anatolia, and from around the Aegean Sea; others probably from different Mediterranean lands and islands. They appeared to have moved by land and by sea into the Fertile Crescent in reaction to the disintegration of the Mycenaean civilization, the destruction of the Hittite empire, and the Canaanite cities along the Levantine coast. Egypt appears to have fought back, first against the Libyans, then against the 'Sea Peoples' and settled some of along the coast of Canaan to form the alliance of Philistine cities. The Hebrews (probably derived from *habiru*, i.e. pastoral nomads) roaming along the desert fringe belt had to enter the green lands and settle down, either peacefully or by force. The camel has finally become fully domesticated and

enabled a small population of oasis dwellers to live in the desert.

It was also the time of the disintegration of the Harappan or Indus civilization in north-western India as well as the end of the Shang Dynasty in China.

6.8 The Age of Iron and of Empires: The Persian, Hellenistic And Roman-Byzantine Empires

After a short moderate climate interlude, a cold global spell characterized the turn of the first millennium BCE. The level of the lakes in the Mediterranean countries and in the Near and Middle East rose: for instance, the Dead Sea by about 50 meters (its total rise during the Last Glacial period was 200 m). The levels of the crater lakes in Italy rose, too, and an intricate gallery in order to drain Lake Fucino was started by Claudius and finished by Hadrian (Giraudi 1989).

The grasslands and semi-deserts of the Levant flourished, allowing the build-up of an extended trade network. The Israelites, the Aramaeans, and the Nabateans all have built their cities and developed terracing and magnificent irrigation systems (Ron 1985; Ron 1986).

In contrast, in more northern latitudes a series of invasions of nomadic tribes encroached, again and again on the frontiers of the Roman, Persian and Chinese empires due to the shortening of the warm and dry season from the cold steppes of central and north-eastern Asia. To protect their empire the Romans built a line of fortifications, the *limes*, while the Chinese completed the Great Wall. In the same time, hunger and strife due to the failure of rice crops characterized the Kofun (royal mound graves) Period in Japan (Sakaguchi 1983).

6.9 Crusaders, Mamluks and Ottomans on the Eve of the Industrial Era: Islamic Period to Present

At ca. 600 AD the global climate turned warm and dry again. The sea level began to rise and gradually covered Roman port installation and other buildings all along the former shorelines, all the way from Caesarea in Palestine to Cadiz in Spain. On the other hand, the level of the Dead Sea fell below that of the present and its southern shallow part dried up (Bookman/Bartov/Enzel/Stein 2006).

Table 6.5: Historical archaeological timetable of the Near East, from 0 to 1,500 CE. **Source:** Issar/Zohar (2004: 219, 2007: 223) reprinted with permission of Springer Verlag.

years C.E.	EGYPT	SYRIA-PALESTINE	MESOPOTAMIA	ANATOLIA
1500	The Near East becomes part of the Ottoman Empire, end of Middle Ages			
1400	Mamluk	Period	Il-Khanate	1453 fall of Constantinople Ottoman Empire
1300			Mongol Invasions	
1200	Ayyubids	Zengids		Seljuks of Rum and Armenian Kingdoms
1100		Crusader's conquests	Great Seljuks	
1000				Middle Byzantine Period
900	Fatimid Period			
800		Abbasid and Ummayyad Dynastic Caliphates		
700				
600	———— Spread of Islam ————			
500	Byzantine Empire		Sassanids	Early Byzantine Period
400				
300	———— Spread of Christianity in Near East. ————			
200	Roman Empire		Sassanids	Roman Empire
100			Parthians	
0		70 Jerusalem destroyed		

As the tropical monsoon rain regime became stronger, the level of the Nile inundations rose. Silts and sands carried from the Nubian Desert and blown in from the coast of northern Africa covered most of the coastal plain of Palestine. The once flourishing Roman-Byzantine cities along the border of the desert were abandoned, becoming stony ghost towns. Northern and central Arabia also became drier due to its dependence on a weakened system of the west-lies, its oasis population on the brink of starvation. The desertion of the *limes* settlements of the Byzantine Empire and the collapse of Sassanid Persia, facilitated the momentum of the invasion of the Arab tribes under the banner of Islam, enabling them to conquer not only the entire Fertile Crescent, but also northern Africa until the Iberian Peninsula and Iran (Donner 1981). A wave of Turkish tribes mixed with Indo-Iranians, Avars and Bulgars, caused the Slavs to penetrate eastern Europe and the Balkan peninsula.

Ca. 900 AD the warm climate reached its climax in parallel with the optimal conditions in Europe where an increase in population created a deficiency of cultivatable land. Around 1000 AD started a cooler phase. Are we correct in connecting these abrupt climatic transitions with the push south of new Turkish tribes and the Hungarians in the east and the Nor-

mans in the west? The second wave from Europe, known as the crusades, started half a century later on the initiative of the Catholic Church, joining forces with the Normans. Whereas the effect of the colder and, therefore, worsening conditions in Europe are on the rise, the Near East became increasingly more hospitable. Here, Turkish Moslems' states and Christian kingdoms rise and fall during two centuries. Slowly the climate becomes still colder and the Little Ice Age prevailed in Europe. With it the Mamluk State flourished, to be replaced by the Ottomans in the early 16th century who remained the rulers of the region for about four centuries (Inalcik 1970; Lord Kinross 1977).

6.10 An Epilogue

The proxy-data time series and tree ring data available from various parts of the Near East show a phase of warming, and thus drying, of the Levant beginning in the first half of the 17th century. This turn of fate led to a general trend of desertion of the villages and decline of agriculture in the central and southern parts of the coastal plain of Palestine. This may have been also the period when the sand dunes completed their conquest of Palestine's coastal plain. It was also the

period at which the Ottoman Empire began its decline (McCarthy 2001).

On the other hand, the scientific and industrial revolutions in Europe enabled its countries to procure colonies and spheres of influence all over the world, including the Near East. Dams were built on the large rivers of the region and irrigated land was extended. Modern methods of excavation of wells and pumping of water improved the state of agriculture (Issar 2007a).

Pogroms in Europe brought many Jews to immigrate to this region and establish agricultural settlements, and later acquire independence. The settler's applied modern methods of irrigation and land management and regions hitherto covered by sands and marshes become arable land (Issar 2007a).

A natural trend of warm climate started about a century ago. Simultaneously, recent observations show that the quantity of the carbon dioxide in the global atmosphere is on the increase claimed to be due to global industrialization. Whatever the reason, the knowledge of the past tells us that the Near East will again become drier and tensions will increase unless a solution to the water problems of the region on an international scale will take place (Issar 2007b).

7 Human Security, Climate Change and Small Islands

Yannis N. Kinnas

7.1 Introduction¹

This chapter examines the impact of climate change on *Small Island Developing States* (SIDS) and its consequences on the human security of their populations. This theme is elaborated by focusing on the linkages among climate change, poverty alleviation, the social cobweb, political stability, and peace through a more holistic definition of security. Pre-existing economic, social, and physical conditions influence how an island is affected by a hazard or climate change (Tompkins/Nicholson-Cole/Hurlston/Boyd/Brooks Hodge/Clarke/Grey/Torz/Varlack 2005: 11). At the International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States in Port Louis, Mauritius on 10–14 January 2005, UNEP presented an *Environmental Vulnerability Index* (EVI) for SIDS.²

Vulnerability differs according to space and time, the priorities existing in a society, the perceived and real threats in various scholarly and policy communities. Some threats or events, which are perceived by one community, may be of minimal importance for another. One unifying aspect of security and risk is the survival imperative, which changes the priorities, according to space, time, and severity of events or phenomena.

“In all considerations on security (and vulnerability), be it international or internal, two elements are crucial: *prediction* of threats (risks, dangers, disturbances), and designing of actions necessary to *respond* to those threats” (Mesjasz 2008). According to

John Coomber (2005) of Swiss Re: “You identify risk. You manage it. You set in place a programme. You measure it. You identify ways to mitigate it.” In the case of climate change, “mitigation will take the form of building, construction standards, location of buildings, flood defences”.³

“There is no consensus on definition, criteria and indicators for the measurement of vulnerability” (Brauch 2005a: 41). According to the Intergovernmental Panel on Climate Change (IPCC), vulnerability is a function of the change to which a system is exposed, its sensitivity, and its adaptive capacity (IPCC 2001b). In a rapidly changing, complex, and interdependent world, vulnerability can only be attacked by increased resilience. In particular, “the vulnerabilities of small islands have increased over the last decade whilst resilience has not kept pace” (Howorth 2005: 225). “The concepts are related in non trivial ways. For example, vulnerability is not the opposite of resilience” (Jansen/Ostrom: 2006: 11). And further: “There are implications of globalization on the resilience, vulnerability and adaptability of social-ecological systems at scales ranging from the local to the global.”

This chapter discusses linkages between human security and the impact of climate change on SIDS. First the concept of human security (7.2) is introduced and applied to climate change (7.3), its relevance for human security (7.4), and its specific impact on the sea and on SIDS (7.5) are discussed. A key assumption is that risk - understood as the probability of expected losses - can be quantitatively determined as a function of hazard, exposure of the element at risk and vulnerability.

1 The author wishes to thank Hans Guenter Brauch and two anonymous referees for their valuable comments to an earlier draft of the text.

2 See the “Islands Web Site”, at: <<http://islands.unep.ch>> that offers access to information on islands and small island developing states (SIDS) especially from within the United Nations system; See the *Environment Vulnerability Index* (EVI) at: <<http://www.vulnerabilityindex.net/>>.

3 The *Clinton Global Initiative* (CGI), a non-partisan project of the *William J. Clinton Foundation*, is a catalyst for action, bringing together a community of global leaders to devise and implement innovative solutions to some of the world’s most pressing challenges; at: <<http://www.clintonglobalinitiative.org>>.

7.2 Security Concepts

Globalization and climate change require a new approach to security in the coming decades. Security is both global and human, and it transcends the traditional approach of 'national security'. Human security has become a cornerstone for survival, because human beings are increasingly vulnerable. According to the *United Nations Millennium Declaration* (2000, section I, §6), for every person there must be 'freedom from fear' and 'freedom from want', which requires human security and poverty alleviation respectively. This approach was further developed in the report *Human Security Now* (CHS 2003). Bogardi and Brauch (2005: 85–109; Brauch 2005, 2005a) suggested a third pillar for human security as 'freedom from hazard impact', which may also be classified as a subcategory of 'freedom from fear'.

The impacts of a natural hazard may differ in several societies. The reasons that a risk may result in conflict can be traced to culture (Kinnas 2001), a lack of infrastructure and/or different priorities. Climate change has contributed to an increase of vulnerability and uncertainty.

According to the report on *Human Security Now* (CHS 2003), human security requires 'protection' and 'empowerment'. It means protecting people from critical and pervasive threats and situations, and building on their strengths and aspirations. It also means creating systems that give people the building blocks of survival, dignity, and livelihood. Thus, human security connects different types of freedoms – 'freedom from want', 'freedom from fear' and 'freedom to take action on one's own behalf'. Kazuo Ogura (2004) suggests that for coping with threats to human security one should distinguish at least three approaches: a) protection from genocide or violation of human rights by civil war combatants of dictatorial military regimes; b) protection from hunger and poverty; and c) a wider approach for human security which includes protection from environmental degradation, terrorism, infectious diseases, international crime and similar risks. According to Ogura the latter constitutes a new type of threat to humanity in general. It is obvious that (b) and (c) are closely linked. A series of international agreements covering security and sustainable development was adopted (Mirovitskaya/ Ascher 2001).

In the perspective of the United Nations University, Environment and Human Security Institute (UNU-EHS), safeguarding and improving human security requires a new approach that would enable a

better understanding of many interrelated variables – social, political, institutional, economic, cultural, technological, and environmental. Deterioration of these factors amplifies the impacts of environmental change and their superposition with the consequences of extreme events when they occur. When the availability of resources and services is undermined, the resulting insecurity can range from hunger and susceptibility to disease, to loss of income and livelihood, to social tensions and open conflict, and to an acute vulnerability to natural hazards. Such vulnerability is apparent in SIDS.

According to Mary Kaldor "conventional military forces organized to defend borders or fight wars are not able to cope with the new sources of insecurity."⁴ Human security refers to the protection of individuals, as opposed to 'state security', which refers to the defence of borders. The European Union can now promote human security in its *European Union Security Strategy* (European Council 2003), which entails a military – civilian planning and integration of environmental issues into external relations. In October 2001, the European Commission and the European Space Agency launched a plan of action for a *global monitoring for environment and security* (GMES), which is supposed to provide Europe by 2008 with an independent, operational capacity.

The growing recognition worldwide that concepts of security must include people as well as states has marked an important shift in international thinking during the past decade. The report on *The Responsibility to Protect* (ICISS 2001) focuses attention on basic human needs (Kinnas 1992). According to the official Canadian perspective, human security refers to the security of people – their physical safety, their economic and social well-being, respect for their dignity and the worth as human beings, and the protection of human rights and fundamental freedoms (ICISS 2001: 15).

For the *Human Security Network* (Dedring 2008; chap. 75 by Fuentes/Brauch) to enhance 'freedom from fear', to be productive, there is a need to find an appropriate balance between the international and national dimension. Such initiatives work best when they are tied to clear multilateral processes and need to complement rather than duplicate existing international initiatives (Hutton 2002). There is no contradiction between the promotion of human security and

4 Mary Kaldor: "A human security doctrine for Europe, and beyond", in: *International Herald Tribune*, 30 September 2004.

the maintenance of national security. The definition provided in the Science Plan of the *Global Environmental Change and Human Security* (GECHS) project (Lonergan 1999a: 29) is relevant for this chapter. It postulated:

human security is achieved when and where individuals and communities have the options necessary to end, mitigate, or adapt to threats to their human, environmental, and social rights, have the capacity and freedom to exercise these options, and actively participate in attaining these options.

However, the degree of security or insecurity depends to a large extent on actions or inactions of people. After the earthquake in Pakistan in 2005, soldiers did not act decisively because as they said, they had no orders. New initiatives may improve resilience to cope with emergency situations. Thus, it is useful to examine the linkages between vulnerability and human security. According to Vogel and O'Brien (2004), vulnerability approaches may be used to assess the seven categories of threats under the wide human security (UNDP 1994), each of them answering to the question 'vulnerable to what' (table 7.1).

Table 7.1: Seven dimensions of human security of UNDP and vulnerability concepts. **Source:** Adapted from Vogel and O'Brien (2004: 6); permission was granted.

Seven dimensions of human security	Types of vulnerability (vulnerable to what?)
<i>Economic security</i> (assured basic income)	Global economic changes
<i>Food security</i> (physical, economic, and social access to food)	Extreme events, agricultural changes, etc.
<i>Health security</i> (relative freedom from disease and infection)	Disease
<i>Environmental security</i> (access to sanitary water supply, clean air, and a non-degraded land system)	Pollution and land degradation
<i>Personal security</i> (security from physical violence and threats)	Conflicts, natural hazards, 'creeping disasters' (e.g. HIV/AIDS)
<i>Community security</i> (security of cultural integrity)	Cultural globalization
<i>Political security</i> (protection of basic human rights and freedoms)	Conflicts and warfare

These seven vulnerability types apply to SIDS. From a social view Cardonna (2004: 49) argues that "vulnerability signifies a lack or a deficiency of development" that often contributes to 'disaster vulnerability'. In his view, population growth, rapid urbanization, environmental degradation, global warming, international financial pressures, and war have all increased vulnerability.

In January 2005, the UN Conference on the Review of the Implementation of the *Barbados Plan of Action* (BPOA of 1994) focused on vulnerability and coping measures for SIDS. At this Conference the *Mauritius Declaration* was adopted that established a set of principles and measures, including the establishment of a regional natural disaster early warning system for the Indian Ocean and the ASEAN region.

While the tsunami in South East Asia in December 2004 illustrated the high vulnerability of small islands and low coasts, a larger scale problem will emerge from sea level rise, which threatens low lying lands with complete destruction. Another tsunami occurred during April 2007, at the Solomon Islands which devastated the region due to an earthquake of grade 8 magnitude in the Pacific.⁵ Sea level rise will be a threat associated with climate change, which is caused, inter alia, by anthropogenic interventions on nature. Other threats from climate change for SIDS include the rise of overall temperature and sea surface temperature, changes in rainfall patterns, in ocean acidity, and the intensity of tropical cyclones.

7.3 Climate Change

The UN Framework Convention on Climate Change (UNFCCC 1992) and the Kyoto Protocol (UNFCCC 1997) were adopted to mitigate the impact of the consequences of climate change and, indirectly, to improve human security by education and public awareness, so that people will be able to face a complex and vulnerable world and build preventive resilience, particularly in the SIDS.

Climate change has contributed to an expansion of the traditional narrow definition of 'international security', focusing more on environmental security (Brauch 2002, 2003, 2005). Poverty leads to insecurity and environmental degradation, e.g. of forests:

While forest degradation contributes to human insecurity, the reverse is also true. Insecurity in the form of

5 AFP: "Tsunami aux Salomon: treize villages rayés de la carte, au moins 20 morts", in: *Le Temps*, 3 April 2007.

chronic poverty, civil war or the mass movements of internally displaced people can destroy ecosystems and as resource rich, multifunctional systems, forests in particular often bear the brunt of insecurity (Hamill/Brown/Crawford 2005: 10).

As Strong (2001: 43) put it: “Climate change is shaping up as the mother of all environmental battles and it will not be resolved quickly or easily.” Climate Change is defined in art. 1,2 of the UNFCCC as follows: “Climate change means change of climate which is attributed, directly or indirectly, to human activity that alters the composition of the global atmosphere.” The Kyoto Protocol of 1997 entered into force in February 2005 after ratification by Russia (Korpoov/Karas/Grubb 2005). By 2012 industrialized countries are required to reduce their collective GHG emissions by 5 per cent, compared with the GHG emission levels of 1990.⁶

A basic weakness exists at the interface between technology and decision-makers; it remains almost impossible to eliminate human error. “The speed of technological change, whether reflected in new developments or new uses of existing technology, is faster than the ability of regulators and others involved in risk governance to fully assess and control the risks of these new developments” (Bunting 2005: 359). It is difficult to solve problems in climate change, and even if some are resolved the solutions may bear new problems. Environmental risks occur when an environmental hazard has the potential to inflict harm (Tompkins/Nicholson-Cole/Hurlston/Boyd/Brooks/Hodge/Clarke/Grey/Torz/Varlack 2005: 10). Therefore environmental risks are cardinal to the insurance sector (Raissouni 2001).

The IPCC⁷ has defined vulnerability from climate change in terms of three interrelated elements: *exposure*, *sensitivity*, and *adaptive capacity*. Sensitivity is the degree to which a system will respond to a given change in climate including beneficial and harmful effects, while exposure is the degree to which a human group of ecosystem comes into contact with particular stresses. Adaptive capacity is broadly defined as the ability or capacity of a system to modify or change its characteristics or behaviour so as to cope better with existing or anticipated external stresses (IPCC 2001b: 22). However, problem resolution often pro-

duces more complex issues. Environmental organizations have long argued that poverty and environmental degradation are interrelated, and have indirect impacts on environmental issues. Discussions on response strategies must be considered against the background of the poverty and environment relationship (Lonergan 1991: 41). The notion that there is both a pollution of affluence and a pollution of poverty has gained much broader acceptance (Conca/Dabelko 2004: 4).

The importance of the sea level rise, due to climate change, was emphasized by the former IPCC Chairman, Bolin.

Undoubtedly, the rise of the sea level that would be associated with a change of climate and its impact on the coastal zone is one of the most important issues needing our careful attention. The fact that a large part of the world’s population lives in the vicinity of the coast adds further justification to address this problem with some urgency (IPCC 1994: 3).

The term “in the vicinity of the coast” includes islands, and particularly the SIDS. If these islands are submerged or vanish completely, further deterioration of global social problems will occur. On 26 December 2004 the tsunami in the Indian Ocean resulted in approximately two million people without shelter. If there is no understanding of the urgency of the situation in the SIDS especially, and in African countries, global problems will become more acute. Thus, greater attention must be given to how the land is used or abused (Watson/Dixon/Hamburg/Janetos/Moss 2000). The use or abuse of land depends also on climate change, which may increase the probability and intensity of extreme weather events and may thus increase internal displacements, transboundary and even intercontinental migration, and in some extreme cases even crises and conflicts (Brauch 2005a).

The SIDS complain that many industrialized countries did not respond to their commitments regarding reduction of GHG emissions. While the EU tends to drive technology through its emissions trading scheme (ETS) policy, the US seems to rely on a policy based on technology. Jonathan Pershing (2006) of the World Resources Institute (WRI) stressed this linkage in a testimony before a US Senate Committee:

There is no single technology - no silver bullet - that can drive the scale of emissions reductions that are required; we must be prepared to rely on a portfolio of options. But there are many important and promising technologies - some ready today, and others on the verge or economic and technological breakthroughs - that have the capacity to reduce emissions cost-effectively.

6 The Protocol includes three flexible mechanisms in order to eliminate emissions: *Joint Implementation (JI)*, *the Clean Development Mechanism (CDM)*, and *the Emissions Trading Scheme (ETS)*.

7 IPCC was granted the Nobel Peace Prize for 2007.

Table 7.2: List of Small Island Developing States (UN Members). **Source:** UN Office of the High Representative for the least Developed Countries: *Landlocked Developing Countries and Small Island Developing States* (2005).

1.	Antigua and Barbuda	14.	Haiti	26.	Singapore
2.	Bahamas	15.	Jamaica	27.	St. Kitts and Nevis
3.	Barbados	16.	Kiribati	28.	St. Lucia
4.	Belize	17.	Maldives	29.	St. Vincent and the Grenadines
5.	Cape Verde	18.	Marshall Islands	30.	Seychelles
6.	Comoros	19.	Federated States of Micro-nesia	31.	Solomon Islands
7.	Cuba	20.	Mauritius	32.	Suriname
8.	Dominica	21.	Nauru	33.	Timor - Leste
9.	Dominican Republic	22.	Palau	34.	Tonga
10.	Fiji	23.	Papua New Guinea	35.	Trinidad and Tobago
11.	Grenada	24.	Samoa	36.	Tuvalu
12.	Guinea - Bissau	25.	Sao Tome and Principe	37.	Vanuatu
13.	Guyana				

In the European Union (EU),

the most recent official figures, for 2003, show that greenhouse gas emissions in the EU-25 are down by 5.5 per cent from their level in 1990. With current measures taken to reduce emissions, the EU-15 is estimated to achieve an overall reduction of 4.1 per cent below the base year by 2008–2012, and the EU-25 an overall reduction of 7 per cent. This is a good result, but it is not enough. More work is necessary if we are to reach our Kyoto target. (Dimas 2005).

Furthermore, Commissioner Stavros Dimas, speaking at the IPCC WGII in Brussels in April 2007 emphasized *inter alia* that:

The European Council has set out key targets that need to be included in a global and comprehensive new agreement that would take effect after the Kyoto Protocol targets expire in 2012. The group of developed countries must reduce its emissions to 30% below 1990 levels 2020. The EU has committed itself to take on this target in the context of an international agreement that comprises other industrialized countries. [...]

Naturally, no mandatory reductions would be asked for the least developed countries by 2020, should also participate although in a differentiated manner. Those among them that reach that level of economic prosperity similar to developed countries should take on obligatory emissions reduction commitments. These should reflect each country's per capita emissions, its potential to reduce them and its financial capacity.

According to the European Environment Agency (EEA 2006), action to combat climate change will deliver considerable ancillary benefits in air pollution abatement by 2030 so that overall costs of controlling

air pollutant emissions of the order of €10 billion per year will be reduced. In addition, such reduced emissions will lead to a fall in damage of public health and ecosystems. Further action to reduce air pollution is needed, including emissions from non land-based sources to move closer to the EU long-term objectives for improving air quality.

The 11th *Conference of the Parties* (COP-11) in Montreal in 2005 dealt also with the post-2012 period. There the *Meeting of the Parties* (MOP 1) for implementing the Kyoto Protocol was for the first time convened, and in March 2006 in Bonn the Committee on Compliance met for the first time. A three track approach (Tracks I, II, III) was finally adopted in Montreal under a compromise solution proposed by the Canadian Environmental Minister, Stephane Dion (Stostedt/Huber 2006). An impressive development in 2007 although without a follow-up was the discussion, after British initiative, for the first time during the 16 April 2007 session of the UN Security Council on climate change.⁸

7.4 Small Island Developing States (SIDS)

After the 1992 Rio Conference, the United Nations decided during the 48th General Assembly in 1993 (Res 48/193) that a Global Conference on the Sustainable Development of SIDS be convened in 1994 that

⁸ *New York Times*, 18 April 2007.

Table 7.3: List of Small Island Developing States (Non-UN Members/Associate Members of the Regional Commissions). **Source:** UN Office of the High Representative for the least Developed Countries: *Landlocked Developing Countries and Small Island Developing States* (2005).

1.	American Samoa	6.	Cook Islands	11.	New Caledonia
2.	Anguilla	7.	French Polynesia	12.	Niue
3.	Aruba	8.	Guam	13.	Puerto Rico
4.	British Virgin Islands	9.	Montserrat	14.	US Virgin Islands
5.	Commonwealth of Northern Marianas	10.	Netherlands Antilles		

resulted in the adoption of the *Barbados Plan of Action* (BPOA). During the first mid-term review (1999) no spectacular achievements were noted. During the second review meeting in Mauritius (2005) the official list of SIDS comprised 37 United Nations members (table 7.2) and 14 Non-UN members (table 7.3) associated with the Regional Commissions of the UN.

In addition to the SIDS there are the members of the *Association of Small Island States* (AOSIS), a larger group of countries, which emerged during the negotiations of the UN Framework Convention on Climate Change (UNFCCC). There are also bigger island states, such as Sri Lanka or Ireland, and tiny islands which belong to various states in the world (e.g. Hong Kong alone has over 260 islands). This latter category is the most vulnerable and they might vanish in the long run, depending on the specifics of sea level rise. The *Regional Seas Programme* of UNEP has been requested to play a central role, because all SIDS cooperate in at least one Regional Seas Programme. There is also provision for the SIDS in Agenda 21, Chapter 17, Section G.

The European Union also has introduced its *Islenet*, which is the *European Islands Network on Energy and Environment*, a network of the European island authorities to promote sustainable and efficient energy and environmental management (Howorth 2005).

According to the European Commission (COM 2006 248 final: 2) the Pacific ACP countries “are today experiencing a number of important challenges in terms of vulnerability, poverty and weak governance”. Six out of the fifteen Pacific island states are least developed. The Pacific Ocean covers one third of the Earth’s surface and somehow these islands are the guardians of the region, and the Pacific Ocean may be considered a global public good.

Consequently, “when communities make unsustainable demands and wrong priorities on ecosystems, this may result in an ecological breakdown, which in turn leads to worsening poverty, tensions

and even conflict” (COM 2006 248 final: 3). In general, the human security situation in the Pacific SIDS can be considered as fragile. Therefore, sustainable management and education is an imperative policy for them, as well as research cooperation to be promoted under the EU Research Framework Programme.

Capacity building, including financing, and access to environmentally sound technology are elements of cardinal importance in improving the resilience capacity of SIDS, which decreases due to external or internal factors. Such needs as those just mentioned were also emphasized during the 3rd Global Conference on Oceans Coasts and Islands in Paris (IISD 2006), and during the 14th session of the *Commission on Sustainable Development* (CSD) in New York in May 2006, where 8 May was devoted to SIDS.

The small island states constitute a priority issue on the global agenda. Saving their coral reefs is also a major activity in wildlife related treaties, such as the *Convention on Biological Diversity* (CBD) that includes a coral reef programme, and the *Convention on International Trade of Endangered Species* (CITES) that protects many coral as well as other species inhabiting reefs. The *World Summit on Sustainable Development* (WSSD) in 2002 adopted targets on sustainable reefs management and a plan of implementation (Hepworth 2003).

It is necessary that the carrying capacity of a coastal area or island must be constantly monitored. The specific development of a region can make islands and cities in coastal areas more attractive than others. Such cities present a special interest due to the particular role they may acquire as growth poles and gates to their hinterland in a broader process of spatial integration, but also as centres of growing economic activities such as tourism, transport, and fishing. Balancing tourism with an appropriate use of heritage constitutes a difficult task. Visitor numbers in SIDS should not exceed the islands’ ability to provide facilities without suffering damage, including their special character (Abrahams/Kelman 2005).

Table 7.4: Land Area and Population for Small Island States. **Source:** Brauch (2005: 68) based on IPCC 1998: 338; UN (2001). Reprinted with permission of the author.

Country	Land area km ²	Population (1995)		Population (2050)		Coastline length (km)	Tourists % of popula- tion (1997)
		in 000	Density pers./km ²	In 000	Density pers./km ²		
Atlantic Ocean							
Cape Verde	4,033	392	97	807		965	11.4
Sao Tome & Principe	960	133	139	294		209	
Caribbean Sea							
Antigua & Barbuda	280	66	236	73		153	364.2
Bahamas	13,935	276	20	449		3,542	586.4
Barbados	431	262	607	263		97	182.4
Cuba	110,861	11,041	100	10,764		6,073	10.5
Dominica	750	71	95	72		148	97.6
Dominican Republic	48,442	7,823	161	11,959	246	940	28.1
Grenada	312	92	295	105		121	116.2
Haiti	27,750	7,180	259	13,982	503	370	2.2
Jamaica	10,991	2,447	223	3,815	347	1,022	45.6
St. Kitts & Nevis	1,269	41	152	34		135	210.5
St. Lucia	616	150	244	189		158	164.7
St. Vincent & Grenadines	389	112	288	138		84	54.6
Trinidad & Tobago	5,128	1,306	255	1,378		3,760	28.7
Indian Ocean							
Comoros	2,171	653	292	1,900	875	340	4.9
Maldives	300	254	854	868	2,893	644	130.7
Mauritius	1,850	1,117	547	1,426	770	177	46.4
Seychelles	280	73	261	145	517	491	166.7
Pacific Ocean							
Cook Islands	236	(20)	x	27		120	
Federation of States of Micronesia	720	(123)	x	269		6,112	
Fiji	18,272	784	43	916		1,129	45.3
Kiribati	728	79	109	138		1,143	
Marshall Islands	181	(383)	x	413		370	
Nauru	21	11	523	26	1,238	30	
Palau	497	(19)	x	39		x	
Samoa	2,842	171	61	223		403	31.1
Solomon Islands	28,446	378	13	1,458		5,313	3.7
Tonga	697	98	141	125		419	
Tuvalu	26	10	385	16	615	24	
Vanuatu	14,763	169	14	462		2,5287	27.1

According to the *World Meteorological Organization* (WMO), many human settlements are already facing increased risk of coastal flooding and erosion, which could be exacerbated by sea level rise and storm surges. Tens of millions of people living in deltas, low lying coastal areas, and on small islands, will face the risk of displacement and loss of infrastructure, despite substantial efforts and costs to protect vulnerable coastal areas. The predicted future climate will place these populations, especially those on small islands, at particular risk of severe social and economic effects (WMO 2003). This challenge will become even more acute due to the projected population change (table 7.4).

The *Mauritius Declaration* of January 2005 includes, *inter alia*: a reaffirmation that SIDS continue to be a special case for sustainable development (§5); a welcome to the proposed establishment of a regional natural disaster warning system for the Indian Ocean and the ASEAN region (§7); the recognition that good governance is essential for sustainable development (§11); the impact of health issues (§7); the adoption of the Mauritius Strategy for the further implementation of BPOA (§18); and the recognition that international trade including services is important for building resilience and sustainable development (§13). It is evident that sea level rise has become a manifold security challenge for SIDS, bearing on their very existence in the long run with national, economic, societal, environmental, and human repercussions.

7.5 Climate Change as a Human Security Challenge for SIDS

SIDS are ecologically highly fragile and global warming could be devastating for local populations. According to the GECHS Report (Loneragan 1999a) issues of inequality and impoverishment must be incorporated into the analysis of environment and security links. The populations of SIDS must have the option to end, mitigate, or adapt to threats to their human, environmental, and social rights. In this connection, policies and measures that will help towards this end will be introduced as a priority issue by the international community. Participation in the formation of such policies and measures is necessary because local populations possess the necessary experience on relevant issues, and this should avoid imposition or irrelevant and unneeded measures.

For SIDS human security has become a current issue in policy-making and in research. They are more

vulnerable to hazards but also in adapting to situations for which they bear hardly any responsibility. Their populations have contributed little to global warming while they are mostly affected by it. Thus, their 'human' and 'national' security is at risk and the uncertainties they feel in facing the future are no good basis for creative solutions. An initiative on infrastructure was set up with the *Global Sustainable Energy Islands Initiative*⁹ (GSEII) by a consortium of NGOs and multilateral institutions to support AOSIS. Joint efforts by NGOs and enterprises are undertaken, e.g. by WWF and Toyota Company in Galapagos. Desalination has become affordable not only for the SIDS group but also for small islands of other states.

It is not only in the interest of the SIDS that human security can be safeguarded. There is a need for greater solidarity and enhanced cooperation among members of the international governmental and non-governmental community to undertake appropriate initiatives in enhancing resilience in these sensitive areas of the world.

7.6 Conclusions

It is evident that climate change affects human security with a particular impact on the SIDS. To enable the SIDS to respond with high capacity there is a need to strengthen "regional and international cooperation and education, training and awareness raising. Countries also need to be encouraged to perform integrated impact assessments in addition to sectoral ones" (SPREP 1997: 2). Furthermore, the provisions of chap. 36 of Agenda 21 should be globally implemented to reorient education towards sustainable development awareness and public understanding, but also training. Such an effort should also include the goals of UNESCO's *Decade of Education for Sustainable Development (2005-2014)*. The efficient coordination of UN agencies should be a primary task. The WMO, ITU, UNEP, FAO, UNESCO, UNDP and others, together with regional organizations like the European Union, should demonstrate their contribution to counter the challenges of climate change. A much more radical shift in the pattern of consumption and production is needed, otherwise humankind is heading for an environmental catastrophe (Tandon 2005).

9 The GSEII supports AOSIS members by bringing renewable energy and energy efficiency projects, models, and concepts together in sustainable energy plans for SIDS. See at: <<http://www.gseii.org>>.

Furthermore, “Risk evaluation and assessment need to become two of the focal points of environmental and sustainability research. These are essential for decisions being made with incomplete knowledge” (ProClim 1997). In substance, incomplete knowledge means increase of uncertainty (Prigogine 1996; Kinnas 1992: 43). Cross-cutting issues, such as monitoring, financing, and governing require broader attention. Monitoring needs criteria and reporting, what is often done by the secretariats of intergovernmental organizations but needs more refinement and coordination. Financing is a sensitive issue and the recent debt relief for several countries is part of its solution. Among these issues of a general nature is the implementation of the targets of the *Millennium Development Goals* (MDGs). Both Africa and the SIDS lag behind other regions in achieving the MDGs.

There are also issues of more specific nature for the SIDS, such as infrastructure, education, and cooperation between the public and private sector. Regarding infrastructure there is a need for technology transfer and for organizing the public sector by adapting constructions to avoid repercussions from climate change and thus decrease vulnerability of the SIDS. Synergies must be developed in coordinating policies among IGOs, e.g. by the *United Nations Environmental Management Group* [UNEMG] (Ivanova 2005: 29). Education projects for protecting biodiversity, combating desertification, and addressing climate changes are also necessary. “Lack of knowledge is the underlying ... cause of behaviour leading to climate change, the thinning of the ozone layer, the loss of biodiversity, land degradation and many other problems” (Briceno 1998: 71) that must be addressed through reliable information and public awareness, which is fundamental for improving the protection of the environment. This includes improved local geographical information through *Geographic Information Systems* (GIS). The *Sustainable Development Networking Programme* (SDNP) or UNEP’s *International Network of Information Referral System* (INFOTERRA) can also be helpful. The UNESCO initiative to establish two academic chairs on sustainable development in the Pacific Islands should be expanded to other SIDS. Training in interdisciplinary and integrated approaches would thus be reinforced. In addition to the information provided to the public at large through the media and NGOs, there is also a need for training of specific professional sectors, particularly lawyers and judges, but also educators themselves.

There is a lack of adequate awareness of existing problems and there is a knowledge gap, but there is also a digital divide. An easy access to internet facilities and the necessary local infrastructure in SIDS is absolutely necessary. Finally, a better framework of cooperation between the public and private sector (Nelson 2002) can face the complex needs of the SIDS. Solidarity and cooperation have become imperative on our planet, which is in need of an equilibrium among ethics, environment, and spirituality so that human security, including human dignity, will prevail (Agha Khan 2005: 70; Kinnas 1997: 42). As Yolanda Kakabadse (1997) noted, during a conference in Thessalonika: “cooperation and synergy among those prompting education for a sustainable future is an opportunity”. Therefore a strategic alliance among UNESCO, UNEP, The World Bank, UNDP, UNICEF, WHO, international NGOs, such as WWF, IUCN, ICSU, and regional organizations should be developed. In this connection, the Bali December 2007 COP-13 of UNFCCC was considered as the springboard for the post Kyoto Protocol era, which is closing in 2012.

It is not only how knowledge is used, but from where knowledge is provided, and the reliability of its sources. Information and communication technologies (ICTs) and infrastructure are spread thinly and unevenly in SIDS, which leads to a greater need for transparency in environmental and sustainable development policies. “Greater information availability could also promote a more effective issue linkage and bargaining strategy and more efficient and equitable technology transfer” (Figueres/Ivanova 2004).

In public policy there is a need for a shift from the politics of fear (Furedi 2005) to the politics of hope. “The future of global governance is likely to rest not on a single system like the UN, but on a new mixture of bottom-up and top-down authority; public, private and civic institutions; and informal norms as well as formal laws and standards. The result will be ‘light but firm’: less bureaucratic, but with more chances of being implemented” (Edwards 2004). “If environmental regulation is to work, the North must pay more, the South must demand less, and all of us who care about the future have to make our views known in the political process” (Humphreys 1996).

8 Redefining Sustainability: A Policy Tool for Environmental Security and Desertification

Rajeb Boulharouf and Douglas Pattie

8.1 Introduction: Evolving Landscape of Sustainability

Major environmental threats such as desertification carry the seeds of disruptive factors that can cast a long lasting shadow on the socio-economic security of nations and interstate relations. The magnitude of these disruptions is exposing the weakness of sustainable development, in its *stritu sensu* conception, as a policy paradigm for environmental security.

The central, distinguishing policy feature of desertification is that it shifts the terms of debate from a traditional sustainable development doctrine holding that the goals of economic development and environmental stewardship are interdependent, to the notion of environmental security, which requires a much more complex process of trading off social, economic and environmental priorities. This formulation suggests that poverty, underdevelopment, and political disenfranchisement are both the cause and effect of environmental degradation.

Given its universal nature, global impact and the close relationship it holds with key socio-economic issues such as food security, agricultural productivity, water resources and water management, population and demographic flows, the desertification process embodies a strong disruptive potential in terms of global stability. By directly contributing to food insecurity, famine, poverty and migrations it should retain public attention in so far as it carries the constitutive elements of few but rather specific dynamics able to give rise to social, economic and political tensions and act as catalytic dynamic for conflict generation.

The environmental dimension of conflicts and migration point at the comparative advantage of the *United Nations Convention to Combat Desertification* (UNCCD), as a process and unique conceptual intervention platform to address the challenges of environmental stress, conflict prevention and the security-environment interlinkages.

One of the major conceptual revolutions in the fields of international public law and international law of development was marked by the materialization of the concept of “sustainable development”. For the first time since the industrial revolutions our self-defined convictions of munificent development and the dogma of continuous growth had to be overcome through an ambitious effort of socio-cultural regeneration. The premise was simple and the conclusion disenchanting: our development, the system of production, that constituted the very basis of our wealth, was no longer viable in its conception and nature.

A new generation of international legally binding instruments was soon to be adopted, effectively redefining the international legal frameworks of reference in the field and proposing strategies for ‘sustainable development’ - ways to improve human well being in the short term without threatening the local and global environment in the long term. The general definition of sustainable development is found in *Our Common Future*, a report from the UN *World Commission on Environment and Development* (WCED). Its targets were multilateralism and interdependence of nations in the search for a sustainable development path. The report sought to recapture the spirit of the 1972 Stockholm Conference, which had introduced environmentalist concerns to the formal political development sphere.

The established dynamics of multilateral negotiations were deeply shaken by the concept of sustainability, genuinely reshaping classical solidarity schemes traditionally established on regional and/or political group basis.¹ The issue of the environment acquired its *lettres de noblesse*, at the very top of the international global agenda when political momentum gathered at Rio de Janeiro in 1992. The *United Nations Conference on Environment and Development* (UNCED) was strong enough to generate real changes in the different spheres of international relations, be it at the bilateral or multilateral levels. The

continuity of such changes, their perennial capacity to overcome the challenges of implementation could, however, only be assessed in the long run.

Critics had already pointed at that early stage that, to a large measure, the wide acceptability of the environmental agenda of the Brundtland Report by world leaders was due to its unequivocal embracing of economic growth. The WCED (Brundtland 1987) report positioned sustainable development not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs. Indeed, the Commission's "overall assessment is that the international economy must speed up world growth while respecting environmental constraints" (UNGA 1987: 96). However, it does not say how this balancing act is to be achieved. Expansion of the global economy through rapid growth in both the North and South, more free trade, increased aid, greater transfer of efficient technology were all part of the Brundtland scenario for sustainable development. However, many policy analysts have critiqued the Brundtland report

as dreamy idealism, blind to the structured inequalities and inequities of existing third world societies. In that context, William Adams (1990) argued that the strategy was basically contradictory.

This criticism translated the difficulties then faced by many scholars and policy analysts with the endorsement of a single definition of sustainable development, that would not, in their views, embody the conceptual capacity to address and/or integrate critical economic and social challenges. This conceptual antagonism would prove to be enduring throughout the evolution of this definition.

Since the UNCED conference, the world has indeed witnessed an exponential proliferation of definitions of sustainable development. Such spread of definitions has become evidence of its limitative conceptual frame rather than its contestability. Pearce, Markandya and Barbier (1989) provide a 'gallery' of over 40 definitions. The proliferation of meanings is not just an exercise in academic or practical clarification but a highly political process of "different interests with different substantive concerns trying to stake their claims in the sustainable development territory" (Dryzek 1997). As it has become more important, key interests have tried to define sustainable development to suit their own purposes. As Lele (1990) has put it, "sustainable development, like beauty, is in the eye of the beholder; it therefore promises something for everyone". Ironically stated in her critical review, sustainable development is a 'metafix' that will unite everybody from the profit-minded industrialist and risk-minimizing subsistence farmer to the equity-seeking social worker, the pollution-concerned or wildlife-loving First Worlder, the growth-maximizing policy maker, the goal-oriented bureaucrat and, therefore, the vote-counting politician. This universal appeal is enhanced by the apparent ideological neutrality of sustainable development. It offers no clear vision of an ideal end state, whether green utopia or otherwise, and no set of political or economic arrangements is specifically excluded. Instead, sustainable development involves a *process of change* in which core components of society - resource use, investment, technologies, institutions, consumption patterns - come to operate in greater harmony with ecosystems.

Recognition and attempted amelioration of environmental damage is part of the growing effort among academics, journalists, and government officials to come to grips with post-modern social ills - maladies that have less to do with a lack of wealth than with the unintended consequences of the misallocation of wealth. Maarten Hajer (1995: 14) suggests

1 Most accounts of the history of 'sustainable development' as a global idea begin with the United Nations Conference of the Human Environment held in Stockholm in June 1972. It was attended by 113 nations, many of them, developing nations; the organizers made a deliberate effort to put Third World concerns on the 'environmental agenda'. The conference promoted the idea that environmental protection and economic development were compatible; indeed, development was presented as essential for undertaking improvement of the environment. The Stockholm effort to bring together the issues of environmental protection and development was continued in The World Conservation Strategy (WCS) which appeared in 1980, a study commissioned by UNEP and executed by the International Union for the Conservation of Nature and Natural Resources (IUCN). Three major priority objectives were defined: (1) maintain essential ecological processes; (2) preserve genetic diversity of plants and animals; and (3) ensure the sustainable utilization of species and resources. The document established a framework for national and subnational conservation, and priorities for international action. It laid stress on the complete compatibility of conservation and development; its objective was to integrate conservation and development in order for the latter to be sustainable. Development was deemed necessary but should be based on the principles of conservation. The key concept in the WCS was sustainability. For a complete history see Adams (1990).

that the “coalition for sustainable development can only be kept together by virtue of its rather vague story-lines at the same time as it asks for radical social change”, whereas insistence on a precise formulation of the term is more likely to deter potential supporters. Thus the ‘motherhood’ idea of sustainable development can win broader acceptance for radical ideas such as equity and democratization.

Multilateral negotiations represent the quintessence of global democracy and, as such, they are duty-bound to fully encompass in their approach the diversity of positions and ideas that characterize the international community. The capacity of such a process to deliver measurable results over a given period of time is further challenged by the level of complexity and sensitivity surrounding them. Lundqvist (2001: 470) has attempted to determine how far ecological states can pursue sustainable development without intruding on principles of democracy and argues that “the state is the best political unit for achieving legitimate binding decisions in a multifaceted goal of sustainable development because it has the best resources, the ability to enforce rules and support scientific research.” However, the more an issue entails strong national, or corporate interests, the less would be its ability to self-generate a consensual decision making processes. The classic ‘command and control’ strategies used to regulate environmental practices have had decreasing marginal returns, and so some have questioned whether democratic governmental controls can achieve movement toward sustainable development. But for those who believe that the ‘Rio Spirit’ hasn’t outlived the favourable conjuncture that its own momentum had once generated, such negative assessments are unjustified and derive from a Manichean perception of international relations, where the credibility of multilateral processes are conditioned to unrealistic quality-like benchmark of imperativeness and immediateness.

This chapter is structured around the premise that factors leading to desertification often carry the seeds of potential conflicts. The challenges to global stability and sustainability are discussed in the context of conflict and threats to security. Two early warning signs of a faltering environmental security are to be found in the pressure points of water resources and migration. The conclusion points to the advantages of the UNCCD as a necessary mechanism for the emerging security paradigm.

8.2 Dawn of the Security Age: The Anatomy of the Desertification Crisis

Nicolas Hildyard argued that underpinning Agenda 21 and the attendant environmental crises was the view that environmental and social problems are primarily the result of insufficient capital, outdated technologies, a lack of expertise and faltering economic growth (Sachs 1993). Increasingly man-made environmental catastrophes were seen as causing extreme human poverty. The Earth Summit in Rio had articulated what may be called the official mainstream view of the ‘environmental crisis’, showing much continuity with the earlier Brundtland Report. One of the most important environmental agreements to address this crisis was the negotiation, adoption and entry into force of the *United Nations Convention to Combat Desertification (UNCCD)*² on 26 December 1996. Unlike its sister conventions of climate change (UNFCCC) and the protection of biological diversity (CBD) which were opened for signature at the 1992 Rio Summit, the UNCCD was a pure product of Rio and showed, in some respects, a new approach to the problem. The UNCCD treaty is the only legally binding instrument whose origin and direct justification can be found in Chapter 21 (UNCED, 1993). As such, the treaty counts today more parties (191 members) than any other similar environmental convention, and

2 The United Nations Convention to Combat Desertification (UNCCD) in countries experiencing drought and/or desertification, particularly in Africa. The negotiated convention text states that “desertification is land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors including climatic variations and human activities.” Desertification is not the natural expansion of existing deserts, but the land degradation in arid, semi-arid and dry sub-humid areas. Desertification is recognized as a process of land degradation in arid, semi-arid, and dry sub-humid areas of the world that is the result of natural phenomena (e.g. climate variation) and anthropogenic factors. The outcome of this type of degradation has typically been considered to be either a reduction or a loss of both biological and economic productivity. Drought, desertification, devastating floods and hurricanes are all in the same range of variant climatic phenomena that ravage ecosystems and impoverish vulnerable local populations. The existence of land degradation, particularly soil erosion and salinization, is testimony to the inappropriateness of certain types of land use. Desertification undermines the fertility of the world’s land, with productivity losses reaching 50 per cent in some ar-eas (Glantz/Orlovsky 1983).

represents one of the most concrete achievements of the Rio legacy in the field of codified global sustainability.

By contrast to other global issues, desertification and land degradation can be defined as non-controversial. The process doesn't generate major political divergences and powerful business interests have been replaced by an emphasis on local community empowerment and traditional soil and water conservation – well being instead of well having. Yet, the UNCCD implementation has been hampered by lack of global attention and adequate financial resources. For example, the UNCCD has only been granted access to GEF resources, after nearly ten years of existence³, while consensus had already emerged to grant those resources to instrument/conventions that had not even entered into force.

The atypical nature of the UNCCD process, this 'desertification exception', derives from a series of factors, the most important of which is to be found in the erroneously perceived spatial and temporal nature of the desertification threat.⁴ Desertification, indeed, is still perceived in the developed world as a far away problem, limited in scope to a regional manifestation and lacking the magnitude of a global scale cataclysm. A second, equally important limiting factor relates to the discernment of desertification as a full-fledged environmental issue. Desertification still carries in the public perception the hallmarks of a purely developmental process. This singular view is further backed by established bilateral schemes that persistently address desertification through the restrictive optic of traditional cooperation for development. Desertification for example, is hardly ever entrusted to Ministries of Environment but rather delegated to Ministries of Cooperation, which often results in a chronic misunderstanding of the emerging environmental se-

3 The UNCED conference produced two treaties on climate change and biodiversity signed by more than 150 nations; the Rio Declaration on Environment and Development, an Earth Charter of principles to govern the relationship of people to the earth; and Agenda 21, a 800-page document containing a programme of action for implementing the principles enunciated in the Earth Charter. The Conference did not contain any proposals to strengthen the United Nations Environment Programme (UNEP); instead a new environmental body called the Global Environmental Facility (GEF) was created and placed under the control of the World Bank. A large part of controversy at the Summit concerned money for the actions provided in Agenda 21: sources of funds, which was to receive how much and so on (The Ecologist, 22,4, 1992).

curity issue at stake. By slowly eroding the environmental dimension of desertification, this flawed perception may result in further removing the issue from the global environmental agenda and seriously limit an enhanced and coordinated response from the international community. Desertification for instance, is often neglected as compared to food or humanitarian crises, as an important factor for migration.

Worldwide media focus seems to exclusively concentrate on selected environmental issues, deemed more suitable for public attention. Under such a selective approach, over-mediatization has often produced counterproductive effects, constraints and exaggerations that privilege sensational aspects over true information (Blumler/Gurevitch 2001). As a consequence, Hans Kepplinger (2003) stated that global threats to a common environment and their complex inter-linkages have been reduced to the distorted image based on a handful of semiotic media icons. The tensions of difference and similarity erupting from the processes of globalization, the emergence of stereotypes, the multiplication of science fiction-like scenarios and the slow erosion of a serious scientific basis, all militate against the issue of sustainable development and ultimately, in favour of a weakened environmental agenda. In *The Song of the Dodo* David Quammen (1996: 635) asserts that even the costly strategy of setting aside nature preserves will ultimately fail to save endangered species. In humankind's 'war' on other species, "the current cataclysm of extinctions is in-

4 The term 'desertification' was originally used by Aubreville (1949) to mean the creation of deserts in tropical regions: the removal of indigenous trees and excessive cultivation by marauding natives of nutrient-weak soil was leading to soil erosion, and eventually to the creation of deserts via edaphic (soil) desiccation. Aubreville viewed desertification primarily as a process but also referred to it as an event (the end state of a process of degradation). He described how forested regions were transformed into savanna and savanna into desert-like regions. One of Aubreville's central concerns was the rate of destruction, resulting from human activities, of Africa's tropical forests. He noted that cultivation, deforestation, and erosion were so entwined as to lead to the destruction of the vegetative cover and soils in the forested regions of tropical Africa where "the desert always threatens, more or less obviously, but is always present in the embryonic state during the dry and hot season" (le désert menace toujours, plus ou moins évidemment, mais il est toujours présent, à l'état embryonnaire, dans la saison sèche et chaude). Savanna would result. Continued disregard for the fragility of the savanna would result in the creation of desert-like conditions.

deed likely to stand among the worst half-dozen such events in the history of the Earth.” Heaping scorn on efforts like the Endangered Species Act of 1973 (in the USA) he states that the market-oriented ideas of free-market environmentalists, such as debt-for-nature swaps and eco-tourism, will not keep earth’s other creatures alive. Only a drastic change in human ways can stop the downward spiral toward doom.

Desertification and environmental security are forcing a shaky ground under sustainable development, now characterized by the challenge of survival as a new *raison d’etat*. Major environmental threats and disruptive factors such as desertification can cast a shadow on the socio-economic security of nations and interstate relations. The magnitude of these disruptions is exposing sustainable development’s Achilles heel, as a policy tool for environmental security.

The central, distinguishing policy feature of desertification is that it shifts the terms of debate from the traditional sustainable development doctrine holding that the goals of economic development and environmental stewardship are interdependent, to the notion of environmental security, which requires a much more complex process of trading off social, economic and environmental priorities. This formulation suggests that poverty, underdevelopment, and political disenfranchisement are both the cause and effect of environmental degradation.

Environmental scarcity functions in a society within a complex matrix of historically derived economic and political situations. Mohamed Suliman (2004) has indicated that traditional analyses of conflict which rely primarily on ethnic, religious and cultural explanations do not take account of the increasingly obvious link between the growing scarcity of renewable resources and violent conflict in developing countries. The environmental dimension of conflicts and migration points at the comparative advantage of the UNCCD as a process, and as a unique conceptual intervention platform in which to address the challenges of both environmental stress and conflict prevention. Major disruptive factors are understood as challenges to the concept of sustainable development in so far as they are capable of substantially modifying the conceptual nature of the issue and the notional shift towards the environmental security challenge in ‘sustainable development’ which can inculcate a new dynamic to the established multilateral processes.

8.3 An Emerging Challenge to Global Stability

The risks of desertification are substantial and clear. Under present scenarios of population growth (chap. 12 by Lutz), climate change (foreword essay by Pachauri, chap. 5 by Bluemel, 6 by Issar/Zohar and 7 by Kinnas) and loss of ecosystem services (chap. 3 by Leemans), even within a *stricto sensu* classic sustainable development approach, the challenges posed by desertification are enormous and should therefore be easily comprehended. Desertification critically undermines the fertility of the world’s land (foreword by Di-allo). In Africa alone, an estimated US\$ 9 billion are lost from desertification every year. The problem, however, is not confined to the African drylands. Desertification affects over 110 countries worldwide. Some 70 per cent of the 5.2 billion hectares of dryland used for agriculture worldwide – 30 per cent of the Earth’s total land area – is already degraded and threatened by desertification. If this is left unchecked, arable land is expected to shrink by one third in Asia, two thirds in Africa and one fifth in South America, putting livelihoods at risk and propelling people to migrate. Desertification is a global problem that directly affects 250 million people worldwide and a third of the earth’s land surface.

Beyond the cold technicalities of such wording lies a chilling reality. Desertification has a firm grip on China. With an estimated 28 per cent of its land affected by desertification, the livelihoods of 400 million people are at direct risk. In China alone, some 24,000 villages, 1,400 kilometres of railway lines, 30,000 kilometres of highways and 50,000 kilometres of canals and waterways are constantly threatened by desertification. Dust storms from deserts in northern China and Mongolia blow as far as Korea and Japan – and across the Pacific Ocean (Youlin 200).

Desertification and drought force people to leave their home in search for a better life (chap. 9 by Rechkemmer; Brauch 2006, 2006b, 2006c, 2007e). Current estimates are that the livelihoods of more than one billion people are at risk from desertification and that, as a consequence, 135 million people, the combined populations of France and Germany – are at risk of being displaced by desertification. Half of the 50 million people expected to be environmental refugees by 2010 are from sub-Saharan Africa. By 2020, it is estimated that 60 million refugees will have moved from desertified areas in the Sahelian region to North Africa and the shores of Europe. Meanwhile, by the same year, the mass exodus from desertified drylands

is projected to multiply the urban population in coastal cities of the Sahel, 3.5 times over from its 1996 level, to reach 271 million (ECOSOC 2007).

In December 2003, at a NATO funded seminar on *'Desertification in the Mediterranean Region: A Security Issue'* 200 leading experts and policy-makers of its Mediterranean Dialogue countries focussed on related security issues and desertification was seen as a common threat to the Mediterranean region that required international trans-boundary solutions. Participants argued that while droughts aggravated the situation by inducing instability and generating competition between farmers and herders for limited land and water resources, desertification increased conflicts between grazing rights and ownership rights resulting in very high economic damage from the ensuing land degradation. Greater pressure on productive land caused an increase in the migration of people within their own countries as well as foreign countries, eventually producing an imbalance between more populated urban areas and desertified areas (Kepner/Rubio/Mouat/Pedrazzini 2006).

Given its universal nature, global impact and the close relationship it holds with key socio-economic issues such as food security, agricultural productivity, water resources and water management, population and demographic flows, the desertification process embodies a disruptive potential in terms of global stability. By strongly contributing to food insecurity, famine, poverty and migrations it should retain our attention in so far as it carries the constitutive elements of few but rather specific dynamics able to give rise to social, economic and political tensions and act as catalytic dynamic for conflict generation.

8.4 Environments in Conflict

The factors that lead to desertification often carry the seeds of potential conflicts. In fragile ecosystems, already characterized by a high level of natural resources vulnerability, lack of and competition for resources can constitute a major disruptive factor. As participants in the UNCCD sponsored workshop on *'Desertification and Migration'* held in Almeria, Spain in 1995, pointed out that the trend in the over-use of renewable resources may accelerate at a speed unprecedented in human history. Evidence is emerging for a correlation between poverty, desertification and conflicts of various kinds in arid and semiarid areas.

In Africa, for example, analysts have reported a steady increase in conflicts fuelled by disputes over

scarce grazing land, as the result of severe desertification. The UN Office for the Coordination of Humanitarian Affairs (UNOCHA) points at alarming figures in terms of the loss of human lives and forced migrations. In their analysis of the 21 reported cases of conflict with desertification as a present source or potential source of conflicts, Bächler (1995) identified 13 such cases in Africa, 4 in South and Central America, 2 in the Middle East and in Central Asia and 2 in South/South East Asia. In particular, evidence showed that environmental stress – especially the depletion and degradation of renewable resources such as water, fish, cropland, and forests – can engender and interact with social and economic conditions to produce violent conflict within nations. It is developing nations that are most vulnerable to these interlinkages because these nations often lack the means required to mitigate the impact of environmental stress.

While there is an evident lack of systematic analysis of desertification induced risks, numerous documented case studies have been presented on environmental conflicts, including specific instances of desertification-induced conflicts in drylands. The common denominator in these studies, beyond subjective consideration of the nature of the threat, clearly resides in the multiplier effect of desertification as a proactive parameter in the conflict dynamic.

However Jon Barnett (2003) has argued that the meaning of environmental security is ambiguous and open to appropriation. The examination of its various interpretations and applications reveal much about the state of global environmental politics and that environmental security may be driven more by the power of security-makers than by the need to address environmental problems. Addressing security in the context of desertification requires rethinking the specific challenges posed by the evolving dynamics of sustainable development. Advocates of a wider security concept (Buzan/Wæver/de Wilde 1998) promote a more inclusive notion of security, capable of internalizing less classical, but fundamental environmental parameters for an enhanced and more reliable conceptualization of security in which the economy and the environment constitute key parameters.

The security component often driven by the challenge of desertification is increasingly perceived as pertinent by countries outside of the drylands. Indeed, while addressing the threats posed by desertification in the Mediterranean, experts at the first Almeria workshop (1995) concluded that given Europe's close proximity to Northern Africa, desertification could negatively impact on food resources, people's

health and the region's economy (Puigdefábregas/Mendizabal 1995). A second workshop in Valencia (2003) analysed in greater detail the future effects of population growth, climate change, urbanization and pollution, water scarcity and management, soil erosion and desertification, and food scarcity in the Mediterranean (Kepner/Rubio/Mouat/ Pedrazzini 2006). Expected migration into cities or onto marginal lands will accelerate the impoverishment of land, resources and people and may lead to persistent upheaval or further migration, potentially stimulating ethnic conflicts or social unrest elsewhere.⁵

8.5 Water and Migrations: Two Reliable Indicators

Joseph Romm (1993: 15-16) pointed to a threat as anything that could "narrow the range of policy choices available to government," a definition so sweeping that one wonders what important foreign policy problem would not constitute a threat. Since then many studies have argued that current migration flows may further exacerbate existing local or supranational conflict dynamics, by substantially altering their pressure absorbing limits. The superposition of substantially modified elements of pressure on existing but formerly 'contained' conflict dynamics may generate new effects both in terms of the nature, quality and spatial situation of the conflict.

Equally, issues relating to freshwater quantity and quality are increasingly becoming the source of strategic considerations in many regions of the world. Insufficient fresh water may prove to be the most vexing problem in the developing world over the next decade, as agricultural, commercial, and residential uses increase. Water tables being drawn down at an alarming rate especially in the most heavily populated nations, are common to all regions and ecosystems. While arid and semi-arid regions are caught in a penury type of dynamic with increasing stress from water scarcity, much of the rest of the world faces growing pollution problems as a result of environmental change and inefficient management of natural resources.

Samson and Charrier (1997) in a report issued by Green Cross International indicated that the potential

for conflict over freshwater is enormous, given its importance for basic survival, industry, energy production and other fundamental components of society. Many freshwater basins, estimated to be more than 300, lie on or across international borders. A number of conflicts linked to freshwater are already apparent at various local and international levels, and the risk for more grows as population and degradation pressures accelerate. In many cases, little preventive action is being taken. So far, only limited fact-finding and even less concrete planning has been systematically carried out to analyse this dangerous potential and to propose integrated management solutions.

The same report indicated that in the Middle East, 9 out of 14 countries currently experience water scarcity and the others are rapidly approaching this state. Although water represents, as David Wishart (1990) explains, one facet of the multidimensional nature of the environmental conflict in Jordan, its importance cannot be ignored in a region where conflict dynamics have produced on average a major military confrontation every ten years. Based on current population and consumption projections, regions such as the Maghreb, the Sahel, East Africa, northern China, and South Africa as well as southern Europe and part of the US will experience water scarcity in the near future. Global environmental change, especially climate change and desertification, will greatly increase these risks both as the result of natural climatic cycles and anthropogenic drivers.

In his comments on the desertification synthesis of the "Millennium Ecosystem Assessment" (2005a) Walter Reid, director of the assessment, observed that drylands systems in developing countries are the regions where people are experiencing the greatest problems from the breakdown in the supply of ecosystem services and that "the ecological, social, and economic impacts of desertification can affect not just the people living in drylands, but also countries far removed from those regions" (see chap. 3 by Lee-mans). Large-scale migrations started to be systematically documented at the beginning of the twentieth century. Lester Brown (2004) from the Earth Policy Institute has indicated that environmental migration in the United States began when nearly three million "refugees (*okies*)" from the southern Great Plains left during the dust bowl of the 1930's, many of them migrating to California. He also points out the scenario of water refugees becoming 'commonplace' in the near future, particularly in arid and semi arid regions. Most of an estimated three billion people to be added to the world population by mid-century will originate

5 A second symposium on Desertification and Migration took place in Almeria, Spain, 25-27 October 2006 that is documented at: <http://www.sidym2006.org/eng/eng_ponencias_conclusiones.asp>.

from countries characterized by falling water tables and demographic pressure, thereby creating an escalation in 'hydrological poverty'.

As posed by Brauch (2003a) desertification requires an analysis of its environmental security dimension. Approximately sixty million people are expected to eventually move from the desertified areas of sub-Saharan Africa towards Northern Africa and Europe in the next 20 years (Brauch/Liotta/Marquina/Rogers/Selim 2003). In Mexico, drought and over-exploitation of land and water have lowered the aquifers in the most heavily populated central region of the country to 40 per cent of their former levels. As a result, between 700,000 and 900,000 Mexicans leave their homes in the rural drylands every year and go to seek their livings as migrant workers in the urban centres and in the United States. Many of the 12 million people affected by drought in Brazil's North Eastern Sertao region have migrated to São Paulo, swelling the population of the city by 300,000 in 1999. Over the last two decades 1.3 million people have fled Haiti as a result of environmental degradation compounded by political unrest resulting in a drop in the island's per capita grain production by half between 1926 and 1996. Mohamed Suliman (1999b) noted the scientific corroboration of an ever-increasing environmental dimension as a triggering element of national and trans-boundary migration flows may radically change the elements of the conflict equation.

Homer-Dixon (1999) provided a composite concept of the environment/scarcity/violence nexus which includes the conflict groups within states are subjected to as a result of three large forces for change: population increase, environmental impacts, and increased inequality. A number of large international research projects with this focus were carried out during the 1990's. As the pressure from increasing environmental scarcities has begun to impact on governments in developing countries, the perception of the problem in focus has shifted to how societies could adapt to unavoidable scarcities of strategic renewable resources. The research thus has shifted to scarcities of those social resources necessary for societies to be able to adapt to natural resource scarcities. Leif Ohlsson (2003) has observed that the pattern of conflict appears between groups within states, rather than between states; and the resource scarcities in focus are renewable resources, such as arable land and water, as opposed to non-renewable resources, such as oil and strategic minerals, which earlier were studied as causes of conflicts between states.

Depending on how environmental transformation translates into the social, economic, and political realms, environmental decline could grow into an increasingly significant factor in violent disputes in the coming decades. Michael Renner (1996) argued that countries whose economies are heavily geared toward agriculture, or other sectors that directly depend on the health of the natural resource base, are most immediately confronted by environmental problems. What matters most in this regard are not necessarily the hardships of environmental degradation per se but the fact that the harmful impacts will be felt unevenly by different social strata, communities, and countries.

8.6 Conclusion

The relationship between environmental degradation and migration is important, complex, and yet little understood. Due to the accelerating dynamics of desertification as a land degradation process, its steady globalization and intimate relationship with extreme and worsening poverty, environmental security is a major new challenge for sustainable development. Survival is casting a shadow on the shaky round of sustainability impeding its ability to react to sharply diversifying global challenges with adequate policy.

The real challenge to the paradigm of sustainability will not come from the capacity to deliver concrete development results in increasingly short periods of time, but from its efficiency and sufficiency in responding to changing dynamics and its ability to foresee long term challenges amid the ambivalences and ironies, the controversies and conflicts that pervade the terrain of global environmental politics.

Further research and investigation of the linkage of security and environment, driven by desertification, acting as both a cause and a consequence of displacement and cross-border migrations should be pursued through programmes facilitating the exchange of technical and scientific data and the constant monitoring of the desertification process. The UNCCD, as the only legally binding instrument at the disposal of the international community in the field of land degradation, desertification and environmental stress can offer the enabling framework for a programme on environmental conflict prevention, by encouraging comparative studies between affected regions with different cultural and economic constraints, establishing an historical perspective and fostering environmental

education and training initiatives in affected areas, with a view towards developing successful models.

The Convention is based on the principles of participation, partnership and decentralization – the backbone of good governance and suggests ways to go beyond conventional modernity models by promoting sophisticated yet moderate-impact technologies based on traditional technologies and local knowledge, redirecting relentless accumulation, and advocating ways of living that are simpler in means, but richer in ends. The bottom-up approach it adopted for the implementation process has raised the profile and strengthened the capacities of those directly affected by desertification, and assists key local actors in identifying and addressing challenges linked to the vision of sustainable development.

Attaining sustainability has proven to be difficult – technically, economically and politically. And without a framework to give direction to new efforts and approaches to counter land degradation, the impact of policy coherence will dissipate. Within this particular context, partnerships should be sought with the academic world, the research community and fellow UN bodies to promote research on desertification-induced population movements and perceptions of security challenges with the view to accurately disaggregate and defining the primary factors motivating migration from the drylands. Future assessments of dryland ecosystems should investigate the correlation between desertification, poverty and migration and become part of a global early-warning system for humanitarian crises in the making.

Recent United Nations estimates (Adeel/Bogardi/Braeuel/Chasek/Niamir-Fuller/Gabriels/King/Knabe/Kowsar/Salem/Schaaf/Shepherd/Thomas 2007) are that upwards of 50 million people may be on the move in five years due to environmental disasters and degradation. The threat posed by desertification has been effectively ascertained when sectorially conceptualized through a variety of reliable indicators, such as food, water and health security. However, analysts still lack dependable tools for a more in-depth and horizontal coherence of policies at the international level, at the national level and the local level. This requires actors at the international level to work together and make an effort to ensure that their policies compliment each other and address the suspicion that the Western development model is at odds with both the quest for justice among the world's people and the aspiration to reconcile humanity and nature.

Most and foremost however, it requires them to challenge the prevailing conceptual dogma of devel-

opment, whereby single development models are presented as unique viable alternatives.

If sustainability in the social and economic soils of desertification is to be effectively addressed along with its global impacts on human security and extreme human poverty, the current work on environmental security must acknowledge and internalize the unique comparative advantage of the UNCCD.

9 Societal Impacts of Desertification: Migration and Environmental Refugees?

Andreas Rechkemmer

9.1 Introduction¹

In its preamble the *United Nations Convention to Combat Desertification* (UNCCD) points to the significant impact of desertification-induced displacement and migration on sustainable development. Indeed, growing evidence on the linkage between land degradation, the reduction of drylands ecosystem services, poverty, and migratory movements has raised the awareness of scholars and policy makers. These linkages were traditionally understood as the interplay between physical patterns of change and human activities. Recent research efforts, however, have shown that desertification must be understood as a social phenomenon largely driven by human activities. Hence migration triggered by land degradation can be perceived as of a socially constructed phenomenon in the age of global change (see chap. 8 by Boulharouf/Pattie; chap. 10 by Ghazi).

This chapter introduces the concept of environmental migration and refugees, describes the various aspects of the interaction between desertification and people and the difficulties to assess them scientifically in a straight-forward manner, and finally takes a look at recent efforts at the multi-lateral level with a view to identify effective mitigation measures. Its thrust is based on a review of recent literature and assessments undertaken at the global level and within the United Nations system.

9.2 Environmentally Triggered Migration and Environmental Refugees

When the “Convention Relating to the Status of Refugees” was adopted in Geneva in 1951, environmental

degradation and natural hazards were not in the focus of the negotiators when they defined refugees as people suffering the “well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion” (Art. 1)². In 1972, with the Stockholm Conference on the Environment, world opinion turned to global environmental issues and led to the establishment of the *United Nations Environment Programme* (UNEP) in 1973. However, the case of worsening environmental degradation leading to environmentally triggered migration remained unnoted until the 1980’s when El-Hinnawi (1985) coined the concept of environmental refugees (Myers 1993, 1995, 2002; Brauch 1997, 1997a, 1997b, 2000–2001).

Environmental refugees are a dramatically growing group of refugees, mostly migrating from rural areas to cities. They are not yet officially mentioned in UNHCR’s statistics as they do not fulfil the criteria of the Geneva Convention. They are neither mentioned in the statistics of the UN Populations Division (2001a, 2001b; UN 2001a) nor in the annual U.S. World Refugee Survey (USCR 2001, 2003, 2004, 2005). As they are not officially counted, only approximate estimates exist. But they may have surpassed all other types of refugees and may become the largest group of migrants in this century.

There have always been people migrating due to natural and environmental changes, hazards or disasters, and several civilizations – such as the Maya (chap. 5 by Bluemel) – collapsed due to environmental change. Since then, the degradation of natural resources has dramatically increased. In the late 1980’s the ecological footprint of humankind finally exceeded Earth’s capacity, marking the first time in history when humankind managed its ecosphere not

1 The author is grateful to Nils Harder, a visiting researcher from the Free University of Berlin.

2 See: “Convention Relating to the Status of Refugees, 28 July 1951”, in: 189 U.N.T.S.150, entered into force April 22, 1954.

Box 9.1: Number of Refugees and Migrants Globally. **Source:** Dow/Carr (2005). Permission was granted.

Refugees are a specific category of people within the broader context of the global population movement. First, to put environmentally induced movement in the context of all global population movement, we note that the International Migration Organization estimates that there were 175 million migrants in the world in 2003 (IOM 2003). Of this number in 2003, the UN High Commissioner for Refugees estimated that there were approximately 10.4 million refugees in the world (UNHCR 2004). An additional 10.2 million people, including asylum-seekers, recently returned refugees, internally displaced persons, and people without nations were identified as populations of concern.

Estimates of Environmental Refugees Today

There are a variety of estimates of environmental refugees. These differ by data source, environmental stressor, and length of forecasts, as well as by the definition of 'refugee'. Estimates of the number of environmental refugees today start at 10 million, more than half of whom are believed to be in Sub-Saharan Africa (Lonergan 2000). According to Westing's (1994, 1994a), three per cent of the African population has been permanently displaced largely as a result of environmental degradation. Other estimates put the number of environmental refugees in 1995 as high as 25 million (Myers 1995).

only locally or regionally, but globally in an unsustainable way (WWF 2004: 1).

During these past decades, increasing scarcity and overexploitation of natural resources, such as soil and freshwater, has become a severe problem due to an unprecedented rate of expansion. These circumstances have evoked a new type of migratory movements of people, i.e. the environmentally induced migration. The causes for this migration are mostly anthropogenic: transformations like degradation of soil or vegetation, fresh water and fresh air, and global climate change.

9.3 Land Degradation, Desertification and its Assessment

As far as land degradation and desertification are concerned, there are about four groups of countries with different causes but comparable results: the very heterogeneous group of the developing countries with their fast overexploitation of land because of growing populations, worsening ecosystem services and international trade patterns without real chances for coping mechanisms; the group of industrializing countries in Asia and South America with their strong extension of food production and population growth, foremost in urban areas; the group of fuel exporting countries like OPEC with their own kind of overexploitation and desertification phenomena; and Eastern European countries with their chemically and agriculturally induced land degradation. They all have to face similar results as loss of ground, desertification and its impacts. The tropics suffer most from these events. As the figure 9.1 indicates, the *Living Planet Index* (LPI) of tropical grasslands, savannahs, and

deserts dropped by 80 per cent since 1970, while temperate areas remained quite stable – which is to some extent the case because these areas have already been altered before. The sharp drop in tropical areas, however, does not mean a loss of 80 per cent of existing species, but a loss of 80 per cent of the former existing individual animals which is the highest number of all observed ecosystems (Prokosch/Heinrich 2006).

In the early 21st century, “[d]rylands occupy 41 % of the Earth’s land areas and are home to more than 2 billion people [...]. Some 10–20 % of drylands are already degraded [...]. About 1–6 % of the dryland people live in desertified areas, while a much larger number is under threat from further desertification.” (MA 2005a: 1). Another synthesis of the state of Earth’s deserts was published by UNEP (2006).

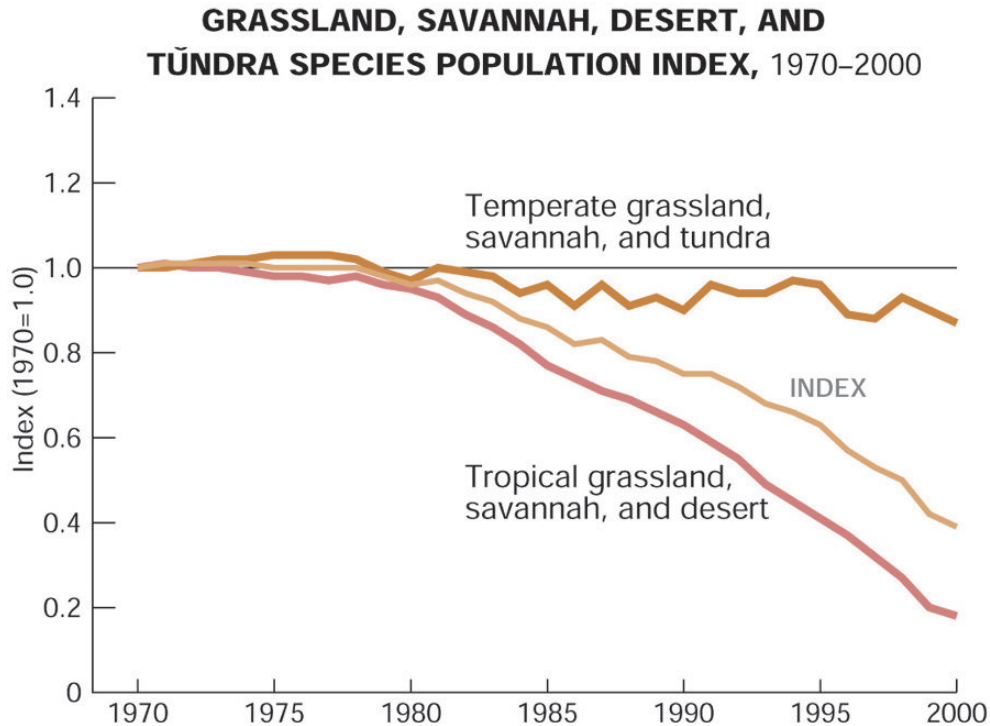
Traditional approaches to assess and combat land degradation distinguished between

the meteorological and ecological dimensions of desertification (the *biophysical factors*) and the human dimensions of desertification (the *socioeconomic factors*). Previous failures to recognize and include the interdependencies of these dimensions in decision-making have slowed progress toward the synthetic approaches needed to tackle the enormous problem of dryland degradation (Reynolds/Stafford Smith 2002: 1).

In the past this has hindered the scientific community in its approach to present a comprehensive understanding of the “causes and progression of desertification” (Geist 2005, 2006).

Therefore, “[s]ynthesis of dryland degradation studies continues to be plagued by definitional and conceptual disagreements, and by major gaps in global coverage.” (Ramankutty/Achard/Alves/Turner II/DeFries/Klein/Kees/Graumlich/Reid 2005: 5) Even the *Millennium Ecosystem Assessment* (MA) with its broad research agenda had to acknowledge wide gaps

Figure 9.1: Living Planet Index. **Source:** Living Planet Report 2004 – published in October 2004 by WWF. © Text and graphics: 2004 WWF. All rights reserved. Reprinted with permission of WWF.



in the scientific understanding of desertification processes as well as their underlying causal factors (MA 2005a: 2).

Nevertheless, with the concept of ‘ecosystem services’,³ the MA used an important and widely underestimated link between environmental degradation and human well-being, partially putting together ecological and human dimensions of desertification, and offering an important answer to the question on how desertification leads to migration: through poverty. Already, dryland populations are being shaken off by the rest of the world, given the fact that they rank very low in terms of human well-being and relevant development indicators (MA 2005b: 625). The UN Millennium Project in its 2005 report also puts some empha-

sis on a healthy environment in order to effectively combat poverty:

Environmental sustainability is also essential to any effort to improve the well-being and health of the world’s poorest people. A degraded environment has dramatic and harmful effects on health, education, gender equality, and economic development. People cannot work and study if they are frequently ill from drinking and bathing in polluted water or if they are malnourished because of soil erosion and desertification (UN Millennium Project 2005: 64).

These effects of poverty also appear in Reuveny (2005) who developed a new theory, arguing that people are able to adapt to environmental changes in only two ways: they can defend the changes, or they can leave the affected area. Which option they choose, he continues, depends on the severity of environmental degradation and on the society’s technical capabilities. In extreme situations, land degradation can remove the economic foundation of a community or society. Experience from recent decades can be interpreted as showing that land degradation and desertification have been a major driving force behind the displacement of people.

In the 20th century, Africa witnessed a whole set of drought-driven migrations to neighbouring countries. In a long-term perspective, the intercontinental

3 „Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fiber; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling. [...] The human species, while buffered against environmental changes by culture and technology, is fundamentally dependent on the flow of ecosystem services.” (MA 2005: V)

migration that has already started from North Africa to Europe can be expected to escalate dramatically as a result of rapidly growing water scarcity (Brauch 2006d).

Myers (2005) mentioned the number of at least 10 million people who had become environmental refugees in semi-arid lands and expects a by far greater number for the time ahead as regarding the one billion people at risk and their population growth rate of often three percent per year. Desertification reduces the land's resilience to natural climatic variations and thus undermines food production, contributes to famine and affects obviously the local socio-economic conditions. It thereby triggers a vicious circle of poverty, ecological degradation, migration and conflict. Desertification-induced migration and urbanization may worsen foreign living conditions by overcrowding, unemployment, environmental pollution and oversteering of natural and infrastructural resources, and by social tension, conflicts and vices such as crime and prostitution in the destination centres. These adverse effects are increasingly contributing to environmental degradation.

Africa has always been in the centre of debates about desertification: the Sub-Saharan Africa, the Sahel and the Horn of Africa, where by far the largest number of environmental refugees exist. It has already triggered some of the most broad scale migrations in recent decades. Even given the fact that now Asia is being called the "main area with degraded drylands, and no evidence was found supporting claims of the Africa Sahel as being a desertification hotspot" (Ramanakuty/Achard/Alves/Turner II/DeFries/Klein/Kees/Graumlich/Reid 2005: 5), desertification happening in Africa, and "Sub-Saharan Africa remains the prime locus of environmental refugees" (Myers 2005).

Thinking of the income situation and human well-being first, the "worst situations can be found in the drylands of Asia and Africa; these regions lag well behind drylands in the rest of the world" (MA 2005a: 8). The situation regarding the present and prospective availability of key ecosystem services appears to be similar: "The greatest vulnerability is ascribed to sub-Saharan and Central Asian drylands. For example, in three key regions of Africa - the Sahel, Horn of Africa, and Southeast Africa - severe droughts occur on average once every 30 years. These triple the number of people exposed to severe water scarcity at least once in every generation, leading to major food and health crises" (MA 2005a: 13). And they, in combination, already triggered an increasing need for refuge, combined with a regional shift: "Initially concentrated

in the East African region, where environmental disasters, such as drought and desertification, and ethnic, border and guerrilla wars in the Horn of Africa (Somalia, Eritrea, Ethiopia and southern Sudan) gave rise to large movements of refugees and IDPs in the 1980's and 1990's, in recent years there has been a shift to Central and West Africa" (IOM 2005: 37).

The synchronous appearance of conflict, migration, and desertification doesn't happen by chance. Their links are clearly visible. "Conflicts and environmental degradation further aggravated the pressure for migration from poorer to relatively prosperous regions, within and outside the [West African] sub-region. In the Sahel, in particular, desertification and cyclical famines have triggered waves of environmentally-displaced persons across national frontiers within the sub-region" (Adepoju 2005: 3). The described environmental events are expected to appear even more often and more severe with ongoing and exacerbating global warming (NEF/IIED 2005, IPCC 2001a), especially when sustainable agriculture practices are not being implemented soon and resolutely.

9.4 Drylands Ecosystem Services, the Causes of Migration and Conceptual Problems

Since people in drylands are very dependent on functioning ecosystem services, their reduction hits them extremely hard. Normally, drylands people are used to hardship and they have evolved traditional coping mechanisms. But when overcultivation and overgrazing lead to permanent and increasing losses in yield, the traditional means of dealing with crisis fail. Then, the typical chain starts: crop yields fall rapidly and animals die from lack of fodder. Industries based on crop and animal products fail, unemployment rises and people get poorer or even reach the state of severe famine. When a land's productivity is being reduced, this automatically leads to a reduction in income, to malnutrition, and to health risks. Together these effects result in serious threats like famine and increasing mortality rates. In order to protect themselves against such impacts, people frequently abandon degraded areas (MA 2005b: 645). This chain of events, combined with structural social and economic disparities, are a powerful driver in migratory movements towards wealthier or at least more promising regions, with large cities as the most attracting destination. "Rapid urbanization is largely a function of rural poverty. Environmental shocks, such as drought

and flooding, have accelerated this process, as has the failure of the rural development industry and state agricultural policies to stabilize populations in the countryside" (Cush/Williams/Peberdy 2005: 16).

According to Biermann (2001), there is little doubt about what drives people to abandon their lands. He categorizes the four main drivers as follows: *deposition* (by regional environmental pollution), *degradation* (e.g. by soil erosion or water scarcity), *disaster* (and sometimes its countermeasures like dam build-ings to control floods), and *destabilization* (as a consequence of stressed and finally failing social nets).

There are numerous well-known empirical exam-ples for large scale migration due to environmental deterioration of a different, natural as well as human-induced, kind. Just to mention two, take the Dust Bowl which forced hundreds of thousands of US citi-zens to leave their homelands in the 1930's (Reuveny 2005: 7), or the Chernobyl reactor catastrophe in 1986 which made large areas uninhabitable for at least sev-eral decades.

However, a fundamental question arises with the notion of 'environmental refugees' as a recent phe-nomenon: Is it conceivable to use this term for a large group of people escaping a degraded environment, while anthropogenic drivers are often mainly respon-sible for both degradation as well as the bad manage-ment of degraded ecosystems? Since in nearly every natural disaster a human fingerprint can be found - due to lacking early warning systems as was the case with the Indian Ocean Tsunami disaster of 2004, or because of social disparities between the rich and poor only allowing wealthier people to escape as was the case with Hurricane Katrina in New Orleans in 2005 - the concept of a changing environment alone leading to large scale migration fluxes has been ques-tioned (Vine 2005). In addition, the scientific concep-tualization of migration through environmental degra-dation can be seen arbitrary. "There are abundant typologies of 'environmental refugees' and 'environ-mental migrants', but little agreement on, or under-standing of what these categories might really mean" (Black 2001: 13). Even authors principally supporting the thesis of environmental refugees do note that there is indeed an urgent lack of theoretical clarifica-tion (Finton 2001).

On the one hand, this lack of scientific consensus may be the reason why the case of people (involuntarily) escaping their habitats due to environmental stress is very slowly, if at all, being put upon the agenda of the relevant governing bodies. The Office of the United Nations High Commissioner for Refugees

(UNHCR) does not recognize environmental degra-dation as a reason for the displacement of people in its "Refugees by Numbers 2005 Edition" (UNHCR 2005), and the same applies to the annual "World Re-fugee Survey" conducted by the United States Com-mittee for Refugees and Immigrants (USCR 2003, 2004, 2005). Only in some very recent publications, environmental disasters can be found as a reason for the forced displacement of people (UNHCR 2006: 27ff.), while in others especially concerning desertifi-cation it remains unnoticed (UNEP 2006). Official unawareness of the environment as a major factor in people's displacement can be seen as one of the causes for the high uncertainties in their exact num-bers.

On the other hand, there is a growing attention to-ward global environmental change as a driver for mi-gratory movements worldwide. For example, the Swedish and Finnish governments have already adapted their asylum policy now including people es-caping natural disasters, as did the United States (USCR 2003). While this - with some caution - can be seen as the beginning of a more integrated concep-tualization of migratory movements in the 21st century, UNHCR and USCR still seem to be sticking to what looks more like an end-of-pipe approach: USCR ac-knowledged a connection between environmental degradation and people's displacement in the way that around refugee camps ecosystems often suffer from exacerbating stress by thousands of people living in barely inhabitable areas (Chen 2005). The newly developed environmental programme of UNHCR therefore aims at these effects and wants to "prevent, mitigate and rehabilitate the negative impact of refu-gees on the environment" (UNHCR 2005a). Refugees fleeing from degrading environments are not yet a concern of UNHCR, but environmental degradation caused by refugees has become an issue of concern.

These statements, as important as they are for the well-being of fugitives in their camps, lack the recogni-tion of recent scientific data about both the causes and consequences of desertification worldwide and in developing countries in particular. One should not only look at what comes out of the pipe (refugees and resulting environmental degradation), but how and why it is being put into it. Or, as Frank Biermann put it, the question is not whether one estimates the number of environmental refugees to half a billion or rather decides not to perceive them as such - the question is merely how we can prevent people from having to give up their homes due to an uninhabitable environment (Biermann 2001: 28). "In this instance,

Box 9.2: Eighth Proposal by the German Advisory Council on Global Change for Managing migration through cooperation and further developing international law. **Source:** WBGU summary; at: <http://www.wbgu.de/wbgu_jg2007_kurz_engl.html>. Permission was granted

Developing comprehensive international strategies for migration. In order to manage environmentally-induced migration, a comprehensive migration policy strategy is required which takes account of the interests of all stakeholders. Its long-term objectives must be geared towards the interests of the destination, transit and home countries alike. In WBGU's view, an approach which focuses primarily on the industrialized countries' internal security - current EU policy being a case in point - is too one-sided, reactive and, at best, only effective in the short term. Prevention strategies do not feature in the numerous bilateral readmission agreements between the industrialized nations and countries of origin. WBGU recommends that at future international migration forums, environmentally-induced migration feature on the agenda and that appropriate plans be developed to deal with this issue. Focusing solely on economically motivated migration is not enough. Germany and the EU must step up their engagement in this area.

Integrating migration policy into development cooperation. In the Least Developed Countries, unabated climate change would increase the risk of people being forced to abandon their home regions due to the collapse of their natural life-support systems. Development cooperation can help to strengthen the adaptive capacities of people living in absolute poverty and thus make it easier for them to remain in their homes. However, development strategies must take greater account of foreseeable climate impacts at the local level. It can be assumed that climate-

induced migration within and between affected states will increase in future, opening up a new field of action in development cooperation. The importance of a comprehensive, pro-active and development-oriented migration policy is increasingly being recognized at the political level as well.

Enshrining the protection of environmental migrants in international law. Environmental migrants currently do not fit into the agreed categories of international refugee and migration law, even though a strong increase in environmentally-induced migratory movements is anticipated. Under current international refugee law, states have no specific obligations in relation to the treatment of environmental migrants, nor are any other legal mechanisms in place for the protection of the affected individuals. In the interests of improving the legal status and protection of environmental migrants, it is important to consider ways of closing this gap in international law. WBGU recommends that rather than adopting an additional protocol to the existing United Nations Convention Relating to the Status of Refugees, vigorous efforts be made at this stage to establish a cross-sectoral multilateral Convention aiming at the issue of environmental migrants. UNHCR should be involved as fully as possible in negotiations on the adoption of the requisite international agreement. This agreement should institutionalize the cooperation between UNHCR and the bodies established within the framework of the participating conventions. Furthermore, the United Nations' efforts to protect internally displaced persons, which have already begun, should be intensified.

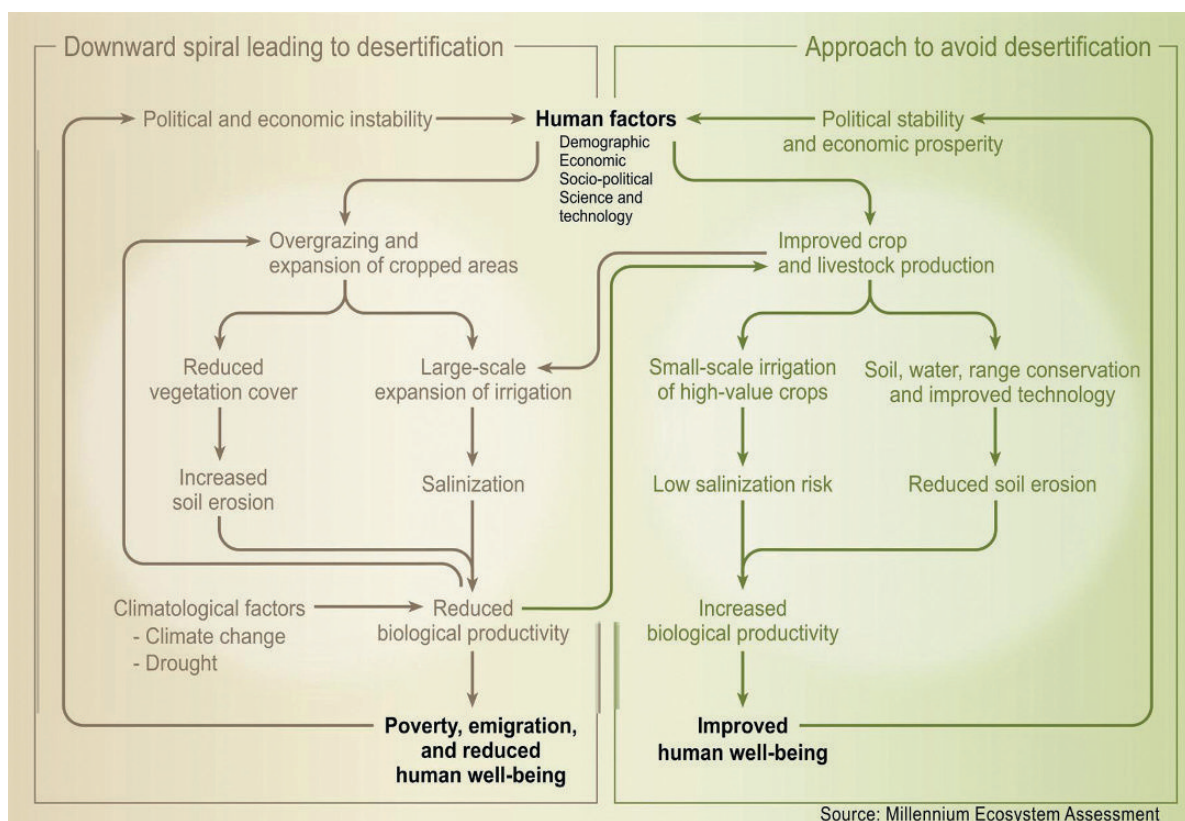
with poverty and 'life on the environmental limits' as the main motivating force, it matters little to the migrants whether they view themselves primarily as environmental or economic refugees" (Myers 2005). While there is surely some truth in this, nevertheless the recognition of desertification as a reason why people are forced to take refuge is an important step towards actually helping them (Conisbee/Simms 2003), because it may open doors to additional funds e.g. for increased activities of UNHCR, and it raises awareness of political decision makers for this yet widely unnoticed or at least unmanaged outcome of environmental degradation. Estimates by the *United Nations University* (UNU) expect that until 2010 there will be up to 50 million environmental refugees. Therefore, former UN Under-Secretary-General and Rector of UNU Hans van Ginkel's call goes for the recognition of environmental refugees within international frameworks, realizing that limited resources already restrain

the relevant global organizations' capabilities to deal with conventional refugees (UNU-EHS 2005a). This is also reflected in a proposal by the German Advisory Council on Global Change (WBGU 2007, 2008) for managing migration through cooperation and further developing international law (box 9.2)

9.5 Growing awareness at the multilateral level, and mitigation efforts

In affected countries awareness is rising about the connection between ongoing drylands degradation and migration. At the 7th *Conference of the Parties of the United Nations Convention to Combat Desertification* in Nairobi 2005 (UNCCD COP-7), Morocco for example "urged parties to be proactive in their response to the impact of desertification on migration"

Figure 9.2: Schematic Description of Development Pathways in Drylands. **Source:** Millennium Ecosystem Assessment (2005). This is in the public domain.



(IISD 2005: 1). On the other side of the Mediterranean Sea, Spain held a second International Symposium on Desertification and Migration⁴ in autumn 2006, relating to the agenda of the *International Year of Deserts and Desertification* (IYDD).

The IYDD was agreed upon by the 58th United Nations General Assembly (2004) in 2004, stating its concern over the exacerbation of desertification especially in Africa and its implications for reaching the Millennium Development Goals in general and on half of Goal No. 1 in particular: The eradication of extreme poverty (UNGA 2005: 1). Among the expected achievements of IYDD is the awareness of desertification implications. This ought to be reached by pointing to the threat desertification poses to vulnerable ecosystems, underlining the most serious consequences

under climate change, and the meaning of further loss of biological diversity. In addition, the perception of relationships between food insecurity, poverty, migration and conflicts should be strengthened (UNGA 2005: 3). So the agenda is supposed to be interdisciplinary, aimed at a more detailed understanding of human dimensions, and it comprises a linkage between desertification and migration.

To complete the overview of 2005 conferences, the *Third session of the Committee for the Review of the Implementation of the [UN] Convention [to Combat Desertification]* in Bonn (CRIC-3) put some attention to this issue. During CRIC-3, two global interactive dialogues were conducted by the plenary, one being about *Land Degradation/Desertification and their impact on Migration and Conflict*. There, by different participants it was noted “that many migrants come from rural areas, and live on agriculture. They are often forced to migrate due to pressures from such land-related issues as industrialization and low productivity of land”, “that land degradation is the greatest threat to the South Sahel and West Africa, which contributes to poverty”, and that *National Ac-*

4 At the first “International Symposium on environmentally induced population displacements and environmental impacts resulting from mass migration”, organized by IOM, RPG and UNHCR from April 22–24 1996 in Switzerland, it was estimated that more than 135 million people are at risk of being displaced mostly as a consequence of severe desertification (IOM 1996).

tion Programmes (NAP) “should include strategies to reduce the causes of environmental migration and resettlement” (IISD 2005a: 15).⁵

The good news is: The downward spiral of overpopulation, overgrazing, and other influences leading to desertification including all its side effects like exacerbated poverty and increased emigration is not inevitable. As presented in figure 9.2 (MA 2005a: 4), effective approaches exist to prevent desertification, increase of biological productivity and thus leading to improved human well-being.

The two sides in figure 9.2 represent two partially competing scientific approaches: The ‘desertification paradigm’ and the ‘counter-paradigm’ (MA 2005b: 645). The left side represents the older, indeed fatal desertification paradigm. It states that drylands are basically stable ecosystems which turn to collapse when human influence exceeds certain levels, and, most important, that few, if any, measures exist to prevent this downward spiral. In the more recent developed and scientifically backed up counter-paradigm, this is only one of two possible outcomes. It first states that deserts are by themselves unstable and therefore highly vulnerable areas. This does not neglect human influence in land degradation and its sometimes disastrous outcomes, but puts it into the broader picture of natural droughts and anomalies which are still far from being fully understood. Following this counter-paradigm, it is also possible, but dependent on social developments and political decisions, to avoid land degradation by using e.g. sustainable farming practices or integrated water system management. Indeed, some research has been undertaken for example during a series of international workshops since 2001 on the role of freshwater resources and on otherwise possible rehabilitation of drylands, on sustainable management of marginal drylands, and on prevention of land degradation

through traditional knowledge and modern technology (UNESCO 2003, 2004).

A recent large scale study by Pretty, Noble, Bossio, Dixon, Hine, Penning de Vries and Morison showed that using sustainable agriculture practices on 12.6 million hectares (roughly 1 per cent of the cultivated area in developing countries) helped increasing the average crop yield by 79 per cent, and it improved water-use efficiency. Also the use of pesticides, where checked, declined by 71 per cent, while crop yields grew by 42 per cent (Pretty/Noble/Bossio/Dixon/Hine/Penning de Vries/Morison 2006: 1114). Such successes are best reached by bottom-up-policies, as top-down policies often exacerbate land degradation (MA 2005b: 648). These policies need to be addressed at sub global levels by regional strategies and their integration in national action plans. This strategy seems to be the most promising and can lead to sustainable management of transboundary watersheds and biodiversity as well as to prevention of further desertification (UN Millennium Project 2005: 223).

Desertification, with all its underlying factors and its manifold consequences, will not be defeated easily. Though, there are ways to combat it effectively, and there are ways to live with the natural instability of drylands. In addition, we do not lack any longer the ability to end poverty (Sachs 2005), one of the main human drivers as well as impacts of desertification. But we do lack the political will to combat it effectively (and surely we still do lack scientific understanding of soils, their degradation, and the human dimensions of desertification). Therefore, we should prepare for growing numbers of environmental refugees, both nationally in our own countries and globally to prevent further political destabilization in developing countries.

5 During the UNCCD Third Session of the Committee for the Review of the Implementation of the Convention (CRIC 3): a Global Interactive Dialogue (GID) was held on 10 May 2005 in Bonn, Bundestag Conference Centre that was chaired by Amb. Mohamed M. El Ghaouth, Representative of Mauritania at the United Nations, New York, and moderated by Hans Günter Brauch, Free University of Berlin and AFES-PRESS; See the speeches by Brauch, at: http://www.afes-press.de/pdf/Brauch_Almeria_Valencia.pdf; and by Oswald Spring/Brauch, at: http://www.afes-press.de/pdf/Oswald_Brauch_lang.pdf; and the official summary in the UNCCD Journal No. 8 of 11 May 2005; at: http://www.afes-press.de/pdf/UNCCD_journal_050511.pdf.

10 Desertification in Algeria: Policies and Measures for the Protection of Natural Resources

Ghazi Ali

10.1 Introduction

With a total surface area of 2.4 million km², Algeria stretches 1,200 km from the east coast of the Mediterranean to the west, and 2,000 km north to south in the heart of the Sahara Desert. This vast area is home for 32 million people, the majority of whom (90 per cent) live in the north of the country. In Algeria three ecosystems prevail:

- The *mountainous ecosystem*, situated in the Tellian zone, with mountain chains and secondary mountain ranges characterized by land which is developed (calgimagnesian, fersialitic, brown), having a fragile structure subject to major degradation due to erosion.
- The *steppe ecosystem*, defined as part of the national territory demarcated in the North by the 400 mm isohyets and in the South by the 100 mm isohyets. It is characterized by soil of poor quality, exhibiting a predominantly hard layer of limestone.
- The *Saharan ecosystem* which covers almost 80 per cent of the total surface area, and which extends to the south of the Saharan Atlas divided by large morphological structures, the sandy ergs, the Hamadas (stony plateaux) and the Hoggar mountain region characterized by absolute dryness and a pronounced salinity.

This varied phytogeography generated a multitude of landscapes and biotopes that are extremely rich in biological diversity. Indeed, biological resources are a strategic element of sustainable development, and include animal and vegetable resources, and biodiversity in general. Sustainable development can only be achieved if these resources are protected and developed.

10.2 Status of the Environment

More than 12 million hectares are subject to water erosion which causes considerable soil loss, resulting in the silting of barriers, particularly those related to the degradation of the natural environment (flora, soil). About 20 million hectares that constitute the steppe region are threatened by desertification. This is linked to systems of exploitation of the environment by human beings who, in most cases, have been ignoring the traditional systems which, although not highly productive, nevertheless ensured a balance and protection of resources.

Thus, this degradation presents a huge problem for the authorities as more than 12 million hectares are subject to water erosion which causes major soil losses and the silting of barriers. This seriously impacts on the drinking water supply for industry, and especially agriculture.

The whole infrastructure of southern Algeria, which covers 200 million hectares, is subject to intense silting as a result of rapid development on the one hand, which often failed to take into account the fragile nature of the oasis ecosystems, and a certain 'laxness' on the part of the 'Touiza' population on the other hand; community work carried out by volunteers which involved the maintenance of foggaras¹, the restoration of AFREGS, sand grids, and the permanent maintenance of the drains. Taking all this into account, the authorities have launched major efforts to combat environmental degradation.

10.2.1 Desertification in Algeria

The degradation of natural resources in Algeria has reached a serious level. There are fears that it cannot be reversed in the medium term. This situation due, to overexploitation of the natural environment as a result of unsuitable agro-silvopastoral activity, makes the process of biological recovery difficult. From the

country's total surface area of 238 million hectares, 3,900,000 hectares are covered by forest. In the north 11 per cent of the land is covered by forests; while for the whole country barely 1.5 per cent is forested (figure 10.1).

Figure 10.1: NOAA Satellite Image of Algeria. Source: FAO Country Profiles and Mapping Information System, Algeria; at: <<http://www.fao.org/countryprofiles/Maps/DZA/19/im/index.html>>.



This shows the difficulty for a rational land protection. The problems of degradation are discussed for the ecological regions. Of a total of 238 million hectares, 200 million are taken up by the Saharan region where all oases suffer from silting caused by intense wind erosion. Demographic growth and urbanization have completely disturbed the precarious balance in the oases, and resulted in a spectacular removal of palm groves that may completely disappear in the medium term if no countermeasures are undertaken (figure 10.2).

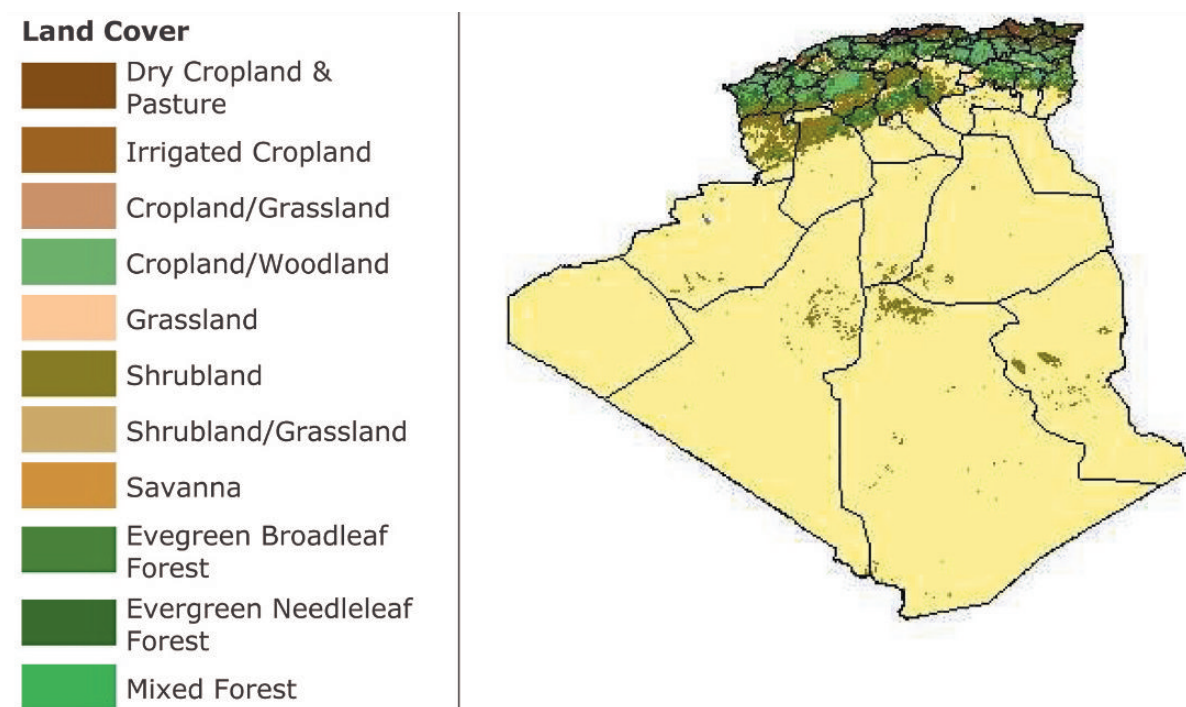
In the arid and semi-arid steppe region in the Northern Sahara nearly 20 million ha are subject to degradation. The population which lives mainly from extensive pastoralism did hardly anything to preserve this steppe, and its livestock of over 15 million animals far exceeds existing capacities. A satellite-based evaluation led to a national map that illustrates the regions that are sensitive to desertification. It shows that the very sensitive surfaces amount to over 7 million ha.

Exacerbated by cyclic drought, today more than 50 per cent of the land is degraded, and natural species are progressively disappearing. This has become worse because traditional land management practices are on the decline. Socio-economic changes occurred before the traditional methods could be replaced with new land management systems that assure the protection and sustainable development of pastoral land. Despite major efforts the situation remains alarming, since this damage caused multiple constraints for the traditional organization system and a migration of those people who until then had ensured the protection of these resources. For this region the demand for resources has been far greater than the supply, which has complicated the introduction of conservation methods. The increasing demand for resources has caused unprecedented environmental degradation with often spectacular effects, such as silting or even the total disappearance of vegetative cover.

Even if the intervention in the steppe has in most cases been mastered, the major problems causing this degradation have not yet been placed in a framework of land management planning. Further, the existing land system does not impose any legal restrictions, which has resulted in the exploitation of vegetative cover. More than 2 million hectares of land have been farmed. This increase in farmland and the introduction of mechanization into agriculture are major causes for degradation due to wind erosion and sterilization of the soil.

1 According to Wikipedia; at: <<http://en.wikipedia.org/wiki/Qanat#Algeria>> (12 November 2007): iQanats (designated foggaras in Ageria) are the source of water for irrigation at large oases like that at Gourara. The foggaras are also found at Touat (an area of Adrar 200 km from Gourara). The length of the foggaras in this region is estimated to be thousands of kilometres. Although sources suggest that the foggaras may have been in use as early as AD 200, they were clearly in use by the 11th century after the Arabs took possession of the oases in the 10th century. "The water is metered to the various users through the use of distribution weirs which meter flow to the various canals, each for a separate user. The humidity of the oases is also used to supplement the water supply to the foggara. The temperature gradient in the vertical shafts causes air to rise by natural convection, causing a draft to enter the foggara. The moist air of the agricultural area is drawn into the foggara in the opposite direction to the water run-off. In the foggara it condenses on the tunnel walls and the air passed out of the vertical shafts. This condensed moisture is available for reuse."

Figure 10.2: Map of Land Cover in Algeria. **Source:** FAO, at: <<http://www.fao.org/country-profiles/maps.asp?iso3=DZA&lang=en>>



10.2.2 The Affected Steppe Land

Pastoral land covers 36 million ha, and accounts for 14 per cent of the country's landmass that is distributed administratively into eight steppe wilayas and 11 agropastoral wilayas. The climate of these pastoral areas is characterized by:

- Weak precipitations with an irregular and complex space-time variation.
- Temperature patterns marked by stark contrasts, with a wide temperature range (cold and rainy winter, hot and dry summer).

With regard to precipitation four large areas with specific ecosystems may be distinguished:

- The area south of Piedmont of the Tellian Atlas with 400 mm/per annum where the more or less degraded forests and scrub are to be found.
- Areas prized by pastoralists, with *artemisia herba alba* (scientific name) situated on the high southern Algiers and Oranian plains, the Aures and Ouled Nail with precipitation of 300 mm/per annum.

- The foothills south of the Saharan Atlas where the terrain is poor, with sparse vegetative cover and precipitation of only 200 mm/per annum.
- The pre-Saharan steppe with precipitation of 100 mm/per annum on scrawny soil of poor quality that is sometimes covered with a thin layer of sand.

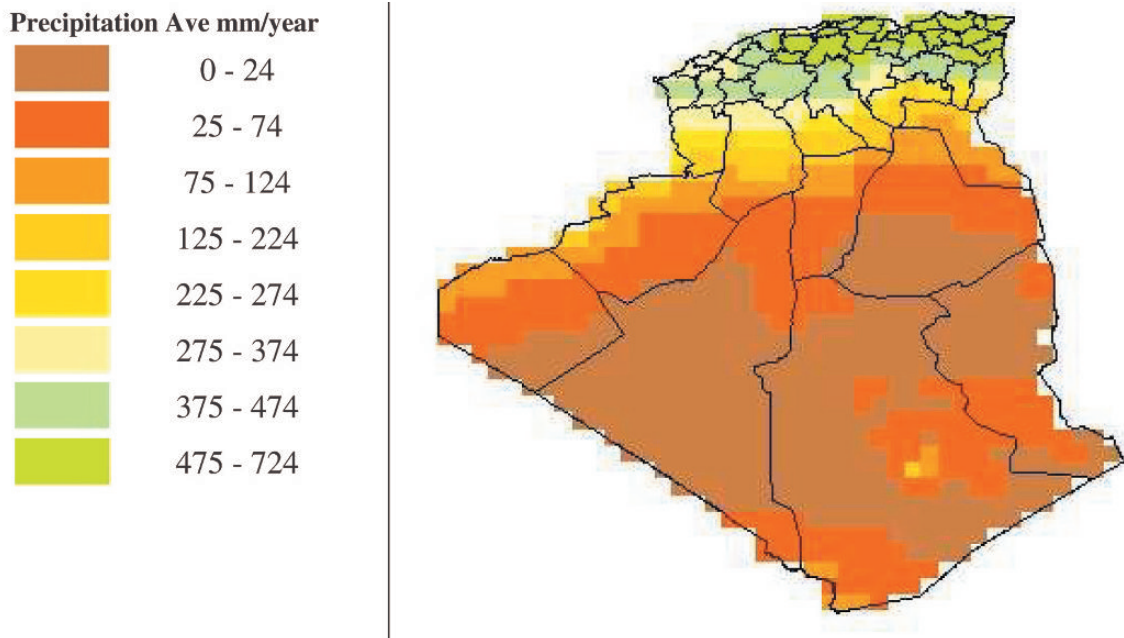
A wide temperature range shows the continental nature of the steppe climate (mm) in Djelfa which can reach a peak of 38° C in the summer and very low temperatures in December.

There is much wind in the steppe and this is a major factor causing soil degradation as they transport fine particles of sand which causes dunes to form. Winds with a speed above 5 metres/second can transport fine particles of soil from land unprotected by vegetative cover.

These winds coming from the north-east to the south are particularly dangerous during spring when they cause severe sandstorms. They also blow from the south-west to the north-east, particularly in the summer when their drying effect inflicts major damage on the vegetation.

There has been an increase in the sand volume in the oases in recent years causing significant damage to living areas as well as to their structures. Books and

Figure 10.3: Precipitation in Algeria. **Source:** FAO Country Profiles and Mapping Information System, Algeria; at: <<http://www.fao.org/countryprofiles/Maps/DZA/06/pp/index.html>>.



cartographic documents on the sandy structures of the south show that this is not a new phenomenon. Due to the vigilance of local populations over many decades, this could be contained. Sand covers more than a quarter of the surface area of the Sahara and constitutes structures of diverse shape and size.

Today siltation has become a major challenge. From aerial records and from observations plausible information on its predominant factors exist, among them are:

- The relaxation of the traditional ancestral battle by the people (Touiza) against the sands. Since many now have jobs in administration, tourism, and industry they no longer defend their small plot of land.
- The absence or disregard of town planning that takes into account the fact that wind directions are primarily responsible for transporting sand. Due to the unplanned and anarchical expansion of settlements, buildings were often established at right angles to old lanes, thus becoming sand traps.

The combination of these two factors has created areas that are susceptible to silting. These oases, situated principally at the edge of the humid ergs, contain major sand dunes and cover more than a quarter of the Sahara's surface.

10.2.3 The Arid and Semi-arid Region

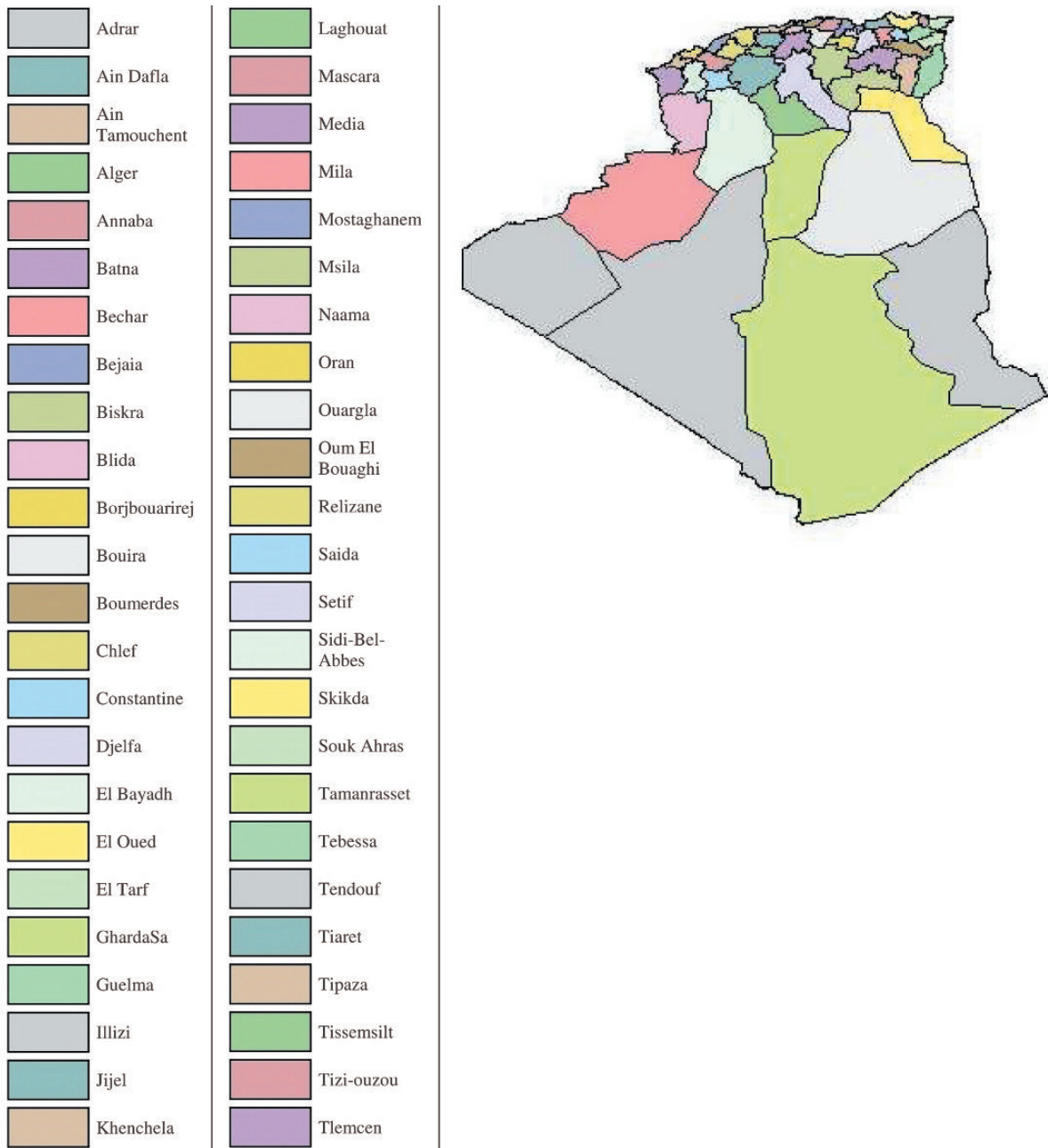
This region comprises nearly 20 million ha and has a population of nearly three million. Income is derived mainly from extensive pastoralism, the requirements of which cannot be met. Thus, overgrazing, together with the mechanization of agricultural practices and cyclic drought, have led to an increasingly dangerous degradation of the vegetation cover, thereby triggering the general process of wind erosion (table 10.1).

Table 10.1: Overview of the areas affected by Silting.

Wilaya (districts)	U	Living Dunes Organized	Silted areas (Sand-covered)
Naâma	Ha	90,000	400,000
El Bayadh	Ha	7,000	10,000
Laghouat	Ha	35,000	500,000
Tiaret			
Saïda	Ha	30,000	570,000
M'Sila	Ha	200,000	800,000
Djelfa			
Batna	Ha	2,000	40,000
Tebessa	Ha		50,000
		364,000	2,370,000

These estimated figures do not take the Saharan sands into account. The ergs alone cover more than a quarter of the surface area, at least 50 million/ha.

Figure 10.4: Districts in Algeria. **Source:** FAO Country Profiles and Mapping Information System, Algeria; at: <<http://www.fao.org/countryprofiles/Maps/DZA/16/ad/index.html>>.



The mountain region with nearly 12 million/ha has a traditional agriculture based predominantly on cultivation of cereals. Torrential rain in the form of very heavy showers on sloping ground with a substratum of tender rocks causes intense erosion resulting in the silting of water reserves estimated at more than 20 million m³/an of sediments. The general degradation of the land is reflected by the poor quality of the land

and the economy of the mountain region, whose agricultural earnings are progressively diminishing.

It should also be noted that soil erosion is inversely proportional to the vegetative cover protecting the land against the mechanical energy of water. Thus (according to Hadjiet), the Tellian massifs are completely stripped of cover, exposing them to intense erosion. The Atlas massifs, on the other hand, are better protected, thanks to the presence of forest cover

Table 10.2: Sensitivity of Administrative Districts in Steppe Land to Desertification.

Wilaya (district) in steppes	Little or not sensitive		Medium sensitive		Sensitive		Very sensitive	
	Sup. (ha)	%	Sup. (ha)	%	Sup. (ha)	%	Sup. (ha)	%
Tébessa	18,265.01	24.96	312,650.63	42.82	191,016.78	26.17	44,089.83	6.03
Khenchela	692,901.44	67.66	191,228.57	18.67	96,426.18	9.41	-	-
Batna	280,493.04	27.39	369,792.99	36.11	185,896.23	18.15	143,392.60	14.0
Biskra	132,514.88	18.46	146,737.14	20.44	384,047.04	53.5	54,448.65	7.58
S/Total Est	1,288,174.40	36.84	1,020,409.33	29.18	857,486.23	24.52	241,931.08	6.92
Djelfa	151,518.27	13.5	406,186.91	36.19	393,515.60	35.06	137,347.39	12.23
Laghouat	128,919.84	20.48	98,256.21	15.61	224,618.30	35.68	177,631.32	28.22
Tiaret	20,736.57	1.53	378,136.27	27.92	582,667.42	42.88	304,224.57	22.46
M'Sila	199,913.58	9.76	258,066.76	12.60	882,914.71	43.11	581,508.87	28.39
S/Total Centre	501,088.26	9.72	1,140,646.15	22.13	2,081,716.03	40.39	1,200,712.15	23.29
El Bayadh	92,833.26	6.03	359,884.84	23.41	461,033.91	29.99	524,250.24	34.10
Naâma	464,651.92	17.86	586,663.82	22.55	1,242,756.8	47.77	235,805.58	9.06
Tlemcen	9,960.79	1.73	507,470.94	88.36	50,152.78	8.73	6,711.71	1.16
Dj. Arar	22,461.73	4.89	62,328.7	13.58	368,242.35	80.28	5,624.40	1.22
S/Total Ouest	589,908.04	11.4	1,516,348.3	29.32	2,122,185.84	41.03	772,391.93	14.93
Total	2,379,170.67	17.21	3,677,403.78	26.60	5,061,388.10	36.62	2,215,035.16	16.02

which limits water erosion. Thus, nearly 58 per cent of the Tellian surface area is affected by erosion, compared to only 10 per cent of the Atlas massifs. This shows that a durable vegetation cover remains the best protection against water erosion.

10.2.4 Evaluation of Desertification

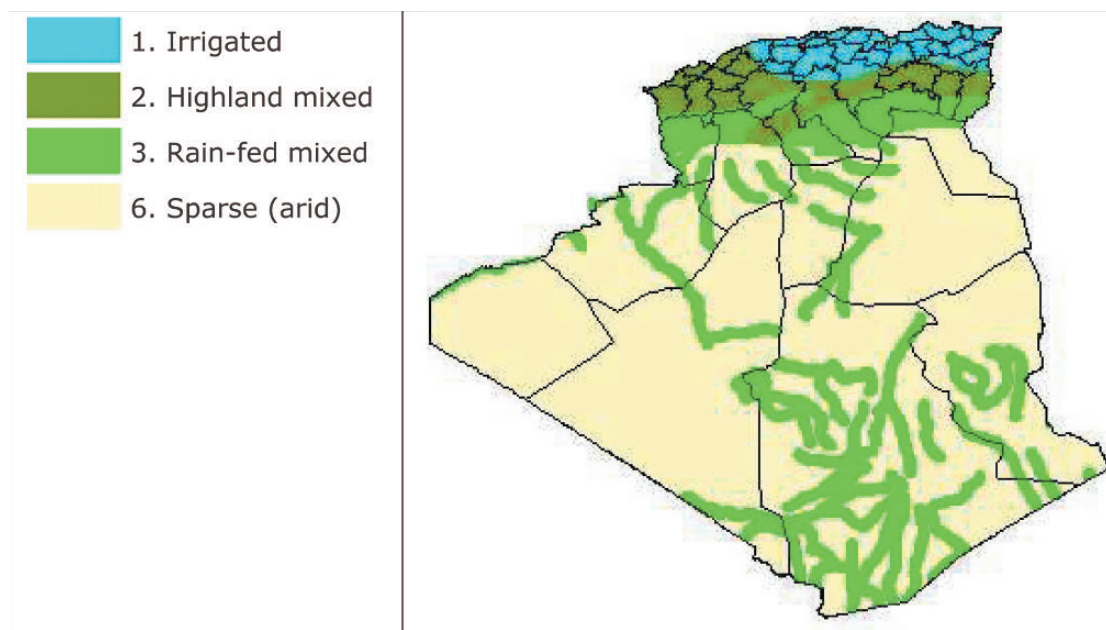
The study initiated by the Ministry of Agriculture (Head Office of Forests), and carried out by the National Centre for Spatial Techniques (CNTS) covered almost 70 per cent of the steppe regions and related to the chart of sensitivity to desertification. This cartography of sensitivity of the steppe regions was drawn up on the basis of: a) satellite data, b) maps of land use, and c) morphologic and paedologic (soils) maps (table 10.2). Each entry was assessed with regard to its potential sensitivity to desertification. Thus five types of sensitivity were defined. The regions classified as moderately to very sensitive were found to amount to 9,226,694 ha, or 67 per cent of the total surface area assessed in this study. The regions classified as suffering from desertification represent 487,902 ha, or a little more than 3 per cent of the total area assessed.

In order to better define the level of sensitivity to desertification at the local level, the study produced these results for the different administrative districts (*wilayas*) in the steppe land. The areas classified as little sensitive cover only 17 per cent of the surface area studied, whereas those areas classified as sensitive to very sensitive cover more than 52 per cent, which amounts to more than half of the territory, underlining the gravity of the situation.

10.2.5 Factors Exacerbating Desertification

Before independence, in the event of a severe drought, there was a significant death rate among the animal population, which eased the burden on the steppe, thereby reducing the pressure on the land. This period also saw cultivation, but only in the (Dhayas) and terraces of the Wadis where the soil is deep and moist. Only cereals were cultivated and they rarely exceeded 4 quintals/ha (1 quintal: 100 kg) in volume that were harvested in spring. This form of management worked for centuries with well-established social rules followed by each community from generation to generation. But this system of balanced management no longer exists due to social, economic, and political changes as a result of:

Figure 10.5: Farming Systems in Algeria. **Source:** FAO Country Profiles and Mapping Information System, Algeria; at: <http://www.fao.org/countryprofiles/Maps/DZA/01/fs/index.html>.



- dramatic population growth, from less than one million in the 1960's to more than three millions in the early years of the 21st century, thus increasing demand and putting more pressure on the environment. Since independence (1962) accelerated urbanization has also created a very speculative market due to the strong demand for meat, which has led to a disproportionate increase in cultivated land to satisfy an increasingly large livestock, which has also been very profitable.
- the inadequate techniques used to exploit the land which proved to be destructive, for example the disk plough which churns up the land, thereby exposing these wide open spaces to harmful winds. This contrasts with past methods, where the swing-plough made it possible to cultivate the land while safeguarding the vegetation (post-farming) thus protecting the soil (for example the pastoral artemisia).
- the impossibility of easing the burden on the steppe, if only temporarily, and even in the event of a severe food shortage, because of the availability of cattle feed. This form of assistance, praiseworthy in the sense of avoiding the ruin of the pastoralists, unfortunately has negative consequences for the land which does not have time to recover from the pressure of an increasingly large herd. Thus herds are maintained and nourished with external factory-produced foodstuffs (concentrates, barley).

Furthermore, the technical progress in the steppe due to state-provided veterinary medicine in combating diseases has significantly decreased the death rate among livestock. Vigorous campaigns against diseases such as Blue Tongue, Clavele, Rabies, Brucellosis, Anthrax, and Hydatid Cyst are regularly carried out.

Free access to the land has also given rise to a multitude of investors in livestock breeding, taking into account its profitability and the exemption from payment of a fodder tax. There has been an influx of large stockbreeders, generally city dwellers with significant means at their disposal, and who are therefore not put off by the existing constraints with regard to water, poor land quality, or the movements of the herds.

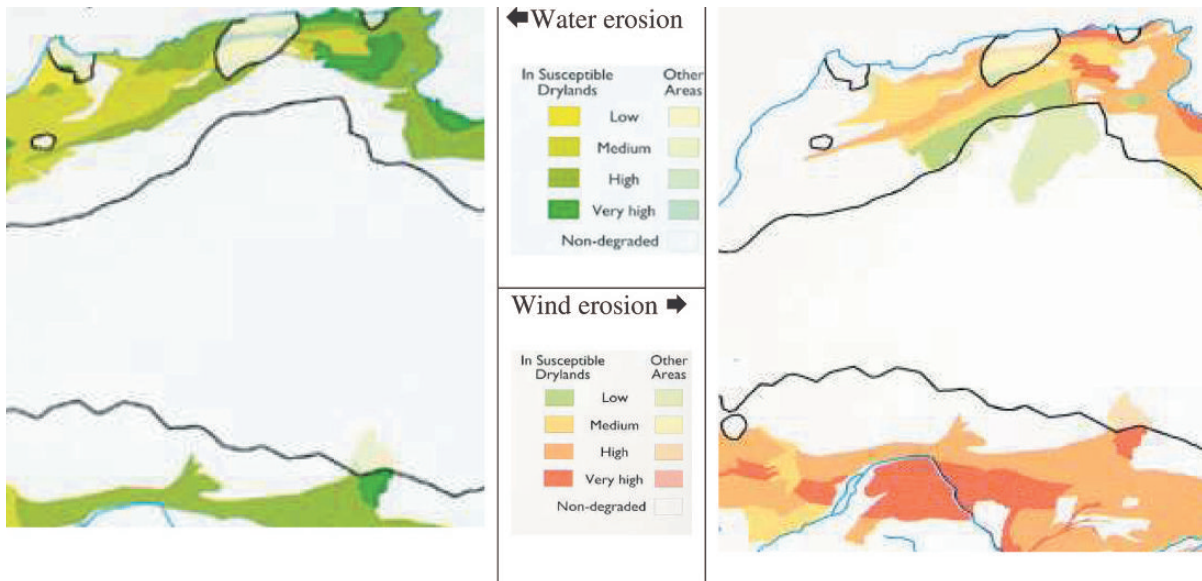
Such breeding backed by considerable financial means has been carried out to the detriment of the small stockbreeders who are not in a position to bring food from outside for their livestock. This situation has been primarily responsible for the progressive disappearance of the small stockbreeders who had no choice but to settle in the outskirts of towns, hoping to find work there.

10.2.6 Degradation Phenomena

10.2.6.1 Water Erosion

The land in high altitudes and slopes is particularly vulnerable to water erosion. As 68 per cent of Alge-

Figure 10.6: Water and Wind Erosion in Algeria. **Source:** UNEP/ISRIC, CRU/UEA; at: <<http://lada.vrtualcentre.org>>.



ria's territory has an average altitude above 800 m, and as 30 per cent of the land consists of slopes with a gradient of more than 12 per cent, this land is especially vulnerable to water erosion. This is further intensified by torrential rains and flash floods. The weather statistics show an average rainfall of 45 mm in a 24-hour period several times a year.

Other factors exposing the land to water erosion include: a) forest fires which undermine the fragile soil; b) excess soil leading to run-off, thus preventing the vegetation from regenerating; and c) traditional farming techniques practised by farmers on slopes, thereby increasing run-off and soil erosion. All these factors cause not only the loss of fine soil particles, but also landslides. The total surface threatened by water erosion is estimated at almost 10 million ha. Soil losses amount to 120 million tons per annum, which equals 40,000 ha of arable land.

Calculations on the basin inclines refer to an annual erosion of 16.6 m³ of land per hectare, which equals 1.6 mm. Water erosion also has other consequences, including the loss of water resources caused by non-alimentation of the groundwater as a result of reduced infiltration and silting of the barriers, some of which reached a rate of sedimentation bordering 100 per cent (especially the Fergoug, Ksob, and Foun-El-Gueiss dams).

10.2.6.2 Wind Erosion

This very important phenomenon particularly affects the arid and semi-arid regions in general, and the steppe in particular. Although it has reached alarming

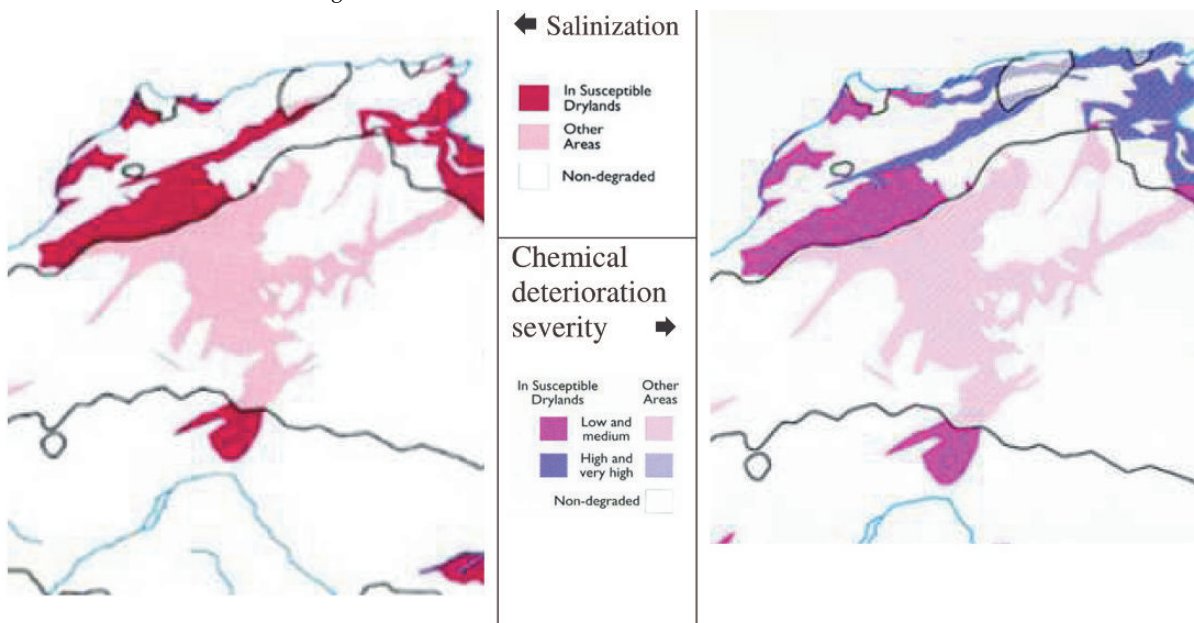
proportions over the years, no scientific quantification has been made in Algeria to assess the soil losses caused by wind erosion. However, a report initiated by the forest administration and developed with teledetection shows worrying results. It claimed that almost 600,000 ha of land in the steppe region suffer from desertification without the possibility of a biological recovery, and that nearly 6 million ha are seriously threatened due to wind erosion.

This erosion is caused by an imbalance in the interaction between climate, soil, vegetation, and human beings. It comes from the combined effects of climatic change (persistent drought) and human activity that is adapted to the fragile soil. These actions are 'imposed' by the increasing needs of a constantly growing population which leads to an expansion of cultivation on land that is unsuitable for agriculture, and the spread of the settlements into areas that were traditionally reserved for farming.

10.2.6.3 Salinization

In addition, the land of *chotts* and *sebkhas*, the irrigated agricultural land, is also prone to salinization due to the poor water quality, evapotranspiration, and bad drainage conditions. This phenomenon is particularly visible in oases and certain agricultural areas situated in the arid and semi-arid regions (Abadla, Relizane et al.). In 2007, about 300,000 ha of land was fit for irrigation out of 1.4 million ha that were classified as prone for irrigation. Thus the risk of salinization exists if adequate drainage conditions are not met.

Figure 10.7: Salinization and chemical deterioration severity in Algeria. **Source:** UNEP/ ISRIC, CRU/UEA; at: <<http://lada.vrtualcentre.org>>.



10.2.6.4 Chemical Pollution

The uncontrolled use of manure and plant health products often causes the disappearance of the earth's microfauna and microflora, and consequently decreases the fertility of the arable layer. It is currently difficult to assess the surface areas affected by such pollution since no follow-up statistics are available, but it should be emphasized that these surfaces are important, particularly in the case of land with high agricultural potential, considering the large quantities of manure used by agriculture (more than 600,000 quintals per annum). Other forms of pollution undermine soil fertility, such as waste water disposed of in the natural environment, as well as waste dumped close to arable land.

10.2.6.5 Cultivation Methods

Inappropriate cultivation methods often cause soil erosion, particularly the cultivation of slopes. The traced furrows create channels where the fast water run-off generates intense erosion. Other farming practices are also responsible for soil erosion, such as the cultivated fallow and the introduction of the disk plough in a steppe environment. The surface areas cultivated annually and subject to wind erosion are estimated at almost 1.2 million ha.

10.2.6.6 Urbanization

Urbanization and industrialization often occur on the most fertile arable land, since those responsible choose the easy options which do not require substantial investment in civil engineering. This negative development generally continues despite the protests from environmental protection associations. The authorities have failed to control this haemorrhage of fertile land. The potential agricultural surface area lost is estimated at 250,000 ha, including 10,000 ha of irrigated land. Thus, the situation with regard to land heritage is most alarming. This multiple degradation, combined with population growth, has meant that the available agricultural surface area per capita is in progressive decline.

Thus, the statistics show that in 1962, the SAU (used agricultural surface) per capita was 0.82 ha; in 1982, it declined to 0.36 ha then to 0.32 ha in 1989, and is currently approaching 0.20 ha/hab. These figures clearly indicate an extremely grave situation for Algerian agriculture, and especially for the country's food security. This implies not only the need for substantial protection efforts, but also for the possible cultivation of new areas in order to increase the agricultural surface area, which of course would require major investment.

Attention should be drawn to the fact that approximately 60 per cent of the total population currently lives on a coastal strip accounting for approximately

1.7 per cent of the total surface area of the country, and where the majority of the water resources, arable land, and industrial infrastructure are concentrated. The density of the population in this region is estimated at 233 inhabitants per km² in 2003, compared to 169 persons/km² in 1977. The pressure exerted on the most productive land by this increasing density is alarming, and only serves to exacerbate degradation and the permanent loss of soil.

10.3 Assessment of Soil Protection Activities

Action taken to combat soil erosion in Algeria began with experiments in anti-erosion techniques, some of which did not produce the expected results. The principal operations carried out concerned the defence and restoration of land (DRS), torrential correction, afforestation, and land improvement.

10.3.1 Defence and Restoration of Land

The defence and restoration of land combines a series of actions to combat soil erosion that have been initiated in 1942 with the creation of the 'DRS technique'. This bench technique consists of cutting the slopes at regular intervals by terraces on which forest trees or rustic fruit trees are planted. In 1964, the total surface area thus treated over a period of 20 years amounted to 375,000 ha that was concentrated primarily on the protection of the plains and barriers in order to ensure the expansion of colonial agriculture.

In 1984, an assessment was made of the physical and economic effects of this technique. It emerged that the benches led to an increase in water erosion, particularly in areas where the structure is unstable, and owing to the fact that this method was strongly opposed by the local population who systematically destroyed the work of the DRS, thereby exacerbating land degradation. This technique has since been abandoned. Probably one of the reasons for its abandonment is the extremely high cost of implementation and the lack of maintenance of its infrastructure.

10.3.2 Control of Flash Floods

This is one of the DRS techniques still in use that allows the regulation of intensive rain and flash floods through the construction of small successive barriers and thresholds along the torrent. These thresholds are generally created using dry stones, and are some-

times maintained with baskets. These barriers amount to more than 1 million m³ across the country. But this is insufficient, given the surface area requiring treatment and the lack of dry stones in many places. The effort to control the torrents is generally accompanied by biological protection through the fixing of banks. The amount has increased during the last few years due to a major work programme that envisages the creation of 330,000 m³ within three years.

10.3.3 Land Improvement

Land improvement indirectly affects the protection of the land against erosion and encourages farmers to work their land, thus mitigating against the effects of erosion. It consists of a major cultivation requiring the use of bulldozers with rooters which dig the ground up to 1.20 m. This technique permits good water infiltration, while increasing the productive potential of the land, and therefore the revenue. Almost 50,000 ha have been treated so far.

10.4 Action Undertaken

Despite the disappointing results from various development programmes, the steppe has nevertheless benefited from major investment in its development. Moreover, this area is promoted by the authorities. Many programmes have been implemented since the 1970's which have resulted in a number of concrete projects:

10.4.1 The Green Barrier

The Green Barrier, situated on a fringe located between the isoyetes 200 and 300 mm of rain, was launched in 1970 by the National Defence Ministry (Office of the High Commission for National Service) and seeks to protect the land from degradation. This national effort initially aimed at a massive afforestation of over three million hectares, and it was soon to become a project of integrated development primarily with regard to the following:

- The reconstitution of degraded forests of the Saharan Atlas covering an area of 300,000 ha.
- The protection of living areas and socio-economic infrastructures from silting through the establishment of dunes and green belts extending to almost 16,000 ha.
- The cultivation of pastoral plantations to increase the amount of fodder over 25,000 ha.

- Integration of the population through new road networks of more than 5,000 km.
- The mobilization of water resources for the local people through the creation of 90 water points.

The first plantations met with hostility by local people who opposed plans which limited the freedom of movement of their herds. These plantations were quickly redirected towards sloping ground that did not interfere with pastoral activity. To avoid damage to young plantations several activities were launched for the benefit of local people. Roads were built to make them less remote, access to water resources was improved, and pastoral plantations were encouraged. However, independent management implied that their durability could not be guaranteed.

Parallel studies were undertaken in each *wilaya* affected by the green barrier where the socio-economic aspect that was previously missing was taken into account. But these studies did not meet the requirements for technical, scientific, and socio-economic knowledge of the steppe, and suffered from an obvious lack of intersectoral coordination.

It is difficult to mention all activities undertaken in the steppe region since independence due to their number, but also due to the lack of intersectoral coordination. The concern of the state has been to ensure a regional balance, which often did not pay sufficient attention to the specific conditions of the area.

10.4.2 Land Utilization

The purpose of this programme has been to increase the agricultural potential, thus creating permanent jobs, particularly in the steppe region. The programme resulted in durable investment in the development of 280,000 ha, what represented almost 55 per cent of the national total. However, land utilization, while permitting the creation of large and economically viable agricultural areas, also created barriers, sometimes preventing the circulation of the herds.

10.4.3 The Afforestation Programme

Special projects (CPR) were launched between 1962 and 1967. The objective was to reduce unemployment in rural areas and to mobilize the citizens for community action in the national interest. During this period a surface area of 38,500 ha was afforested. Other programmes followed in the framework of the triennial plan (1967-1969), the 1st four-year plan (1970-1973),

the 2nd four-year plan (1974-1977), the special programmes (1967-1978), the communal plans (1967-1978), the 1st five-year plan (1980-1984), the 2nd five-year plan (1985-1989), the programme of development of the steppe, the 'Green Barrier' programme, the annual programmes of 1990 to 1993, and the major work programme of 1994. Between 1962 and 1994 more than 1 million hectares were afforested. But given the damage suffered by the plantations and the deterioration due to drought, fire, or lack of maintenance, the actual surface areas which has undergone reforestation is estimated at nearly 700,000 ha.

The qualitative assessment carried out in 1986 showed that only 50 per cent of the plantations had a success rate of 80 per cent, 35 per cent had a success rate ranging between 20 and 50 per cent, and 15 per cent of the plantations had a success rate below 20 per cent. Based on this assessment the actual surface area that was successfully reforested and whose vegetative cover can be classified as forest amounted to nearly 700,000 hectares.

10.5 Assessment of Environmental Protection Legislation

Environmental legislation started in the 1980's dealing in particular with:

- *Ordinance 75-43* on farming transferred all pastoral or agricultural land to the state. This law covered all areas between the isohyets of 200-400 mm as well as the pre-Saharan region below the isohyet 200 mm, but excluded the land subject for permanent development.
- *Law 90-25* on land classification which defines pastoral land as "any land covered by a natural, dense or sparse vegetation including species with an annual or multi-annual vegetative cycle".
- *Law 83-18* on ownership of agricultural land (APFA), which does not refer to pastoral land, seeks to encourage agricultural investment in the steppe. The local authorities have the right to grant land, in particular to young people, to make it productive within five years. If they succeed, the recipients are granted the right to own the developed area. This development is restricted to potential land that requires mobilizing water resources and excludes pastoral land.
- *Law 84-12* on the 'General Regime for the Forests' also applies to the land that declares the protection and rational use of land subject to erosion and desertification as a national interest. The land

of the steppe region is thereby obviously most affected.

- *Law 01-20* of 12 December 2001 on sustainable development of the land in an integrated, coherent and prospective manner integrates economic and social development as well as protection and development of the natural resource potential into public policy.
- *Law 83-03* of 5 February 1983 on environmental protection, modified and updated by the new law 03-10 of 19 July 2003, is entitled as the “law relating to environmental conservation within the framework of sustainable development”. This new law takes international agreements into account to which Algeria has subscribed and it is based on modern sustainable development principles. The provisions contained in this law made nature conservation a task that is in the national interest, and consequently “it is the responsibility of each and every person to protect our natural inheritance”. The protection of the land from erosion and desertification is in the public interest. Thus, environmental protection associations can be created in accordance with the pertinent regulations.

The law of 2003 concerning environmental protection constitutes major legislative support for protective action, in particular the participation of those people affected by desertification. It envisaged the role of associations for the protection of the natural environment, which indicates a willingness to involve all people concerned. With regard to law 84-12 on the general forest regime, the state plays a major role in the process of development, realization, and financing of projects to combat desertification. Thus, in many cases the participation of the population has contributed to the success of multiple previous projects. But these laws are often difficult to implement because the texts are missing which explain and describe the areas of application.

10.6 Natural Resources Requiring Protection

These laws refer to both plant (10.6.1.) and animal resources (10.6.2.) that require protection.

10.6.1 Plant Resources

Natural plant resources are characterized by three principal ecosystems: a) forest ecosystems, b) pastoral ecosystems, and c) Saharan ecosystems.

With a surface area of 238 million ha, Algeria has very limited forest cover. With 4,150,000 ha of forest, the level of forestation is only 1.5 per cent. If we take into account sylvan grounds, i.e. those in the north, the level is only 10 per cent, compared to the level necessary for ecological balance, which stands at 20 to 25 per cent. However, the Mediterranean forest is subject to continuous degradation due to human-induced pressure and fires.

With regard to the steppe, pastoral ecosystems undergo persistent degradation, in particular desertification. In addition to persistent and cyclic drought, pastoral vegetation in spite of its variety and richness is subject to exploitation of the ‘mining type’ which, if this situation persists, would see it disappear completely in the medium term. The *esparto*, with 3 million ha, remains the dominant homogeneous vegetation with the *artemisia* (4 million ha), the *lygeum spartum*, as well as the *pistachio* tree and the *jujube* tree in the days.

The flora of the Sahara is in most cases of the relic type, such as the *cypress* of the *tassili*. Occasionally there are the *acacias radiana*, but the herbaceous flora remains the most important, with 500 species of *vascular plants* and 700 species of *cryptogams*.

10.6.2 Animal Resources

The genetic inheritance of domestic and wild fauna is rich and diversified. Its location is dependent on agricultural practices and plant resources for domestic fauna (10.6.2.1) on the one hand, and on the other hand on the situation of natural biotopes for wild fauna (10.6.2.2).

10.6.2.1 Domestic Fauna

Domestic fauna is characterized above all by its genetic inheritance, being well adapted to the climatic conditions of the country, particularly the ovine livestock. The latter is estimated at 17 million, with 50 per cent made up of the local breed *Ouled Djellal*, 30 per cent of the *Hamra* breed, and 15 to 20 per cent of the *Rembi* breed. The highly prolific breed of *D'mina* is found primarily in the south-west. The bovine race is estimated at 1.2 million, more than 80 per cent of which can be found in the Tellian regions. This livestock principally consists of the *Brune* breed of the Atlas and the *Guelma*.

During the last decade, imports of highly productive bovine breeds took place, such as the black and white and the red. This imported livestock is estimated at between 200,000 and 300,000. The alpine

breed, 70 per cent of which can be found in the steppe regions, is estimated at more than 2 million. The *equidae*s consist of *barbes*, Arab thoroughbreds and *Arab-bores*. A 150,000 of equidae livestock exist particularly on the high plains. The donkey breed which suffered major decline is estimated at 450,000, similarly the mule is estimated at 200,000. The dromedary accounts for a herd of 100,000, and is located exclusively in the Saharan regions. Finally, there are farm animals where there has been spectacular development during recent years due to industrial breeding (poultry, turkey, guinea fowl, goose, and duck).

10.6.2.2 Wild Fauna

The privileged situation of Algeria explains the diversity of the biotopes which extend from the Mediterranean to the Saharan regions. The protected areas contain important animal species, including 90 species of mammals, 350 species of birds, 70 species of reptiles, 12 species of amphibians, and 70 species of freshwater fish. In addition to the importance of endemic species, the wetlands contain significant populations of migratory species.

Among the species which have disappeared or are in the process of disappearing from the steppe ecosystems are the lion of the Atlas, the ostrich of North Africa, and those which are in the process of extinction or even in some places extinct, include the *addax*, the *oryx*, the gazelle, the stag, the lynx, the bustard. This has been a result of overzealous hunting and competition between humans and beasts.

10.7 Perspectives

Three perspectives are distinguished focusing on the land (10.7.1), on vegetable (10.7.2.), and animal resources (10.7.3).

10.7.1 Perspectives on the Land

The current situation of land resources will probably get worse for the following reasons:

- Intensive winter rain which occurs regularly will continue to be the principal cause of severe erosion, particularly when the soil loses its vegetative cover. Drought is also a periodic natural risk creating conditions for soil erosion. The soil will be characterized by an elevated salt and limestone content leading to salinity. This situation applies particularly to newly developed land which re-

quires irrigation. It is essential to create a network of drainage for any new act of development in all areas.

- Demographic growth, although it has slowed down during the last decade (from 3.2 per cent in 1966-1977 to 2.3 per cent at present). Urbanization will continue, in particular with regard to small- and medium-sized towns in the country's interior due to the fact that large urban centres have reached a saturation point.

If this situation persists the loss of arable land may be expected to increase in the years ahead, considering the country's housing deficit and the intensive development of the cities. While an annual loss of more than 7,000 ha has been registered so far, this loss could be 2 or 3 times greater in the medium term, considering the requirements referred to above. This situation can only be controlled with the implementation of:

- a rigorous and sustainable regional planning policy through the development of various land use plans: PDOS (Plan of the Occupation of Land), PDAU (Urban Planning)).
- increased activities to combat soil erosion, particularly in the sloping basins of the belt and the steppe region.

With regard to the slopes of the basins, development must be multi-sectoral in nature, with each sector having the duty to ensure a comprehensive and harmonious development. The active involvement of the population must be achieved through an introduction of appropriate agricultural rotation, the practice of adapted techniques, and the availability of specialized equipment.

These objectives can only be achieved by a permanent and intensive popularization, where the ways and methods must be adapted to the sociological conditions of each specific terrain to meet the traditional practices which are already well anchored in rural areas. The control of medium-term planning with regard to the creation of large water reserves is necessary to allow for the treatment of the catchment area at least five to ten years before a dam is built. These activities must be integrated within the framework of a long-term national strategy to combat erosion and desertification (e.g. through national plans).

10.7.2 Plant Resources

Forest fires, the uncontrolled cultivation in the steppe, misguided agricultural practices, as well as

overgrazing and the anarchical introduction of exotic species provide a very pessimistic picture with regard to the future of plant resources, unless active measures of management, conservation, and development are undertaken. Accordingly, it is necessary to:

- continue the national inventory of flora to be aware of and control the existing potential;
- identify areas which are fragile and under threat to enable priority measures to be taken;
- continue with studies on the development of forests as well as their application in order to ensure their protection and to exploit their products in a rational way;
- intensify afforestation activities in particular within the framework of the National Afforestation Plan currently under development;
- continue the diversification of species by selecting and producing quality seedlings based on local vegetation, what includes modernizing the seed-bed network;
- consolidate the adequate protection of the forests;
- set up a seed bank, botanical gardens and stations for the conservation and multiplication of plants with a view to reintroducing them into their original ecosystems;
- organize the agro-pastoralists, particularly in the steppe, in order to limit degradation of the vegetation. The legal status of these lands appears to be an essential issue to be resolved in order to ensure appropriate organization in the future;
- intensify research and experimentation, especially on local species to increase their productive potential;
- engage specialists (particularly in education) to assume scientific and technical responsibility for the development and protection of vegetable resources (systematization of the genetic potential).

10.7.3 Animal Resources

Of utmost importance for domestic fauna is the conservation and selection of local breeds adapted to our ecosystem. For this purpose, it is necessary to create a record of national breeds in order to first recognize our potential, and subsequently to improve it. To do this it is necessary to establish priorities so that they may be dealt with by the existing specialized institutions which must be strengthened in terms of staff (specialists) and material.

- To take charge of matters of current concern, it is necessary to reinforce specialized structures, in

particular those dealing with artificial insemination, identification of the livestock, as well as the permanent control of performance and production. This approach must be supplemented by enhanced and comprehensive medical cover at all levels.

- For wild fauna, it is necessary to:
- intensify the reintroduction of rare or extinct animal species;
- update the list of species requiring protection following completion of the inventory in progress.
- create a reference of existing national fauna;
- reinforce protection legislation and to ensure its application on the ground;
- organize hunting associations and to engage them in the protection of wild fauna;
- implement training schemes directed towards specialization in the field of wild fauna.

10.8 Conclusion

In conclusion, we can say that considerable effort has been made by the authorities, but which unfortunately has not succeeded in reversing the trend towards degradation. Moreover, all the programmes initiated were very technocratic and did not take into account the situation on the ground which should logically integrate the populations set to benefit from these programmes. The voluntary objective to do good, not taking into account the various players in a specific area, combined with the exclusion of the populations living in the areas to be developed, resulted in projects which were certainly ambitious, but very scattered, producing results which failed to match the effort made.

Moreover, the programmes carried out were mostly of a curative nature, and were applied without thorough knowledge of the real situation, i.e. without a comprehensive assessment, quantified so that these projects could produce the desired results. These projects are also potentially hampered by an annual planning system which blocks programming due to the fact that important files are treated in the long term, for example those dealing with the fight against erosion or the protection of biological resources in general.

Given this situation, if the methods of approach remain the same, the trend will be towards continued degradation at a rate difficult to estimate, but certainly considerable. Therefore, the best means of combating desertification is to ensure the harmonious

development of the regions concerned, which is closely linked to the question of security. A situation of continued degradation of the country's natural resources will only cause famine, which in turn will generate social conflicts, and consequently insecurity.

11 Securitized Water

Úrsula Oswald Spring and Hans Günter Brauch

11.1 Introduction¹

There can be no life on earth without water. Water for life can be either ‘blue water’ for drinking or ‘green water’ for the production of food. Water shortages may be offset through trade with ‘virtual water’ (chap. 41 by Allan) while the lack of ‘blue water’ may be compensated by desalination of brackish and seawater or by water imports via pipelines (Gruen 2007; Rende 2007; Güreler/Ülger 2007).

‘Water scarcity’ of blue and green water, ‘water degradation’ due to the intrusion of waste water and industrial pollution and ‘water stress’ as a result of an increasing gap between water supply (decline in precipitation) and ‘water demand’ (caused by population change, industrialization, and increased personal consumption) are the result of complex interactions between natural and climatic factors (precipitation patterns) and human influences that can result in manifold hydro-meteorological hazards (storms, floods or drought). In human history water scarcity, degradation, and stress were major factors for the decay and disappearance of many high civilizations (e.g. in Egypt and of the Maya). They were key push factors for people movements as well as for forced migration away from drought and famine stricken areas. Access to and control of water have been persistent causes or triggers of communal, tribal, regional, national, and in very few cases international conflicts. But in many cases international water management has been an area of cooperation in international river basins. Water has been an object (poisoning of wells, water cut-off) as well as a tool of warfare (bombing of water reservoir dams).

Throughout human history water issues have been highly political (*politicized*) and in a few cases they have even been ‘*securitized*’, where they have become political issues of utmost importance that require ex-

traordinary policy responses to avoid warfare and further environmental destruction. In the Nile River Basin (chap. 48 by Adly/Ahmed; chap. 49 by Kameri-Mbote/Kindiki) any unilateral modification of the water flow among the ten riparians may seriously affect the livelihood of people in downstream countries, and thus could become a cause of political and even military conflict. To prevent this from happening, the *Nile Basin Initiative* (NBI) was set up, as one of many *International River Basin Management* (IRBM) regimes.

The goal of this chapter is a systematic conceptual review of the securitization of water in the context of the triple reconceptualization of security (Brauch 2008). In the following sections the evolution of the water security concept will be mapped (11.2), water will be discussed in the context of the *widening* (11.3), *deepening* (11.4), and *sectorialization* (11.5) of security. The concluding part suggests a dual scientific and policy-oriented complex analysis of water security (11.6) that combines bottom-up initiatives of water conservation with top-down strategies of water management, water laws, hydro-diplomacy, and conflict resolution.

11.2 Evolution of the Water Security Concept

The links between ‘water’ and ‘security’ issues are complex and directly linked with many other security concepts:

- Water is a major object of analysis in *environmental security* to maintain ecosystem services, and to protect the biological and hydrological cycles and the ecosphere.
- Water as a key problem of *social* and *societal security* permits livelihood, recreation, and joy of life. It requires policy initiatives to avoid hydrological disasters and illnesses through protection, preven-

1 The authors are grateful to three reviewers for their detailed, very helpful and critical comments.

Box 11.1: Ministerial Declaration of The Hague on Water Security in the 21st Century, 22 March 2000. **Source:** <http://www.worldwatercouncil.org/fileadmin/www/Library/Official_Declarations/The_Hague_Declaration.pdf>. This text is in the public domain.

1. Water is vital for the life and health of people and ecosystems and a basic requirement for the development of countries, but around the world women, men and children lack access to adequate and safe water to meet their most basic needs. Water resources and the related ecosystems that provide and sustain them, are under threat from pollution, unsustainable use, land-use changes, climate change and many other forces. The link between these threats and poverty is clear, for it is the poor who are hit first and hardest. This leads to one simple conclusion: business as usual is not

an option. There is, of course, a huge diversity of needs and situations around the globe, but together we have one common goal: *to provide water security in the 21st Century*. This means ensuring that freshwater, coastal and related ecosystems are protected and improved; that sustainable development and political stability are promoted, that every person has access to enough safe water at an affordable cost to lead a healthy and productive life and that the vulnerable are protected from the risks of water-related hazards...

tion, resilience-building, early warning, and evacuation to safe places in case of extreme weather events.

- Water as an issue of *economic security* creates development opportunities.
- Water is a precondition for *food security* that requires permanent, sufficient, accessible, safe, and nutritional food that is also culturally accepted.
- Water is essential for *health and livelihood security* to protect people from thirst, waterborne illnesses, vector diseases, but also from floods, drought, and plagues.

This chapter will address the following research questions:

- When and how has water been securitized by government representatives, and how has the concept of water security been used in the scientific literature?
- Which role has been given to water in the different 'dimensions' of security (political, military, economic, societal, environmental), for different levels of analysis, actors or reference objects (national, international, and human security) and in other sectoral security concepts (food, health, gender)?

The water security concept will be introduced first as a political concept (11.2.1), and its major use in scientific analyses (11.2.2) and by international organizations (11.2.3) will be reviewed.

11.2.1 Notion of Water Security as a Political Concept

The concept of 'water security' was introduced in the Ministerial Declarations of the *Second World Water*

Forum (WWF) in The Hague (2000, see box 11.1) and developed further at the third WWF in Kyoto (2003) and fourth WWF in Mexico City (2006).² The scientific application of the water security concept is offered in part VII below.

The Ministerial Declaration of The Hague (2000) pointed to these main challenges for achieving water security that refer to several other security concepts: a) *meeting basic needs* (societal security); b) *securing food supply* (food security); c) *protecting ecosystems* (environmental security); d) *sharing water resources* (political security); e) *managing risks* (environmental, human and gender security); f) *valuing water* (economic security); g) *governing water security* (political security).

In an analysis of this Ministerial Declaration, John Soussan and Rachel Harrison (2000) offered an issue-oriented definition of water security that

relates the management of water resources to the vulnerabilities and overall livelihoods of poor people and to the integrity of ecosystems. Included in it are both resource issues (scarcity of water, problems of water quality, the effects of storms, floods or droughts, etc) and human issues (conflicts over water allocation, limited knowledge or capital assets for efficient water management, etc). ... This includes the need to consider issues of enhancing sustainability and environmental integrity and reducing the vulnerabilities that so many people face. Equity is also a core concept, so that the needs of *all* users and value and potentials of *all* uses of water resources are recognized in decisions over their future.³

2 See "Water Security in the 21st Century", Ministerial Declaration, Second World Water Forum, The Hague, 22 March 2000, para.3, available at: <http://www.thewaterpage.com/hague_declaration.htm>; Ministerial Declaration, Third World Water Forum, Kyoto 23 March 2003, para.11, available at: <<http://www.mofa.go.jp/policy/environment/wwf/declaration.html>>.

This ‘water vision’ suggested many changes in water management, with three key objectives for 2025:

- Empowering women, men, and communities to decide on levels of access to safe water and hygienic living conditions, and on the types of water-using economic activities that they desire – and to organize to obtain them.
- Producing more food and creating more sustainable livelihoods per unit of water applied and ensuring access for all to the food required for healthy and productive lives.
- Managing water use to conserve the quantity and quality of freshwater and terrestrial ecosystems that provide services to humans and all living things.

From the pledges and commitments made by governments in The Hague six main themes emerged:

- Integrated water resources management and river basins.
- Water policies and laws.
- Institutional capacities and development.
- Participation, empowerment, and gender.
- International collaboration and assistance.
- Education, awareness, and training.

The 2nd WWF in 2000 also launched *The African Water Vision* that is “concerned with the equitable and sustainable use of Africa’s water resources for poverty alleviation, socio-economic development, and regional integration. It seeks to address the water paradox of the continent (floods and droughts, water scarcity and under-exploited water resources). The Vision also seeks to address the sustainable supply of water to meet the requirements of food and energy security and improved access to safe drinking water and adequate sanitation.”⁴

The ‘Mexico Ministerial Declaration on Water’ of 17 March 2006 emphasized the goal of achieving water security by stating that “to improve water security, African countries need to invest in water infrastructure up to the level where they can, in order to achieve a self-sustaining auto-induced growth to eradicate pov-

erty and achieve sustainable development.” The “Concept Note for the First African Water Week” (AWW) from 26 to 28 March 2008 outlined a strategy for “Accelerating Water Security for Socio-economic Development of Africa.” This note defined water security as:

the capacity to provide sufficient and sustainable quantity and quality of water for all types of water services (drinking, sanitation and health, food production, energy, industry, ecosystem protection) and protect society and the environment from water-related disasters.

The first *African Water Week* discussed the global and regional experience with water security and socio-economic development, reflecting on Africa’s positive and negative experience, and on the impact of climate change and variability on Africa’s water resources. Among the water security challenges it addressed the sanitation gap and the strategies for closing it, as well as on infrastructure for water security. Similar strategies have been developed in many Latin American and Asian countries.

Water security has also been defined by the *Global Water Partnership* (GWP 2000) as an overarching goal where: “... every person has access to enough safe water at affordable cost to lead a clean, healthy and productive life, while ensuring that the environment is protected and enhanced.” Since 2000, the water security concept has been used by water specialists in the natural and social sciences, by policy-makers and international organizations.

11.2.2 Water Security in International Scientific Analyses

The application of the security concept for water-related issues has gradually evolved in the literature where different definitions and approaches coexist. Naff (1993: 257–259, 273–274) used a state-centred security concept with regard to these water-related issues: agriculture (food security), demographic pressures (migration), resource scarcities (environmental degradation), health and economic issues, ideological and cultural differences that have potential security implications. He argued that in the Middle East “water exhibits all ... elements of conflict” due to its vital nature and complexity as a terrain security issue. Water is perceived as a zero-sum security issue that carries “a constant potential for conflict.”

From a bottom-up perspective, the Sri Lanka Rainwater Harvesting Forum (1999: 8ff.) defined *household water security* (HWS) based on research con-

3 “Commitments on Water Security in the 21st Century. An Analysis of Pledges and Statements made at the Ministerial Conference and World Water Forum, The Hague, March 2000”, at: <<http://www.unesco.org/water/wwap/targets/watersecurity.pdf>>

4 See the African Development Bank; at: <http://www.afdb.org/pls/portal/docs/PAGE/ADB_ADMIN_PG/DOCUMENTS/NEWS/CONCEPT%20NOTEENG.PDF>.

ducted in rural communities where water is a scarce resource and “not only a commodity but also a natural resource and a perceived human entitlement.” Ariyabandu (1999) and others have defined household water security as “accessibility, reliability and timely availability of adequate safe water to satisfy, basic human needs” for drinking, sanitation, bathing, and cooking.

In an analysis of water discourses, Allan (2001: 184, 2003) has used the water security concept in the context of both “economically and environmentally logical policy priorities” and “politically feasible policy priorities” for “achieving strategic water security” by securing the supplies of ‘virtual water’. He argued that “the idea of food insecurity is not part of the ‘sanctioned discourse’ in most Mid-East countries and therefore the relationship between water and food deficits cannot be debated.” He discussed the securitization approach and security complex theory for the MENA water, and for the security sub-complexes for the Levant and the Gulf sub-complex and especially for Israel for the 1950’s to the 1990’s (Allan 2001: 243–250). He stressed that in this region “water security and water adequacy however defined are political issues. Peoples and their leaders need to assure each other that they are secure. Water is an important dimension of communal and national security in arid and semi-arid countries” (Allan 2001: 332).

Falkenmark (2000: 11) defined water security:

as freedom from fear related to water supply and society’s dependence on water for a whole set of different functions... The topic *water and security* has arisen as a by-product of the growing interest in environment and security (Priscoli). This reflects arguing for a more ‘holistic’ conception of security that goes beyond protecting the state from external aggression to addressing environmental problems that threaten the health and well-being of individuals or economic security of countries. It could be that the developed countries are more likely to think of environment and security in terms of global environmental changes, and developing countries more with the human security implications of local and regional problems. Water is in fact forcing us to rethink the notions of security, dependency and interdependence. While increased interdependence is often viewed as increasing vulnerability and reducing security, there is an alternative way to look at interdependence. These notions can be seen as networks that increase our flexibility and capacity to respond to exigencies of nature and reduce our vulnerability to events such as droughts and floods and thereby increase security.

Falkenmark (2001) summarized the results on “how hydrosolidarity between upstreamers and down-

streamers may be approached in a realistic way.” Turton argued that

water scarcity has basically been addressed as a national security issue in view of the interest raised in CIA and similar national security-oriented circles for the case of water-scarce multinational river basins (‘securitization’ of the issue). He therefore stressed the need to ‘insecure’ the water management issue by replacing the international conflict focus by a cooperation focus and a focus on societal capability to cope within the constraints given by the natural resource situation (summarized by Falkenmark 2001: 9).

In contrast, the seminar discussed water rather from a human security perspective “in terms of safe household water” for human health (health security), food security linked to local production, and environmental security that “depends on [the] ability to minimize environmental threats in terms of i.a. ecosystem degradation”. This discussion was later taken up in the new approach to ecohydrology, where Falkenmark and Rockström (2005: 21–22) argued that three policy perspectives have to be included in their integrated approach: a) human security; b) environmental damage security; and c) human and environmental security (table 11.1). From these three security perspectives they asked: What has to be *secured*? What has to be *avoided*? What has to be *foreseen* or *anticipated* and met by risk reduction?

For balancing water for humankind and nature through a socio-ecohydrological approach Falkenmark and Rockström (2005: 217–218) distinguished three lines of action:

- *Securing* water security, food security, and ecological security, acknowledging water’s life-giving characteristics.
- *Avoiding* difficulties in terms of pollution and silting linked to water’s lift-up/carry away functions and its mobility, to be achieved by water pollution abatement and soil protection.
- *Foreseeing* unavoidable conflicts and difficulties linked to climatic variability (droughts, floods), and to water’s multiple functions and mobility reflected in non-negotiable natural processes in the landscape.

This approach refers to many different ways to achieve social acceptability and to avoid water conflicts within a wider notion of water governance. In a similar direction, David Grey and Claudia W. Sadoff (2007: 2) argue that achieving water security implies: “both harnessing the productive potential of water and limiting its destructive impacts.” They defined “‘water security’ to be the reliable availability of an ac-

Table 11.1: Fundamental policy directions and water security perspectives. **Source:** Falkenmark and Rockström (2005: 22). Permission was granted.

Security perspectives	Policy direction	Function	Phenomenon	Preparedness dimension
Human security	Secure	Necessity, life support	<ul style="list-style-type: none"> • Household water supply • Industrial water supply • Crop production 	<ul style="list-style-type: none"> • Human health • Employment • Income generation • Food supply
Environmental damage security	Avoid	Mobile solvent Eroding agent, silt carrier	<ul style="list-style-type: none"> • Water pollution • Land degradation • Silting 	<ul style="list-style-type: none"> • Ecosystem • Resilience degradation • Land productivity degradation • Silting of reservoirs
Human and environmental security	Foresee	Biosphere linkages	<ul style="list-style-type: none"> • Climate variability • Transport function • Rainwater partitioning 	<ul style="list-style-type: none"> • Recurrent floods/droughts • Upstream/downstream linkages • Green/blue flow linkages

ceptable quantity and quality of water for health, livelihoods, and production, coupled with an acceptable level of water-related risks.” In their analysis three factors influenced the “societal challenge of achieving and sustaining water security”: a) the hydrologic environment (the absolute level of water resource availability, its inter- and intra-annual variability and its spatial distribution); b) the socio-economic environment (the structure of the economy and the behaviour of its actors); and c) the impact of climate change on the future environment that “will play important roles in determining the institutions and the types and scales of infrastructure needed to achieve water security” (Grey/Sadoff 2007: 5). To achieve water security in the 21st century both authors argued that

this challenge must be met by building on the environmental and social lessons of the past. The once unforeseen consequences of environmental change and social displacement have been clearly identified and documented... Setting environmental and social standards so high that they greatly constrain, or even prevent, achieving water security is equally unacceptable. There are always some trade-offs which need to be identified and debated by governments and their citizens, and, to the extent possible, mitigated (Grey/Sadoff 2007: 20).

They concluded that

most poor, water-insecure countries face a far greater challenge than that faced by those who had achieved water security in the last century and are wealthy coun-

tries today. Today’s water-insecure countries face more difficult hydrologies, much larger populations with more varied water demands, and a greater understanding of, and therefore greater responsibility for, the social and environment trade-offs inherent in water management. In this increasingly inter-connected world, there is a growing realization of the imperative of protecting vulnerable people and livelihoods, and providing for basic human needs and broader human opportunities. In order to do this, achieving water security at the global, regional, national, and local levels is a challenge that must be recognized and can be met (Grey/Sadoff 2007: 25).

Ashton and Turton (chap. 50) use the related concept of a ‘hydro-political security complex’ that emerged from an extension of ‘national security’ concerns to include transboundary environmental issues. Schulz (1995) defined a ‘hydro-political security complex’ as a set of states that are geographically part owners and technical users of a water body, and that consider that water body to be a major national security issue (Mathis/Aguilar-Barajas 2003). In both definitions a wider understanding of security is included (Buzan/Wæver/de Wilde 1998).

Jansky, Nakayama, and Pachova (2008: 1) argued that ensuring water security – which they defined as: “adequate protection from water-related disasters and diseases and access to sufficient quantity and quality of water, at affordable cost, to meet the basic food, energy and other needs essential to leading a healthy

and productive life without compromising the sustainability of virtual ecosystems” – has become a key global goal during the past decade. From a narrow state-centred security perspective issues of sovereignty are crucial, while from a wider conceptualization many non-state actors have achieved more prominent roles in national and international water governance.

In her synthesis of the 2001 SIWI seminar, Falkenmark (2001: 13–14) noted many conceptual obstacles due to the “compartmentalized approach taken by most water professionals, representing typical differences in their *sectoral focus*. Second, there are a set of scientifically based *paradigm locks*, which originate from a deep-going sectarianism within science incompatible with water’s large complexity in both roles and functions” between the different approaches of the geosciences and the biosciences. She concluded that the effort to reach a

water-related human security, that encompasses both water security, food security and environmental security, will depend on a new generation of responsible and knowledgeable hydrocitizens, carried by ethical principles of sharing rather than by conventional principles of capturing the water resources in a catchment (Falkenmark 2001: 15).

11.2.3 Use of the Concept in International Organizations as an Issue of International Security

Many international organizations have extensively used the water security concept but often with different meanings. For the UNESCO Institute for Water Education (IHE) in Delft, “water security involves protection of vulnerable water systems, protection against water-related hazards such as floods and droughts, sustainable development of water resources and safeguarding access to water functions and services.” This research theme “is primarily concerned with human interventions in water systems. These are aimed at the enhancement of the beneficial and sustainable use of water for various purposes such as water supply, irrigation, drainage, navigation, hydro-power, environmental purposes and the protection against water-related risks such as floods and droughts.” These interventions are “to meet the needs of society in the widest sense and in order to be able to face the challenges of all kinds of global changes (e.g. climate change, land use change, etc.).”

Within the framework of the joint UNESCO-Green Cross International project entitled “From Potential Conflict to Cooperation Potential (PCCP):

Water for Peace,” Cosgrove (2003) offered a synthesis of the UNESCO’s work on water security and peace that focused on

practical projects in six international river basins: the Danube, the Jordan, the Okavango, the Plate, the Volga, and the Volta. These locally managed projects have worked to raise awareness and identify solutions to disputes and conflicts by facilitating dialogue between citizens, governments, local authorities, the private sector, and water experts from the different basin states. One major objective of the Water for Peace project has been to ensure that civil society is actively engaged in the process of developing agreements and solutions as to how to share water, and the benefits of water, in the basins in which they live.

Many other international organizations (UN, FAO, WHO, UNEP, UNDP, UNU, etc.) have extensively used the water security concept – in most cases without a definition. In many cases the goal of achieving water security for the water insecure countries has been linked to the UN *Millennium Development Goals* (MDGs) that were adopted at the Millennium Summit in September 2000, thus committing their countries to a new global partnership to reduce extreme poverty with a series of time-bound targets. Its Goal 7: *Ensure Environmental Sustainability* includes target 10 that requests to “halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation” that should be measured with two indicators: a) Proportion of population with sustainable access to an improved water source, urban and rural (UNICEF-WHO); b) Proportion of population with access to improved sanitation, urban and rural (UNICEF-WHO).

But in the *Report of the World Summit on Sustainable Development* (2002) and in the Secretary-General’s *Report On Larger Freedom* and in the *World Summit Outcome Document* (2005) there has been no single reference to the ‘water security’ concept. The above review of the water security concept in scientific discourses and policy declarations has shown that the different notions of security require a discussion of the widening, deepening, and sectorialization of the security concept since the global turn (1989).

11.3 Widening: Dimensions of Water Security

In the aftermath of the Cold War the security concept has been widened by many governments – at least in Europe – in their defence white papers and policy dec-

larations, from the narrow political dimensions to include economic, societal, and environmental issues that directly impact on security dangers and concerns. This ongoing transformation has been conceptually mapped by Buzan, Wæver, and de Wilde (1998).

Above (chap. 1 by Brauch; Brauch 2008, 2008a) five dimensions of a widened security concept were distinguished: environmental (11.3.1), societal (11.3.2), economic (11.3.3), political (11.3.4), and military security (11.3.5) that offer a context or different conceptualizations of water security. These dimensions will be reviewed by focusing more on the related substantial than solely on conceptual and definitional issues.

11.3.1 Water as an Issue of Environmental Security

Three basic factors affect the environmental security of water: first, the reduction of water supply due to climate change and the modification of soils and productive activities that diminish the green water flow and affect biodiversity. Second, the process of water degradation and pollution due to human and productive activities, and the missing infrastructure for waste water treatment, sanitation, and recycling. Third, the effects of more numerous and intense hydro-meteorological hazards (storms, floods, landslides, drought, and forest fires) that affect biodiversity, human beings, their infrastructure and thus create pollution.

United Nations sources estimated that 'blue water' run-off through the ecosystem and recharge of groundwater account for about 35 million km³. The annually available water in form of environmental service amounts to about 40,000 km³, of which roughly 10 per cent were diverted for human uses in 1995, thereof 70 per cent were used in agriculture, 20 per cent in industry, and 10 per cent for domestic proposals (Cosgrove/Rijsberman 2000). Their data do not include the green water flow, used in the small farmer rain-fed agriculture and the return flow from irrigation.

'Green water', coming from precipitation (25 millions km³) is stored in soils and evaporates from it. It is the main source for ecosystems and is essential for 60 per cent of food production worldwide, especially for poor peasants who depend on it for their rain-fed fields. The remaining 40 per cent are used for fish production and aquaculture in fresh waters. Shiklomanov (1993, 2005) and Shiklomanov and Rodda (2003) also analysed the distribution of green water in aquifers, glaciers and permafrost, in everglades, lakes, rivers as well as for biological and atmospheric water.

Shiklomanov (2005; table 11.2) estimated that of the global freshwater resources less than one third are located in aquifers, two thirds in glaciers, atmospheric humidity, everglades, rivers, and in biological water. With climate change more water will get into the system through melting glaciers that produce first floods and later droughts, above all in the Himalayan and Andean regions. Thus any change will directly affect environmental and human security.

11.3.1.1 Water Security: Use and Distribution

Water security is directly linked to human activities and well-being. Of the total world population of 6.6 billion, 1.2 billion people have no access to water; 2.2 billion experience water scarcity, and 3 billion lack improved drainage and treatment which pollutes fresh water and groundwater due to faecal material and industrial waste dumped without treatment.

Water scarcity and pollution are related to the global water distribution, which is unequal in space and time (see figure 11.1). More than half of the world population lives in regions experiencing water stress that is often aggravated by economic stress. Water scarcity may induce either to save water or to waste this precious liquid. Thus, the *Global Water Partnership* (GWP) argued:

On the one hand, the fundamental fear of food shortages encourages ever greater use of water resources for agriculture. On the other, there is a need to divert water from irrigated food production to other users and to protect the resource and the ecosystem. Many believe this conflict is one of the most critical problems to be tackled in the early 21st century (GWP 2000: 58).

In geographical terms water access differs regionally. North and Central America receive about 15 per cent of global water resources for 8 per cent of the world population. South America obtains 26 per cent of global water for 6 per cent of the world population. Europe receives 8 per cent for 13 per cent of the world population, while Australia and Oceania account for 5 per cent of global water for a population share of less than 1 per cent. Africa receives 11 per cent of water for 13 per cent of the global population; but the greatest scarcity exists in Asia where 36 per cent of global water is available for 60 per cent of the world population (UNESCO/IHP 2005). Middle Eastern countries, especially Palestine, Jordan, Saudi Arabia, and Israel are far below this average.

Regarding global demographic growth, the per capita availability of water will decline from 6,600 m³ to 4,800 m³ in 2025, affecting especially those countries with high population growth rates in Africa,

Table 11.2: Distribution of Freshwater Resources in the World. **Source:** Shiklomanov (2005: 11). Permission was granted.

Location	Volume (10 ³ /cm ³)	Per cent of water	Recycled Volume	Period for renewing/ years
Aquifer	10,530	30.1	–	1,400
Humidity in soils	16.5	0.05	16,500	1
Glacier	24,064	68.7	–	–
• Antarctic	21,600	61.7	–	–
• Greenland	2,340	6.68	2,477	9,700
• Arctic Islands	83.5	0.24	–	–
• Mountains	40.6	0.12	25	1,600
• Permafrost	300	0.8	30	1,000
Lakes with fresh water	91	0.26	–	–
Everglades	11.5	0.03	2,294	5
Rivers	2.2	0.006	43,000	16 (days)
Biological water	1.12	0.0003	–	–
Water in the atmosphere	12.90	0.04	600,000	8 (days)
Total	35,029.2	100	–	–

Asia, and Latin America. During the past century population increased three times and water demand six times, due to changes in human behaviour and production. During the past two decades global water consumption alone has doubled. The future demand for direct consumption will increase by 2025, reaching between 4,300 to 5,200 km³. This average does not reflect the unequal distribution among social classes, or the differences of access within families and local communities.

11.3.1.2 Water Security in Consumption Patterns

Water use can be divided into consumptive (urban, domestic, agriculture, livestock, services, industry, and environment) and non-consumptive use (hydro-energy, aquaculture, recreation, navigation, transportation; Oswald 2005: 26). The per capita water consumption depends not only on the physical availability, but also on the existing infrastructure and cultural habits. Figure 11.2 shows that major differences of daily water consumption exist between industrialized and developing countries, but also between different regions. Undoubtedly Africa is the continent with the lowest domestic consumption, followed by Asia and Latin America. These countries suffer from a weak water infrastructure and sanitation problems, mostly due to economic stress. The projection shows that these differences will continue at least until 2025. This

refers not only to difficulties to obtain the daily required amount of water, but also to threats for health and livelihood security.

During the next two decades global water consumption will undergo significant changes (figure 11.3), above all due to an increase in water demand in developing countries as a result of population growth and additional demand for agriculture and domestic purposes. In the industrialized countries water consumption is estimated to remain stable.

The seasons also affect water access. Most people in southern countries with low socio-economic capacities depend on rain-fed agriculture for their subsistence, and in these regions climate change will threaten their livelihood and survival. Climate change is closely related to desertification, which is affecting large semi-arid and arid regions, mostly in poor countries. More than 250 million people are directly threatened by desertification, and 24 million tons of arable land disappears each year.

Regions hit by desertification lose also their biodiversity and therefore menace food supply of wider regions. “The current extinction rate is up to one thousand times higher than the fossil one. The projected extinction rate is more than ten times higher than the current rate” (MA 2005). Different scenarios exposed by projected impacts of climate change depend on the capability of humanity as a whole to reduce green-

Figure 11.1: Environmental Water Scarcity Index by River Basin. **Source:** World Resource Institute (2003); at: <http://www.iucn.org/themes/wani/eatlas/html/gm_16.html>. Permission was granted.

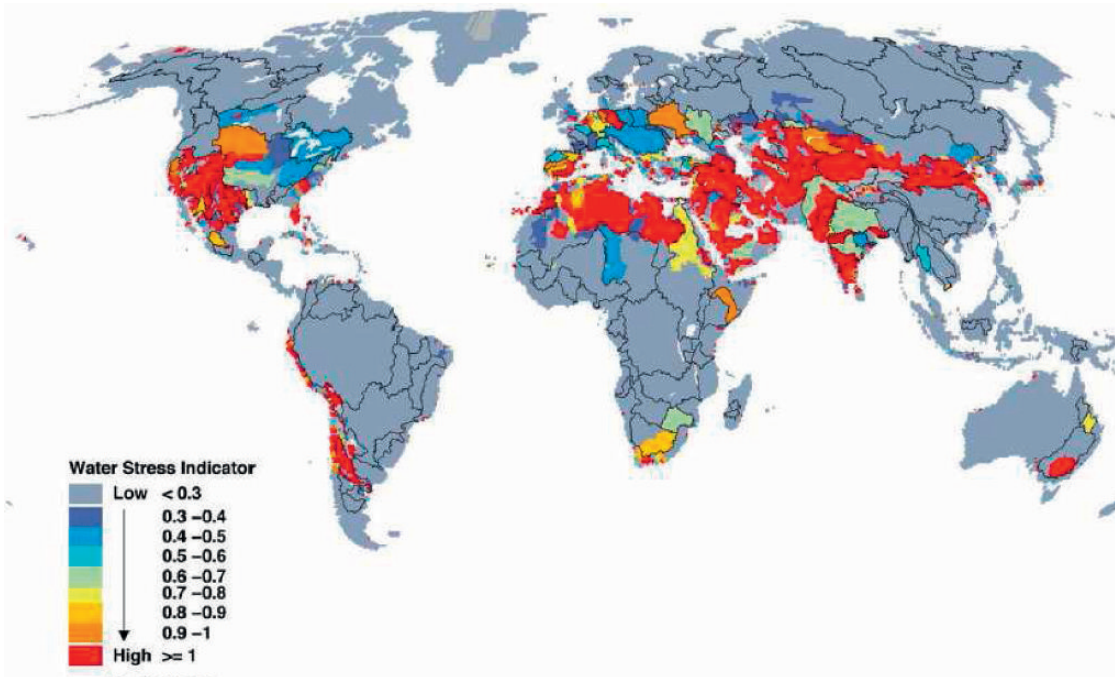
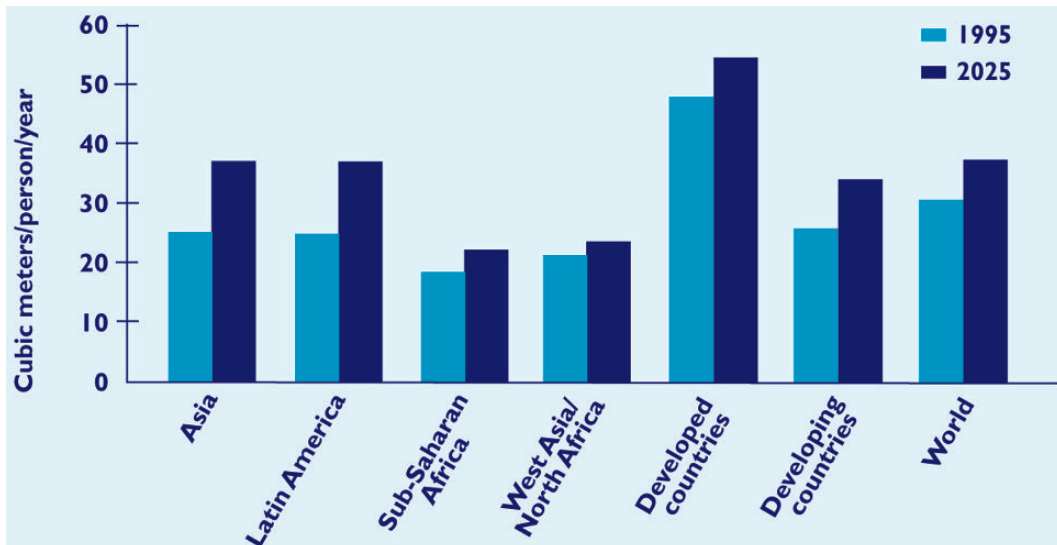


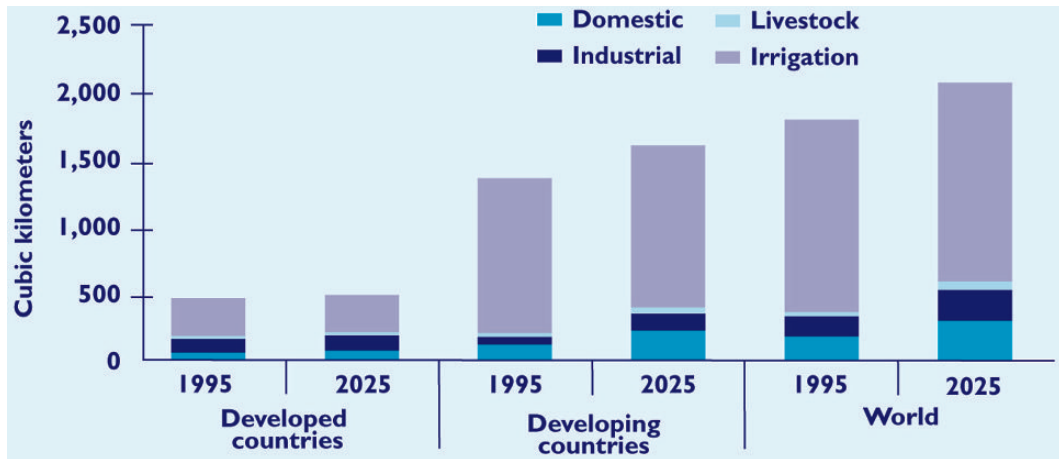
Figure 11.2: Per capita domestic water consumption in 1995 and 2025. **Source:** Rosegrant/Cai/Cline (2002: 5, figure 4). Reproduced with permission from the International Food Policy Research Institute <www.ifpri.org> and the International Water Management Institute <www.iwmi.cgiar.org>. The report from which this figure comes can be found online at: <<http://www.ifpri.org/pubs/fpr/fprwater2025.pdf>>.



house gases” (Oswald 2007: 4). Vörösmarty, Green, Salisbury and Lammers (2000) projected that precipitation will decline in Pakistan, in Northern China, in Mexico, the Middle East, and in Sub-Saharan Africa where severe droughts are highly likely, while rainfall is projected to rise in the North and South (IPCC

2007, 2007a). Different scenarios, referring to climate change, desertification, and population growth have projected that water scarcity is most likely to increase significantly in arid and semi-arid regions, and this will affect developing and poor countries and megacities most severely.

Figure 11.3: Water consumption by sector in 1995 with projections to 2025. **Source:** Rosegrant/Cai/Cline (2002: 5, figure 4). Reproduced with permission from the International Food Policy Research Institute <www.ifpri.org> and the International Water Management Institute <www.iwmi.cgiar.org>. The report from which this figure comes can be found online at: <<http://www.ifpri.org/pubs/fpr/fprwater2025.pdf>>.



Water as an issue of environmental security has been conceptualized for different referent objects, e.g. with regard to human beings and humankind (human security), the state (as ‘national water security’) and the international realm (as ‘international water security’, e.g. Pachova/Nakayama/Jansky 2008; see 11.4).

11.3.2 Water as an Issue of Societal Security

Water as an issue of societal or communal security focuses on all three policy directions (Falkenmark/Rockström 2005: 22) to *secure* (household and industrial water supply and crop production), to *avoid* (water pollution, degradation, and silting) and to *foresee* (climate variability and change, hydro-meteorological hazards, upstream/downstream linkages, and green/blue flow linkages).

Water scarcity, degradation, and stress directly affect the society and its representatives, from the family to the local community, the village, town or city, regional, national and international non-governmental organizations and social movements. Water as a ‘basic human need’ has also been discussed as a ‘basic human right’. Water is a prerequisite for human life that is essential for the production of food and for human health and well-being. As hydropower, water has been an essential renewable energy source, displacing millions of people, primarily indigenous and peasants from their land. But too little and too much water often results in hydro-meteorological hazards that kill and affect people and damage and destroy their belongings and public and private goods.

Given the projected water scarcity and the decline in per capita water supply, soil and groundwater represents a potential source to satisfy the water needs of a growing population and of their productive needs for fresh water and agriculture. In some regions (figure 11.1) water stress will rise with declining supply and growing demand. In the past, due to rainfall and returns from irrigation, water was considered a renewable resource, but the higher demand has resulted in many regions in water stress and depletion of aquifers. The relationship between society and water has been further aggravated by climatic and bio-chemical factors that have limited water supply. The quality of this scarce resource has deteriorated especially due to inadequate management. Finally, there is an invisible relationship between society and the economy with nature, where the excess of productive capacity, the concentration of people in mega-cities, and the unsustainable use of aquifers is rapidly depleting water.

The overuse of water is often increased by an unsustainable hydrological demand, and the lack of investment in treatment and recycling infrastructure has been threatening water security, thereby creating irreversible environmental damages. Water as an issue of societal security is also closely linked with the economic dimension of human, national, and international security.

11.3.3 Water as an Issue of Economic Security

Water as an issue of economic security refers to both an essential public good and to a commodity of the free market. Economic stress (poverty, lacking finan-

cial resources) reinforces the physical and environmental stress due to water scarcity, pollution, and hazards. This dual water stress is being further aggravated by social stratification, lacking access to money and political incapacity to deal with inequity. It also relates to cultural factors and social representations where women are normally responsible for caring for families and thus suffer most from water scarcity, pollution, and diseases. In most cases, they have no opportunity to participate in water policy decisions and to propose investments to improve the access to water and its quality, and to avoid potential threats due to disasters and environmental destruction. The physical and economic stress undercuts human and civil rights and therefore the management of economic security has to take into account the distinction between the value of water for survival in form of the *logic of value* and for the market in form of the *logic of change*.

11.3.3.1 Values of Water

The theory of value in general and of the value of water relies on three philosophical assumptions: 1. The Platonic theory argues that the value is absolutely independent of things, and therefore it can only be situated in the spheres of metaphysics and mythology. 2. The nominal approach relates value to subjectivity, to the aggregated or disaggregated processes, and can thus not constitute an ultimate value. In extreme cases this position denies the link between value and the deposit of value by a person who understands it as a medium and not as a final goal. 3. Finally, there is an appreciation, related to the previous understanding of nominalism, where a moral value is only given through its appreciation (Terricabras 1994: 3637). Scheler in his pure axiology disagreed with these three theories and established six criteria for his own theory of values.

1. The *process of validation* implies a difference between the validating being and the entity that is being validated.
2. *Objectivity*: The values do not depend on individual preferences and are fundamental for all acts.
3. *Lack of independence*: While values are not independent, they are not subjugated to external

instances, but represent an ontological independence expressed as an attribute of being.

4. *Polarity*: The present values are always opposites and the negative value is considered as being without value.
5. *Quality* is independent of quantity and its quality is pure.
6. *Hierarchy*: the values are not indifferent, not only with regard to their polarity, but the total value establishes a hierarchical order from agreeable to disagreeable (Oswald 2005: 131).

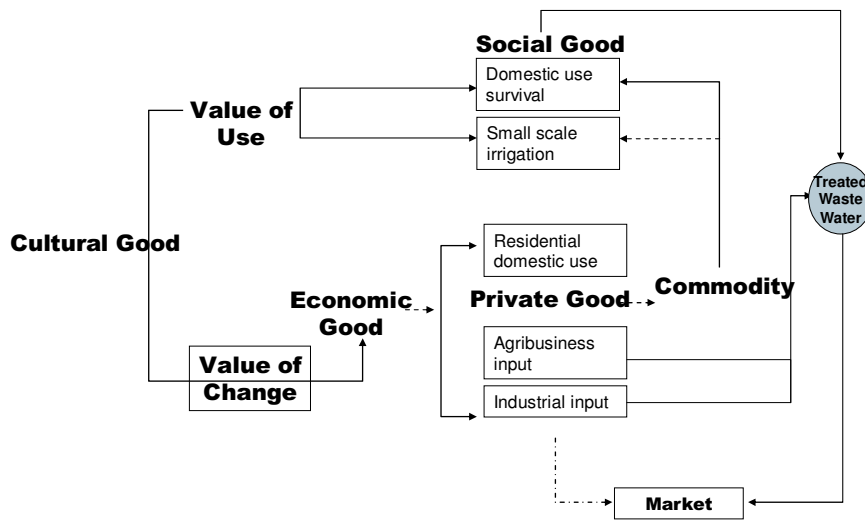
These philosophical approaches to the theory of values indicate that any consideration of value is a social construction related to the occidental philosophical tradition of opposites, centred in human beings and not in abstract economic entities. Thus, a socially responsible approach should distinguish between 'value of use' and 'value of change' of water (figure 11.4). With this distinction water is treated as a cultural good with collective property rights and the state as the administrator and arbiter.

The 'value of use' grants a basic human right for everybody to get clean and sufficient water for survival and well-being (ontological independence). This *human right to water* (HRTW) includes a domestic minimal water requirement, depending on each country that differs between 50 and 250 litres/day. This includes in rural areas the water needed for small-scale irrigation to produce the subsistence for a family (hierarchy). Nevertheless, the free market system is threatening this basic human right for livelihood for poor people, imposing on governments their logic of 'value of change'.

Within the logic of 'value of change', economic goods are produced within the market economy with profits and the costs of the use, administration, and treatment of water must be paid. Supply and demand are basically regulated by market forces, and water is used for the production of commodities and luxury lifestyle. Both logics are apparently opposed and generate a contradiction. Nevertheless, the linkage between both values could permit a stable water administration, consisting of cross-social subsidies to protect the highest vulnerable regions and social groups (figure 11.5).

The 'value of change' should also cover the costs for sewage water treatment and the market of treated water for agriculture and industrial processes. Within this system the process of privatization of water services, in ethical terms and based on the theory of social and ontological values, should only be permitted in the sphere of 'value of change', while the 'value of

Figure 11.4: Logic of the Values of Water. **Source:** Ramos (2004), modified by Oswald Spring (2005: 147).



use' must be granted by any government to vulnerable citizens as the fulfilment of their basic human and civil rights. However, in poor countries an important number of people lack the money for the service of safe water and sanitation, and therefore depend on unsafe water access. To overcome this injustice and to offer any person clean water and safe environment, transparent systems of administration and socially agreed tariffs are required (OECD 1999a).

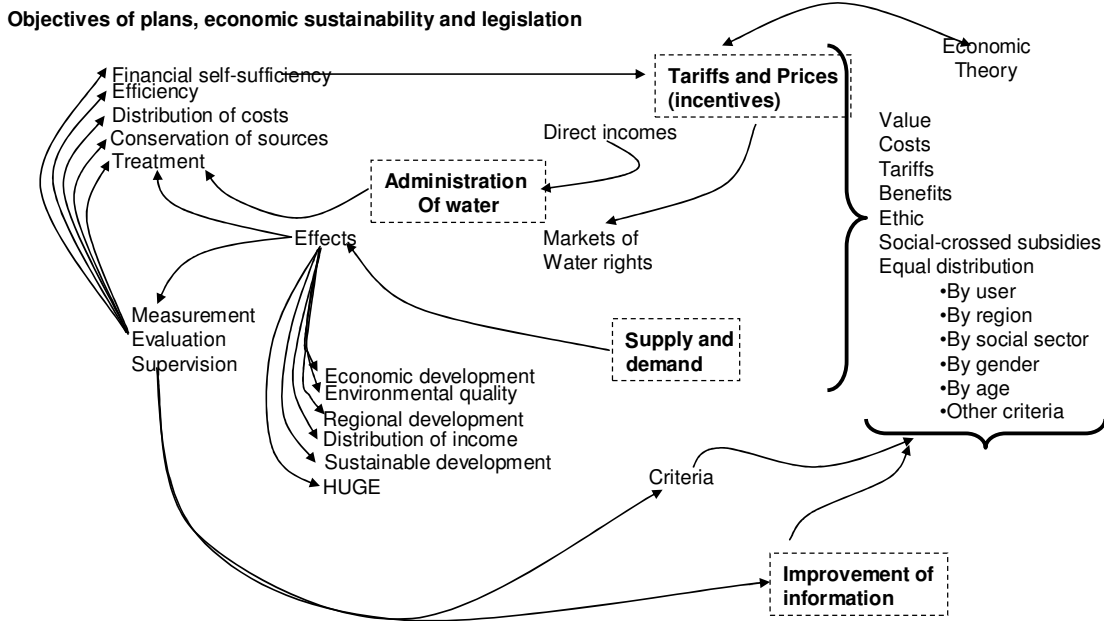
11.3.3.2 Administration of Water Security and Tariffs

An efficient administration of water includes a complex societal arrangement far beyond the traditional market mechanisms of supply and demand. Undoubtedly, tariffs and prices of water should enhance the conservation of the resource and the economic sustainability of the water system. Whenever the subsidies are greater than the income, then budget transfers must be introduced to maintain the stability of the administration. The complexity of the variables requires an efficient system of information, a transparent policy on subsidies depending on water stress, the social conditions of consumers, and regional development policies to avoid economic stress. To prevent corruption within the system, citizen audits and agreed social policies should establish an equilibrium between the income from tariffs and basic water rights. This should prevent that the private use of water for profit will destroy the fragile equilibrium of the hydro-balance within a region, including e.g. aquifer overexploitation and insufficient recharge. The inter-

vening variables explain why the theory of value is not an exclusive economic issue, but much more a social and moral one, especially in countries where water stress is physical and economic, and where scarce resources must be optimized to fulfil the basic human rights including the most vulnerable.

Oswald (1999) discussed a law of tariff in the state of Morelos in Mexico based on three key criteria: social, environmental, and regional. The *regional* variable refers to the real cost of the service, including the extraction from the aquifer, the purification of drinking water, wastewater treatment and recycling, water administration, and infrastructure maintenance. The investment for new infrastructure came from the state budget. The *environmental* criteria encouraged saving techniques within households, in agriculture, industry, and services. For a minimal consumption quota a minimal price applied, while with increasing consumption the price increased progressively. The economic opportunities persuaded people to introduce water-saving procedures in consumption patterns and the recycling of grey water. With regard to domestic use, 85 per cent of the consumption applied to treatment costs. When the consumers installed dry toilets (Vietnamese Latrines) or recycled waste water they did not have to pay for its treatment. Finally, the *social* criteria permitted that poor neighbourhoods and villages benefited from cross-subsidies from residential areas, industries and services, but only for a minimal consumption. Industries that obtained profits from water use (bubble water) were obliged to pay an additional tax. This law was socially accepted and

Figure 11.5: Sustainable Economy of Water. **Source:** Sandoval 2000, modified by Oswald Spring (2005: 153).



audited by citizens, because local people know the economic situation of neighbours much better, and corruption was thus limited.

In terms of Scheler’s theory of value, water is an object that cannot be validated by market forces and that has an intrinsic value as a survival good. Therefore, the value does not depend on individual preferences or market forces, but is fundamental for everybody. Scarcity and other external instances should be mitigated to not affect this ontological value. Any pressure put on the ‘logic of use’ is able to destroy the survival of vulnerable people. Thus, market pressure is understood in precarious life conditions as a negative value, and for this reason it is without value. In ethical terms, the market should never be allowed to destroy the life of a person or a community; human beings come before profits. Further, the quality of water for consumption must be pure and only one drop of polluted water or a limited number of pathogens are able to destroy health and life quality. Finally, the sum of the announced criteria, hierarchically ordered, permits vulnerable social groups a quality of life. On the contrary, if these values are not respected they result in illness and misery. For the nation state and international organizations (e.g. WTO and GATS) this signifies the respect for and the enforcement of basic civil and human rights, based on national constitutions that are supposed to grant everybody a livelihood and human security.

The combination of this case study with the philosophical reflections offers an instrument for overcoming the economic stress and generating ideas to fulfil for everybody its basic human right to safe water and improved health. To achieve this goal, investments in the range of 35 and 100 billions US\$/year are required globally, in addition to the 75 billion US\$ that were spent in 2005. Robert Lenton (2005) estimated that investing about 100 US\$/year/person for the next 25 years would guarantee every person in the world water security with safe water and sanitation.

Thus, poor countries could achieve the MDG for water by 2015. The costs for infrastructure in poor countries decline due to the rural-urban migration into megacities and technological advances. The costs for services in densely populated areas are cheaper, compared with the investments in remote and dispersed rural regions, and treatment facilities are getting cheaper with the use of micro-organisms.

11.3.4 Water as an Issue of Political and Military Security

Water as an issue of political and military security refers to the level of national and international politics both within and between nation states, but increasingly also with non-state actors on competing goals for ensuring access to water for their own survival. In very few cases water was used as a tool of war in efforts to kill people by poisoning water or attacking

water reservoir dams to cause artificial flooding. Water scarcity and degradation has triggered domestic and international conflict, but hardly resulted in all-out ‘water wars’ where armed forces were involved. (II.3.4.1). In many cases water scarcity or pollution has resulted in cooperation among the affected states (II.3.4.2).

On the political and technical level a new paradigm of an *Integrated Water and Resources Management* (IWRM) was launched (II.3.4.3) that has not yet been fully implemented in many regions and countries due to a lacking horizontal cooperation between ministries and stakeholders, and among different ministries and stakeholders. An integral IWRM approach requires a multidisciplinary, multi-stakeholder, multi-institutional, and multilevel decision-making processes that includes payment for environmental services and financial support at the basin level. The establishment of water regimes in transboundary river basins (II.3.4.3) has been used to foster cooperation among states that has resulted in very few cases even in an ‘environmental peacemaking’ with a spillover to other issue areas (Conca/Dabelko 2002).

11.3.4.1 Water as an Object of Conflicts and as a Cause of Disputes

Throughout history, water has been used as a tool of conflict, e.g. by poisoning of the wells or water supplies of the opponent, by diverting rivers (e.g. in 539 BC by Cyrus II who diverted the Euphrates during the siege of Babylon) or by attacking dams (during WW II and during the Korean War) to cause artificial flooding or by attacking water infrastructure and bridges (during wars in Yugoslavia, 1999 and Iraq, 2003). The protection of water in conflict (chap. 58 by Tignino), but also the prevention of water as a tool of conflict, has become an object of humanitarian law, of human rights conventions, and also of international environmental agreements.

Within the first policy dimension (to *secure* the water supply), the control over scarce water resources has been an issue of political security and of diplomatic negotiations among neighbouring states in international river basins that resulted in many international water treaties (Wolf 1998, 1999; Bogardi/Castelein 2002) and water regimes (chap. 51 by Kipping; chap. 52 by Borghese; chap. 53 by Lindemann). Many conflicts in international river basins had a hydro-political component, but water considerations were seldom the sole cause of conflict. Especially in water-scarce countries, domestic water disputes between rural zones and urban centres, between and

within communities, towns and villages, and between neighbours have been on the domestic political agenda for millennia. In periods of severe water scarcity and drought, e.g. in the Sahel zone, many violent clashes have occurred between herders and resident farmers that have so far not been recorded in the existing war and conflict databases.

In the scientific debate there has been a dispute between those who claimed that there have been no ‘water wars’ (Wolf 1998) and others who have documented many violent ‘water conflicts’ between (Gleick 1993, 1998, 1998a, 2008) and within countries (Shiva 2003; Oswald 2005). These debates are based on different definitions of wars and conflicts that have guided the data collection. Aaron Wolf and his team’s argumentation is based on the *Transboundary Freshwater Dispute Database* that provides

a framework for quantitative, global-scale explorations of the relationship between freshwater resources and international cooperation and conflict. Projects were designed to test common theories linking freshwater resources to cooperation and conflict, in particular within the context of geography and environmental security. The projects, which follow in sequence, consider three main hypotheses on the likelihood and intensity of water resource disputes. To test these hypotheses, a unique set of tools was created that links water-specific event data with a geographic information system (GIS) that meshes biophysical, political, and socio-economic data sets at the river basin and other scales. There are three linked data sets: (1) an event data set documenting historical water relations, including a methodology for identifying and classifying events by their intensity of cooperation/conflict; (2) a GIS data set of countries and international basins, both current and historical; and (3) a spatial data set of biophysical, socio-economic, and political variables, linked to the GIS.

Peter H. Gleick (1993, 1998, 2008) in his *Water Conflict Chronology* listed close to 200 water conflicts between 3000 BC and the end of 2007. He argued that “water resources have rarely, if ever, been the sole source of violent conflict or war.” He documented “a long and highly informative history of conflicts and tensions over water resources, the use of water systems as weapons during war, and the targeting of water systems during conflicts caused by other factors.” In his view:

Conflicts may stem from the drive to possess or control another nation’s water resources, thus making water systems and resources a *political or military goal*. Inequitable distribution and use of water resources, sometimes arising from a water development, may lead to *development disputes*, heighten the importance of water as a

strategic goal, or may lead to a degradation of another's source of water. Conflicts may also arise when water systems are used as instruments of war, either as *targets* or *tools*.

In his update of February 2008, Gleick distinguished among six categories or types of conflict: a) *Control of Water Resources* (state and non-state actors), where water supplies or access to water is at the root of tensions; b) *Military Tool* (state actors; 56 cases), where water resources, or water systems themselves, are used by a nation or state as a weapon during a military action; c) *Political Tool* (state and non-state actors; 16 cases), where water resources, or water systems themselves, are used by a nation, state, or non-state actor for a political goal; d) *Terrorism* (non-state actors: 68 cases), where water resources, or water systems, are either targets or tools of violence or coercion by non-state actors; e) *Military Target* (state actors; 43 cases), where water resource systems are targets of military actions by nations or states; and f) *Development Disputes* (state and non-state actors; 3 cases), where water resources or water systems are a major source of contention and dispute in the context of economic and social development.

Following Libiszewski (1999) and focusing primarily on the first policy direction (table 11.1), Lindemann and Kipping (2005: 13-14) distinguished among four types of international water conflicts: *absolute* (in the Nile and Jordan river basins) or *relative allocation conflicts* (between upstream and downstream countries, e.g. in Central Asia), *disputes over water pollution* (Rhine or Rio Bravo/ Grande) and *development conflicts* (e.g. on cooperation to prevent and reduce flooding). Wolf, Stahl, and Macomber (2005) have argued that the conflicts over the allocation of water quantities and on water infrastructure projects are most prone for escalation. But there is a lack of systematic and statistical evidence, as environmental factors including water scarcity, degradation, and stress were not coded as causes of wars.

The *Uppsala Conflict Data Program* (UCDP) has collected information on armed violence since 1946, including ongoing violent conflicts. More recently the scope of data collection was broadened to include other cases of organized violence. However, this database neither lists environmental causes of conflict nor does it even refer to water as a source of conflict. The database of the *Heidelberg Institute for International Conflict Research* (HIIK) in its annual Conflict Barometer on: "Crises - Wars - Coups d'État - Negotiations - Mediations - Peace Settlements" did not list 'water' among its nine causes of conflict (territory, se-

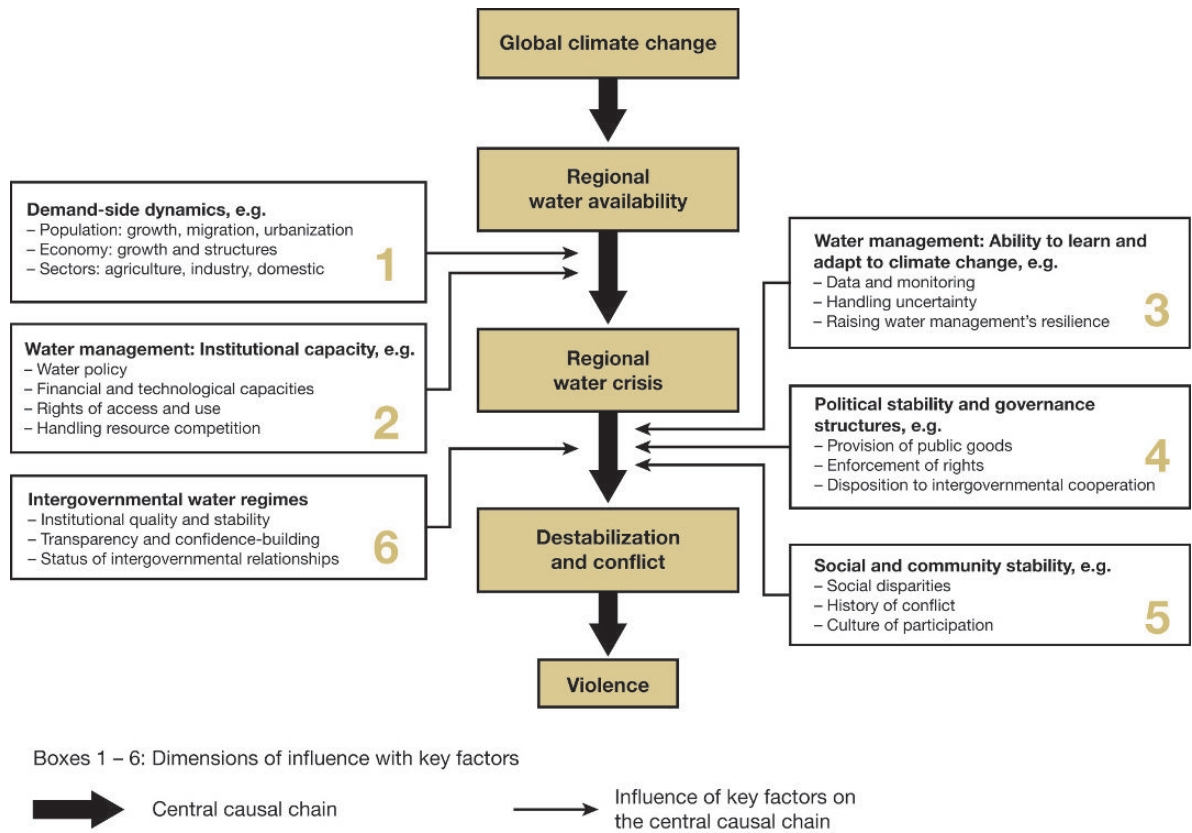
cession, decolonization, autonomy, system/ideology, national power, regional predominance, international power, resources, others). But in two cases for the Middle East it listed water as a cause of a latent conflict between Israel and Jordan (1945), and for Israel and Lebanon (2001). HIIK stated that "a positional difference over definable values of national meaning is considered to be a latent conflict if demands are articulated by one of the parties and perceived by the other as such."

While the two conflict databases (UCDP, HIIK) ignored water as a cause or trigger of violent conflict since 1945 (or 1989), the databases of the *Transboundary Freshwater Dispute Database* by Wolf and the *Water Conflict Chronology* by Gleick point to the two contrary outcomes of the many water disputes in human history, of water cooperation as a means of conflict resolution or of the application of force by using water as a military tool or target. However, based on the available literature and statistical data no conclusive answer on the claims (Gleick) or denials (Wolf) of the existence of water wars, conflicts or disputes between states or non-state actors is possible.

Comparative studies on water scarce regions show structural similarities and differences on water cooperation through agreements (e.g. between Israel, Jordan and Palestine, or between the USA and Mexico). In most Third World countries demographic pressure, global environmental and climate change, competition between different water uses (agriculture and domestic vs. industrial and services), pollution and often a militarily, socially, and technically powerful upstream partner or unstable border conditions, could create increasing water stress and therefore potential disputes and violent conflicts between non-state and even state actors (Salman/Upreddy 2002; Pachova/Nakayama/Jansky 2008).

Whether the water-related conflict potentials result in domestic violence or even in international armed confrontation depends on the policy decisions of the governments in the water stressed regions, and on the success or failures or basin-wide water management schemes, cooperative regimes, and institutions. Among the four conflict constellations of the WBGU (2008) two are directly water-related, focusing on a) climate-induced degradation of freshwater resources due to the differentiated impacts on precipitation patterns (figure 11.6); and b) climate-induced increase in hydro-meteorological hazards (figure 11.7). But the other two are closely related with too little or too much water resulting, c) in a decline in food produc-

Figure 11.6: Conflict constellation 'climate-induced degradation of freshwater resources: key factors and interactions.
Source: WBGU (2008: 83)



tion, and d) forcing or inducing the affected people to migrate (GTZ/BMZ 2008: 64–67).

Figure 11.6 illustrates for 'the climate-induced degradation of freshwater resources' the influence of six factors: 1) demand-side dynamics, 2) water management; institutional capacity, 3) water management ability to learn and adapt to climate change, 4) the political stability and governance structures, 5) the social and community stability, and 6) the contribution of intergovernmental water regimes on the outcome of the central causal chain whether it leads to destabilization and violent conflict or to cooperation.

Figure 11.7 shows for the conflict constellation of a 'climate-induced increase in storm and flood disasters' the influence of four factors: 1) the hazard impact, 2) social vulnerability, 3) the social stability, and 4) the political stability and governance structure that determine whether the central causal chain escalates into violence or whether emergency relief contributes to a de-escalation.

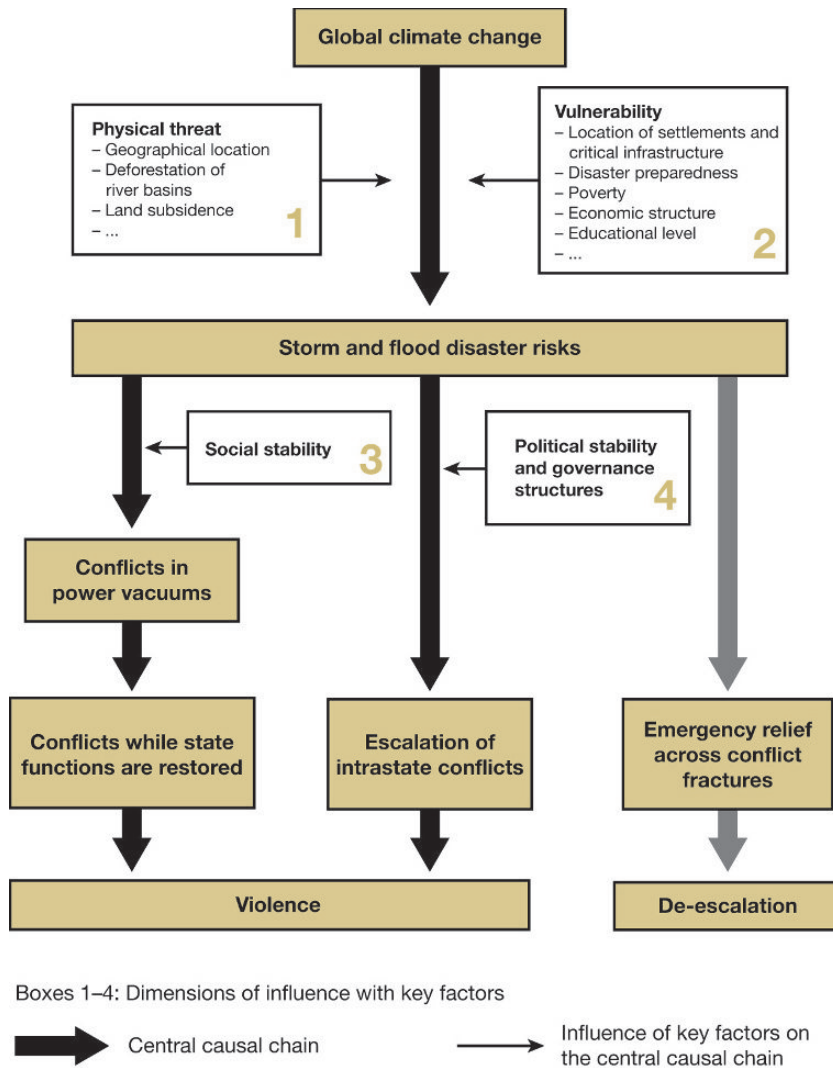
Conflicts are not always negative; they have been motors of changing the world. They are present in each human and social relationship. But a negative

outcome in form of violence should be avoided through negotiation, conflict management, and peaceful conflict resolution. There are several ways to resolve conflicts: socially, politically, and technically. Frequently, conflicts are postponed, transformed, manipulated, and their resolution is administered in little doses; but it is also possible to resolve them by aiming at the roots through an effort towards hydro-diplomacy (Oswald 2007).

Gleick (1993; 2001) has linked violent outcomes of water disputes to a shortage of resources often due to *absolute* or *relative* allocation problems. The *Cornucopians* (Lomborg 2002) have proposed technical solutions, political agreements, and cheap methods for desalination of sea water to resolve problems of water shortage. A third group, the *Neo-Malthusians*, have linked the increasing resource scarcity and violence to population growth (Meadows/Meadow/Randers/Behrens 1972; World Bank 2004; FAO 2005).

These approaches were criticized by some political scientists (Selby 2003; Kipping/Lindemann 2005). They were less optimistic and emphasized that the dis-

Figure 11.7: Conflict constellation ‘climate-induced increase in storm and flood disasters: key factors and interactions.
Source: WBGU (2008: 109).



tribution of water must include the specific interests of stakeholders and the environmental deterioration of international basins due to growing contamination. These problems cannot be resolved in the traditional framework of sovereign states, and therefore specific policies and negotiations are required, where neighbouring nations can find collective advantages to achieve an amicable agreement based on consensus (Oswald 2007).

In an overview of environment and conflict linkages, Schwartz (2002) combined socio-economic factors with environmental stress and violent outcomes. Bohle (2002) linked human security with globalization, while the Swiss group (Bächler/Böge/Klötzli/Libiszewski/Spillmann 1996, Bächler/Spillmann 1996a, 1996b; Bächler/Spillmann/Suliman 2002) re-

lated human activities to natural factors, economic agents, and suggested to increase resilience through networks of proactive empowerment that try to reduce risks and hazard impacts. Furthermore, anthropological studies and gender specific research have shown a higher social vulnerability of women, children, and elders in terms of persons who died or were seriously affected during extreme events, but also higher personal and economic costs to obtain this vital liquid (Oswald 2008).

11.3.4.2 Water Stress as a Cause for International Cooperation

Water scarcity, degradation, and stress require that neighbouring social groups and governments must ne-

gotiate economically sustainable water management agreements on this scarce resource. Both the technical water management efforts and political concerns about human, gender and environmental security in a framework of sustainable development could be reinforced by scientific and technological training to optimize existing financial and physical resources (Dombrowsky 2003). In addition, a participative bottom-up approach involving all stakeholders could promote a new water culture (Oswald 1999). A resolution of water conflicts through negotiations of water disputes may lead to a consensus among antagonistic groups, economic concerns, and could thus constrain wider geopolitical and military interests.

Conca's (2002: 1–22) concept of 'environmental peacemaking' was empirically discussed for several water-related case studies, and in *Governing Water* Conca (2006: back cover) examined political struggles to set up a global framework for water governance. He argued that "threats to the world's rivers, watersheds, and critical freshwater ecosystems have resisted the establishment of effective global agreements through intergovernmental bargaining ... because the conditions for successful interstate cooperation ... cannot be imposed upon water controversies." He further stated that "while interstate water diplomacy has faltered, less formalized institutions - socially and politically embedded rules, roles, and practices - have emerged to help shape water governance locally and globally." Thus, inter- and transnational epistemic communities of water experts and professionals and water regimes have developed.

These activities create an opportunity for technical solutions (desalinization of brackish and sea water), for the construction of infrastructure, such as sewage plants and recycling facilities of treated water, and could thus also increase the availability and quality of water for complex and fragile ecosystems and offer fast growing populations future development opportunities. A hydro-diplomatic approach combines geopolitical factors with social organization, technological alternatives, and training at the local, regional, national, and international basin level, where goodwill improves the possibility to reach a win-win situation for all people involved.

11.3.4.3 Integrated Water and Resources Management (IWRM)

Water management integrates human activities on the use and conservation of water. The concept of *Integrated Water and Resources Management* (IWRM) has been introduced as a new paradigm that has been

defined by the *Global Water Partnership* (GWP) as "a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems" (Technical Advisory Committee 2000). The IWRM "encourages the development of integrated basin-wide water use and management strategies, action plans and institutions" (Jansky/Nakayama/Pachova 2008: 1).

The IWRM concept explicitly challenges conventional water development and management systems. It starts with the recognition that traditional top-down, supply-led, technically based and sectoral approaches to water management are imposing unsustainably high economic, social and ecological costs on human societies and on the natural environment. Business as usual is neither environmentally sustainable, nor is it sustainable in financial and social terms. As a process of change which seeks to shift water development and management systems from their currently unsustainable forms, IWRM has no fixed beginnings and will probably never end. The global economy and society are dynamic and the natural environment is also subject to change, IWRM systems will, therefore, need to be responsive to change and be capable of adapting to new economic, social and environmental conditions and to changing human values.

IWRM pursues three key strategic goals: a) to enhance efficiency of water resources; b) to achieve equity in the allocation of water across different social and economic groups; and c) to aim at environmental sustainability, to protect the water resources base and associated ecosystems. In the IWRM toolbox this new paradigm was introduced as going beyond the business as usual approaches what implies "a process of change; a process which can start from small beginnings", that aims at a gradual and incremental change that is inspired by the 'Dublin Principles' (1992, see box 11.2).

The IWRM concept refers to multiple causations. With regard to the problem of *increased threats from flooding* it points to at least 9 key causes: a) climate change, more extreme events; b) increased occupancy of flood plains; c) inadequate maintenance of existing flood defences; d) dam siltation; e) deforestation and upstream rural land use change; f) urbanization of catchments; g) improved land drainage or flood defences upstream; h) ineffective land zoning or building regulations; and i) lack of incentives for local/community vulnerability reduction measures. The IWRM concept also refers to three types of governance failure, which are inherent in most countries:

Box 11.2: Principles for Effective Water Governance. **Source:** GWP IWRM Toolbox; at: <http://www.gwpforum.org/gwp/Media/Toolbox/main_features.pdf>. Text is in the public domain.

- *Open and Transparent:* Institutions should work in an open and transparent manner.
- *Inclusive and Communicative:* Improved participation - depending on all levels of government - is likely to create more confidence in the end result and in the institutions that deliver policies.
- Policies and action must be

Coherent and Integrative:

- *Equitable and Ethical:* All men and women should have opportunities to improve or maintain their well-being. Equity between and among the various interest groups, stakeholders, and consumer-voters needs to be carefully monitored throughout the process of policy development and implementation.

In terms of *Performance and Operation*, good governance requires that processes and operations are:

- *Accountable:* Roles in the legislative and executive processes need to be clear. Each institution must explain and take responsibility for what it does.
- *Efficient:* providing economic efficiency, and also concepts of political, social, and environmental efficiency.
- *Responsive and Sustainable:* Policies must deliver what is needed on the basis of demand, clear objectives, an evaluation of future impact and, where available, past experience.

- *Market failure* (e.g. incomplete/non-existent property rights, uncorrected environmental and social externalities, incomplete information, information asymmetries, monopoly);
- *Institutional system failure* (e.g. lack of worker commitment, no public respect/compliance culture, incomplete regulatory systems, failure to regulate monopolies, no legitimacy for regulators or service providers);
- *Government failure* (e.g. water agencies acting to further internal, not public interests, capture vested interests, capacity constraints, bureaucracy, lack of accountability).

The toolbox offers specific instruments for dealing with each of these three failures. The toolbox stated that for the suitability of particular tools, four factors must be taken into account: political, professional, implementation, and compliance capacity. The tools must also take the enabling environment into account.

The Plan of Implementation adopted at the WSSD in Johannesburg in 2002 called on all countries to develop IWRM and water efficiency plans by 2005. The *Global Water Partnership* (GWP) stressed in a Paper on “Guidance in preparing a national IWRM plan: advancing the WSSD plan of implementation” (GWP 2004) that the IWRM approach implies recognition that truly sustainable water resources management involves managing demand, not just supply.

The IWRM concept integrates water, environmental, and food security issues with poverty alleviation. Focusing on irrigation efficiency, IWMI (1998) concluded that an additional 17 per cent of investment would be needed in the period 1995–2025. More nor-

mative scenarios for the World Water Vision (Gallop/Rijsberman 2000; Cosgrove/Rijsberman 2000) stated that additional changes in lifestyle and diet are required, including improved rain-fed management, what will increase crop yield by 6 per cent.

The technological vision of these measures for achieving water security, represented by the *World Water Vision* (WWV), the IWRM concept and FAO activities, were criticized by social movements. They argued that this focus continues the policy that led to the exhaustion of aquifers, to the pollution of surface water and of coastal areas and sea water. Several social movements claimed that these approaches never questioned the root causes of poverty, often related to the deprivation of water rights in traditional societies, and that they often hinder small-scale bottom-up projects and technologies and support the interests of agribusiness. Land and water rights were traditionally owned by local people while modern water laws have promoted privatization processes and water concessions abolishing these rights. Finally, they argue that these analyses lack methodological criteria for evaluating the policy outcomes. In theoretical terms they abolish the ‘value of use’ and impose a ‘value of change’. This logic may deprive poor people of their human right to water (Young 2005).

11.3.4.4 Management Schemes and International River Basin Regimes

On the international level, much attention of the international donor community has focused on integrated political, economic, social, and technical management schemes at the level of international river basins that would not only increase economic and so-

cietal security and sovereignty of poor countries and of vulnerable social groups, but also contribute to improving health. To achieve these goals, two different concepts were developed referring to the *Integrated River Basin Management* (IRBM) or, as in Agenda 21, to the *Integrated Water Basin Management* (IWBM) that attempt:

to treat the river and its tributaries together with the land and underground water as a unit. It recognizes the need to manage the river basin as an entity, and implies the importance of land use, as well as the value of ponds, lakes and wetlands within the basin. The National River Authority's *Catchment Management Plans* (CMPs), the subsequent EA *Local Environment Agency Plans* (LEAPs) and the plans generated under *Local Agenda 21* (LA21) are examples of a way of thinking sometimes referred to as 'catchment consciousness'. This idea links society and economics to the more familiar technical aspects of water management. However, CMPs were river focused, LEAPs are of variable quality and LA21 plans are also of variable quality and incomplete.

Since the 1990's, many studies were published, from different scientific disciplines (from the perspective of geography, economics, law, political science and international relations) as well as by NGOs (ENDS/Gomukh 2005), national ministries (Sweden, Ministry of Foreign Affairs 2000) and international organizations (UNEP 2002; OECD 2003; UNESCO 2003, 2006) that have been guided by the policy goal to resolve water allocation conflicts on the basin level by setting up joint institutions for the transnational information exchange, cooperation, and management of water resources in multinational river basins (Clarke/King 2004).

A key issue is the interrelationship between water and human and gender security issues, as water directly affects human security. Further, most water-related issues from hygiene, cooking, and caring for ill people is traditionally in the hands of women, and thus affects gender security what represents a key element in the conceptualization of security.

11.4 Deepening: Referents of Water Security

The referent object of the water security concept and for achieving water security is no longer solely the state, but with the deepening of the security concept, the conceptual and analytical focus has widened to the individual human being and to humankind (*human security*) including a specific gender focus (*gen-*

der security), to the society (*societal or communal security*) and beyond the nation state to regional and global international organizations and non-state societal and business actors.

11.4.1 Human Security Approach on Water Issues

According to Gutiérrez (1999), water security goes beyond the availability of water and includes the individual right of access to water as well as the national sovereignty over water. Nicol (2005: 4) claimed that water security, from the household to the global level, implies "that every person has *access* to enough safe water at affordable cost to lead a clean, healthy and productive life, while ensuring that the natural environment is protected and enhanced" (GWP Framework of Action document). Wouters (2005: 168) defined water security as "the state of having secure access to water; the assured freedom from poverty of, or want for, water for life." From a human security perspective, Falkenmark and Rockström (table 11.1) argued that water is a necessity and life support that directly affects the preparedness dimensions of human health, employment, income generation, and food supply. The discourse on water security has been influenced by Annan's (2005) three pillars of human security:

- Water security is based on three core freedoms: freedom from want, freedom from fear, and freedom to live in human dignity.
- Ensuring water security may lead to a conflict of interests, which must be capable of being identified and effectively dealt with at the international, national, and local levels.
- Water security, like water, is a dynamic concept, and one that needs clear local champions and sustained stewardship (Wouters 2005: 169).

11.4.2 Gender Security Approach on Water Issues

In developing countries, small-scale food production is owned by women, indigenous and poor peasants, and normally depends on traditional technology, what often results in low crop yield averages. Traditional agriculture with its integral management of natural resources, water conservation, polycultivation, and mixed agriculture has maintained for centuries the fertility and humidity of soils, and therefore represents a typical case of sustainable management, including

environmental services. In most developing countries, poor women have been key food producers and about half of the world food production is cultivated in orchards mostly by women (FAO/SDWW 1999; FAO/IFAD/WFP 2005; FAO 2006). Women are also crucial actors in water management for drinking water and food preparation, and they are also the main persons responsible for food production and market activities. Food storage and food security depends primarily on the ability of women to conserve their surplus production.

But at the international, national and local level, planning, development, and management of water is controlled mostly by men. Therefore, the gender perspective must be globally integrated, and women must be involved in water policy decisions. UNIFEM has supported the enhancement of the economic security of women by engendering their access to water, the recollection of data, enhancing market access for selling subsistence production, and empowering women especially in vulnerable situations such as extreme weather events and in armed conflicts (Bennett/Davila-Poblete/Nieves Rico 2005).

11.4.3 Water Security as an Issue of National Security

While the concept of 'water security' often refers to the impact of too little (scarcity, degradation, stress) and too much water (hazards), in the context of the US led War on Terror, 'water security' has become an important issue of US national security to ensure water protection and safety against deliberate and large-scale poisoning by terrorists.

The US *Environmental Protection Agency* (EPA) established a "Water Security" Division that pursues a somewhat different policy agenda:

Improving the security of our nation's drinking water and wastewater infrastructures has become a top priority since the events of 9/11. Significant actions are underway to assess and reduce vulnerabilities to potential terrorist attacks; to plan for and practice response to emergencies and incidents; and to develop new security technologies to detect and monitor contaminants and prevent security breaches.

Water security has also become a key concern of the US Departments for Homeland Security and Defence as well as for the US intelligence community. But the Report of the National Intelligence Council's 2020 Project, *Mapping the Global Future*, did not specifically address water security threats for US national

security, as they have plenty of water resources in the northern part of the country.

Besides the specific case of the narrow conceptualization of water security and its link with US national defence and homeland or internal security, in many other countries achieving and maintaining water security has become a major national prerogative that requires the utmost efforts, especially in democratic societies, to satisfy the basic human needs of citizens for drinking water and food ('value of use'). For some countries, especially in the Middle East, the goal of achieving water and food security has been solved with imports of 'virtual water' in terms of cereals and meat products. Satisfying food needs at affordable prizes for all societal groups has become a political object to avoid bread or food riots, and thus to maintain domestic stability and internal security.

11.4.4 International Security

As was discussed above (11.2.3) the concept of water security has been extensively used by international organizations in the framework of international development and security concerns and strategies. A major goal in many studies and policy declarations has been to avoid a militarization of disputes over water scarcity, degradation, and stress. Major tools for achieving international water security have been discussed in the context of geopolitical approaches to 'hydropolitics' (Ohlsson 1995) or in the framework of bi- and multi-lateral hydro-diplomacy (Oswald 2006). There is also a concern among upstream and downstream users, above all when the downstream countries are politically weaker (Río Bravo dispute between USA and Mexico), but also when the livelihood of a powerful downstream user depends on a river basin (Egypt). International strategies and measures, such as IRBM or IWBM, diplomatic agreements and treaties as well as conflict resolution initiatives (hydro-diplomacy), are among the most efficient international activities to avoid water wars and to mitigate tensions among involved nations.

11.5 Sectoral Applications of Water Security

Water security has been introduced as one of several sectoral security concepts, such as food (11.5.1) and health (11.5.2) security. Below selected linkages between water security and these other two sectoral concepts will be discussed.

11.5.1 Water as a Food Security Issue: Virtual Water

While developing countries often use more than 90 per cent of their water resources for primary activities (agriculture, mining), many industrialized nations have reduced their water consumption for agriculture and industrial production. The high input of water into food production processes is called 'virtual water' (Allan 1998, see chap 41) and it allows water rich countries to produce water-intensive crops for export, and those with scarce water resources can import these products (table 11.3).

Table 11.3: 'Virtual Water': Average requirement of water in productive activities. **Source:** FAO (2000a).

Product	Unit	Equivalence of water in m ³
Cow	head	4,000
Sheep, goats	head	500
Fresh meat	kg	15
Meat from labour	kg	10
Fresh chickens	kg	6
Cereals	kg	1.5
Rice	kg	1,900
Citric fruits	kg	1
Palm oil	kg	2
Roots and tubercles	kg	1
Steel	ton	190,000

Virtual water permits regions experiencing water stress to import food products from areas with better water conditions, and therefore use their scarce resources for domestic and industrial purposes instead for agriculture. Wheat and other cereals, as basic food crops, are traded globally. Many water scarce countries in Asia, Latin America, and in the Middle East have been importing cereals for several decades, and thus substantially reduced their water demand.

This is a logical answer for rapidly growing populations with a rising water demand for domestic purposes and industry. But due to climate change the water demand for irrigated agriculture will increase (figures 11.8 and 11.9) in arid and semi-arid regions. With present irrigation patterns, water demand may increase less than with potential irrigation schemes that are responding to a better quality of life and industrial countries, due to their present high level of irri-

changes in the diet e.g. in China and India, what will raise water and food needs in both countries.

Favourable climate conditions allow developed countries to concentrate their production in rain-fed areas while poor countries are highly dependent on irrigation (figure 11.10). This dependency will increase with a decline in precipitation and will require technological improvements in water management to obtain higher yield averages by drop. But it will create also an increasing dependency on basic food imports for the highly populated nations in the tropical areas.

Water resources are not unlimited and the projections for future precipitation levels indicate a reduction in the reliability of rainfalls and of the amount of water available for irrigated areas worldwide. Due to higher temperature evapotranspiration will rise and crop yields in many countries have been projected to decline, both factors leading to an increase in water needs (table 11.4). Many regions in Africa suffer already from a low reliability of their water supply for irrigation. Similarly, in Asia and Latin America the reliability of precipitation levels will decline drastically during the next two decades, and only some developed countries in moderate climate zones will most likely improve their situation. This implies that water security is globally threatened due to high population growth and greater food and water demand in regions where the supply of water and the reliability of irrigation will drop. Thus, climate change will also create, through the increasing water stress, problems for food security of many developing countries. These new environmental challenges posed by climate change will oblige planners and producers to seek a better understanding of the links between production methods, crops, yield averages, and the local food culture.

Table 11.4 documents the results of three scenarios with regard to crop yields in rain-fed and irrigated agriculture. The *business as usual* (BAU) scenario shows for rain-fed cultivations the worst results, while *higher rainfall area* (LINV-HRF) will offer for poor and industrialized countries the best results. These scenarios do not reflect governmental recommendations, which are related to higher investments and water saving technologies. For the irrigated areas the BAU scenario shows the best results while the other two methods are almost the same and therefore new irrigation techniques are required to feed the growing population. Nevertheless, the reliability index for irrigation water supply is declining in all developing countries (table 11.5) and rises only in industrialized countries. Severely affected are Asian and Latin American countries and often overexploitation of aquifers.

Figure 11.8: Total water consumption for irrigation with projections to 2025. **Source:** Rosegrant/Cai/Cline (2002: 5, figure 4). Reproduced with permission from the International Food Policy Research Institute <www.ifpri.org> and the International Water Management Institute <www.iwmi.cgiar.org>. The report from which this figure comes can be found online at: <http://www.ifpri.org/pubs/fpr/fprwater2025.pdf>.

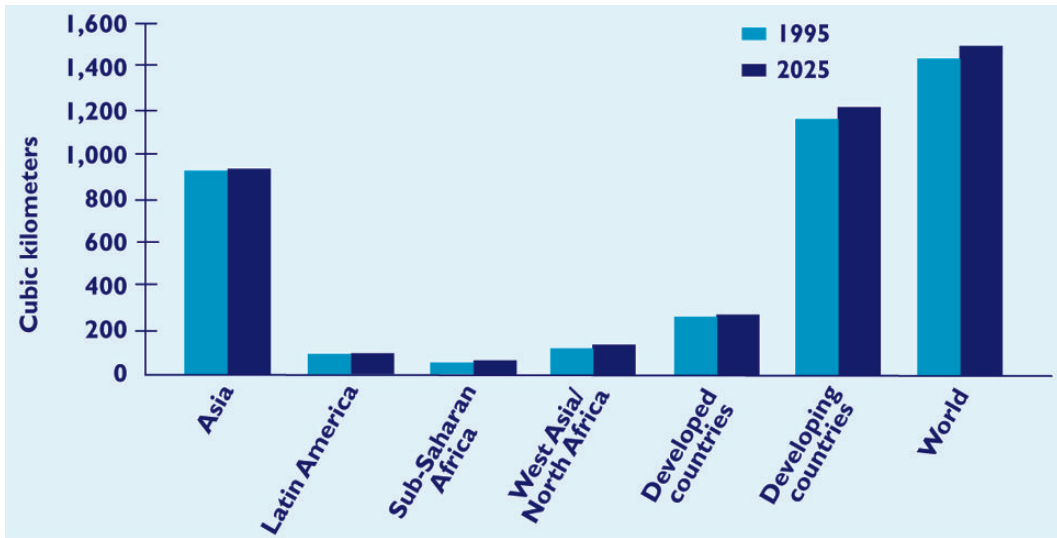
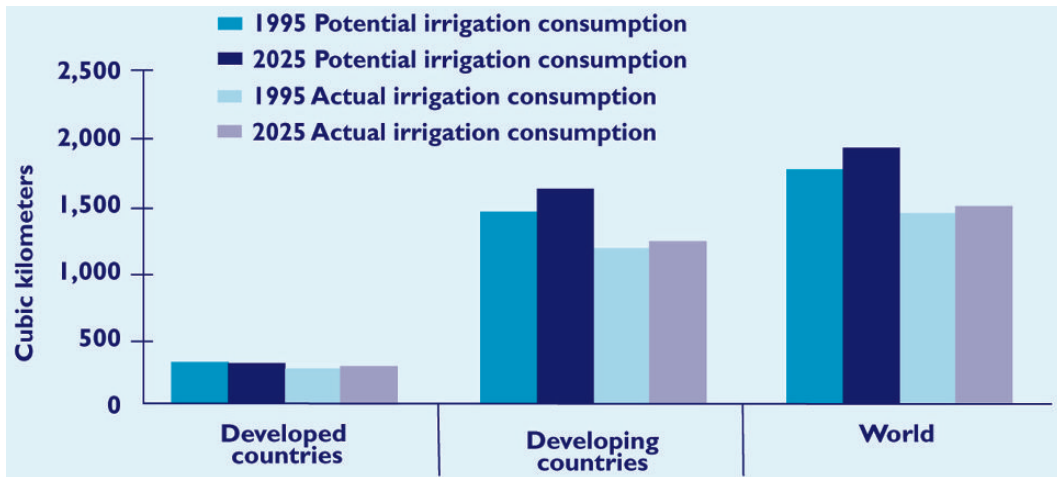


Figure 11.9: Potential irrigation consumption with projections to 2025. **Source:** Rosegrant/Cai/Cline (2002: 5, figure 4). Reproduced with permission from the International Food Policy Research Institute <www.ifpri.org> and the International Water Management Institute <www.iwmi.cgiar.org>. The report from which this figure comes can be found online at: <http://www.ifpri.org/pubs/fpr/fprwater2025.pdf>.



When comparing the amount of virtual water for different production schemes, there is no doubt that, with population growth, climate change, and desertification, the global food supply cannot shift to occidental meat patterns. On the contrary, also in industrialized countries a shift will be needed to a diet that is based more on cereals. This diet not only requires less water (except for rice where seeds with a lower water demand are developed), but this will also lead to a healthier diet for people, create less obesity,

and reduce diabetes, and cardiovascular and degenerative diseases.

In synthesis, the global trend to achieve food and water security refers to a complex linkage among several factors, including the ‘virtual water’ trade (Hoekstra/Hung 2002; Allan 2003 and chap. 41). To consolidate a sustainable water policy that can achieve both food sovereignty (chap. 33 by Oswald) and a healthy nutrition, several processes must simultaneously be developed together with different consumption patterns:

Figure 11.10: Irrigation and rain-fed production in cereals. **Source:** Rosegrant/Cai/Cline (2002: 5, figure 4). Reproduced with permission from the International Food Policy Research Institute <www.ifpri.org> and the International Water Management Institute <www.iwmi.cgiar.org>. The report from which this figure comes can be found online at: <http://www.ifpri.org/pubs/fpr/fprwater2025.pdf>.

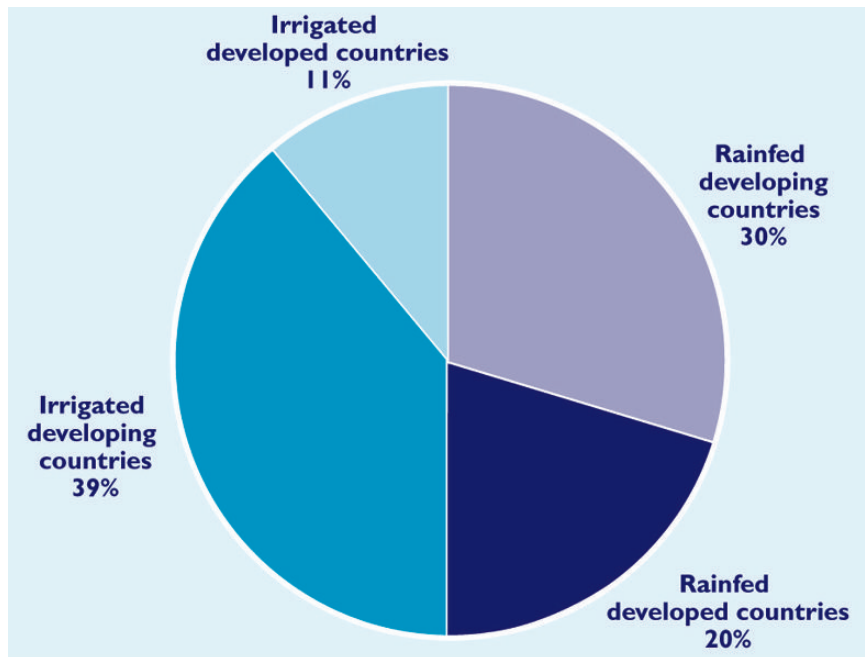


Table 11.4: Scenarios for rain-fed and business as usual production. **Source:** Rosegrant/Cai/Cline (2002: 5, figure 4). Reproduced with permission from the International Food Policy Research Institute <www.ifpri.org> and the International Water Management Institute <www.iwmi.cgiar.org>. The report from which this figure comes can be found online at: <http://www.ifpri.org/pubs/fpr/fprwater2025.pdf>.

REGION	Rainfed yield (metric tons/hectare)			Irrigated yield (metric tons/hectare)		
	BAU	LINV-HRF	LINV-HIER	BAU	LINV-HRF	LINV-HIER
Asia	2.46	2.96	2.49	4.50	4.05	4.13
Latin America	2.92	3.13	3.08	5.46	4.85	4.92
Sub-Saharan Africa	1.19	1.22	1.30	3.08	2.95	2.99
West Asia/North Africa	1.75	1.93	1.89	4.86	4.55	4.61
Developed countries	3.89	4.24	3.95	5.97	5.54	5.59
Developing countries	2.08	2.36	2.18	4.53	4.09	4.16
World	2.77	3.07	2.86	4.80	4.37	4.43

SOURCE: Authors' estimates and IMPACT-WATER projections, June 2002.

NOTE: BAU stands for business as usual, LINV-HRF stands for lower irrigation investment and higher rainfall area and yield, and LINV-HIER stands for lower irrigation investment and higher effective rainfall use.

- Assess all crops with their different water needs and establish a regional balance of water requirements (Oki 2002).
- Prioritize basic food crops for all social groups, protecting the most vulnerable, and analysing soil, seed, and production methods to increase the productivity per drop of water through a democratic and participative process, taking the needs of vulnerable groups into account.
- Develop regional water balances between the supply of green and blue water, including evapotranspiration and run-off with regard to short, medium, and longer-term time horizons, including climate change scenarios.

Table 11.5: Irrigation water supply reliability index by regions, 1995 and 2025. **Source:** Rosegrant/Cai/Cline (2002: 5, figure 4). Reproduced with permission from the International Food Policy Research Institute <www.ifpri.org> and the International Water Management Institute <www.iwmi.cgiar.org>. The report from which this figure comes can be found online at: <http://www.ifpri.org/pubs/fpr/fprwater2025.pdf>.

IRRIGATION WATER SUPPLY RELIABILITY INDEX		
REGION	1995	2025
Asia	0.81	0.76
Latin America	0.83	0.75
Sub-Saharan Africa	0.73	0.72
West Asia/North Africa	0.78	0.74
Developed countries	0.87	0.90
Developing countries	0.81	0.75
World	0.82	0.78

- Transform productive systems for strategic crops in any water-scarce country through modernization of irrigation systems (micro-tunnel, drop irrigation system, micro-aspersion, greenhouse techniques, capture of dew, recycling of treated waste water, desalinization of sea and brackish water, etc.), and substitution of water-intensive crops with those that need less water.
- Return to a diet based on cereals and reduce meat consumption and water-intensive crops in dry and semi-arid areas with high population growth.
- Monitor the atmospheric conditions, including the impact of climate change, aquifer behaviour, water table decline, physical-chemical conditions of water for irrigation, water demands in agriculture, society and industry, including water-saving processes, recycling of treated waste water.
- Establish water laws for each country and for regions with clear priorities for domestic, industrial, and agricultural water uses, and without omitting ecosystem requirements.
- Develop water tariffs that take social, regional, environmental, productive, and saving techniques and costs for maintenance of hydrological infrastructure into account.
- Compute the virtual water content and flows, eventual substitution of export crops, and regional consolidation of food crops that can also reduce the emission of greenhouse gases caused by trade.
- Invest in water infrastructure to reduce evapotranspiration, loss of flow, infiltration techniques, and increase the recharge of aquifers (blue water flow), and of lakes and rivers (green water flow). Renewable energy desalinization of sea and brackish water can increase the supply of domestic, industrial, and irrigation uses.
- Use different water qualities for different purposes and productive processes, thus caring about safe water for human consumption.
- Aquaculture or inland small-scale fish production permits the horizontal integration of productive cycles, where the waste of the primary production (pig, chicken, and cow sheet is used for feeding fish) and the bones of fish contribute to fertilization of crops. The horizontal integration of productive processes improves food intake in poor rural areas and boosts through adequate nutrition the health of marginal people.
- The vertical integration of small-scale businesses (dried fish; transformed crops; agro-industrial transformation of cereals, vegetables and fruits; orchards; backyard livestock production) at the regional level stimulate regional markets, increase local incomes, and improve the nutrition of marginal people.
- A new ‘culture of water’ must be developed, where consumption patterns are changed and saving practices introduced in all phases of water management – extraction, production, service, re-use and recycling.

11.5.2 Water as an Issue of Health Security

Every year more than three million people die from waterborne diseases and vector-related illnesses. Of these about 2 million are children less than five years old. The links between water and health security are related to three factors: First, an insufficient amount of water destroys a sustainable and healthy livelihood. Second, the water supply in any community should be free from waterborne micro-organisms by offering people safe drinking water and an environment with-

out vector-related diseases (malaria, dengue, and schistosomiasis). Third, waste water must be treated and recycled in the production process, while sludge could be composted and used for soil improvement.

Many health problems are directly linked to the lack of access to safe water, especially in developing countries. Water scarcity and lacking treatment facilities increase the pollution of clean water. Waste water and contaminated food products combined with chronic undernourishment due to water shortage in agriculture creates serious health problems and reduces life expectancy. Furthermore, desertification processes and the destruction of ecosystems due to modernization projects such as hydroelectric dams, tourist development, urbanization, and the dry-out of marshes and everglades contribute to a perverse cycle of illness, illiteracy, undernourishment, poverty and greater disaster impacts. Water scarcity is therefore a complex process which has a cultural impact. Poverty is not only related to scarce resources, but also to economic stress due to a lack of investments for the creation of infrastructure.

11.6 Conclusions: Towards a Comprehensive Analysis of Water Security

With the adoption of the “Ministerial Declaration of The Hague on Water Security in the 21st Century” at the second World Water Forum in 2000 ‘water security’ has been introduced as a new political concept that has since been developed further by the Global Water Partnership, the following World Water Fora, and widely used in political declarations by governments and international organizations, and in scientific analyses and discourses on environmental, water, and security issues, but in most cases without a specific definition.

After the *politicization* of water at the Dublin Conference (1992) and at the Rio Earth Summit (1992), since the year 2000 the *securitization* of water has upgraded water issues to a policy problem of utmost importance that requires extraordinary measures in facing and coping with the manifold related development and security-related problems posed by global environmental change, especially by climate change and desertification.

Water security can only be achieved by multilevel and horizontal societal, national, and international coordination and cooperation, with an enhancement of the life-creating and sustaining role of water and

simultaneously through a better control and management of its destructive impacts through hydro-meteorological hazards.

This requires that water as a basic human need and as a human right for everybody must be available to all human beings in sufficient quantity, in safe quality, and at an affordable price. Thus, water should not be privatized, commodified, and controlled by a few multinational corporations whose primary interest is to achieve the highest possible profits to satisfy their shareholders. Rather, water as a global commons should be treated as a major public good (‘value of use’), where knowledge creators (scientific community) and distributors (education, media) as well as societal, economic, and state actors should be guided by an ‘ethic of responsibility’ (Jonas 1984).

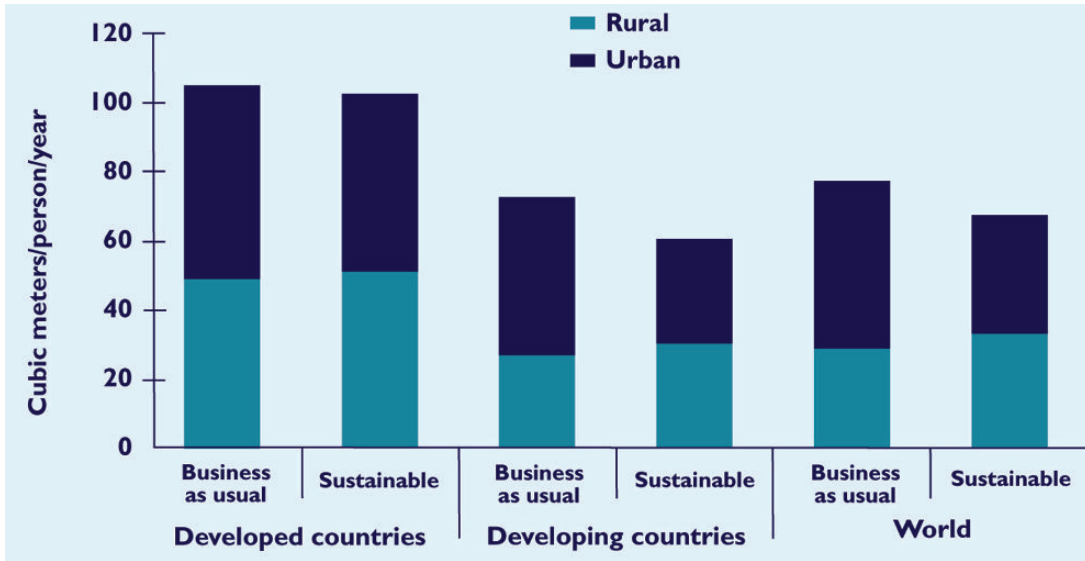
11.6.1 Scientific Tasks for Achieving Water Security

Water security issues require a complex analysis that combines in the scientific realm the knowledge of several scientific disciplines of the natural (hydrology, chemistry, biology, medicine, agriculture, etc.), engineering (water engineering, construction), and social sciences (economics, political, legal and, administrative science) as well as the humanities (philosophy, religion, literature, ethics) in order to search for multidisciplinary solutions that go beyond the narrow engineering approach that has focused only on the construction of technical tools, while often ignoring the political and cultural processes as well as values and human behaviour.

This multidisciplinary approach that involves a pluralism of methods (from empirical data collection to modelling and scenario development) must be complemented in the policy realm with a ‘horizontal coordination’ (Scharpf 1994; Oswald 2005) of different ministries responsible for aspects of water-related policy problems (environment, economics, agriculture, fishing and aquaculture, food, health, hazards, justice, city planning, rural development and foreign relations, etc.).

While the results of both supplementary multidisciplinary scientific approaches that aim at the ‘concilience’ (E.O. Wilson 1998) of different disciplines, and of the horizontal coordination among different ministries and agencies on the national level and among international organizations, agencies, and programmes on the regional and global level, may always be suboptimal, this holistic approach to water security issues

Figure 11.11: Sustainable consumption of water in rural and urban areas. **Source:** Rosegrant/Cai/Cline (2002: 5, figure 4). Reproduced with permission from the International Food Policy Research Institute <www.ifpri.org> and the International Water Management Institute <www.iwmi.cgiar.org>. The report from which this figure comes can be found online at: <http://www.ifpri.org/pubs/fpr/fprwater2025.pdf>.



may nevertheless create synergies and cost savings, compared with business as usual approaches.

Achieving water security through “the reliable availability of an acceptable quantity and quality of water for health, livelihoods and production, coupled with an acceptable level of water-related risks” (Grey/Sadoff 2007) requires

the need to consider issues of enhancing sustainability and environmental integrity and reducing the vulnerabilities that so many people face. Equity is also a core concept, so that the needs of *all* users and value and potentials of *all* uses of water resources are recognized in decisions over their future” (Soussan/Harrison 2000).

Scientists from their respective disciplines should create basic and applied scientific knowledge, concepts, and technologies for demand management through water-saving, conservation, recycling as well as supply side management, including political strategies for dealing with water scarcity (drought) and abundance (during storms and floods) in international river basins. The key policy goal should be to enhance environmental and water cooperation through ‘environmental peacemaking’ (Conca/Dabelko 2002) and ‘hydro-diplomacy’ (Oswald 2007) to peacefully resolve unavoidable water disputes, thus preventing an escalation of these water conflicts into water wars.

11.6.2 Policy Tasks for Achieving Water Security

Achieving ‘water security’ at home and maintaining a ‘water peace’ with neighbouring states in shared river basins can be achieved by combining *top-down* policies related to water management, water laws, resolution of the many domestic water conflicts at home, use of hydro-diplomacy for resolving intra-state water conflicts, with *bottom-up* societal initiatives aiming at water conservation, water harvesting, and improved sanitation at the household, community, and village or city level.

By taking urban and rural water security into account in a framework of sustainable water management and consumption, developing countries can better cope with the coming scarcity. Therefore, a complex water culture should be developed that involves affected people. As part of a long-term perspective top-down governmental policies and locally adapted bottom-up practices should be combined. Different scenarios necessitate that developing countries promote a sustainable water management to deal with both population growth and declining water availability due to climate change (figure 11.11) without ignoring water needs for ecosystem management and future generations.

In technological terms a key formula of a hydrological balance assumes that the amount of water entering the soil equals the amount of water leaving the

soil plus the water used for plants and stored in the ground. This water balance considers four key components: infiltration of precipitation into the soil and used by plants; evapotranspiration, deeper infiltration for recharge of aquifers and run-off from surface water into rivers, lakes, and seas.

To improve regional water security for all social groups and above all for vulnerable people, international and national plans must be developed in cooperation with local authorities and organized citizens. First, a precise diagnosis of existing water resources and of regional and temporary changes is needed, while scientists develop long-term scenarios of probable impacts of climate change. Second, scientists analyse the use and the loss of water and propose technologies for improving water efficiency. Third, governments must develop a long-term plan for investments to overcome the economic stress, to build the lacking infrastructure, and to maintain the existing water supply system in good conditions. Fourth, particular care must be used for irrigation technologies, for recovering watersheds, and for the protection of aquifers. This could imply changes in crop patterns and a substitution of water-intensive products with those requiring less water. Fifth, water is a public good and there should be a clear distinction between the logic of 'value of use' and the 'value of change'. All people, including the most vulnerable and poor, have a right to get sufficient access to clean water for their personal needs and enough food for a healthy life. Sixth, preventive efforts must avoid and reduce human losses during hydro-meteorological events. This includes the restoration and protection of mangroves, coral reefs, forests, and river basins in a framework of IWRM activities. Seventh, education and training from the kindergarten to the university should create a culture of water with the goals of saving water, avoiding pollution, and promoting the reuse of treated water in different processes.

In synthesis, the reflections on value, on ethics, and on scenarios have shown that water cannot be promoted as a commodity, and that it cannot be left to the whims of the free market. Water should not be commodified, privatized, traded or exported for profits. Water must be exempted from financial speculation as a good or as a service (GATS) or as an investment, in all bilateral and multilateral agreements. It is a basic human right that belongs to all human beings. To understand water security, *Vía Campesina*, a social peasant movement that is active in many developing countries, insisted:

Water belongs to the earth and to all species for all time. It is an inalienable human right and a public common good to be protected by all peoples, communities and nations, and the bodies that represent the local, state and international political authorities.

12 Changing Population Size and Distribution as a Security Concern

Wolfgang Lutz

12.1 Introduction

Population concerns are at the very heart of most security concerns ranging from more traditional military and political to economic, environmental, social, and human security considerations. The changing size and structure of the population matters for almost any conceivable definition of security because security always has to do with people, the wellbeing of individuals, of states, and the rivalry among sub-populations of the human species on this planet. On top of the ubiquitous importance of changes in population size and structure for security, all three forces of demographic change – fertility, mortality, and migration – are in their own right critical factors in various concepts of security: in the context of human security, survival (i.e. avoiding mortality) can be viewed as the ultimate criterion for the presence or absence of security; in the context of societal security, international migration constitutes a major challenge for social cohesion and national/cultural identity; finally, in a national security context, the possible disappearance of a state through the ‘dying out’ of its national population as a long term consequence of very low fertility rates may be viewed as a more serious threat to the integrity of the state than any possible outside aggressor.

Given the complex importance of population and demographic change for very different aspects of security, this chapter will not attempt to discuss the importance of population dynamics and its specific driving forces for any specific definition of security. Instead, it will present a synthesis of what we do and do not know about likely future trends in the determinants of population change, and the impact this has on our view about future trends in population size, structure, and human capital in general. We then leave it to the reader to draw conclusions about the implications of these trends on whatever aspect of security he or she has in mind. A non-exhaustive list of possible impacts that demographic trends may have on dif-

ferent concepts of security will be briefly mentioned only in the following paragraphs and in the conclusions.

We begin with a more traditional national and military security concept. First and foremost, it is the size of one population as compared to that of other states that throughout history has influenced the balances of power and the conceptualization of ‘hard’ security. This is particularly the case when populations grow and shrink at different speeds (through migration or natural growth). This exerts pressure on an established regime to change and produce a new balance of power. While traditionally larger populations have been equated with more military power, in a modern economic and military setting, the skills of the population (human capital) and the technologies used may be more important for its geopolitical standing. For this reason, this chapter also reviews new methods for projecting human capital, in addition to the more traditional focus on population size and age structure. But the traditional way of focusing primarily on population size is still pervasive. Russian President Putin, in May 2006 in a speech to the Duma, called Russia’s declining population the biggest problem of the nation, while Bulgaria’s Prime Minister recently noted that demographic trends in his country pose the most important security threat. While there has been a long-standing fear of population decline (Teitelbaum/Winter 1985) that has, for instance, inspired the elaborate pro-natalist policies in France, actual population declines that are not the consequence of wars or famines are a new phenomenon. Currently, several Eastern European countries are shrinking rapidly due to a combination of out-migration, very low fertility, and rather high mortality. The population of Bulgaria, for instance, declined by 15 per cent over the past 15 years and is expected to continue to shrink.

A change of population size in the other direction, namely rapid population growth in developing countries, has given rise to an equally long-standing security concern, but with an emphasis on environmental

and human security. In the extreme, the concerns about rapid population growth, the so-called ‘population explosion’ (Ehrlich/Ehrlich 1990), has often been described as the single, most important threat to humanity. Over the past decade there has been a rapidly increasing body of scientific literature studying in a more differentiated way the complex interactions between population and the environment. Progress has been made in the field of new methods of analysis (Lutz/Prskawetz/Sanderson 2002) as well as in terms of sectoral assessments with respect to climate change (O’Neill/MacKellar/Lutz 2001), food security (Fischer/Shah/van Velthuisen 2002), coastal ecosystems (Curran/Agardy/Cruz/Dasgupta/Kumar/Lutz/Williams/Kessler/Adams 2002), and other key dimensions of environmental security. This literature will be briefly discussed in section 12.6.

But aside from changes in the sheer number of people, demographic variables have much to offer in terms of implications for security concerns under a societal security perspective. When we look at a population not primarily as a national population, but rather in terms of its composition by different ethnic, linguistic or religious groups, changes in the relative sizes of these groups often raise important questions of social cohesion and, in many instances, security. International migration, one of the three forces (along with birth and death rates) that shape population size and structure, is a key element with respect to such changes and associated concerns. Another change in the structure of population, namely, the significant ageing of populations in many countries in the world, has been giving rise to serious concerns about the sustainability of existing social security systems, and may even have implications for future economic growth and the geopolitical balance of power which brings us back to the more traditional national security concerns. Hence, in this respect population ageing may be viewed as a national and a societal security issue.

In the following sections, this chapter will first present some data on the current demographic divide between rapidly ageing and still rapidly growing populations, then discuss what we do and do not know about the range of likely demographic trends over the 21st century, and finally add the ‘quality dimension’ in presenting projections by level of education in addition to age and gender. Toward the end of the chapter we will briefly discuss issues in population and environmental security, and conclude with policy considerations.

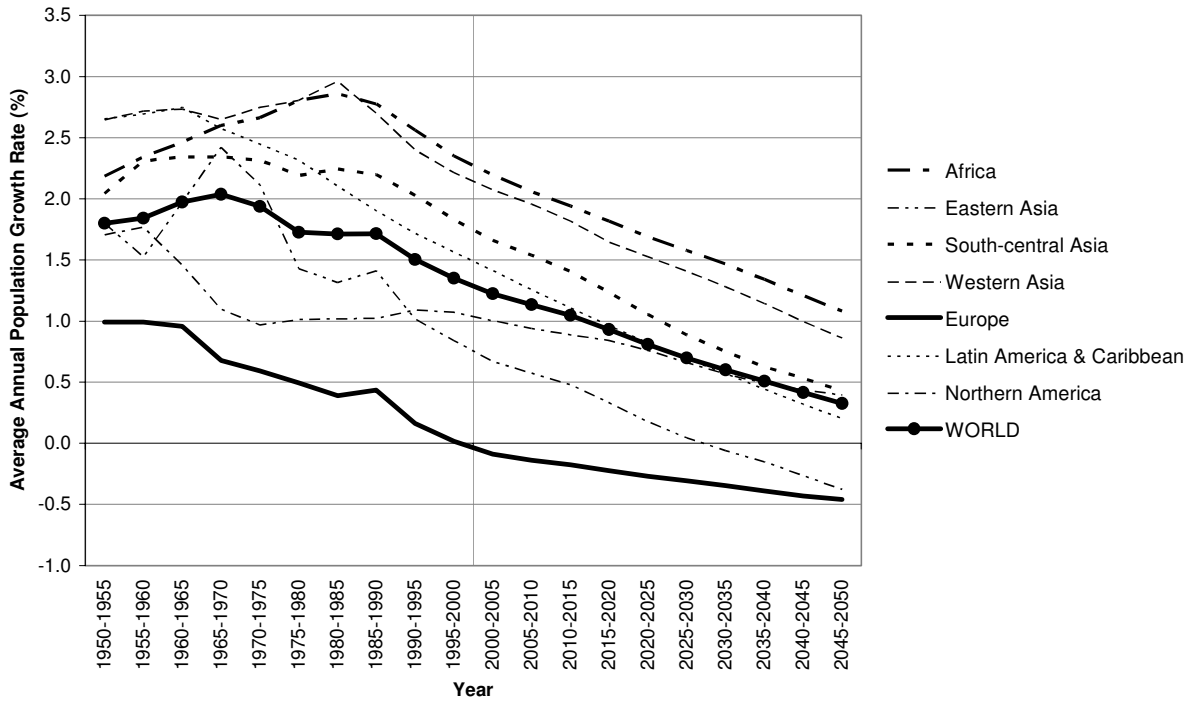
12.2 A Demographically Confusing World

Current global demographic trends and the associated challenges are somewhat confusing to many observers. This may also be the reason why in the context of security concerns population is often left out or is being viewed in contradictory ways. On the one hand, in many developing countries population growth rates are still very high due to birth rates well above replacement level (of two surviving children per woman) and a very young age structure.¹ For this reason, in a number of countries the population is likely to double over the coming decades. On the global level, the world population will increase from its current 6.4 billion to somewhat below 9 billion by the middle of the century (Lutz/Sanderson/Scherbov 2001). On the other hand, there are an increasing number of countries in which the birth rates have fallen well below replacement level and the population is ageing rapidly. For these countries we expect a future of even more rapid population ageing and in many cases, a shrinking of total population size. Because of these significantly different demographic trends for some parts of the world, there is still concern about the negative consequences of rapid population growth, while simultaneously, in other parts of the world, there is concern about the negative implications of rapid population ageing.

The picture is further complicated by the fact that this demographic divide does not always go along the traditional divide between industrialized and developing countries. Some developing countries have recently seen very rapid fertility declines, and the number of ‘poor’ countries with sub-replacement fertility is increasing. China is the most prominent example, where fertility has recently fallen to an uncertain level between 1.3 and 1.7 (Lutz/Scherbov/Cao/Ren/Zheng 2005). For this reason, over the coming two decades, China will have both significant further growth and significant population ageing. It is expected to grow by around 200 million people due to a momentum caused by the very young age structure, with the consequence that more women enter reproductive age. At the same time, the one-child family policy is causing serious problems in terms of the support of the rapidly increasing number of elderly. Surprisingly to some, the USA will also belong to this same group, which will simultaneously experience growth and ageing, because – unlike Europe – it is ex-

1 This section partly draws on Lutz (2004).

Figure 12.1: Average annual population growth rates of selected world regions, 1950-2050. **Source:** United Nations 2003 (medium variant).



pected to grow significantly due to high immigration and higher birth rates than in Europe.

Figure 12.1 illustrates the trends in population growth rates for different world regions from 1950 to 2050, based on UN estimates for the past and the medium variant projections (United Nations 2003). These projections give the paths considered as most likely from today's perspective. But the future demographic trends have significant uncertainties which will be discussed in the following section, and which are not adequately reflected in the UN population projections. In their high and low variants the UN presents only alternative assumptions with respect to fertility trends, and combines them with identical mortality and migration assumptions. Since these trends are equally as uncertain as fertility, the high-low range significantly underestimates uncertainty, particularly with respect to ageing (Lutz/Vaupel/Ahlburg 1999; Lutz/Goldstein 2004).

Figure 12.1 shows that Europe consistently has the lowest population growth rate of all continents, falling from one per cent per year in 1950 to zero growth at the moment, and an expected 0.5 per cent shrinking by 2050. The figure also shows that all world regions have passed their peak in growth rates, and have entered a declining trend that is expected to continue over the next half century. The only continent depart-

ing from this general pattern is North America, which saw rather stable population growth of around one per cent from 1965 to present. That growth is expected to decline only moderately in the future. Actually, by 2050 the UN expects North America to have a higher population growth than Latin America, and higher than the world average (United Nations 2003).

Table 12.1 gives the trends in the two main drivers of population growth, namely, mortality and fertility. It shows that over the past half century, life expectancy increased considerably in all parts of the world. Only in Africa has HIV/AIDS caused a moderate decline at the continental scale over the past decade, with life expectancy having considerably declined in some of the hardest hit countries. For the future, a recovery in Africa is assumed, along with a continued increase in life expectancy in all parts of the world.

Fertility rates have also declined considerably around the world over the past decades. With below 1.4 children per woman, Europe has the lowest level with the other extreme in Africa, where the average is still around 4.9 children per woman. For the coming decades, the UN assumes continued declines in fertility around the world with the exception of Europe, where a recovery is assumed. While the assumed continuation of the fertility transition in developing countries is uncontroversial, the assumption of substantial

Table 12.1: Life expectancy at birth and total fertility rates by selected regions (1950-2050). **Source:** United Nations 2003 (medium variant).

Region	Life Expectancy at Birth (both sexes)					Total Fertility Rate				
	1950-1955	1975-1980	2000-2005	2025-2030	2045-2050	1950-1955	1975-1980	2000-2005	2025-2030	2045-2050
Africa	37.8	48.2	48.9	57.1	64.9	6.74	6.59	4.91	3.23	2.40
Eastern Asia	42.9	66.4	72.1	75.0	77.7	5.68	3.13	1.78	1.83	1.85
South-central Asia	39.4	52.6	63.2	69.1	74.0	6.08	5.09	3.25	2.18	1.91
Western Asia	45.2	60.6	69.1	75.2	78.0	6.46	5.30	3.45	2.57	2.19
Europe	65.6	71.5	74.2	78.1	80.5	2.66	1.97	1.38	1.63	1.84
Latin America & Caribbean	51.4	63.0	70.4	75.5	78.5	5.89	4.48	2.53	1.98	1.86
Northern America	68.8	73.3	77.4	79.7	81.8	3.47	1.78	2.05	1.96	1.85
WORLD	46.5	59.8	65.4	70.2	74.3	5.02	3.90	2.69	2.25	2.02

fertility increases in Europe is more disputed. There are indeed good reasons to assume that fertility may even continue to decline as a consequence of further declining family size ideals and possibly worsening expected income for the young generations relative to their consumption aspirations. This reasoning has recently been pulled together to a consistent 'low fertility trap hypothesis' (Lutz/Skirbekk/Testa 2006). Whether this hypothesis is true, or whether other forces that exert an upward pressure on fertility are stronger, is a completely open question at this point.

12.3 Demographic Transition as the Main Driver

Explanations and projections of fertility trends in different parts of the world have been generally guided by the paradigm of demographic transition, which assumes that after an initial decline in death rates, birth rates also start to fall after a certain lag. In this general form, the model has received overwhelming empirical support in capturing the remarkable fertility changes that happened over the 20th century.

The demographic transition began in today's more developed countries (MDCs) in the late 18th and 19th centuries, and spread to today's less developed countries (LDCs) in the last half of the 20th century (Notestein 1945; Davis 1954; Davis 1991; Coale 1973). The conventional theory of demographic transition predicts that, as living standards rise and health conditions improve, mortality rates first decline and then, somewhat later, fertility rates decline. The demographic transition theory has evolved as a generaliza-

tion of the typical sequence of events in what are now MDCs, where mortality rates declined comparatively gradually, beginning in the late 1700's and then more rapidly in the late 1800's and where, after a varying lag of up to 100 years, fertility rates declined as well. Different societies experienced transition in different ways, and today various regions of the world are following distinctive paths (Tabah 1989). Nonetheless, the broad result was, and is, a gradual transition from a small, slowly growing population with high mortality and high fertility to a large, slowly growing or even slowly shrinking population with low mortality and low fertility rates. During the transition itself, population growth accelerates because the decline in death rates precedes the decline in birth rates.

The demographic transition paradigm that has been useful for explaining global demographic trends during the 20th century and that has strong predictive power when it comes to projecting future trends in countries that still have high fertility, has nothing to say about the future of fertility in Europe. The recently popular notion of a 'second demographic transition' is a useful way to describe a bundle of behavioural and normative changes that happened recently in Europe, but it has no predictive power. The social sciences have not yet come up with a useful theory to predict the future fertility level of post-demographic transition societies. All that forecasters can do is to try to define a likely range of uncertainty.

12.4 Mapping the Uncertainty Range of Demographic Trends in the 21st Century

All three components of demographic change – fertility, mortality, and migration – are uncertain in their future trends. The UN medium variant presented above is based on an attempt to make the assumptions that are most likely from today’s perspective. But we already know today that there is a high probability that the actual future trends will either be above or below the medium assumption. How should we deal with this significant uncertainty in population forecasting? This question is the title of a recent special issue of the *International Statistical Review* (Lutz/Goldstein 2004). This state of the art report shows that in the field of population forecasting, we are currently seeing a paradigm change from scenarios to probabilistic forecasting. Scenarios, as used in many fields of forecasting, are descriptions of possible future paths without any statement of the likelihood of these paths. Particularly in the case of deep uncertainty, i.e. when there is not only parameter uncertainty but the entire model is uncertain, they have become a standard tool for thinking about the future. Since we know the model, as described by the cohort component model of population projections, only the parameters are uncertain. For this reason, some decades ago forecasting agencies around the world, following the example of the United Nations Population Division, produced high and low variants in addition to the medium variant. This high-low range is supposed to indicate a ‘plausible range’ of future population trends. But such a high-low range can only be defined in terms of one of the three components of change and is mostly based on alternative fertility assumptions, while uncertainty in mortality and migration is disregarded.

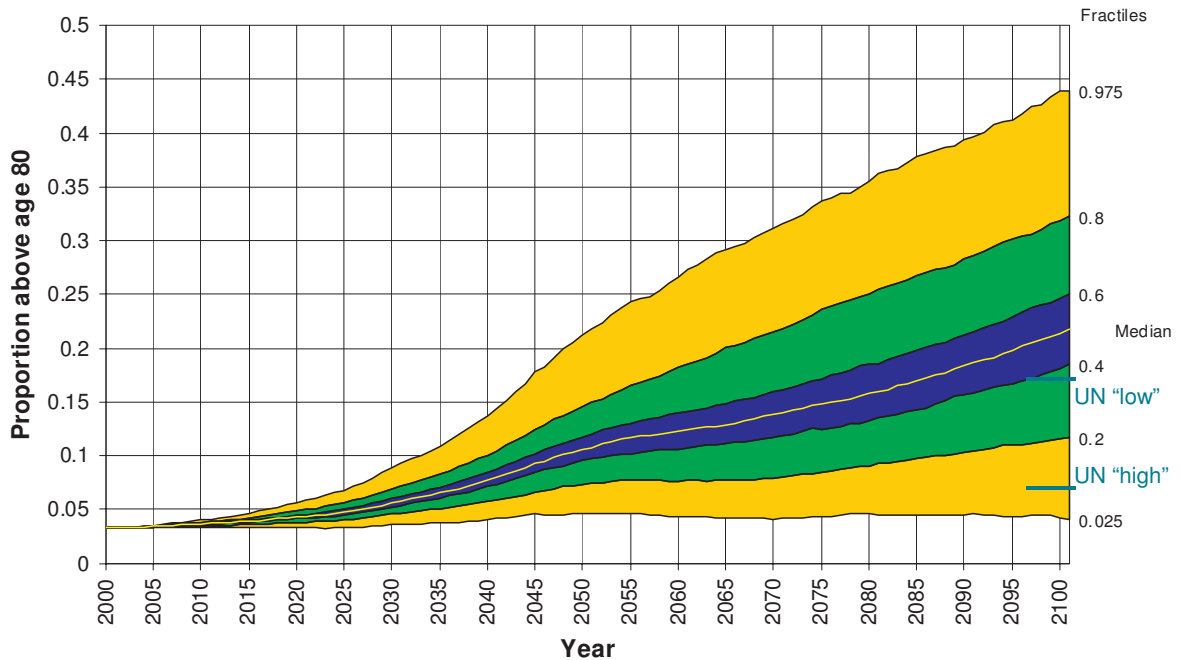
To remedy such shortcomings, IIASA (Lutz/Sanderson/Scherbov 1997) produced the first fully probabilistic projections of the world population. These were essentially based on subjective probability distributions for future fertility, mortality, and migration, as defined by a group of experts. In 2001 new probabilistic projections were performed that are based on a synthesis of three alternative approaches (time series analysis, ex-post error analysis, and argument-based expert views) (Lutz/Sanderson/Scherbov 2001). The examples below are taken from this most recent forecast. Such probabilistic projections go in several important dimensions beyond the traditional scenario analysis: They are able to simultaneously consider the uncertainty in all three components of change; they

can define in more precise quantitative terms what uncertainty intervals the given ranges cover; and based on the assumption of certain correlations, they can aggregate from the regional to the global level in a probabilistically consistent way. These important advantages of a probabilistic approach over a scenario approach make it worthwhile to consider whether in other fields, such as environmental change or future health, one should go beyond scenarios.

The key findings of Lutz/Sanderson/Scherbov (2001) are that with a high probability of above 80 per cent, world population will peak over the course of this century and then start to decline. They also show that the 21st century will bring significant population ageing in all parts of the world. In short, it is concluded that while the 20th century was the century of population growth, with the world growing from 1.6 to 6.1 billion people, the 21st century will be the century of population ageing, with the global proportion above age 60 increasing from currently 10 per cent to between 24 and 44 per cent (80 per cent uncertainty interval). Even more significantly, the proportion of the world population that is above age 80 will increase from currently one per cent to between 4 and 20 per cent, depending largely on the future course of life expectancy.

Figure 12.2 shows that for Western Europe the proportion above age 80 might even increase much more dramatically than on the global level. The figure shows that currently around 3 per cent of the population is above age 80, and that this proportion will not change much over the coming decade. After the year 2030, however, the uncertainty range opens up very quickly. In 2050, the 95 per cent interval already goes from around 4 per cent at the low end to more than 20 per cent at the high end, with the median at around 10 per cent. In other words, in 2050 the proportion above age 80 is likely to be three times as high as today, but it could even be six times as high. Its actual level will depend mostly on future old-age mortality – whether life expectancy will level off toward a maximum or whether it will continue to increase unabated. This difference becomes even much more significant during the second half of the century. By the end of the century, the 95 per cent interval is extremely wide, ranging from essentially the current level of 3 per cent to an incredible 43 per cent of the population above age 80. Even the median shows a proportion of about 20 per cent. Societies with such significant proportions of the population above age 80 will clearly be very different from today’s societies. Most likely, however, an average 80-year-old person

Figure 12.2: Proportion of population above age 80 in Western Europe. **Source:** Designed by the author.



during the second half of the century will be in much better physical health than an average 80-year-old person today.

What will this significant expected population ageing in Western Europe mean in terms of future security challenges? This is clearly a new situation that has never been experienced in human history, with Europe and Japan spearheading the trend. For this reason there is no empirical evidence to refer to when trying to anticipate the consequences of ageing. Depending on the model used, the results tend to differ significantly. Some researchers conclude that the additional burden on the pension system can easily be compensated by productivity growth and higher capital intensity. Others claim the opposite, that ageing may actually lead to lower productivity in the future with the elderly less eager to engage in new technologies and investments going to other parts of the world, where the population is younger and the expected returns to investments greater. Depending on which view is correct, the implications for geopolitical power and economic growth and hence the national security as well as the social security of the ageing countries will differ significantly.

12.5 The Changing Global Distribution of Population and Human Capital

The demographic trends of the past decade, together with those expected for the future, result in major changes in regional population distribution on our planet. Asia, which holds the giant share of the world population, has the most stable proportion (about 55–60 per cent) over the period 1950–2050. The shares of North America, Latin America, and Oceania are also surprisingly stable over time. Big changes affect only Europe and Africa, where over the course of 100 years they fully exchange their positions. In 1950, Europe (including Russia) was home to some 550 million people, constituting 22 per cent of the world population. At present, Europe has increased to 725 million, but since the world population has increased much more rapidly, Europe's share has declined to only 12 per cent. This is similar to that of Africa, which started at 8 per cent in 1950. By 2050 Europe is expected to shrink to some 630 million, which at that point will only be 7 per cent of the world population. Africa, on the other hand, is likely to continue to grow to around 1.8 billion by 2050, almost three times the expected population of Europe.

As significant as these changes in relative population size are, it is not clear exactly what they will imply for a region's geopolitical standing. The strength and

Table 12.2: Population (in millions) aged 20-65 by education and gender in 2000 and in 2030 according to the 'constant' and the 'ICPD' scenarios. **Source:** Author's calculations (together with Anne Goujon).

Regions	Base year		Secondary and Tertiary			
			Constant		ICPD	
	2000	2000	2030	2030	2030	2030
	Male	Female	Male	Female	Male	Female
North Africa	19	11	47	38	49	41
Sub-Saharan Africa	32	17	79	61	106	90
North America	88	89	100	99	100	99
Latin America	66	65	140	143	143	147
Central Asia	13	13	25	25	25	25
Middle East	17	12	50	40	53	46
South Asia	134	57	250	116	288	195
China region	238	153	416	354	406	346
Pacific Asia	53	41	99	90	106	99
Pacific OECD ^a	40	40	40	39	39	40
Western Europe	106	95	124	122	125	122
Eastern Europe	26	23	31	30	31	31
FSU Europe ^b	54	57	58	61	59	62
World	887	673	1,459	1,219	1,531	1,343

a) Pacific OECD = Organisation for Economic Co-operation and Development members in the Pacific region.

b) FSU Europe = European part of the former Soviet Union.

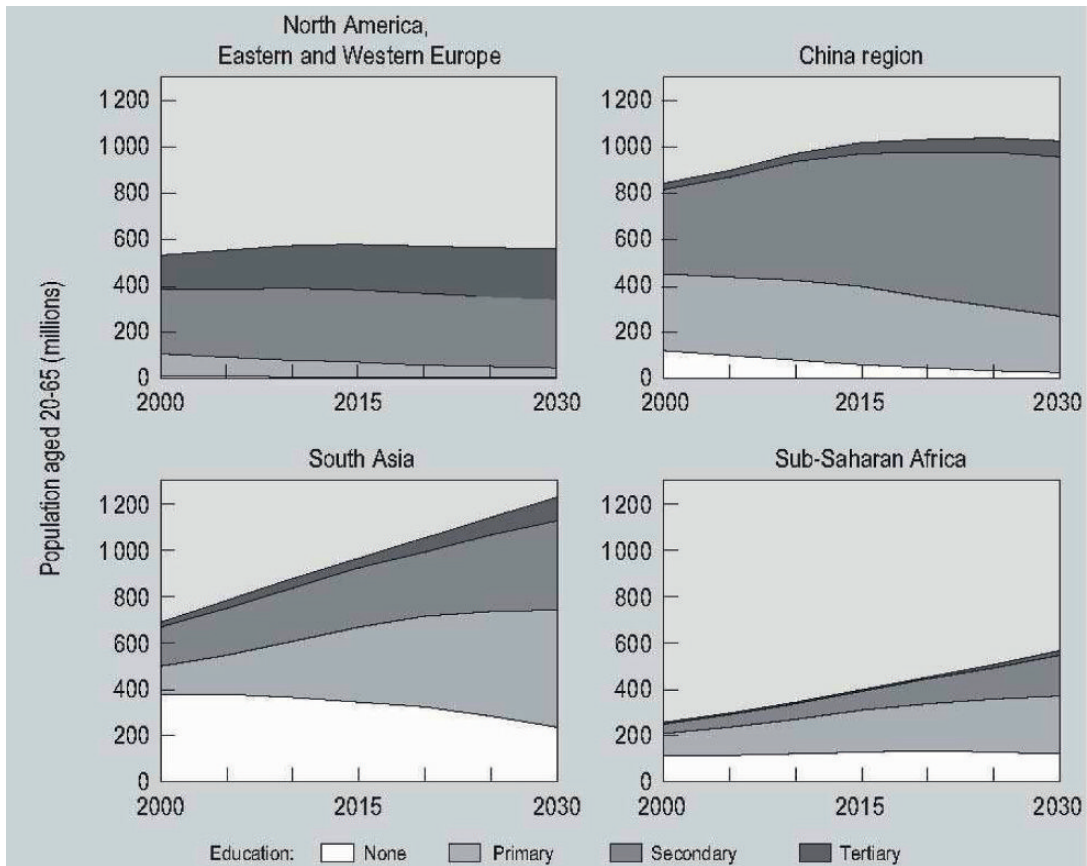
influence of a nation or a continent is not directly a function of its population size. If this were the case, then Africa today should have a similar standing in international politics, economics or military strength to that of Europe, and this is not remotely the case. What seems to count more than the sheer number of people is the human capital, which can be defined in a simplified way by looking at the people of working age stratified by their level of education. The global distribution of human capital is changing as well, but the pattern looks rather different from that of mere population numbers.

The first global projections of human capital have been recently produced by IIASA (Goujon/Lutz 2004). Table 12.2 lists the persons of working age that have at least some secondary or tertiary education in 2000, as well as for two alternative scenarios to 2030. The scenario 'constant' assumes that current school enrolment rates remain unchanged over time, which will result in significant improvements of human capital in many countries because of past improvements in education and the process by which the less-educated, older cohorts will be replaced by better-educated, younger cohorts.

The other scenario, called 'ICPD', assumes that the ambitious education goals defined at the International Conference on Population and Development (ICPD) 1994 in Cairo will be achieved. These include a closing of the gender gap in education and universal primary education.

Table 12.2 shows that in terms of human capital, Europe (including Russia) is still a world power, with well over 350 million working age people with a higher education - many more than in Africa, and even more than the huge South Asian subcontinent. This helps to put the pure population numbers into perspective. But the table also shows that significant changes in the global distribution of human capital are to be expected, even under the constant enrolment scenario. Under this scenario, every world region will see some improvement of its overall human capital. On a relative scale, gains in today's least developed regions will be strongest partly because the recent improvements in educating the younger generation have already been a significant gain in comparison to the virtual absence of education for the older cohorts. In absolute terms, even under this constant enrolment scenario, huge gains in the

Figure 12.3: Population (in millions) aged 20-65 by level of education, according to the 'ICPD' scenario in four mega-regions, 2000-2030. **Source:** Goujon/Lutz 2004: 138.



number of working age people with secondary or tertiary education are to be expected in Latin America, South Asia, and the China region. In today's industrialized countries, only moderate gains are to be expected. Comparing these results to the most optimistic scenario assuming the education goals of the ICPD, there is surprisingly little difference to the constant enrolment scenario. This is due to the great momentum of educational improvement. Increases in school enrolment today and over the coming decade will only very slowly affect the average educational attainment of the whole working age population. The difference is worth noting in Sub-Saharan Africa, because the current school enrolment rates there are still far below the Cairo targets. Because the ICPD also implies lower fertility in some regions, the absolute numbers are even smaller under the ICPD than under the constant rate scenario.

Figure 12.3 summarizes the information of table 12.2 in graphical form. It compares four 'mega regions'. It shows that currently Europe and North America together still dominate the world in terms of

human capital, although South Asia and the China region are already bigger in terms of working age population. The figure also shows the different pathways of China and South Asia (India), which reflects the fact that unlike South Asia, China has invested heavily over the past decades in primary and secondary education, and will see a peaking of its population size over the coming decades. South Asia will soon surpass the China region in terms of population size, but will fall back in terms of human capital.

Even under the most optimistic scenario, Africa will see only very moderate increases in human capital. An interesting point worth noting is that China's human capital is increasing so rapidly, that by around 2015, the China region will have more people of working age with secondary or tertiary education than Europe and North America together.

These global shifts in human capital are likely to result in changing geopolitical and economic weights, and also have significant implications for global security in several respects. The changing weights may destabilize current institutional arrangements on the

international level when a country's economic and military power is out of proportion with its traditional influence in international politics. This problem of instability of the traditional role may equally apply to the rising superpowers in Asia and the European countries which are losing in their relative standing.

12.6 Population and Resources, Climate Change and Environmental Security

Ever since the writings of Thomas Malthus (1798), the assumed negative impact of population growth on food security and environmental conditions has been a topic of much discussion. From an ecological perspective, there has been little doubt that the increase in human numbers has been and will be a major reason for environmental degradation, including climate change that will significantly affect the living conditions on this planet. While the most vocal of these voices on the ecological side have coined the notions of 'population bomb' (Ehrlich 1968) and 'population explosion' (Ehrlich/Ehrlich 1990), there have been equally vocal economists claiming that there is essentially no limit to the number of people that the earth can potentially support (Simon 1981, 1990). A comprehensive summary of this discussion is given in Cohen (1995).

Recently there has been much serious scientific analysis that goes far beyond the simplistic dichotomy described above and accounts for the highly complex nature of population-environment interactions which go in both directions and are subject to many intervening factors. Progress has been on both the methods of population and environment analysis (Lutz/Prskawetz/Sanderson 2002) as well as on specific sectoral studies. In particular, the areas of population and land use change (National Research Council 2005) as well as population and climate change (O'Neill/MacKellar/Lutz 2001) have seen major progress. With respect to climate change, the number of people has usually been considered a key factor in the total emission of greenhouse gases, together with wealth and technology, which is reflected in the famous $I=PAT$ equation (where I stands for impact, P for population, A for affluence, and T for technology). But since emissions cannot be expected to grow directly proportional to population, more recent work has also considered the impact of changing household patterns and age structures on emissions. Since a certain proportion of energy consumption is dependent

on the number of households (such as heating, cooling, construction, etc.), rather than on the number of individuals, and in the context of population ageing, the number of households tends to increase significantly while population size stagnates, this factor may lead to continued emissions growth, even in the absence of population growth.

In quantitative terms, O'Neill/MacKellar/Lutz (2001) show that the projected reduction in greenhouse gas emissions in 2100, which result from slowed population growth, remains at a substantial 30 per cent (12.4 GtC) under the rapid demographic transition scenario versus 17.6 GtC under a reference population scenario. Based on various sensitivity analyses, the authors conclude that alternative population paths can have a substantial impact on future greenhouse gas emissions. This is a highly relevant finding for the different kinds of environmental and human security that are assumed to be affected by global climate change.

Another important question for which population matters in terms of the security threats associated with climate change is the adaptive capacity of a population. It is highly likely that demographic factors and in particular the educational composition of the population affect the ability of societies to cope with the consequences of inevitable climate change. In countries in which major resources are being absorbed for coping with the consequences of rapid population growth, and in which (partly for this reason) large segments of the population have little to no formal education, it might be significantly more difficult to successfully fight off some of the assumed consequences of climate change, such as extended droughts, extreme weather events including more frequent and more severe tropical storms, and a rise in the sea level. The importance of population and human capital for the adaptive capacity of societies needs more explicit attention in the scientific literature because this line of influence might be an even more important effect of population change on environmental and human security than the traditional view of population growth as a driver of climate change.

There are many relevant sector-specific (water, air, land, etc.) aspects to this, but there is no space here to discuss the rapidly growing field of population and environment analysis. Most of these studies are site-specific and deal with different aspects of the environment, such as land-use change, deforestation, fresh water availability, water pollution, air pollution, biodiversity, protected areas, and coastal marine systems.²

In general, the outlook of an end to world population growth and likely global population shrinking in the longer term future is good news from an environmental security point of view, because it will tend to make efforts towards sustainable development easier. In addition, the fact that the most highly polluting countries (except for the USA) are already on a declining trajectory, and the most rapidly growing countries in Africa have the lowest per capital emissions, is in principle a force in a more optimistic direction. However, as economic growth in these countries picks up, per capita emissions are likely to increase in parallel with population size. This realistic view that some harmful climate change may be inevitable makes it even more important to increase environmental security through the enhancement of adaptive capacity.

12.7 Population Policies and Security

The history of international population policy is inextricably linked with the history of the international family planning movement, which emerged in the 1920's as a complex amalgam of eugenicists, public health advocates, and social reformers (Adams 1990; Hodgson 1991).³ Scientific advances in genetics and large-scale human rights abuses in Germany under National Socialism thoroughly discredited both eugenics and the policies derived from it. As a result, the international population movement was in disarray after World War II (Kühl 1997).

In reconstructing itself, the early post-war movement relied heavily on two justifications for public support of voluntary family planning. One justification was the health and well-being of women, children, and young families. The second justification, not stated openly but never far in the background, was geopolitical in nature. During the 1950's, new census data revealed staggering rates of demographic increase in India and other LDCs. With the Cold War as a background, policymakers in the West feared that exploding Third World populations would be fertile breeding grounds for political instability. Early US government international assistance for family planning was explicitly justified in these political terms (Donaldson 1990).

Concerns over national economic and political standing have also sometimes served as the basis for pro-natalist policies, such as generous parental leave, child allowances, public provision of day care, etc. (Teitelbaum/Winter 1985). In the 1960's and early 1970's, for example, a number of East European countries, alarmed by the prospect of population decline, restricted abortions and put in place financial incentives for childbearing. With many countries in Europe and East Asia facing labour force shrinkage and even possible overall population decline, pro-natalism seems to be on the rise again.

At the Bucharest population conference in 1974, MDCs argued that higher fertility in LDCs was an impediment to macroeconomic growth. By the time of the next international population conference, held in 1984 in Mexico City, virtually all countries, with the exception of the United States, had adopted this view.

Over the past two decades – and centred around the 1994 Cairo population conference – the view that policies affecting population should, above all, stress the welfare of individuals, as opposed to demographic trends and their macro-consequences, has gained primacy. In this view, ensuring access to health care and education, fostering women's empowerment, and guaranteeing reproductive rights are ends in themselves, not means to achieving particular demographic goals (Bok 1994). Overemphasis on 'number', according to this school of thought, has led to coercive practices and insufficient attention to contraceptive safety, with consequences falling largely on women. Voluntary family planning programmes are now seen as a means of guaranteeing the rights of individuals and couples to have the number of children they desire, not as a means of reducing fertility. They are viewed as just one part of what should be a broad provision of reproductive health services that also includes pre- and postnatal health care, treatment of infertility, and other reproductive health problems, including sexually-transmitted diseases, and education and counselling on all aspects of pregnancy, childbirth, infant and women's health, and parenting.

But in terms of their implications for aggregate security concerns, over the most recent years the discussion of demographic trends has again started to add aggregate level concerns such as population ageing and its consequences for human security, as well as the consequences of population on environmental degradation and hence environmental security to the pervasive individual welfare rationale. In the end, we need to move to a balanced approach because both levels of consideration matter: It is hard to think of in-

2 A comprehensive summary of many of these studies can be found at: <www.populationandenvironment.org> which also organizes regular global cyber-seminars on related topics.

3 This section partly draws on Lutz/Sanderson/O'Neill (2004).

dividual well-being without the aggregate level conditions of security – be it military, human or environmental security – at the national and even global level.

12.8 Conclusions

In this contribution we tried to summarize the state of the art in demographic analysis and forecasting of the population by age, gender, and level of education in different parts of the world. Probably the most important message is that we now see the end of world population growth on the horizon. The world population is likely to level off at around 9 billion during the second half of this century and then possibly start a declining tendency, with an increasing number of populations experiencing fertility rates below the replacement level of two surviving children per woman. This is very good news for all kinds of human and environmental security concerns that focus on the negative consequences of ‘exploding’ human numbers. While the end of world population growth by itself will not solve any of the world’s problems, it clearly makes solutions easier by taking off some of the pressure, e.g. in the expected level of future environmental pollution or in achieving global food security. In many parts of the world, particularly in Africa and South Asia, rapid population growth will remain a major concern for the coming decades. But on the global level it seems fair to say that many difficult solutions are likely to become a bit easier to achieve than they would be under continued population growth.

With the end of global population growth in sight and population ageing and shrinking already being experienced in an increasing number of countries, the focus of the security attention is moving from total size to the distribution of the population. In this context the rapidly changing age distribution is largely a human security concern challenging the viability of established social security systems and creating fears about who will care for the rapidly increasing number of elderly in the societies concerned. There are also concerns that population ageing will result in lower economic growth. On the other side of the spectrum in developing countries that only recently experienced their fertility declines, there are concerns about the political and public safety consequences of a ‘youth bulge’, i.e. unusually large cohorts of young people entering adulthood and not finding jobs or other means of getting integrated into society. Here it is hoped that the ‘demographic window of opportunity’ that temporarily results from low total age dependency ra-

tios (few children and not yet many elderly) and often leads to accelerating economic growth will help to provide jobs for these large numbers of restless young adults.

Another changing distribution that is considered to be highly relevant for more traditional national and military security concerns is the changing spatial distribution of people and their human capital over the planet. When Russian president Putin raises prominent concerns about the low fertility in Russia and the shrinking population size, particularly in the eastern part of the country, while simultaneously Chinese businesses spread rapidly across Siberia, there is a clear fear that changing population distributions may make it difficult in the future for Russia to maintain control over its vast territory. Another relevant change in distribution that affects many European countries and the USA is the changing ethnic, linguistic, and religious composition of national populations caused by past, current, and likely future international migration. Whether or not this is viewed as a national security threat is a matter of the conceptualization of national security: whether it is viewed as the security of a specific ethnic group which traditionally occupied the state territory and which now finds itself in a position of shrinking relative size, or whether it is applied to all residents of a country, regardless of their ethnic background.

Finally, as with many other security threats it is important to distinguish between objective dangers and subjective perceptions of them. In this contribution we focus on the objective trends and their likely future evolutions according to the best available science. But it is important to understand that the topic of population is also highly emotional and ideologically controversial at all levels, ranging from discussions in individual families to international negotiations among states. A good example of the latter is the treatment of population at the World Summit for Sustainable Development in Johannesburg in 2002. A very balanced and carefully worded statement produced by the Global Science Panel on Population and Environment (Lutz/Shah 2002) was dismissed from the agenda of the meeting because diplomats were afraid of reopening the European-American conflict over abortion and reproductive rights. Hence population, a key element in environmental change and sustainable development, was completely absent from this important conference on sustainable development in the 21st century.

13 Life on the Edge: Urban Social Vulnerability and Decentralized, Citizen-Based Disaster Risk Reduction in Four Large Cities of the Pacific Rim

Ben Wisner and Juha Uitto¹

13.1 Background and Objectives

Rapid urbanization and the growth of megacities have for the first time in history resulted in a predominantly urban world. Such an urban explosion, most of which has been in the less developed countries, has increased human exposure to natural and anthropogenic hazards. In particular, the 1990's the world witnessed an exponential growth in disasters. There were 700 large-scale disasters in 1999 alone, which resulted in the death of approximately 100,000 people and caused economic losses in excess of US \$ 100 billion. This figure reflects an annual 10 percent increase in losses throughout the decade. In 2003 weather related disasters alone cost insurers \$ 60 billion (UNEP 2003).

In 1996 the United Nations University (UNU) launched an international comparative study of the social geography of urban disaster vulnerability. Research on factors contributing to urban social vulnerability was carried out with the aim of incorporating social vulnerability in urban disaster risk management. Collaborative case studies were undertaken in six megacities, four of which are located in the Pacific Basin: Tokyo, Los Angeles, Manila and Mexico City.²

During the initial phase, citizens' participation and strong links between municipal authorities and non-governmental organizations (NGOs) working with vulnerable groups were identified as critical factors for reducing vulnerability. The extent of these partnerships and whether vulnerability had been included as a planning variable varied considerably amongst the municipalities studied. This chapter attempts to provide an explanation for that variability and also tries to draw out implications for policy and practice.

13.2 Theoretical Grounding

13.2.1 Social Vulnerability

Disasters affecting human beings are the result of complex interactions between human and natural systems. While such an interpretation of disasters is not new (Burton/Kates/White 1978), the depth, diversity, and complexity of the human side of these transactions have only been more fully appreciated in recent work.³ 'Social vulnerability' to disasters is one of the most important factors at work on the human side of the society - environment relationship.

'Social vulnerability' is defined (after Wisner/Blaikie/Cannon/Davis 2004: 11) as the characteristics of a person or a group that affect their capacity to anticipate, cope with, resist and recover from the impacts of a disaster. Vulnerability is, thus, defined by a number of factors that include social and economic status, as well as the political conditions prevailing that influence a person's or a group's position and

1 Wisner was coordinator for the UNU study of urban social vulnerability in six large urban regions (1998-2002), and study site manager for greater Los Angeles while Professor of Geography and Director of International Studies, California State University at Long Beach (1996-2000). Uitto was academic officer at the UNU (1990-1999) at the beginning and throughout most of the UNU study. The authors are grateful to the UNU project city coordinators: Dr. Sergio Puente, Mexico City; Dr. Jean Tayag, Manila; and Dr. Shigeo Takahashi, Tokyo.

2 The other two megacities were Mumbai in India and greater Johannesburg (Gauteng Province) in South Africa.

3 See: Maskrey 1989; Blaikie/Cannon/Davis/Wisner 1994; Cutter 1996; Hewitt 1997; Twigg/Bhatt, 1998; Morrow 1999; Alexander 2000; Buckle/Marsh/Smale 2000; Wisner/Blaikie/Cannon/Davis 2004; Pelling 2003a, 2003b; Wisner 2004; Bankoff/Frerks/Hilhorst 2004.

power in a society. There is also a time dimension, as people's degree of vulnerability may vary depending on his or her life situation, age, and also seasonality (Uitto 1998). The spatial dimension of vulnerability is dependent on the fact that people and groups with similar characteristics tend to occupy the same or similar areas. The United Nations Habitat Agenda (see at: <www.unhabitat.org.agenda>) recognized that:

Vulnerability and disadvantage are often caused by marginalization in and exclusion from the socio-economic mainstream and decision-making processes and the lack of access on an equal basis to resources and opportunity...Vulnerability and disadvantage are mainly caused by circumstances, rather than inherent characteristics.

Alexander (2000: 12-22) distinguishes between several types and levels of vulnerability, especially between 'deprived vulnerability' and 'wilful vulnerability.' In the first case, the knowledge generated concerning hazards and their impacts is not diffused nor utilized for disaster mitigation. In the latter case, this knowledge is deliberately ignored. This implies that the state of wilful vulnerability is maintained because powerful groups in a society have an incentive not to invest in hazard mitigation or to enforce laws and regulations (Wisner 2001; Oezerdem 2003). A typical case might be when there is no incentive to enforce building codes, thus rendering residents vulnerable to hazards, e.g. earthquakes. A further point made by Alexander is that the level of vulnerability is related to the level of economic development in a society. Poorest societies have the least resources to reduce vulnerability. At the stage of rapid development, the assets at risk grow faster than the possibilities of mitigation, thus increasing vulnerability.

Disaster risk is thus a function of the vulnerability of people, including their settlement and livelihood, and the degree to which society has engaged in disaster mitigation activities (Wisner 1999). This can be expressed in a formula, where R = risk; H = hazard (extreme event or process); V = vulnerability; M = mitigation:

$$R = (H \times V) - M.$$

Distinguishing between social protection and self protection (Cannon 2000: 47; Wisner/Blaikie/Cannon/Davis 2004: 88-95), one also recognizes that vulnerability is also to some extent a function of the degree to which people's own capacities for self protection are blocked by social, political, and economic constraints and obstacles. Thus, taking, such local capacity (C) into account, in addition to the social protec-

tion afforded by governments (M), the expression for disaster risk becomes:

$$\frac{R = (H \times V) - M}{C}$$

'Capacity' has become a major focus of organizations on the front line of disaster management such as the International Federation of Red Cross and Red Crescent Societies (IFRC), UNDP, and many non-governmental organizations (NGOs). The concepts of capacity and vulnerability are keys to demonstrating that disaster risk development and sustainable human development have a core common agenda (Wisner 2003a; UNDP 2004). Thus vulnerability and capacity in the face of disaster risk should be seen as important components of urban sustainability, and as elements of a sustainable urban livelihood (Sanderson 2000). Capacity as 'self protection', in this context, has many connections with the kinds of citizen-based environmental management activities included under Local Agenda 21 (a major practical follow up to the Earth Summit in 1992). Capacity and vulnerability are largely determined by social factors, such as socio-economic status, age, gender, ethnicity, and health, which have distinct spatial dimensions in an urban setting, and which, in turn, are largely determined by access to resources (Wisner/Blaikie/Cannon/Davis 2004: chap. 3).

13.2.2 Megacities, Globalization, and Vulnerability

The urban regions that have emerged in the latter half of the 20th century are huge, encompassing pre-existing cities, spilling over into watersheds, food and fuel producing areas, and developing satellite or 'edge' cities at a rapid rate (Coy/Kraas 2003; Kraas 2003). These new configurations present challenges of planning and administration as well as difficult logistical situations. The protection of lifeline infrastructure and provision of these cities is often problematic during 'normal' times. Urban metabolism (supply of consumables and disposal of waste) becomes highly questionable in disaster scenarios (Mitchell 1999; Fernandez 1999).

Urban size and fragmentation lead to difficulties in planning and administration. However, beyond this obvious challenge to the megacity, there are complexities in the way that different jurisdictions, agencies and - more generally - stakeholders perceive hazards. This gives rise to significant problems in communication and coordination of effort focused on different

Table 13.1: Population of megacities with 10 million inhabitants (1950-2015). **Source:** UN Populations Division (2006).

1950		1975		2000		2005		2015	
1. New York-Newark	12,3	1. Tokyo	26,6	1. Tokyo	34,4	1. Tokyo	35,2	1. Tokyo	35,5
2. Tokyo	11,3	2. New York-Newark	15,9	2. Mexico City	18,1	2. Mexico City	19,4	2. Mumbai	21,9
		3. Mexico City	10,7	3. New York-Newark	17,8	3. New York-Newark	18,7	3. Mexico City	21,6
				4. São Paulo	17,1	4. São Paulo	18,3	4. São Paulo	20,5
				5. Mumbai	16,1	5. Mumbai	18,2	5. New York-Newark	18,9
				6. Shanghai	13,2	6. Delhi	15,0	6. Delhi	17,6
				7. Calcutta	13,1	7. Shanghai	14,5	7. Shanghai	17,2
				8. Delhi	12,4	8. Calcutta	14,3	8. Calcutta	17,0
				9. Buenos Aires	11,8	9. Jakarta	13,2	9. Dhaka	16,8
				10. Los Angeles-Long Beach-Santa Ana	11,8	10. Buenos Aires	12,6	10. Jakarta	16,8
				11. Osaka-Kobe	11,2	11. Dhaka	12,4	11. Lagos	16,1
				12. Jakarta	11,1	12. Los Angeles-Long Beach-Santa Ana	12,3	12. Karachi	15,2
				13. Rio de Janeiro	10,8	13. Karachi	11,6	13. Buenos Aires	13,4
				14. Cairo	10,4	14. Rio de Janeiro	11,5	14. Cairo	13,1
				15. Dhaka	10,2	15. Osaka-Kobe	11,3	15. Los Angeles-Long Beach-Santa Ana	13,1
				16. Moscow	10,1	16. Cairo	11,1	16. Manila	12,9
				17. Karachi	10,0	17. Lagos	10,9	17. Beijing	12,9
				18. Manila	10,0	18. Beijing	10,7	18. Rio de Janeiro	12,8
						19. Manila	10,7	19. Osaka-Kobe	11,3
						20. Moscow	10,7	20. Istanbul	11,2
								21. Moscow	11,0
								22. Guangzhou, Guangdong	10,4

stages of disaster management: prevention and mitigation, warning and response, and rehabilitation and recovery (Handmer/Penning-Rowsell 1990; Comfort 1999).

Disaster planners have seldom engaged with the literature concerning 'sustainable cities' (Stren/White/Whitney 1992; Roseland 1997) and 'healthy cities' (Davies/Kelley 1993). Although the IDNDR's intention was to 'mainstream' disaster reduction as part of routine planning, that has still not happened. Disaster management should be indistinguishable from 'normal' urban and regional planning (OAS 1990; IDNDR 1996) but that goal has not yet been attained.

Thus in common with much other work in geography, resource management, public health, among other disciplines, the UNU project sought to change 'normal' urban planning practice. In particular, it attempted to identify ways that municipalities and NGOs can cooperate in capacity building for more resilient cities. This requires recognizing the agency and knowledge of a wide variety of citizens and lay people (Enarson/Morrow 1998; Eade 1997; Wisner 1995; 2004) and translating such knowledge into common language that planners and citizens can share.

13.2.3 Focus on Urban Areas in the Pacific Rim

This chapter focuses on four megacities in the Pacific Rim. This geographical focus is natural given that the Pacific Basin has experienced extraordinary urban growth and is now the host of a large number of megacities and extended urban areas. It also has a history of multiculturalism and international migration, a part of which is illegal. Furthermore, the lands surrounding the Pacific Ocean are regularly exposed to a broad range of natural hazards, including earthquakes, volcanic eruptions, tsunami and tropical cyclones (see below).

The rapid population increase and the growth of very large cities in Pacific Asia has long been a cause of concern for urban scholars and planners (Fuchs/Brennan/Chamie/Lo/Uitto 1994). World wide population growth rates are highest in the coastal zone of the tropics, most affected by cyclones (Hanzhou Declaration 1999). It has been projected that urbanization rates in Asia as a whole will reach 54 percent by the year 2020, up from a mere 23 percent in 1970 (Lohani/Whittington 1996). Nine out of the twenty-five largest urban conglomerations in the world are today located in Pacific Asia (Choe 1998). These include the Tokyo/Yokohama extended metropolis as well as Manila. According to the UN's urbanization prospects 2005 of the 22 mega cities of more than 10 million inhabitants 14 were in the wider Asia Pacific region (table 13.1).

All of the cities in the Pacific Rim are exposed to a gamut of natural hazards (Britton 1992; Mitchell 1992). These include earthquakes, tsunamis, flooding, landslides, volcanic eruptions and subsequent lahar flows, forest fires, and tropical cyclones (typhoons or hurricanes) (Orrick/Bemis/Francis/Goss/Howell/Yurkovich 2002: 19-22). An analysis of earthquake hypocenters shows major concentrations along the Pacific, Philippine and South American Plates (Ogawa 1996). Similarly, most tropical cyclones originate near the equator and affect worst Southeast and East Asia, as well as Central America. China, the largest and most populous country on the Pacific Rim experienced during the 40 years 1949-1990 the following on average each year: 5.6 floods, 6 earthquakes greater than R6 magnitude, 6.9 tropical cyclones, and 7.5 droughts (Jingshen/Gangjian/Gang 1992). All of these are capable of affecting China's cities in a variety of ways. Also linking the countries of the Pacific Rim ever more closely through increased trade and migration (legal and illegal) is the diffusion of new and resurgent diseases such as antibiotic resistant tuberculosis, influ-

enza, cholera, and new diseases such as SARS (Wisner/Blaikie/Cannon/Davis 2004: 197, note 5).

13.3 Introducing the Four Megacities

13.3.1 Human and Physical Geography

Table 13.2 summarizes some striking similarities among these four large urban regions besides their location on (or near)⁴ the Pacific Rim. First is their size. They all fall squarely into the strict definition of 'megacity' with well over 10 million people living in their metropolitan areas. They are all extensive, but Los Angeles far exceeds the others in sprawl, and has the lowest average density. The other three are densely populated, with both Mexico City and Tokyo, respectively, just below and just above one thousand inhabitants per square kilometre of urban space.

Los Angeles is the youngest city region among them, with even its mere 220 years provides a history rich enough to provide several 'root causes' of social vulnerability to disaster. The others are each twice as old, or nearly so, even dating Mexico City from the Spanish conquest and not from its Aztec origins.

All four urban regions contain considerable flood prone flatlands even though Mexico City is the only one without a coastal location. These latter three have over many years augmented their coasts with considerable land fill which shares with the drained lake bed under the historic centre of Mexico City soil conditions subject to subsidence and liquefaction. In all cases there are hills adjacent to or intermixed with these flatter parts. Therefore, despite their differences in climate, in all cases there are times in the year, or particular climate events, when one can expect landslides.

13.3.2 Economic and Political Geography

Three of these urban regions contain a national capital region and the economically primate city of their country. Tokyo is considered to be a 'world city' in terms of financial networks (Castells 1999). The other

4 Mexico City is 300 km from the Pacific, but it is forcefully influenced by earthquakes that occur at a plate boundary in the Pacific off Mexico's western coast. Also, as the national capital of a country with a long Pacific coast line and major economic linkages with other Pacific Rim countries (the US, Canada, Japan, South Korea, Taiwan); it seems appropriate to include Mexico City despite its landlocked condition.

Table 13.2: Comparison of Four Megacities. **Sources:** *Manila and Tokyo:* Fuchs/Brennan/Chamie/Lo/Uitto (1994); Yeung/Lo (1996); Tayag (1999), Velasquez/Uitto/Wisner/Takahashi (1999); *Tokyo:* Takahashi (1998, 1999); Tokyo Metropolitan Government (1995); *Manila:* Tayag (1999); Asian Development Bank (ADB 2000, 2002); Bankoff (2003b); *Mexico City:* Cruz (1993); Gilbert (1994, 1996); Roland/Gordon (1996); Puente (1999a, 1999b); *Los Angeles:* Wisner (1999a, 1999b, 2003a); Bolin/Stanford (1998); General: U.N. (1999).

Characteristics	Greater Los Angeles	Metropolitan Manila	Greater Mexico City	Metropolitan Tokyo
Population	13	11	18	26
Size (000 Km²)	87	15	22	14
Density (Pop/ Km²)	149	733	818	1,857
Age Since Foundation (Years)	220	430	477 (666)	398
Situation	Coastal and inland valleys	Coastal peninsulas between bay and lake	Inland valley on plateau	Coastal, running N and W into hills
Topography	Mix of flood plain, canyon, coastal cliff and estuary	Coastal plain, river flood plain, hilly to East	Centre over ancient lake bed, many ravines to N, W and S, flatter to NE	Flat in much of ward (<i>Ku</i>) area, more relief in <i>Tama</i> area to West
Climate	Semi-arid	Tropical	Semi-arid	Temperate
Political & Economic Importance	Regional economic role, Pacific Rim and Latin America, regional economic and political role in U.S.	Nationally primate and sub-regional economic role in Asia	Nationally primate in economic and political terms, regional economic role in the Americas	Nationally primate in economic and political terms, world and regional economic centre
Per cent Poor	25	40	50	10
Per cent in Informal Settlement or Illegal Migrant	5-10	30	40	2-3
Natural Hazards	Earthquake, fire, flood, landslide	Earthquake, flood, landslide, typhoon	Earthquake, flood, landslide	Earthquake, flood, typhoon
Last Major Disasters	Northridge earthquake in 1994; wildfires in 1995	Payatas garbage dump flood, fire, and landslide in 2000	Earthquake in 1985	Earthquake and fire in 1923

Notes: “*Age since Foundation*”: All mega cities were predated by small settlements, some occupied for a long and undetermined period. In the case of Mexico City two ages are given. The first uses the date of the establishment of the Aztec settlement of Tenochtitlan (1325 or 1345). The second uses the date of the defeat of the Aztecs by Cortez (1524). The banks of the Pasig River in present day Manila were inhabited long before the Spanish colonial period, but the age provided uses the date of Spanish control of Manila (1571). “*Per cent Poor*”: Per cent below locally defined poverty line. Clearly one is dealing with relative and not absolute poverty in these comparisons, however, in all cases among the ‘poor’ there is little or no surplus for financial investments in self-protection because of the relative expense of food, shelter, utilities, and transport. “*Percent Informal Settlement or illegal immigrants*”: There is little squatter or informal settlement in greater Los Angeles or greater Tokyo except for some semi-permanent encampments of homeless individuals and the illegal use of condemned buildings (‘squats’). In area extent and numbers of inhabitants, these are not at all comparable to the large informal settlements in greater Mexico City and greater Manila. However, when one considers the numbers of illegal or undocumented persons in the urban population, a different but related percentage can be estimated for Los Angeles and Tokyo. The commonality between the two measures is ‘illegality’ and the challenge for risk reduction that that produces. “*Last Major Disaster*”: The fire bombing of Tokyo during the Second World War is not included, although more recent than the 1923 earthquake and fire, because it was not triggered by an extreme natural event. While the catastrophic mass movement of solid waste, and subsequent fire, that buried homes and people at Payatas, Manila, is partly the failure of a human artefact (a solid waste dump site), the trigger was heavy rainfall.

three have significant regional economic importance: Mexico City and Los Angeles in the Americas, and Manila in Southeast Asia.

It is because of this regional importance that three of the four are the destinations of considerable numbers of illegal immigrants either in the sense of foreign nations in search of livelihoods or political refuge (Los Angeles and, to a lesser extent, Mexico City and Tokyo) or in the sense of nationals who have come from other parts of the country and now live in illegal or informal settlements (large proportions of the population of Manila and Mexico City).

13.3.3 Time Geography of Hazard

Parts of all four urban regions are prone to earthquakes, floods, and landslides. Coastal gales and other storms can affect all but Mexico City. Wildfires are a hazard in parts of Los Angeles, and to a lesser extent, also in Mexico City. These megacities have long chronologies of disaster, although only Tokyo, like San Francisco, London, and Lisbon, has been almost totally destroyed in the past.

Given the social and physical heterogeneity of these great urban regions, and also because of the long journeys to work endured by much of their populations, the time-place geography of hazard is highly contingent and complex at the micro scale.

13.4 Los Angeles and Mexico City: Specific Comparisons

13.4.1 Shared Geographies of Hazard

Los Angeles and Mexico City both encompass large urban regions, with metropolitan populations of 14 and 18 million respectively. They both spread to fill much of the available land in large regions: the coastal plain and internal valleys that run eastward into foothills and mountains in the case of greater Los Angeles; the Valley Mexico and its surrounding mountain slopes and ravines in the case of greater Mexico City. Both urban regions are fragmented administratively. First, in both cases the urban region is divided among multiple administrative jurisdictions: six counties in the state of California and among three Mexican states (but principally one: the *Estado de Mexico*) and the Federal District. Both urban regions are further divided into municipalities: 116 in the case of Los Angeles County, and 65 *Delegaciones* (delegations) in the case of Mexico's Federal District. Finally, in both

cases, there is no overarching metropolitan government for the whole urban region as exists for greater Manila or greater Tokyo (Wisner 1999a; Puente 1999a).

Both megacities face a similar array of hazards. Among natural hazards they both face earthquakes, flooding, landslides, and urban-wildland interface fires.

Mexico City is affected most seriously by movements in tectonic plates off the western coast under the Pacific Ocean. This wave energy travels inland, where the local soil factors amplify the shaking, especially in the area of the historic centre of the city, which was built on a lake that was drained in the 16th Century. In 1985 at least 10,000 people died in such an earthquake (Wisner/ Blaikie/Cannon/Davis 2004: 281-292). So far the mortality from earthquakes in greater Los Angeles is lower. Fewer than 100 died in the Northridge temblor in 1994, but the economic loss can run into the billions of dollars (Bolin/Stanford 1998). Also, models based on the 1934 earthquake in Long Beach suggest that thousands could be killed in a future large event (RMS 1995).

Flooding in both urban regions is a hazard because of the intense seasonal rainfall and proximity to mountains that have been largely deforested because of development pressures. In both cases there are extensive and ambitious public works designed to channel and control run off, with varying degrees of success. In the case of Los Angeles the storm drainage canals have produced a secondary hazard of their own. Each year a number of children are swept away by powerful waves of water that course down from the hills with little warning (Rigg 1996; ICBO 2003).

Landslides produce economic loss to homeowners in parts of Los Angeles, but a deadly hazard in some areas of Mexico City. Informal, self-built settlement in some parts of Mexico City is situated over centuries-old, disused mines subject to cave-ins that produce sinkholes. In other areas steep slopes are unstable although inhabited by the poor. In yet others rocks fall from ridges and slopes above settled areas are the principle geomorphologic hazard.

Forest and grass fires affect the outer most zones of Mexico City's extensive area; however the population density is quite low in these areas. By contrast, there are a large number of people living among highly flammable Mediterranean, chaparral vegetation in greater Los Angeles. Limited road access increases the risk. During the great fire in Laguna Beach in 1994 nearly the entire town was threatened, and evacuation

by sea was being considered as the fire was finally controlled (Wisner 1999c; Davis 1998: 95-147).

What sets these urban regions apart is Mexico City's proximity to an active volcano and LA's exposure to coastal storms and coastal erosion. Ash fall from eruptions of Popocatepetl volcano reached the southeast of Mexico City in 1994 and 2001. Persons displaced by the eruption in 2001 were placed in shelters in Mexico City. As the metropolitan area grows in the direction of Puebla, directly on the slopes of the volcano, the hazard from future eruptions will increase (CENEPRED 2004).

Coastal gales are a hazard affecting seaward zones in greater Los Angeles, especially during years affected by El Niño. The pier in Santa Monica was washed away in El Niño storms, and high value real estate routinely falls into the sea from the Palos Verde peninsula northwards through Malibu (Glantz 2001).

These two urban regions also face similar technological hazards. Explosions and fires from the refining industry have occurred in both places. Air pollution is a chronic problem in both Mexico City and Los Angeles (Wisner 1999a: 405-409; Puente 1999a; Ezcurra/Mazari-Hiriart/Pisanty/Aguilar 1999). Sewerage and drainage systems in both urban regions are sometimes overcome. In Los Angeles there were large discharges of raw sewage during storms in the late 1980's and 1990's (Davis 1990: 196-200). In Mexico City the deep sewer system put in at great expense in the 1960's serves only the central part of the city. Given the natural problems of drainage on an ancient lake bed, even this limited system cannot always cope with run off, and the majority of residents live in areas where sewage is discharged into the *aguas negras* (black waters) of narrow ravines and streams (Ezcurra/Mazari-Hiriart/Pisanty/Aguilar 1999; Du-Mars 1995: chap. 5).

13.4.2 Shared Sociology of Survival

One tends to think of Los Angeles as rich and Mexico City as poor. However, differences in average per capita income make little difference for the most vulnerable social groups in both places. In both urban regions the working poor spend considerable income on minimally adequate housing and long, expensive journeys to work. Given the neo-liberal trend towards privatization and elimination of social welfare benefits in both the US and Mexico (and especially in California, where the neo-liberal model got its start with a referendum in 1978 that froze public expenditure - the so-called 'tax payer rebellion'), there is limited access

to health care, quality education, and social services for the working poor on both sides of the border (Bolin/Stanford 1998; Wisner 1999a). Tension between authorities and illegal immigrants has grown far worse since the attack on New York's World Trade Towers in September 2001 (Wisner 2003b), despite the fact that a Hispanic mayor of Los Angeles has been elected.

Contrary to expectations, there is probably better access to primary health care for the poor in Mexico City through the system of social security hospitals than in Los Angeles, where the emergency room at USC/County Hospital has become the de facto provider of primary care for a large number of people who do not have private health insurance. Throughout the LA metro region smaller community and church-run hospitals are closing or being sold to Health Management Organizations due to the economics of concentration and privatization of health-care.

The bottom of the socio-economic distribution in Mexico City tends to be immigrants from areas of Mexico inhabited by indigenous groups of people from the south of the country. They are to be found in self-built accommodation in some of the areas of the city with least infrastructure (no drainage, no sanitary system or reticulated water supply) on steep slopes. Their counterparts in greater Los Angeles tend also to be minorities, especially undocumented Hispanic immigrants from Mexico, Guatemala, or El Salvador. They live in areas of the city exposed to highest risk from factory emissions and explosions and floods. They also tend to live in overcrowded tenements that are at risk from fire (often arson) if made of wood, and at risk to earthquakes if they are of the older brick construction. In both Mexico City and Los Angeles there are considerable numbers of homeless youths who are at risk to violence, HIV/AIDS, fires in abandoned buildings, as well as to the other natural and industrial hazards to which all marginalized social groups are vulnerable.

Among these more marginal social groups in both urban regions livelihoods and survival strategies depend on informal networks, casual labour under highly exploitative conditions, many kinds of informal economic activities such as street trading, sale of lottery tickets, etc., and mutual aid. There is mistrust of authorities but a high degree of social solidarity within these social groups. Solidarity is often channelled into the efforts of local NGOs to provide services not provided by official municipal agencies, for example the Pico Union/Westlake Cluster (in LA)

and tenants’ association at Tlatelolco or popular education groups, like Los Olvidados.

Given the social and economic heterogeneity within these two huge urban regions, and their long histories, it is not surprising that politics, too, is diverse.

The Hispanics in California account for more than a third of the state’s population, and since 1999 the state’s ‘non-Hispanic whites’ have been a minority group (BBC 2000). More and more Hispanics are also registered to vote. Thus, especially in some parts of greater LA, including the City of Los Angeles (the largest single city, with four million people), there is an opening for collaboration between municipal technocrats and the leadership of neighbourhood based NGOs. The voters of the City of Los Angeles also approved a change in the city charter that mandates a more decentralized and participatory process of setting local priorities in social services, public works, etc. The City of Los Angeles’ Department of Emergency Preparedness hopes to work with these new neighbourhood councils to spread disaster risk awareness, preparedness, and mitigation of risk.

In Mexico City’s Federal District the election of two successive mayors from parties other than the historically dominant PRI has provided support for programmes that reach out to the marginalized population. The Federal District’s office of civil protection has not gone as far as its counterpart in LA in the direction of linking its efforts with those of other local government departments or involving local neighbourhoods. However, in Mexico City there is a longer history of rigid hierarchy and paternalism to overcome. It is also only very recently that the Federal District even had an elected mayor. Until 1995 the Federal District was governed directly by the central government (which is to say the historically hegemonic, once-ruling party, the PRI) through an appointed governor. Despite these handicaps, the Federal District is trying some impressive experiments such as the collaboration with the tenants’ association at the Tlatelolco high rise apartment complex, and its establishment of a dedicated geological survey team within the office of civil protection. Through its efforts the true magnitude of the landslide, flood, and earthquake hazard in the DF are becoming more widely known.

13.4.3 Contrasting Perceptions of Social Vulnerability

Despite these important similarities in the geography of hazard and the sociology of marginality, the UNU

study found quite different definitions or perceptions of who the highly vulnerable social groups were. Table 13.3 summarizes these differences.

Table 13.3: Groups Perceived by Disaster Management Professionals to be Highly Vulnerable to Disasters (per cent of officials). **Source:** Authors’ field work.

Mexico City	Los Angeles
Squatters (67%), especially Living in ravines Living over ancient mines Living near hazardous industries	Elderly persons (100%)
Children (23%)	Disabled persons (93%)
Legal immigrants (16%)	Persons with special medical needs (86%)
Disabled persons (14%)	Mentally ill (54%)
Elderly (14%)	Illegal immigrants (29%)
Homeless (11%)	Foreigners/ foreign-born (29%)
Mentally ill (5%)	Homeless (21%)
Persons with special medical needs (5%)	Street children (14%)
Illegal street vendors (5%)	People living near oil refineries (7%)
Artisanal fireworks producers (5%)	People living near water pumping stations (4%)
Street children (2%)	People living in mobile homes (4%)

Notes: “% officials”: Percentage of 44 disaster management officials interviewed in greater Mexico City and 28 interviewed in greater Los Angeles. “Legal immigrants”: This includes people from the rural areas of the country where indigenous people live. “Foreigners/ foreign-born”: This was said to be mostly to do with lack of knowledge of English.

In Mexico City the more detailed breakdown by age, gender, socio-economic status was generally thought by officials in both the Delegations of the DF and the Municipalities of the *Estado de Mexico* to be an academic luxury of a rich country. While a small number of the respondents did acknowledge that some of these groups face additional risks or additional problems in recovery from disasters, the consensus was different. Most believed that illegal or informal squatters, who most commonly live in ravines, over the ancient mines in some of the surrounding slopes,

were generally vulnerable. They thought that everyone in such a living situation was vulnerable without finer distinctions. The exception to this concerned a more common belief that children needed special protection.

In greater Los Angeles there was nearly universal acknowledgement of the special vulnerability faced by the elderly, disabled persons, children, and people with special, chronic medical needs (e.g. those on oxygen or ventilators at home or those in need of frequent dialysis). The mentally ill or retarded were also recognized in more than half of the interviews with disaster management officials in greater Los Angeles. A smaller, but significant group of municipalities took the legality of immigrant status, language ability of foreigners or the foreign born, and homelessness to create situations in which people can suffer increased vulnerability to disaster.

13.4.4 Similar Approaches to Knowledge and Planning

Despite differences in the way that social vulnerability is defined and understood by municipal disaster managers, their approaches to planning and to the acquisition of information is similar. Table 13.4 summarizes these data.

Both Mexico City officials and their counterparts in greater Los Angeles involve neighbourhood groups and NGOs in the planning process, but more do so in the Mexico megacity. This difference is due in large part to the history of social and political organization the two urban regions. In Mexico there is a long history of political party patronage and clientelism that manifests itself in the form of a variety of local associations and groups. There is also a tradition of opposition and protest in Mexico that gives rise to other groups.

It is striking, however, that despite claims of involvement of citizens in the planning process, very few municipalities in greater Mexico City actually obtain information about socially vulnerable groups from neighbourhood groups (where, of course, the fine grained and detailed information exists).

At the level of the municipal jurisdiction both sets of officials claim a high degree of inter-sectoral cooperation. In part this turns out in practice to be a matter of legal formality - attending the same planning meetings, signing off on the same planning documents. However, more than half in both cases claim to obtain information from other departments in the

Table 13.4: Knowledge of Vulnerable Groups and Planning of Programmes to Reduce Vulnerability In Mexico City and Los Angeles (per cent of officials). **Source:** Authors' field work.

Mexico City	Los Angeles
Involve neighbourhood groups in planning (71%)	Involve neighbourhood groups in planning (50%)
Obtain information from neighbourhood groups (9%)	Information from neighbourhood groups (21%)
Involve NGOs in planning (43%)	Involve NGOs in planning (21%)
Inter-sectoral coordination at the municipal level (91%)	Inter-sectoral coordination at the municipal level (100%)
Information from other government department in municipal government (68%)	Information from other government department in municipal government (61%)
Information from national agencies (30%)	Information from national agencies (14%)
Experience problems using social data (66%)	Experience problems using social data (71%)

Notes: “*Involve neighbourhood groups...*”: Many of these take the form of groups formed around someone who has taken the free 18-hour course made available to citizens called *Citizen Emergency Response Training (CERT)*. The inspiration for this kind of training came from the experience of spontaneous citizen action after the 1985 earthquake in Mexico City, where LA Fire Department chief Frank Borden had gone as an observer. The course included fire suppression, light search and rescue, first aid, transportation of the injured, communication, and team leadership. “*Involve NGOs in planning*”: One of the six municipalities that involve NGOs is the City of Los Angeles, where there is an active network of 70 NGOs with official status in the planning and emergency response system called the *Emergency Network Los Angeles (ENLA)*. There is a great contrast between a city like the City of Los Angeles and its relationship with NGOs through ENLA, and other, much smaller municipalities that have no process for involving NGOs with the exception of the two national, quasi-governmental bodies, the American Red Cross and the Salvation Army. “*Inter-sectoral coordination...*”: Universal claims of coordination are explained by the legal requirement in California to follow what is known as the *Standard Emergency Management System (SEMS)*, which mandates plans, and exercises that involve multiple sectors and mutual aid contingency arrangement among cities and counties. “*Information from national agencies*”: This was most commonly information from the *National Centre for Disaster Prevention (CENAPRED)* or the *National Institute of Statistics, Geography, and Information (INEGI)*.

same municipal government. This sharing of information goes beyond mere formalism.

A most striking result is how few municipalities take advantage of the many publications and electronic information sources made available by their respective national government agencies. In part this is a matter of lack of financial resources and labour time by understaffed, small municipal offices. In part this is a reflection of the background and lack of specific training in social science of most of those who work on disaster management at the municipal level. In greater Mexico City they mostly have engineering backgrounds or some from the construction industry. In greater Los Angeles they come either from careers in law enforcement or from fire fighting. In neither case do the managers find it easy to use social data.

Municipalities generally have the technical (and possibly the financial) resources for meeting the needs of socially vulnerable groups, but they lack detailed information about them and lack their trust. NGOs (and some neighbourhood groups) have more detailed information about socially vulnerable groups and, because of more frequent and positive contacts; they tend to have their trust. Therefore, the overall conclusion of the UNU study is that municipalities and NGOs/neighbourhood groups need to cooperate. They need to share their strengths and make up for one another's weaknesses. However, such cooperation is hard to put into practice.

13.5 Manila and Tokyo: Specific Comparisons

13.5.1 Shared Geographies of Hazard

Manila and Tokyo both have coastal locations, where flooding is a hazard and typhoons are capable of damaging exposed areas. Long histories in both cases of the reclamation and extension of coastal land with land fills and dense urban encroachment on, even paving over, rivers flowing into their respective oceans exacerbate these hazards.

Bankoff (2003a: 11; 2003b) notes that flooding in Manila was a frequent occurrence during the 19th Century, and that since records were kept, there have been serious floods in 1942, 1948, 1966, 1967, 1970, 1972, 1977, 1986, 1988, 1995, 1996, and 1997. Tayag identifies three triggers of flooding in Manila (1999). Low-lying areas are flooded when the major river systems (the Pasig-Marikina Rivers and San Juan River) overflow, especially when accompanied by high tide.

Such flooding can occur when there is excessive rainfall due to typhoons, to the annual Southwest monsoon, or to showers that cause isolated flash flooding. She notes that flooding in greater Manila is aggravated by poor or non-existent drainage, rapid urbanization, low river capacity due to heavy siltation, dumping of refuse into rivers and the encroachment of settlement into flood plains. Water management in Manila is also complicated by over-pumping of ground water and salt-water intrusion from Manila Bay (Rau 1992: 282).

Located in 'Typhoon Alley', the Philippines suffer most from cyclonic storms. Between 1948-1999 its 780 inhabited islands experienced 200 typhoons (Longshore 2000: 260). Greater Manila has been seriously affected by typhoons in 1937, 1956, 1970, 1972, 1983, and 1995.

Secondary health hazards, especially cholera, dengue, malaria, and measles epidemics have been found to be associated with flood disasters (Relox/Perez/Villareal 1997). Another study found that in the greater Manila region between 1984-1988 "hospital admission of dengue fever cases increased 1-and 2-month after the cyclone passages while gastroenteritis, hepatitis, typhoid fever, bronchopneumonia and tetanus admission decreases after the typhoon" (Relox/Arruejo 2002).

Tokyo also has a long flood chronology. In 1910 nearly the whole of central Tokyo was flooded when heavy rainfall in the Chichibu Mountains caused the Arakawa River to burst its banks. Typhoon Catherine in 1947 again caused the Arakawa to overflow, together with the Tone River, and 300,000 people had to be evacuated (see at: <<http://www.ara.or.jp/asc/english/history/history.html>>). The Tone River flooded again in 1981, 1982, and 1983 (Kishii/Kuzuha/Hayano 2002). Oya and Haruyama (1987: 2) list 26 floods affecting the lowlands of greater Tokyo between 1963-1984 alone. Kumagai and Nojima (1999: 67) acknowledge the high flood hazard in greater Tokyo, but they stress that since 1966 there has been massive investment in structural mitigation (embankments, pumping stations, water gates) and no significant flooding in the lowlands. In fact, reliance on such physical works began in 1911 with public works designed to control the Arakawa River (finally finished in 1930). The result has been a westward shift of flooding from the lowlands into more hilly regions of greater Tokyo (as population has grown in these former rural areas). One trigger for flooding in greater Tokyo is cyclonic storm, especially the spring and autumn 'rain typhoons' that bring large amounts

of rain. Tokyo is further north than Manila, and so it experiences typhoons less frequently, perhaps one every two or three years, with a particularly severe storm hitting every five or six years (Longshore 2000: 200). Although the shape of the coast near Tokyo and normal storm tracks make it unlikely that it would receive a direct hit by a typhoon, wind, rain, and storm surges associated with storms that pass nearby have caused millions of dollars of damage over the years, for instance in 1934, 1945, 1961, 1965, 1969, and 1991 (RMS 1999). This, however, is a matter of economic loss and not lives, homes, and livelihoods lost, as in Manila. The most deadly recent typhoon to affect Tokyo was in 2002, when four people died in the worst storm to strike in fifty years (BBC 2002).

The hills and low mountains that rise, in both cases, from behind the coastal plain are prone to landslides, flash flooding, and also produce run-off that must find its way through densely populated urban cores before discharging into the Laguna de Bay or Manila Bay in one case, or into Tokyo Bay in the other. As we have seen earlier, this is also the case in greater Los Angeles.

Both Manila and Tokyo have experienced rapid growth of population and also in the numbers of industrial facilities, including refining and storage of petrochemicals and other potentially hazardous industries capable of causing explosions and chemical spills during floods and earthquakes. In Tokyo, for example, most middle-class and high income residential areas are in higher areas, and the lower zones are devoted to industrial facilities as well as working class housing. This includes a 40 km long corridor along Tokyo Bay and inland along the Tama River where there are steel mills and chemical plants (Kumagai/Nojima 1999: 65). In Manila there is much chemical and other industrial activity mixed with low income housing along the Pasig River. Complex upland topography combines with a complicated pattern of streams in the plains to produce challenges for maintenance of transportation corridors under extreme conditions. There are many bridges and potential choke points in the transportation systems of both megacities. Even under the best of conditions, transportation is congested.

All of these factors become relevant considering the vulnerability of people, livelihoods, and infrastructure to possible earthquake damage. Tokyo's location near the borders of tectonic plates makes it more prone to earthquake than Manila. There is also a greater value of investment in the built environment in Tokyo than in Manila, so the probability of loss – thus

vulnerability – must also be considered higher. On the other hand, mitigation measures are more developed in Tokyo, and the consequences for low income city dwellers in Manila in the event of a major quake would be more severe. In particular, it is less likely that they would be able to restore their livelihoods. The poor have less to lose, but that little is vital to their well-being, and its replacement is more difficult.

Tokyo had at least six major earthquakes since 1615 (Kumagai/Nojima 1999: 66, citing Matsuda 1993). Ten thousand people died in one in 1855, and the Great Kanto earthquake that shook the region in 1923 claimed 140,000. Fire was a major factor in this death toll, and season of the year and wind speed and direction are associated with this additional, secondary hazard (Kumagai/Nojima 1999: 66-67). Since the rebuilding that followed the Second World War much older, flammable construction has disappeared, but the use of natural gas, propane, and petrochemical products has increased in a considerably larger metropolitan area, where crowded areas persist. Despite much planning attention to possible recurrence of a 1923-scale event, especially attention paid to provision of evacuation areas safe from fire, Tokyo still runs a very high risk of serious death, injury, and massive economic loss in such an event (Takahashi 1999, citing Tokyo Metropolitan Government 1998; Hadfield 1991).

Volcanoes tower above both Tokyo and Manila – Mts. Fuji and Pinatubo – although far enough away that the impact of eruptions would be more disruptive than catastrophic, much as ash fall from the volcano Popocatepetl affects the outskirts of Mexico City.

There are five earthquake source zones under or near Manila, including the Marikina Valley Fault that bisects the city. A moderate intensity earthquake affects Manila, on average, every 15 years, and although relatively rare, very heavy damage (VIII or IX on the Modified Mercalli damage scale) may occur with an interval of 79-350 years (Punongbayan/Coburn/Tayag 1993). Given what has already been said about topography and encroachment into low lying areas, liquefaction is one of the major hazards facing Manila residents in the event of an earthquake, together with ground rupture and shaking, fire, chemical spills, and landslides in outlying areas.

In the 1950's and 1960's, during a period of rapid and relatively unregulated industrial growth, Tokyo suffered considerable air and water pollution. Manila still suffers this fate, more through non-enforcement of environmental law than through its lack. A body of

law also exists in the Philippines since the early 1990's that nominally protects the urban poor from arbitrary or forced displacement without due process and sometimes compensation. However, despite the existence of such law, and legal aid NGOs to help the poor take advantage of it, the power of the state to move people out of their established locations is one of the social hazards affecting low income people (Santiago 1998: 117-120).

13.5.2 Contrasting Sociologies of Survival

If patterns of hazard in Tokyo and Manila are similar, coping with and adaptation to hazard could not be more contrasting. First there is the question of poverty. The contrast is greater than between Mexico City and Los Angeles. In Tokyo, there are, of course, perhaps 5,000 homeless people, mostly men. There are low income people, in relative terms, and some groups of illegal immigrants. However, these amount to a very small proportion of Tokyo's population, unlike the underclass and working poor in Los Angeles. In addition, unemployment in Tokyo is lower than the average for Japan, something that cannot be said for Manila in relation to the rest of Philippines.

The Philippine Commission for the Urban Poor estimated that the number of squatters in Manila grew from 1.65 million in 1982 to 3.5 million in 1993 (Tayag 1999: 5). The Asian financial and economic crisis in the years 1997-2000 saw 3.5 million additional people in the Philippines fall below the poverty line, and trends toward poverty reduction were reversed, leaving a national poverty rate near 40 per cent (Raceles 2003). In Manila livelihoods for people living at or below the poverty line depend on casual labour, petty trading, and many dangerous, informal sector activities such as recycling materials from the huge solid waste dump in Quezon City called Payatas (Gonzales 2003; Vanzi 2003; Asian Development Bank 2000; 2002). On 10 July 2000, after torrential typhoon rains, a mountain of garbage collapsed on the self-built homes of recyclers living nearby and more than 200 people died (Mydans 2000), although estimates of the dead and missing go as high as 700-1,000 (Westfall 2001; Luna 2001). Spontaneous, informal, or 'squatter' settlement is the spatial access and shelter strategy essential to the ability of Manila's poor to secure a niche in the urban fabric, even though this means that many people are forced to choose dangerous (contaminated, flood-prone) locations. Low income people in Manila have limited access to some government and NGO social and health services, and

poor access to sanitary infrastructure. Even for those people connected to Manila's distribution system, some 58 per cent of the water is lost (O'Meara 2001: 341).

Neighbourhood networks and mutual aid based on kinship remain - as in rural areas - the main safety net for the poor. By contrast, in Japan, officially provided municipal and other government services are the main welfare umbrella. Although many elderly people still live with their children in Tokyo, even this vestige of familial bonds and filial piety is disappearing as the population lives longer and longer and as the cost of urban accommodation continues to rise. Social service and advocacy NGOs are less common in Tokyo than they are in Manila, where widespread income poverty is, to some extent, balanced by rich social capital. Volunteerism is on the rise in Japan following the spontaneous outpouring of youthful solidarity with the victims of the Kobe earthquake in 1995. There are groups advocating the rights of people living with disability and other special groups, yet the militancy and impact of such groups are less in Tokyo than in Manila (Heijmans/Victoria 2001; Tayag 1999).

Age structure also affects the sociology of survival in these two cities, and again a large contrast is apparent. The population of Japan is old by comparison to that of Manila, and many of these elderly live with disability and ill health and are highly dependent on social services and, to some degree, their families. Dependency is also an issue in Manila, where economic pressure at home is cited as one of the main reasons why some children live on the street (Bacos/Ramirez/Dorado/Velasco/Barba, nd). Approximately one-third of Manila's population is aged 1-14 years (see at: <<http://www.cityofmanila.com.ph/demography.htm>>).

13.5.3 Contrasting Perceptions of Social Vulnerability

The contrast between Manila and Tokyo is similar to that between Mexico City and Los Angeles, only more extreme. Residents of urban informal settlements in Manila were regarded by the majority of the officials interviewed (87 per cent) to be the social group at highest risk (67 per cent shared this view in Mexico City). The elderly and disabled were universally seen as the groups in Tokyo who are most vulnerable. Indeed, a highly nuanced typology of the vulnerable elderly emerged from interviews there in the 23 central wards.

These differences may well mirror the macroeconomic conditions prevailing in the two cities. As in Mexico City, national patterns of poverty give rise to migration to informal settlements in the countries' major economic centres. Urban marginality results, as well, in many homeless children and youth. These were the second most commonly mentioned in Manila.

Reflecting its role as a destination for many legal foreigners with little knowledge of Japanese, such people were considered potentially at risk by 70 per cent of disaster planners in Tokyo. This has more to do with Tokyo's role as a global business and financial centre and less to do with illegal working class immigration, although there are some of the latter who arrive from mainland China, the Philippines, Bangladesh, Iran and North Korea (table 13.5).

13.5.4 Similar Approaches to Knowledge and Planning

Despite considerable economic and political differences between Manila and Tokyo, there is a similar approach to knowledge of disaster vulnerability and planning. Indeed, all four megacities show the same pattern. They all attempt to involve neighbourhood groups in planning. All four also claim high degrees of inter-sectoral coordination and connections with other jurisdictions within the megacities. None of the four cities are particularly good at involving non-governmental organizations in planning. Finally, disaster planners in all had difficulties using social data.

However, there are important differences within these generally similar patterns. Manila and Tokyo were better at the municipal level in acquiring information about vulnerable groups of people from neighbourhood groups (65 per cent and 57 per cent of municipal level respondents saying they did). In Los Angeles only one in five planners could count on this source of information, and a mere 9 per cent in Mexico City.

Another thing in common in Manila and Tokyo was the existence of legally established, strong, and well-financed metropolitan government structures. Their existence explain the high degree of inter-sectoral and inter-city coordination claimed. This was only diminished with Tokyo's wards by the strict interpretation of privacy laws that prevent one department's sharing of social data with another. Neither greater Mexico City nor metro Los Angeles have metropolitan governments, or even informal consortia, that embrace their entire, and very extensive, urban regions.

Table 13.5: Groups Perceived by Disaster Management Professionals to be Highly Vulnerable to Disasters (per cent of officials). **Source:** Authors' field work.

Metro Manila	Central Tokyo
Squatters (87%)	Elderly persons (100%) Bed-ridden elderly (61%) Elderly living alone (48%) Elderly in general (26%) Dementing elderly (13%)
Street children (71%)	Disabled persons (100%)
Elderly (13%)	Legal foreigners (70%)
Disabled persons (7%)	Infants (39%)
Young children (7%)	Persons with special medical needs (35%)
Others (3%)	

Notes: “% officials”: Percentage of 31 disaster management officials interviewed in Metro Manila action officers responsible for disaster planning in the 16 administrative subunits of Metro Manila plus 5 at primary district (*barangay*) level, and 10 in a variety of government commissions; and 23 disaster management officials in the 23 central wards in the case of Tokyo. “Street children”: However, these respondents believed that they were not responsible for dealing with the vulnerability of street children as their welfare falls under the Department of Social Welfare and Development. Five officials believed that street children are too mobile and transient to be the responsibility of any municipal jurisdiction. “Disabled persons”: In the case of Tokyo this included both physical and mental disability. “Legal foreigners”: Officials mentioned only legal non-Japanese residents who may have difficulty understanding Japanese language warnings and instructions. While the growing presence of illegal immigrants, especially among those doing casual labour, was recognized, no official believed that they were a group of vulnerable people for whom special disaster planning should be done. Likewise, the homeless in Tokyo subway stations, in parks, and along the Sumida River were acknowledged to exist, but they “did not count” for planning purposes (Wisner 1998). “Others”: There were single mentions among the 31 officials (3 per cent) of orphans, students living in boarding houses, women (battered, pregnant, or lactating), mentally retarded (due to drug use), persons in flood prone areas.

Finally, Manila and Tokyo municipalities both used information made available by national level institutions such as Philippine's Presidential Commission on Urban Poverty or Japan's National Land Agency. Nothing like such an uptake of nationally-generated infor-

Table 13.6: Knowledge of Vulnerable Groups and Planning of Programmes to Reduce Vulnerability (per cent of officials). **Source:** Authors' field work.

Metro Manila	Central Tokyo
Involve neighbourhood groups in planning (73%)	Involve neighbourhood groups in planning (100%)
Obtain info. from neighbourhood groups (65%)	Obtain info. from neighbourhood groups (57%)
Involve NGOs in planning (18%)	Involve NGOs in planning (22%)
Inter-sectoral coordination at the municipal level (100%)	Inter-sectoral coordination at the municipal level (100%)
Obtain information from other department in municipal government (100%)	Obtain information from other department in municipal government (13%)
Obtain information from national agencies (100%)	Obtain information from national agencies (100%)
Experience problems using social data (71%)	Experience problems using social data (100%)

Notes: *"Involve neighbourhood groups in planning"* (Manila): The 1992 Local Government Code specifies that local citizen groups must be represented in special bodies such as health boards, but not all municipalities have managed to involve neighbourhoods in disaster planning. *"Involve neighbourhood groups in planning"* (Tokyo): There is a centuries' long tradition of urban neighbourhood groups based on ceremonial functions and other more practical activities such as fire fighting. Tokyo's neighbourhood fire brigades date back to the 18th Century. However, many groups are merely formal and not active. Fifty-seven per cent of officials expressed concern about the level of participation of citizens at neighbourhood level, and 83 per cent characterized their ward's neighbourhood groups as "formal." Only four wards (17 per cent) said they had very active neighbourhood groups. *"Involve NGOs in planning"* (Manila): Excluding the Philippine National Red Cross, which is present and active in all municipalities and treated as part of government for planning purposes. *"Involve NGOs in planning"* (Tokyo): The Japanese Red Cross was referred to in eight wards (35 per cent), and *Shakai Fukushi Kyougikai*, an umbrella organization to coordinate social welfare organizations dealing with visual impairment, physical disabilities, and mental retardation in seven wards. However, only five wards claimed to have active involvement of NGOs in their plans. *"Inter-sectoral coordination..."* (Manila): Via the Metropolitan Manila Development Authority and its Metro Manila Disaster Coordinating Council. *"Inter-sectoral coordination..."* (Tokyo): Via the Tokyo Metropolitan Council. *"Obtain information from other departments..."* (Tokyo): Strict interpretation of privacy laws in all but three wards meant that there was very little sharing of information about vulnerable groups of people from one department (e.g. that dealing with the elderly, for example, or the disabled) and the department of disaster planning. *"Obtain information from national agencies"* (Manila): Particularly the Presidential Commission on Urban Poverty and the Department of Social Welfare and Development. *"Obtain information from national agencies"* (Tokyo): The Tokyo Metropolitan Council provides many maps and planning materials, as does the National Land Agency.

mation takes place in Mexico City (ironically, since the national premier National Centre for Disaster Preparedness - CENAPRED - is located in Mexico City). Table 13.6 presents the data on sources of knowledge and planning in Manila and Tokyo.

13.6 Common Problems and Obstacles

13.6.1 Difficulties Facing Municipality/ NGO Cooperation

The starting point of this research project was the hypothesis that non-governmental and community-based organizations (NGOs and CBOs) can provide a vital link between highly vulnerable populations and municipal governments. In the ideal world, such groups would have information about and trust rela-

tionships with marginalized groups of people that the city finds it difficult to understand or to approach. Our research partially supports the hypothesis. However the situation appears more complex than we originally believed. There are at least three complicating issues.

First, most NGOs have their own fairly narrow and well-defined agendas and areas of expertise and concern. In part this is a natural result of how NGOs are formed and remain funded. They carve out niches in the urban ecology. Focused concerns might be housing, legal empowerment, women's rights, sanitation, etc. The problem observed is that such groups see disaster management and the process of vulnerability reduction through the prism of their established agenda. In a more general way, Foreman (1998) has noted the narrowness and inflexibility of NGO agendas as both a weakness and a strength (Benson/Twigg/Myers 2001).

There were a few, predictable NGOs whose mandate specifically concerns aspects of risk communication or more general disaster management, such as the Red Cross in all four cities, or *Emergency Network Los Angeles* (ENLA) and the Salvation Army. Ironically, however, these NGOs have been so fully ‘officialized’ and incorporated into the municipal system of disaster management that they do not function as conduits to and from the poorest of the poor and other special needs groups.

In a similar way, we encountered some specialized disaster-oriented CBOs, such as Tokyo’s neighbourhood fire fighting teams, the neighbourhoods in central Mexico City trained by the Association of Retired Fire Fighters,⁵ and the CERTs in Los Angeles mentioned earlier. These suffer, however, from narrowness of mission and, in the case of Los Angeles, a definite class bias. Most of the roughly 20,000 CERT-trained individuals in the City of Los Angeles are white and middle class.

The second complication concerns politics. In a number of interviews the municipal officials believed that NGOs involved themselves in relief and post-disaster recovery work to further their own political ends. They were not trusted and collaboration suffered. From the NGO side, there was as often a history of antagonism with the government. Mistrust from the NGO side could have deep roots and centre around larger societal issues such as human rights and corruption – giving rise to such epochal changes as the electoral loss of Mexico City by the PRI political party or the use of massive ‘people’s power’ non-violent demonstrations to cause Philippine president Estrada to resign. Mistrust could also be focused on feelings of neglect and social exclusion by the communities served by the NGO, as was the case of the Pico Union Cluster near Downtown in Los Angeles. This is a low income residential district populated by Hispanic immigrants, especially from El Salvador and Guatemala, many of them undocumented. The housing stock comprises five and six storey brick tenements and poorly maintained, subdivided wood-frame Victorians that date from an earlier, more affluent period in this districts’ settlement history.

The third complication concerns continuity and capacity building. In numerous cases, NGOs that had

formed spontaneously in response to disasters such as the 1985 earthquake in Mexico City or the Northridge earthquake in greater Los Angeles did not persist beyond the early stages of recovery. If the whole point of developing a ‘culture of prevention’ is to build networks at neighbourhood level capable of ongoing hazard assessment and mitigation at the micro level, preparedness training, and the identification of vulnerable individuals, then the organizational base is weakened or even lost each time ‘emergent’ NGOs rise and fall in response to specific events.

13.6.2 Problems with Municipal Decentralization

Since the hazardscape of megacities is so diverse, planning and implementation needs to take local variations in hazard, vulnerability, capacity (and thus, risk) into account. Efforts are therefore common to build professional planning expertise at various scales – the megacity’s constituent municipalities, and then, moving as close to the neighbourhood as possible. Sometimes this works well, as in some of Manila’s *barangays*, within the Tlatelolco public housing complex in Mexico City, and in West Hollywood, where there is a vigorous, neighbourhood based Disaster Volunteer Corps. In such circumstances local people assess their own vulnerabilities and their own capacities. They know, house by house, who lives there who may have special health or disability related needs, and who has special knowledge (nursing, construction, etc.) and skill. However, this kind of neighbourhood based comprehensive planning is still too rare. There are a number of problems that block effective decentralization.

Lack of formal coordination is a problem. Only Manila and Tokyo have metropolitan authorities mandated to coordinate and to support “city” level planning. In Mexico, there is such an authority at the level of the 18 cities (*Delegaciones*) that constitute the Federal District, but Mexico City spills out into neighbouring Mexican states. Nothing but the federal government is formally mandated to coordinate efforts at mitigation, preparedness, response, and recovery across the whole of the megacity area. The State of California’s SEMS system legally requires mutual aid arrangements among counties and cities, and being so very large, the City of Los Angeles and LA county do often take a leading role in the urban region, but informally.

Even where coordination and support for decentralization does exist, there is often a failure to take

5 This *Asociacion de Bomberos en Retiro* was unknown to municipal authorities, and was unregistered as an NGO, prima facie evidence that it was not the product to client-patron politics so often encountered among nominally independent NGOs in Mexico City.

Table 13.7: Social Capital and Trust Matrix. **Source:** The authors.

Social Capital(SC)	Trust (T)				
	Interpersonal (T1)	HH vs. CBO (T2)	HH vs. Govern-ment (T3)	CBO vs. Govern-ment (T4)	Government vs. Government (T5)
Knowledge (SC1)	Expertise, memory and mobility	Culture and idiom (class and ethnic differences)	Cynicism and mass media, literacy and criticality	Bottom up vs. top down	Centralism, regionalism and distribution of knowledge resources
Solidarity (SC2)	Duration, contingency and strength	Inclusiveness or exclusiveness (divisiveness?)	Delivery and training	Accountability, delivery, media-tion and control	Electoral manipulation, Ethnic politics
Access (SC3)	Intra-household (e.g. gender) distribution and access	Capture and co-optation; Delivery and transparency	Personal experi-ence, oral History and myths	Credibility and legitimation, organizational culture; Brokers and champions	Mediation and bureaucracy vs. direct networking

full advantage of opportunities. There is great variation among Tokyo’s 23 central wards (cities) and among Metro Manila’s cities in their ability to plan and to conduct outreach to vulnerable groups. The same is true of Mexico City and Los Angeles. In Los Angeles, small, municipalities with little tax base and a poor, often illegal immigrant population are hardly able to maintain essential services let alone conduct sophisticated vulnerability and capacity assessment. Examples are the city of Vernon (Davis 2000a: 191-204) and the city of Compton (Davis 2000a: 137-142).

The most commonly cited constraints cited in the UNU study interviews with municipal level officers were lack of training and lack of resources. Across the four megacities, most of the officers interviewed come from either an engineering background (or the construction industry) or police (or fire fighting). It is rare to find someone with a background in social science, thus the integration of social and physical data in risk analysis does not come naturally to these personnel. They need more training and support. This, however, costs money, and the resource constraint was often mentioned, even in the two more affluent megacities, Los Angeles and Tokyo.

13.6.3 Overview of Issues: On Trust and the Notion of Social Capital

In table 13.7 above we have summarized the key issues that emerge from the cases we have investigated. These are the factors that come into play as five sorts of trust (or its absence) affect the ability to mobilize

and utilize the three kinds of social capital - knowledge, solidarity, and access.

From left to right one finds interpersonal trust, trust between households (HH) and community based organizations (HH vs. CBO), trust between households and government at various levels (HH vs. Government), trust between CBOs and government, and, finally, trust among various branches and levels of government. All these manifestations of trust and distrust influence whether social capital remains hidden or latent or is mobilized and becomes active (Barnes 2002; Beck 1992; Beck/Giddens/Lash 1994; Bujra 2000).

History and memory are playing a major role in determining these trust relations. For example, a long history of racism and police brutality in Los Angeles provides the historical background to suspicion between minority households, especially those with members who are illegal immigrants, and government, and it is a major factor that CBOs need to take into consideration (Davis 1990; 2000b). In turn, such CBOs walk a tightrope in order to maintain their credibility with local government and such household constituents.

13.7 Conclusions

If the municipalities in our study of four megacities are at all typical for the Pacific Rim (we think they are⁶), then urban social vulnerability remains a serious problem as yet insufficiently faced by municipal, metropolitan, or other higher levels of government. Among the problems documented are:

- Fragmented and uncoordinated responsibility for different at risk groups;
- Legal barriers to access to social data;
- Staffing shortage and lack of training in use of available social data resulting in little use of existing sources;
- Limited or ritualistic use of community or neighbourhood groups;
- Limited or sometimes no planning at municipal level for longer term recovery issues;
- Political hostility toward NGOs;
- Funding shortages and high turnover in NGO staff.

The last three of these problems are very common and block the effective use of social capital to reduce risk. Socially vulnerable and marginal groups of people in cities have needs but also capacities. Their local knowledge and coping as well as their needs can be communicated to government agencies through NGOs and CBOs. City agencies have systems of risk reduction that may be of benefit to socially vulnerable groups of people. Here again, it is the bridge, mediation, or interface provided by organs of civil society that can provide access to official risk reduction.

On the positive side, however, we have observed the following:

- Innovative use of existing neighbourhood groups for preparedness or even for hazard and vulnerability mapping; in other words, it *can* be done!;
- Cases of excellent coordination between municipality and NGOs;
- Improvements in risk communication and increased sensitivity on the part of some municipalities to the needs of foreigners, both legal and illegal;
- The exponential growth of CBOs and NGOs during the decades of the 1980's and 1990's, therefore producing a basis - with all the pros, cons and difficulties mentioned earlier - for much deeper and systematic relations between cities and civil society.

Our main conclusion, therefore, is that the social basis for disaster-resilient cities is continued generalized capacity building across the whole of these heterogeneous populations (Eade 1998). Revitalized democratic participation in the governance of cities, better

education systems, employment generation, broader inclusion of women, minorities, and youth all contribute. This may sound like too sweeping a generalization. However, it is no more general than the oft quoted saying that 'earthquakes don't kill people, buildings do' (Bendimerad/Wenzel/Green/Wisner 1999). On the social side, one could say, "governments can't ensure safety unless the people demand it" (Wisner 1995, 2004).

6 For comparative purposes see: Mitchell 1999; IFRC 1998; IDNDR 1996: U.N. Centre for Human Settlement 1996; Parker/Mitchell 1995; Fuchs/Brennan/Chamie/Lo/Uitto 1994; Stren/White/Whitney 1992.

14 Policy Dimensions of Human Security and Vulnerability Challenges. The Case of Urban India

Isabelle Milbert

14.1 Introduction

Cities are now commonly labelled as vulnerable, violent, conflict-prone (Grunewald/Levron 2004) and the list of threats to city dwellers' security is longer every day. Urban insecurity often appears to be linked to economic and social inequalities, gender imbalance, new forms of violence, and political fragility (Wisner 1999; Moser/Rodgers 2005). Environmental disasters are hitting them badly and more frequently (Mitchell 1999; UN/ISDR 2004), not to forget the impact of different types of more pernicious environmental damages in the long term (Satterthwaite 1998).

However, in periods of crisis, cities are also considered by many people as a refuge from drought, floods, or from loss of traditional rural livelihoods. Many environmental hazards result in refugees landing in cities' peripheries and public spaces (see e.g. the role of Kolkata during floods in the Ganges valley). Urban centres often function as safe places in conflicts (Grunewald/Levron 2004). People perceive them as a place where it is at least possible to survive, and where international or national aid is accessible, contrary to remote rural areas.

Therefore, the question is to assess the place of urban centres in the human security debate. Bogardi and Brauch (2005) argued that human security should rest on three conceptual pillars:

- 'freedom from want' by reducing societal vulnerability through poverty eradication programmes (UNDP 1994; CHS 2003);
- 'freedom from hazard impact' by reducing vulnerability and enhancing coping capabilities of societies confronted with natural and human-induced hazards (UNU-EHS 2004); and
- 'freedom from fear' by reducing the probability that hazards may pose a survival dilemma for the people most affected by extreme weather events (UNESCO, HSN) (Brauch 2005: 23).

However, this objective of security is challenged by the extreme vulnerability of a good part (often a majority) of the city's population. The objective of this chapter is to understand how the concepts of security, vulnerability, and resilience interact in the building of public policies, and how some policies aiming at security building may eventually result in endangering even more the most vulnerable population.

This chapter will not cover cities in conflict and their vulnerability to terrorism (Light 2002). It rather concentrates on Indian cities, which appear relatively 'at peace', and on the issues of urban dwellers' security and vulnerability in their interaction with different stakeholders.

The case of India appears particularly heuristic: public policies are democratically elaborated, and security concerns are discussed in a context where no open national or international conflict is declared. The magnitude of the urban poverty issue is certainly a specific character of Indian cities, where 20 to 50 per cent of the population lives in slums (Kundu 2006; Baud/Dhanalakshmi 2007), and where problems related to gangs, violence, and personal safety develop distinctly from Latin American or African cities (Rodgers 2004a).

14.2 The Essential Vulnerability of the Indian Urban Space

Is it possible to define Indian urban centres and population as vulnerable? Nathan (chap. 87) points to the dual characteristics of vulnerability:

on the one side, (...) a tendency to undergo damages, i.e. a state of fragility, or a set of conditions, that raise the susceptibility of a community to the impact of a damaging phenomenon. On the other side, vulnerability is an incapacity to anticipate, cope with, resist to, adapt to and recover from hazards. Vulnerable units are either not resistant, i.e. not capable to withstand the shock (without adapting); and/or not resilient, i.e. not capable

to absorb the shock and adapt to come back to an acceptable state.

Only 27.8 per cent of the total population of India lives in cities (Census of India, 2001). Some of them are among the largest metropolises in the world, in particular Mumbai (16.3 million), Kolkata (13.2 million), and Delhi (12.8 million). In 2001, 36 cities had more than one million inhabitants. From 1991 to 2001, the decennial growth of Bangalore was 37.7 per cent. Delhi grew by 52 per cent, and Surat (2.8 million) registered the highest growth with 85 per cent during the same period of time. 6 to 7 million persons are added annually to the urban population.

A close look at statistics and city environmental situation is disquieting: for instance, 70 per cent of Greater Mumbai area is flood prone, and 75 per cent of the population live in these neighbourhoods (Kapoor 2005: 97). Also these cities appear increasingly vulnerable to industrial and natural disasters, as demonstrated in the industrial disaster in Bhopal (1983), the Ahmedabad earthquake (2001), the tsunami in Chennai (January 2005), and the Mumbai floods (July 2005). A city like Jamnagar in Gujarat, which is a prosperous centre surrounded by petrochemical industry, still has more than 40 per cent of its population living below the poverty line. These cities combine multiple vulnerabilities. Gujarat had barely overcome a drought in 1995 when it was hit by a cyclone in 1998, followed by the earthquake in 2001, and the Hindu - Muslim riots in 2002 (Kapoor 2005: 25).

Risk and vulnerability structure and organize the fragmentation of Indian cities. Safe areas, generally speaking, are bought and built by the organized sector, in line with municipal rules. A number of areas considered as environmentally unsafe, which are not allowed construction, are actually appropriated, and built on by the informal sector. Therefore, to ensure environmental security in informal areas can often be considered as a lost battle. And to wish to rehouse the low income population in safer zones does not correspond to the actual pressures on land and speculation. There is a constant risk that poor urban dwellers would be pushed away, year after year, towards peripheral, ill-serviced and marginal areas (see the debate on Delhi in Dupont/Ramanathan 2007). The cumulative characteristics of vulnerability defined by Nathan (chap. 87 below) become evident: people build slums because of their socio-economical weakness, which prevents them from accessing the formal market; most slums are built on areas with a physical drawback (flood prone, steep slope, under electric wires, along railway lines or highways...), making them

incapable to mitigate a risk or to recover from the impact of a hazard. Their organizational, political, and legal vulnerability is also intrinsically linked to their informal (and thus illegal) status. Technical vulnerability results from the impossibility of using most knowledge or techniques, for financial or political reasons. Psychological, cultural, and organizational vulnerability creates inadequate security paradigms.

Human exposure to anthropogenic and natural hazards is strongly correlated to the economic and social status of the considered urban population. The environmental fragility of many cities is actually quite distinct from one neighbourhood to the other. In some parts of the city, which are well built according to the security standards and rules, a disaster will provoke only financial and material losses. While in the poor areas, a disaster provokes many fatalities, many injured, and the loss of non-insured livelihood assets which are huge if compared to people's earnings, and are not even measurable. The incidence of disasters on city dwellers therefore depends on their socio-economic status, which conditions their neighbourhood, their habitat quality, and their relationship to power. In India, the tendency has been to concentrate investment and management efforts on those parts of the cities which are obviously engines of modernity and economic growth.

Numerous studies have demonstrated the vulnerability of slum dwellers, in terms of exposure to communicable diseases, malnutrition, waterborne diseases, mental health (Parkar/Fernandes/Weiss 2003), and exposure to environmental hazards (Lavigne/Milbert 1983). The informal settlements made of recycled material has been often described (Saglio-Yatzimirsky 2002) and the innovative methodology of mapping lack of services and informal land use has enabled to draw a "mapping of poverty" (Baud/Pfeffer/Sridharan/Nainan 2007). However, much information on the most vulnerable is still missing, concerning for instance, street children or women.

14.3 Security Policies and Human Vulnerability in the Urban Space

Security can be considered as a common good (Gabbas/Hugon 2001). To grant security to all citizens of the national territory is the main justification of the state. This applies to the Westphalian state, and the traditional definition of security, but also to the 'welfare state' and to the very wide definition of human

security elaborated in the Human Development Report (UNDP 1994).

The coordination and implementation of public policies should counter individual vulnerability and facilitate the combination of different factors contributing to improved security. Their long-term purpose is, in theory, to ensure the achievement of this essential common good. This could be achieved through the definition of socio-economic rights, through the implementation of law and order, and eventually through social, economic and urban policies, contributing to the emergence of a welfare state. In developing countries, the failure to build a welfare state has undermined the state as the guarantor of security and strengthened other stakeholders, especially international organizations, municipal bodies, and social movements.

To overcome fragmentation which has placed some urban neighbourhoods on Western standards while others are more vulnerable than even remote rural areas, some authors have focused on vulnerability assessments at the local scale thorough the use of specific indicators aiming at measuring vulnerability at the community scale. For instance, Hahn (2003) suggested several indicators to assess the four types of vulnerability factors proposed by UN/ISDR at the municipal level: physical and demographic as well as social, economic, and environmental vulnerability (Villagran de Leon 2006: 44).

A number of measures have also been proposed to assess the vulnerabilities of cities and neighbourhoods, such as physical vulnerability, using a combination of indicators related to the state of houses, geomorphology, and services. Using census data and GIS systems permits to map and compare communities inside the same geographical region, and even to map some specific components of vulnerability, such as poverty.

14.4 Differential Approaches to Urban Vulnerability and Search for Security

Indian cities are confronted with multiple specific vulnerabilities, or a 'cumulative vulnerability', in the social, physical, infrastructural, and political field. City dwellers are extremely conscious of the difference set by A. Lavell (2004) between two levels of vulnerability: exceptional vulnerability associated with exceptional events, and everyday vulnerability associated with permanent conditions of poor people (health problems, malnutrition, unemployment, income defi-

cits, illiteracy, social and domestic violence, alcoholism, etc...) which limit their development. In urban India, the main problem is that everyday vulnerability is so great and varied, and the social risks faced by most urban dwellers are so numerous and crucial, that there is little social demand for tackling the industrial and natural hazards. Technically measurable risks related to infrastructure, and industrial and natural hazards are considered as a second priority by the population.

14.4.1 Vulnerability, Security and Infrastructure

High population density and the low quality and unequal distribution of infrastructure services are direct causes for many disasters, whether 'low intensity disasters' (cholera, dengue fever...), or brutal eruptions (plague in Surat, floods in Mumbai).

Data on water and sanitation services indicate considerable state-wide variations in Indian cities. There is a strong negative correlation between access to piped water and sanitation, and the state per capita income. For instance, private water taps are available to less than one third of the urban population in Kerala, Bihar, and Orissa. In Bihar and Madhya Pradesh, more than 45 per cent of the urban population has no access to any type of latrine, while this is the case for 15 per cent of the population in Maharashtra (Zerah 2007: 130-131). Sewerage is virtually non existent in Bihar, Madhya Pradesh, Orissa, and Assam (in the North-East and among the poorest and the least urbanized states). The most urbanized and richest states fare better but are still under 50 per cent of serviced dwellings, and the national average is only 22.5 per cent (Zerah 2007: 132). The level of basic amenities decreases with the size of urban agglomerations.

Though there are important improvements in basic amenities such as electricity, water supply, road paving and access to telecom services, the quality of many of them has been declining: "increasing coverage in infrastructure [that] is not matched by improvement in the service level." (Savage/Dasgupta 2007: 50). 90 per cent of the urban water supplied is polluted (CPCB 2000). "Of the total wastewater generated in the metropolitan cities, barely 30% is treated before disposal. Untreated water finds its way into water systems such as rivers, lakes, groundwater and coastal waters" (3iNetwork 2007: 209). Only 72 per cent of solid waste generated by urban areas are collected daily, which leads to increased pollution in public spaces (CPCB 2000).

Infrastructure hazards are concentrated at the interface between the formal and informal part of metropolises. Illegal electricity connections create a high risk, since they are prone to fall on the slum huts connected to them. Water delivery by trucks or even by individual vendors is a common sight in cities such as Chennai, especially in the peripheries. Not only is this water service very expensive (around 10 times costlier than tap water), it also increases the contamination hazard. The health hazard increases even more when a number of slum dwellers end up digging the soil in order to draw their own water with hand pumps. In Delhi, these hand pumps are often distributed as a reward during election campaigns, without any consideration of the fact that groundwater in the city is highly polluted.

Slum dwellers are extremely conscious of the risk involved in utilizing this deficient infrastructure, and they know how much and which way it impacts negatively on their health. But they have no alternative for a living place enabling them to have access to the work market (Milbert 2006).

One of the main infrastructure threats to security in India is linked to road management and traffic, and it is one of the least mentioned by population and officials. In India, the total number of road accidents has gone up significantly from 114,000 in 1970 to 394,000 in 2001 and fatalities have risen from 14,500 to 80,000 per year. The 7 largest metropolitan cities in India (Mumbai, Kolkata, Delhi, Ahmedabad, Bangalore, Hyderabad and Chennai), representing 6.5 per cent of the Indian population, witnessed 16.9 per cent of the total accidents in 2001, 6 per cent of the fatalities and 8.9 per cent of all injuries (Valli 2005: 59). A recent World Bank study shows that the greatest percentage increase in traffic deaths between 2000 and 2020 will occur in South Asia (144 per cent increase), while traffic deaths should decline by around 30 per cent in high income countries¹ (Kopits/Cropper 2003: 30).

14.4.2 Vulnerability and Industrial Activities

The *Union Carbide India Limited* (UCIL) pesticide plant accident in Bhopal in December 1984 has become a symbol of the inefficiency of these regulations, of the collusion of the public and private stake-

holders in relation to risk management, and of the accumulation of carelessness leading to disaster. The decline of the security budget of the plant contributed to the lack of maintenance and workers' security within the premises. Subsequent litigation has shown the superficial character of security controls, combined with the shortcomings of the plant management itself. Public authorities did not properly implement the regulations on industrial pollution controls.²

Officially, 7,000 people died in the following days. Over the last 20 years at least 15,000 more people have died from illnesses related to the gas exposure. Today more than 100,000 people continue to suffer chronic and debilitating illnesses for which treatment is largely ineffective. Again, the victims are the slum dwellers who had built their huts close to the factory, thus forming a large slum around the plant. These neighbouring residents had repeatedly complained that they were suffering from gas leakages, but public authorities had ignored the claims by people who were squatting on the land. Subsequently, after the disaster took place,

the payment of compensation to victims did not ... begin until 1992 and involved numerous problems, including payment of inadequate sums, delayed payments, arbitrary rejection or downgrading of claims. ... The social and economic rehabilitation measures have been poorly implemented and have failed to lessen the impoverishment of already economically vulnerable survivors. Those orphaned and widowed by the gas leak are in a particularly precarious condition.³

India has also developed some particularly hazardous activities. For instance, it is one of the major countries in the ship-breaking industry. It is estimated that this activity produces around 4000 tons of solid and hazardous wastes per annum, which are disposed of on seashores (3iNetwork 2007: 220).

Many Western engineers still complain of the disrespect for security rules and the disinterest for security, comforted by strict hierarchies implying lack of concern for the lowest categories of personnel, even

1 These results are displayed according to the World Bank regional classifications. The global estimate of road traffic fatalities in 2000 is 723,439 (Kopits/Cropper 2003: 35).

2 For background information see: "What happened in Bhopal?", in: *The Bhopal Medical Appeal and Sambhavana Trust*, at: <<http://www.bhopal.org/whathappened.html>>; and the official view of Union Carbide: "Bhopal Information Center"; at: <<http://www.bhopal.com/>>.

3 Amnesty International, ASA 20/005/2005, "Union Carbide Corporation (UCC), DOW Chemicals and the Bhopal Communities in India - The case" (21 January 2005); at: <<http://www.amnesty.org/en/report/info/ASA20/005/2005>>: 2 (1 April 2006).

in the most modern industrial complexes. However, the Bhopal-type disaster has not occurred again. In recent years, experts have noted a change in the social control of accidents in the corporate sector. It seems that safety is becoming an official objective and an indicator of good management, in the same way as the respect of costs, time, and quality. Especially in large building sites, the biggest developers in the construction industry are now getting organized, moving towards a better attention given to the safety of workers on building sites and roads.⁴

Several laws⁵ and urban planning regulations have been formulated to protect the population against hazardous industries. However, their implementation has been lacking. First, as underlined by Lagadec (1981: 578), “law is posterior to events” in the field of industrial risk management. The expert knowledge is neither transmitted to the political level nor to the municipal level, where the implementation is due to take place. Therefore, the authorities in charge of implementing the law are not aware of the implications of changing the practices, and many regulations remain unimplemented.

A second point is the lack of information on these regulations, in particular information for the population. This applies even more to people working in the informal sector. Information is not disseminated, neither on safety regulations (which would be costly to respect), nor on the threats (to avoid a panic among the population). In the immediate periphery of chemical industrial complexes (for instance, in the peri-urban area of Mumbai), toxic fuels run down the lanes where children are playing, between two rows of barracks, dwellings, and informal workshops. In many industries such as the coir industry, toxic products are manipulated with bare hands. In March 2006, in one of Mumbai’s most exclusive locations (Breach Candy), some street vendors were pictured selling fruit and vegetable from containers which had been used for thorium storage. The combination of indifference to security, maintenance, and the persistence of informal sector practices still provokes incredible deficiencies in the security chain.

An education on industrial risks has a cost and necessitates a political impulse, an involvement of the private sector and mediators such as NGOs. “Population cannot be educated through the promulgation of legal regulations, but only through concrete examples” (Lagadec 1981: 588).

14.4.3 Risks Related to Natural Hazards

Indian cities are extremely fragile environmentally: floods in Mumbai and Kolkata, drought in Delhi, tsunami in Chennai, and earthquake in Ahmedabad are but a few recent examples. The natural hazards impact is considerably aggravated by the lack of preparedness of city management and by the fact that they are additional risks.

For instance, in July 2005, heavy rain in Mumbai combined with the very fragile topography of the city⁶ and with the mishandling of tons of solid waste, provoked the flooding of the Mithi River and cut off all major communications within hours. About 6.5 million commuters were trapped in the southern part of the city. Many lives were saved thanks to the courage and solidarity of ordinary citizens. Power was not restored for several days (up to two weeks in some areas). During the first four days after the flood, very few police officers or civic employees were seen in the major flooded areas (Whitehead 2005: 18). Mumbai planners then discovered that they did not even have an evacuation plan, in a city where some neighbourhoods have the highest density in the world. The management of sewer and storm water drainage remains poor. In March 2006, nine months after the disaster, practical prevention measures were still at a preliminary stage. Contrary to municipal regulations, lorries were still using the banks of the river for unloading construction waste, thus contributing to water clogging.

The aggravation of the consequences of floods, landslides, and earthquakes is directly related to the way the urban territory is appropriated by the poorest. Population density, urban growth, and informal buildings have a direct impact on the physical vulnerability and on the ecological niche. Squatters ‘take the risk’ of building on flood-prone land (Mumbai, Kolkata), for the same reasons as they do on sloping areas in La Paz, Quito or Rio de Janeiro. Many huts are built in high risk-prone areas such as roadsides or rail-

4 Interview of Professor Koshi Varghese, IITM, Chennai, January 25TH, 2006

5 See in particular the Dangerous Machines (Regulation) Act, 1983, the Environment (Protection) Act, 1986, the Air (Prevention and Control of Pollution) Amendment Act, 1987, the Central Industrial Security Force (Amendment and Validation) Act, 1999, the Disaster Management Act, 2005.

6 Mumbai is built on reclaimed land as the site was originally made of 7 distinct islands.

way lines (Mumbai), engendering terrible accidents where many lives are lost.

If a neighbourhood is officially labelled as risk-prone, this reinforces the risk that the authorities may destroy the dwellings and clear the area at any moment. It is not sure that the affected families will be relocated, since they often cannot prove how long they have lived there, they belong to the informal sector and have built their houses without permit. “Environmental solutions being offered have an inherent anti-poor bias” (Kabra 2000: 82). Therefore, urban dwellers living in dangerous areas remain quiet and avoid complaining about the degradation of their environment, because they have integrated the official point of view that they have no right to be there.⁷

14.4.4 Overwhelming Social Vulnerability

Social and economic vulnerabilities are so evident and immediate for low income city dwellers that it minimizes the perceptions of other types of vulnerability. Poverty and insecure employment come first, and give way to impressive inequalities inside city boundaries. These inequalities are translated in space by the presence of squatter settlements and slums. In Mumbai, around 50 per cent of the population now live in slums (Landy 2007). The fact that their municipal authorities have launched large programmes of slum destruction only adds to the precarious state of these inhabitants (Milbert 2006).

Unemployment is the biggest risk. The informal sector enables millions of people, especially the youth, to find work in the context of the limited recruitment by the organized sector. In the light of adverse social conditions and in the absence of state provisions, the informal sector can devise *coping strategies* in order to survive, which are based within the family, the community, and social networks (Green 2005: 72; Lautier 2000). The growth of the informal sector may be regarded as a way out of the misery (Milbert 2002), but it keeps people in an insecure livelihood with low salaries, uncertainty of work and competition, and it keeps them out of the formal political negotiating tables. Thus “their needs and liveli-

hood constraints are not taken into consideration when city policies are made” (IFRCRCS 2004: 150). The weight of the informal sector explains partly the uncontrolled drifting of many public policies at the stage of implementation.

Interpersonal violence figures are well below the Latin American figures, which are plagued by statistics on crime, drug trafficking, and gangs (Rodgers 2004b). The Indian statistics on urban violence have been depending in the past on other variables such as ethnic and communal (inter-religious) violence. According to Varshney (2002), differences in ethnic violence between Indian cities, their brutal eruption followed by years of relative peace explains that urban homicide rates in South Asia may vary widely in time and space (see Mumbai after the 1991–1992 riots, Ahmedabad after the 2002 riots). The perception of these vulnerabilities may be on the way to change in Indian metropolises. For a long time, crime and delinquency, which have become crucial socio-political issues in European and Latin American cities, were not perceived as such in Indian cities, where traditional solidarity is still very present. However, a number of categories see their vulnerability increase considerably when they are no more in a position to rely on their village, caste or family ties.

A growing concern for interpersonal violence and criminality is empirically observed, whether in rich or poor areas. It leads to new housing strategies, like gating and guarding (Thieme 2006) in the middle class, while the poor are much more helpless in the face of a rise of interpersonal violence. Night assaults, women and children trafficking, and numerous cases of women molested are reported, in particular in Northern Indian cities. The responsibility or complicity of some individuals belonging to the police has sometimes led to court cases. Among the most vulnerable to these forms of violence are those living with a physical or mental handicap (Parkar/Fernandes/Weiss 2003).

To develop policies supporting human security in such a context represents the most difficult challenge. It would imply a global societal vision, a perfectly efficient planning, a faultless management and an inclusive approach, going beyond traditional social cleavages. In front of deficiencies, some stakeholders are tempted to create gated communities, or privately organized walled cities eliminating the informal sector, its vulnerabilities and risks. This option is considered by many as a non democratic temptation, but is developing rapidly in the periphery of large cities.

7 In other places where the right to shelter is more recognized, such as in Peru or Bolivia, urban dwellers whose houses are at immediate risk also tend to hide it, since exposing it to the public would provoke an immediate fall in their house value, and second because they also might be expelled from their house by the municipality in the name of security (Milbert/Nathan 2005: 12).

Eventually, people fear less natural or man-made, infrastructural or industrial disasters, which are an exceptional event than risks related to livelihoods, social cohesion and essential needs, which are daily risks and concern all family members. In case of disaster, there is hope that the community (local, national, international) might react in a solidarity move, while the management of the 'ordinary' daily vulnerability (access to food, to shelter) has to be coped with in solitude, and often with disdain from the rest of city dwellers. For instance, after the December 2004 tsunami, some NGOs in Chennai were establishing a distinction between the refugees, victims of the tsunami, entitled to aid, food and shelter, and the 'ordinary poor' who tried to access the relief centres.

14.5 The Governance Dimension of the Security Challenge

Globalization is accompanied by a deep transformation of the modalities of power exercise (Milbert 2007), through fragmentation of decision-making, negotiations with stakeholders, cooperative action, and multiplying networks of formal and informal actors (Commission on Global Governance 1995: 4). The question is to know if these new modalities, described under the concept of governance, and apparently improving communication between technical, political and citizens' networks, are favourable to the building of human security.

The Indian political framework has followed the same evolution towards governance. Security matters are still very much at the core of the central government's functions as far as international security, and innovative legislation and regulations are concerned. However, states are also prime stakeholders in legislating and implementing regulations, and decentralization has put a lot of responsibilities in the hands of municipal bodies. International stakeholders are playing an important role in the dissemination of norms and techniques, in coordination with a multitude of new stakeholders such as researchers, consultants and NGOs, all linked together by a number of informal channels. The corporate sector, in relation with these think tanks, is also participating in the elaboration of new internal security rules. Examining governance issues implies to take into consideration some newcomers who are most often quoted as bearers of progress, before looking at the evolution of the implementation of public policies.

14.5.1 International Cooperation and Urban Security

International cooperation agencies have been extremely cautious in their involvement in the urban sector, especially after the Habitat II UN Conference in 1996. The necessity of huge investments, the complexity of urban problems, and the weak visibility of the results are certainly part of the explanation. The Development Banks (World Bank, Asian Development Bank, and Inter American Development Bank) have launched the most important urban projects (Milbert 1999), and to this day they are the most important fund providers in the struggle against urban poverty, including in the field of slum rehabilitation, infrastructure for the poor, and urban and rural employment programmes.

Setting up norms is considered as one of the core tasks of these international bodies. These norms, which would be valid anywhere in the world, are considered as a key element of urban management and of the construction of risk mitigation and resilience. They rely on high level technical expertise and renowned examples, are made easily accessible and widely disseminated (Milbert/Nathan 2005: 15). They propose a number of principles in relation with infrastructure, industrial techniques, land use, pollution, housing construction, and also in the field of inter-institutional coordination and people's participation (see e.g. the Cities Alliance frameworks). Including in the field of human security and social vulnerability in slums, they have brought ideas for strategies to implement recommendations of the IFRC-RCS (2004: 157): "understand what slum dwellers perceive as disasters; explore barriers that constrain people from coping; link measures supporting resilience to income generation; improve relations between municipalities and slum dwellers."

However, these norms that have been adopted internationally often appear unrealistic as they ignore the structure of power and they do not take into account the importance of the informal sector, developing out of the scope of national and international regulations. When most of a city is built without building permits and on non-constructible land, it is nearly impossible to have international norms being implemented.

Most bilateral and UN agencies have shown immediate concern with the theme of disaster mitigation and prevention. The international organizations' preoccupation for these themes is understandable: a number of disasters are naturally falling under their

competence since they ignore borders, whether we consider their origin, their scope or their impact. UNCHS, UNDP, UN/ISDR, WHO, ICRC, and the World Bank and many others (Milbert/Nathan 2005) have developed information systems, planning methods, prevention strategies, and intervention strategies. UNOPS and CRID are good examples of international institutions aiming at developing sophisticated technological tools of simple use, enabling the concerned stakeholders such as municipal authorities to use them in order to build their own interventions.

A lot of international funding has concentrated on disaster management, post-disaster reconstruction and disaster prevention. This introduces several biases. It focuses attention on 'internationally visible' disasters, while thousands of 'small' disasters remain 'silent' and 'slow' (see for instance malaria or lung diseases in Indian cities) and 'local', depending on the number of fatalities and the media coverage: for instance, an encephalitis epidemic is not going to be discussed in the same way in a tourist spot or in a remote area. Also, it seems that some authorities and sometimes even slum dwellers have been relying on the potential of international aid if the risk was to materialize in disasters. Thus the threat perception among the population diminishes, encouraging old habits of neglecting environmental hazards and staying on in an informal habitat in risk prone areas.

14.5.2 The New Role of Decentralized Stakeholders

Since the 19th century, Indian urban local bodies have found themselves in an awkward position: in some cases, they have been only a relay in a vertical political, and administrative hierarchy (see for instance the numerous years without municipal elections in Uttar Pradesh), while in some others, local democracy has functioned (see the case of Kerala, West Bengal or Mumbai). The 74th Constitutional Amendment (1992) aimed at strengthening urban local bodies. It restored democracy and local finance, and transferred to them a number of functions directly related to human security. However, there has been no uniformity in the devolution of functions to urban local bodies across the different states of India, and this is particularly true in the case of urban poverty alleviation. For instance, in Gujarat, the institutions dealing with urban poverty remain dispersed in a number of state-level departments. This lack of clarity is quite detrimental to the efficiency on the field.

Decentralization of responsibilities without adequate financial support and capacity building can also be an additional cause of vulnerability. Many Indian municipal bodies, including fast-growing municipalities, find themselves today in a situation where some of the devolved functions are difficult to implement, for lack of professionally trained staff (see Wisner 2001: 264).⁸ From one city to another, the approach to the management of squatter and slum areas varies widely.

In the contemporary context of decentralization and multiplication of stakeholders in city management (Le Galès 1995), the responsibility and proximity of urban local bodies to city dwellers would imply that they guarantee action, information, and participation at all moments, including during a crisis. However, research conducted in India (Kapoor 2005: 221) demonstrates how deep the mistrust of city dwellers is towards state and municipal authorities as far as security building and risk management is concerned. Numerous testimonies have shown how these institutions proved inefficient and unconcerned in the 1994 Surat plague crisis (Shah 1997) as well as during the August 2005 Mumbai floods. "The urban municipal bodies (...) are cash trapped and riddled with political interference" (Kabra 2000: 82).

Decentralization policies have eventually created considerable differences between cities and have reinforced the role of individuals. In the case of Surat (Gujarat), the plague epidemic in 1994 came as a symbolic and practical consequence of years of mismanagement of the sanitation system. Shah (1997: 610) described a city "plagued" by a chronically sick, corrupt and disinterested administration, which demonstrated its incapacity including at the moment the epidemic broke out. But this crisis worked as a catalyst. Under the leadership of a new municipal commissioner, a number of measures were taken: road widening schemes were initiated, as well as improvements in sanitation, slum rehabilitation, and paving. Toilets were installed and garbage collection doubled. Efforts are being made to address public hygiene, and the population has been active in maintaining their neighbourhoods clean. In the aftermath of the plague, Surat gained the status of the second cleanest city in In-

8 Wisner shows that in the case of the 2001 El Salvador earthquake, only a handful of the country's 264 municipal governments had any professionally trained staff, and that the national government had no wish at all to support municipalities where opposition parties were very strong.

dia. We formulate the hypothesis that there is a link between this last point and the following: Surat is today one of the fastest growing cities in India, economically and demographically.

In times of crisis, local powers are certainly a unique focus of social relations, but they are often marginalized in terms of information, crisis management, and funding. Their duty is to inform, to comfort, and to mobilize a population which can be at the same time apathetic or overreacting, and which is often ridden by divisions and mutual distrust. They should not hide the reality of the risk, but they cannot throw the population into panic.

It is extremely difficult to implement a risk mitigation process in urban agglomerations which have very limited budgets, where mayors and municipal commissioners have short mandates, and where the municipal administration lacks the required technical competence. Thouret and d'Ercole (1996) have shown how disaster strikes harder, with maximum damage, when power shows lack of concern and irresponsibility, leading to a lack of information and preparedness by the population.

14.5.3 Issues Around Social Movements, NGOs, and Popular Participation

There is a consensus that local stakeholders, NGOs, and municipalities should be involved in programmes to reduce different types of risk, and that they should be associated with decision-makers at all levels (Pelling 2003a: 84; chap. 13 by Wisner/Uitto). In Latin America, social movements and NGOs play a crucial role in facilitating access to security for the low-income urban dwellers, for instance in helping them secure access to land security, as was the case in Villa El Salvador in Peru, for instance. But in the case of Indian cities, the needs are so important and numerous, and issues are so complex, that these institutions can play an efficient and visible role on the field only if they come to complement existing policies and funding. For instance, a number of NGOs have specialized in channelling specific public programmes (health, education, livelihoods, minorities, disaster prevention...) to the targeted beneficiaries, who otherwise would not be informed. Another responsibility is located upstream, for instance to inform and document the human security gaps in the slums. A third role is advocacy, using a number of new legal tools (public interest litigation, right to information) enabling representatives of social movements to appeal to the authorities to take a political stand on these issues.

Most disasters, like the Mumbai floods in August 2005, demonstrate the immediate response of traditional mutual help networks, in contrast with the lack of preparedness of the municipal authorities. However, India does not have the technical and financial backing which enables Japanese authorities to combine these self-help traditions, coordinated by neighbourhood assemblies, with huge investment programmes in security systems. In India, the informal character of most of the buildings and activities, and the clientelist relationship between local politicians and city dwellers impede many measures of prevention that would contribute to human security, leading to this statement: "The sheer magnitude of urban risk which combines inadequate infrastructure, poor water and sanitation, pollution, deforestation, high population density, recurrent natural hazards, fragile livelihoods and weak governance - means that the responsibility of building resilience to risk cannot be left to either at risk communities or municipalities alone" (IFRC-RCS 2004: 154).

14.5.4 The Implementation of Public Policies

Indian cities are therefore in a situation where a great number of poverty-related, infrastructure and environmental risks are well assessed, and even in some cases disasters would be predictable, while most authorities have still to establish the chain of public policies related to this reality. Anti-poverty measures are also identified at the national and international level, but at the local level implementing them constitutes a challenge to the social order for local elites. Also, many authorities fear that pro-poor policies might encourage more migration from rural areas and from poverty-ridden states such as Bihar, and they hope that slums would constitute a repellent to further migration.

Security is not a given factor: it is also enhanced through power games existing between different urban stakeholders, those who benefit from transformations and those who bear the consequences of degradation (Mackinnon 1999: 47). In a chapter on "Urban Governance - Agent of Disaster", the *World Disaster Report 2004* recalls that "poor governance keeps slum dwellers vulnerable, because it denies them access to the kind of support, such as credit or basic services, that they need to help enhance their resilience to risks" (IFRC-RCS 2004: 150).

For instance, slum rehabilitation is a well-known method of improving livelihoods of slum dwellers and reintegrating them into the economic urban flow. But

this would mean selling the land (public or private) on which slums are installed, without taking into account the speculative price they might reach. Therefore, in many cities, authorities prefer to clear slums and install new upper middle class housing and offices. In these cases of clearance, only a minority of slum dwellers are entitled to relocation, taking into account Indian complex rules and standards. Some buildings under construction in the periphery of Mumbai (Mankhurd) which are meant to provide for future relocation will undoubtedly create new, unforeseen social and economic problems.

Thus, public policies may constitute a direct blow to human security, and directly cause disaster for tens of thousands of the poorest urban dwellers. In Delhi and Mumbai, large-scale clearance operations took place since 2000; 90,000 dwellings were destroyed and 450,000 people made homeless within six months in Mumbai during 2005 (Bunsha 2005). Brutal, overnight evictions provoke the destruction of all their belongings for populations among the most vulnerable, as well as the loss of their livelihoods and their social life, not to speak of public health and the right to shelter issues.

The main problem for slum dwellers is that they cumulate all vulnerabilities and remain with a very small number of assets, while the urban environment is itself at risk, until the point when disaster is bound to strike. Many public policies have been adding to this vulnerability, through slum clearance, nonrecognition of the informal sector, and marginalization in polluted areas. Although, from the political point of view, this slum population is often active, the persistence of these situations raises the issue of their social and economic rights as citizens. They can also be considered as extremely resilient socially, since these appalling economic and environmental life conditions have not led to the development of more violence.

However, if asked, Indian authorities would reaffirm their constant concern for a number of elements constitutive of human security. They have tried to better target the very poorest, and to provide more social welfare in the rural areas, considering that both rural and urban policies are intrinsically linked. For instance, original and very large-scale public policies have been elaborated to avoid food shortages. They are quite widespread and much appreciated also in cities (Landy 2007). Also, requests for security are often understood by authorities in terms of 'fight against anti-social elements'. It remains that the informal neighbourhoods of cities have not yet been prioritized.

After many years where most slums were not taken into consideration by town planners, the Master Plan 2015 of Bangalore identified "shadow areas", defined as areas that have accumulated shortages with regard to the physical and social infrastructure. These areas were identified through a mix of several available indicators: lack of supply of water, insufficiency of schools and teachers, prevalence of slums... The results showed that the majority of the peripheral areas and about one third of the area under the jurisdiction of the Bangalore Municipal Corporation could be considered "shadow areas" (3iNetwork 2007: 66).

Although many programmes were officially geared at slum dwellers (water, sanitation, women's education), they could never overcome the gap between organized and informal settlements. To this day, 90 per cent of India's land titles are weak (3iNetwork 2007: 63). Now a new challenge started with the launching at the national level of the *Jawaharlal Nehru National Urban Renewal Mission* (JNNURM), created in 2005, which explicitly prioritizes infrastructure investments in favour of the poor urban population, and creates new methodologies of implementing policies in contractual agreement with the states and urban local bodies.

14.6 Conclusion

Indian cities and urban dwellers, even in a context of rapid economic growth, remain vulnerable to industrial, infrastructural, natural and social risks. So far, public policies have not been able to bridge the gap between a relatively well-protected organized sector and informal sector workers who are cumulating vulnerabilities. This is translated in physical terms in Indian cities, which today are getting increasingly fragmented spatially, along the lines of their social, economic and environmental vulnerability.

Several Indian cities, such as Mumbai, Kolkata, Delhi, Chennai, Bangalore and Hyderabad now rank among the largest and most dynamic urban centres in the world. But security in all its senses has become a key element in the fierce international competition for foreign investment and industries location. Therefore, while these cities belong to the network of the global economy (Taylor 2004: 30), they still remain at its periphery. Shortage of services, environmental threats, and the persistence of urban poverty have an impact on development dynamics and social cohesion. They are now becoming priorities of the central government, in close relation with states and urban local bodies.

15 Interactions between Conflict and Natural Hazards: Swords, Ploughshares, Earthquakes, Floods and Storms

Ben Wisner

15.1 Introduction: Violent Conflict and Natural Hazards: Definitions and Approaches

There are many ways violent conflict complicates, confuses, and obstructs the efforts of planners, engineers, and others to assist people in protecting themselves, their livelihoods, and their built environments from natural hazards. For example, civil war and the so-called 'war on drugs' in Colombia have displaced more than a million rural people, who have sought a more secure existence on the edges of large cities such as Bogota.¹ This influx of unemployed, poor people into highly dangerous locations where they squat in self-built houses in steep ravines, adds a great deal to the challenge faced by emergency management planners. Although some very important innovations in earthquake and landslide preparedness and mitigation have come out of Colombia in the past decade,² the sheer numbers of people displaced by violence threatens to overwhelm efforts to implement such innovative designs and programmes.

Beginning in the 1990's application of knowledge that could prevent loss from natural hazards was frequently blocked, deflected, diluted by violent conflict and its aftermath. A year after the tragic tsunami that affected Sri Lanka and ten other countries, the Tamil Tigers and the Sri Lanka government had still not concluded an arrangement for sharing relief and recovery assistance.³ Thus, as ambitious as it might seem, a dialogue needs to be fostered between the disciplines of peace research and disaster research for the benefit of both sides.⁴

Peace research and disaster research have similar and, at some times, overlapping histories. Briefly, peace research began as a discipline in the 1970's in part out of dissatisfaction with 'realist' approaches to international relations that take the necessity of war or the threat of war for granted in international relations. Instead, peace research drew on a venerable, centuries-long tradition of concerns with social justice and non-violent conflict mediation to produce a positive notion of peace.⁵ It sought the root causes of war and other forms of violent conflict in what are con-

1 Two million people have become internally displaced in Colombia since 1985; 300,000 alone in 2000. Rural health services have been destroyed. In urban areas these displaced persons live in very dangerous places. This is a recipe for increasing exposure to flood, landslide, earthquake, and epidemic disease. See: Médecins Sans Frontières 2001. *The Top Ten under Reported Humanitarian Crises of 2001*; at: <www.msf.org/content/page.cfm?articleid=7B5D6023-75EA-415A-80CC71C8E6B90DCF>. In addition, the majority of the displaced in Colombia are children, Afro-Colombians, and poor women. Only 20 per cent of these internally displaced persons have received any aid from the Colombian state, and even that has been 'minimal and short term' (A. Lopez, "Talking Sense on Colombia", American Friends Service Committee, Philadelphia, September, 2001; at: <<http://www.afsc.org>>: 7).

2 Wilches-Chaux, G./Wilches-Chaux, S., 2001. *¡Ni de Riesgos!* (Bogotá, Colombia: Fondo Para la Reconstrucción y Desarrollo de Eje Cafetero); at: <<http://www.ejecafetero.gov.co>>; Omar Dario Cardona, "Low cost, locally based repair and retrofitting of non-engineered, rural structures" [in Spanish] (Bogota, Colombia: University of Los Andes); at: <http://www.radixonline.org/knowningvsdoing2htm#>.

3 BBC News, "Sri Lanka suspends tsunami deal", 15 July 2005; at: <http://news.bbc.co.uk/1/hi/world/south_asia/4685291.stm>.

4 Other specialists are taking up the daunting subject of war and peace, for example, in the context of public health: Krug/Dahlberg/Mercy/Zwi/Lozano (2002); Murray/King/Lopez/Tomijima/Krug (2002); Cahill (1999); Wisner/Adams (2003); and in the field of food security Cuny/Hill (1999); Macrae/Zwi (1994).

ventionally considered 'normal' economic and political power relations.

Peace research approached a definition of violence and conflict from a broad perspective. Drawing from this research tradition, the analysis that follows treats several manifestations of violence:

- *Organized activity intended to kill or harm others.* Only one-to-one, interpersonal violence is excluded from the analysis that follows, although strictly speaking even domestic violence has been shown to be correlated with natural disaster occurrences.⁶ Organized violence takes the form not only of state vs. state war but increasingly as the activity of war lords, urban gangs, and mobs.
- *Use of the threat of violence to displace or coerce others.* In situations where rural or urban people live in fear of organized violence, they may be forced to forfeit their assets and leave their homes. Even when they remain, their behaviour may be constrained and coerced.
- *In addition, in peace research Galtung (1967, 1968) introduced the concept of 'structural violence'.* This describes entire economic, social, and political systems whose normal functioning produces and reproduces hunger, ill health, and premature death primarily via the structural maintenance of inequalities and inequities. More generally, these 'structures' deny people the ability to exercise their capacities.⁷ This is a powerful concept, and its invocation by peace researchers has had much the same motive as attempts within

disaster research to develop 'integrated' frameworks of understanding.

- *Finally, historical memory of violence and its post-traumatic consequences* even when the actual use of violence or threat of violence has subsided. Historical memory may affect the ability of groups of people to generate the trust required to implement disaster reduction measures. One should understand the term 'post-traumatic consequences' in a broad sense that includes the individual mind and body, domestic and social relations (including trust), as well as the longer term impacts on livelihoods, the natural environment and resources, and on the built environment. Thus in numerous ways recovery from violent conflict may face similar challenges on a similar time scale as recovery from catastrophic disaster.⁸

This broad definition of violent conflict is in keeping with the way in which the United Nations and its specialized agencies and others have guided the evolution of the concept of 'security.' A narrow preoccupation with 'international security' from a politico-military point of view characterized this concept when the U.N. was founded in 1945 (Bothe 2008; Brauch 2008a; Oswald 2008; Waever 2008). Whereas today the U.N. Development Program, among others, recognizes many interrelated aspects of 'human' security:

5 See the discussion of the sub-fields of peace studies and their origins in the *Guide to Graduate Programs* produced by the Peace and World Security Studies Program (PAWSS) at Hampshire College; at: <<http://pawss.hampshire.edu/students/grad/#2>>. There the earliest roots of peace studies are traced to various religious views of non-violence and concerns with social justice. The field is also subdivided into these focal areas: Conflict Resolution and Negotiation, Citizen Participation in Socioeconomic Development, Arms Control and International Security, Law and more recently also human and ecological security and sustainable peace.

6 Gillis Peacock/Morrow/Gladwin (1997); Fran H. Norris, "Disasters and Domestic Violence", in: U.S. Department of Veterans' Affairs, National Center for Post Traumatic Stress Disorder, Fact Sheet; <http://www.ncptsd.va.gov/facts/disasters/fs_domestic.html> (4 July 2005).

7 Galtung (1969); compare Sen's (2000) notion of development as freedom.

8 The time dimension of recovery in both these circumstances is poorly understood and little researched. Certainly the well-known overlapping bell-shaped curves that Haas/Kates/Bowden (1997) found to fit recovery from the 1906 San Francisco earthquake and the 1972 earthquake in Managua, Nicaragua cannot be generalized (see one critique of later use of this model in Wisner/Blaikie/Cannon/Davis (2004: 353-363). Generally the length of time required for full psycho-social, economic, and environmental recovery from catastrophic events has been underestimated. This may be because of a desire on the part of the donor community and recipient governments to 'move on' and to re-establish minimum conditions for international trade and 'business as usual' as soon as possible. However, consider the continuing low level violence (social banditry) in post-war situations such as Cambodia, Guatemala, and Somalia long after peace agreements. In a similar way, donors and affected nations are reluctant to admit that in certain respects recovery may simply not occur. Some households never regained rural livelihoods following the Sahel drought and famine in the late 1960's or in the wake of hurricane Mitch (1998) in Honduras and Nicaragua. It is likely that some large proportion of those who survived the Asian tsunami may never again engage in fishing or farming (see Wisner/Walker 2005).

economic security, food security, health security, environmental security, personal security, community security, and political security (Brauch 2005; see chap. 74–96 in part IX of this vol.).

Disaster research shares peace research's impatience with excessively narrow definitions. Current thinking about integrated disaster management grew out of dissatisfaction with a narrow approach that focused primarily on the hazard and not on vulnerability of the people and systems affected by a hazard. In addition, this earlier 'hazard' – as opposed to 'vulnerability' – approach tended to be inspired by the 'top down', 'command and control' style of cold war civilian defence.⁹ By contrast, the vulnerability approach to integrated disaster management tries to balance participatory, or 'bottom up' use of local knowledge and capacity for risk reduction with 'top down' technical expertise.

Digging deeper, one can also see that the emphasis on social justice and the root causes of conflict one finds in peace research are also there in the search for root causes of disaster vulnerability (Wisner/ Blaikie/ Cannon/Davis 2004; Wisner 1993, 2003). In this way, Tony Oliver-Smith (1994: 31) called the 1970 earthquake that destroyed the town of Yungay, Peru, a "500 year earthquake." What he meant is that the vulnerability of the people of Yungay can be traced back many years to the destruction by Spanish conquest of the ancient Inca system of architecture and land use, which was risk-adverse and exposed the Inca population to less risk from natural hazards. Likewise in Guatemala City people referred to the 1976 earthquake as a 'class quake', demonstrating that people on the street were aware that the majority of the homes destroyed were those of the poor Mayan squatters who had built on the steep waste land in the city. In this manner, integrated disaster risk management seeks out root causes for vulnerability just as peace research probes the root causes of violent conflict.

At the beginning of the 21st century there is a growing consensus that human beings have a right to

security and development as an extension of their right to life (Uvin 2008; Katselis 2008; Sending 2008; Klingebiel/Roehder 2008). A rights-driven approach to both development work and the practice of integrated disaster management must see violent conflict as a major obstacle to achievement of those rights.¹⁰

15.2 Violent Conflict and Disaster: Scientific, Moral, and Policy Challenges

It is important to note the scale and human cost of violent conflict in relation to the human loss from natural hazards. Disasters, especially those that seem to be principally caused by natural hazards, are not the greatest threat to humanity. Despite the lethal reputation of earthquakes, epidemics, and famine, a much greater proportion of the world's population has had its lifespan shortened by events that are often unnoticed: *violent conflict, endemic disease, and hunger* – conditions that pass for normal existence in many parts of the world, especially (but not only) less developed countries (LDCs). Occasionally earthquakes have killed hundreds of thousands, and very occasionally floods, famines, or epidemics have taken millions of lives at a time. But to focus on these alone (in the understandably humanitarian way that outsiders respond to such tragedies) is to ignore the millions who are not killed in such events, but who also face grave risks. Many more lives are lost in violent conflict and to the preventable outcome of disease and hunger.

If one totals deaths during the 20th Century (1900–1999) from violent conflict, disasters triggered by a natural event, epidemics, and accidents (road, rail, air, industrial), it is violent conflict that accounts for 62 per cent of these 424 million deaths. By contrast, rapid-onset disasters such as earthquakes and volcanic eruptions account for only 2 per cent; whilst epidemics take 12 per cent as their share.¹¹

U.N. Secretary General, Kofi Annan (2001: xix), put these multiple threats to human security into perspective in 2001 when he wrote:

We know that we cannot be secure amidst starvation, that we cannot build peace without alleviating poverty, and that we cannot build freedom on foundations of

9 One of the earliest authors to call attention to the distinction between 'hazard' and 'vulnerability' paradigms in disaster research was Kenneth Hewitt in his essay, "The Idea of Calamity in a Technocratic Age" (Hewitt, 1983). See also: Hewitt (1995, 1998); O'Keefe/Westgate/Wisner (1976). On the history, and possible resurgence, of the command and control paradigm in the U.S., see: David Alexander, "Do *you* want to be commanded and controlled? Reflections on modern emergency management"; at: RADIX website, *Latest Additions*, 6 February 2003; at: <http://www.radixonline.org>.

10 James K. Boyce, "Let them Eat Risk? Wealth, Rights, and Disaster Vulnerability", Political Economy Research Institute (PERI), Working Paper 4, University of Massachusetts Amherst, 2000; at: <http://www.umass.edu/peripdfs/WP4.pdf>.

injustice. These pillars of what we now understand as the people-centred concept of 'human security' are inter-related and mutually reinforcing.

Violent conflict poses challenges to scientists and planners who attempt to anticipate 'surprises' and other kinds of complications and uncertainties that can accompany natural and technological hazard events. War and other kinds of violent conflict, therefore, are a serious addition to difficulties in applying an integrated approach to disaster management. These violent conflict-induced complications can be seen in all phases of the disaster management cycle. Efforts at integrated mitigation, prevention, and preparedness are made more difficult by past, present, and possible future violent conflict. For example, early warning may be impossible under conditions of violent conflict. Goma, a city of 500,000 in the eastern part of the Republic of Congo, had no public warning of a perilous volcanic eruption in 2002.¹¹ There was at the time simply no municipal government since the city was under the control of a rebel army contesting the authority of the central state in Kinshasa. Response capacity may also be reduced under conditions of violent conflict. Fire fighters were

stoned and shot at when they responded to fire during the uprising in Los Angeles in 1991. Relief, reconstruction and recovery are all subject to additional requirements and possible limitations when they confront pervasive violent conflict or its aftermath in addition to the effects of the natural or technological hazard event (e.g. drought, flood, epidemic, explosion, or chemical release). For example, a refinery burned for many days uncontrollably during the bombing of Belgrade which was part of NATO's intervention in the conflict on Bosnia and Kosovo.

During the 1990's many violent conflicts broke out in various parts of the world, and many civilians were killed, maimed (especially by land mines), injured, deliberately mutilated, starved, occasionally enslaved, and displaced by the belligerent parties. So great has been the need for humanitarian relief in these conflict and post-conflict situations that some normal development assistance has been diverted, and opportunities for self-generated development delayed or destroyed, further worsening the position of marginal and vulnerable populations in the long term. Furthermore, there has been confusion among development agencies, including non-governmental organizations (NGOs) about how to act in regard to:¹³

11 See Wisner, Blaikie, Cannon and Davis (2004: Chap 1, Table 1.2) who used diverse sources in estimating these numbers, which, especially for the earlier part of the century and for specific kinds of conflicts, must be considered only as roughest approximations. For estimates of deaths due to war and political violence the author is most grateful to Kenneth Hewitt, Wilfred Laurier University, Canada, for time spent in personal communication and consultation on these matters during July 2002. Hewitt's (1997) book: *Regions of Risk* and an earlier article (Hewitt 1994) were also helpful as well as Sivard (2001) and M. White: "Wars, Massacres and Atrocities of the Twentieth Century Wars" (1999); at: <<http://users.erols.com/mwhite28/war-1900.htm>>. *Drought and famine death statistics* are based on the author's approximate calculations that expand on the official reports that are regarded as a gross underestimates, since entire famines, such as the 'Great Leap Forward Famine' in China (1959-1961, which may have killed 30 million people (Yang 1996; Becker 1996; Heilig 1999) are omitted from official data bases. *For other disaster mortality statistics* the author relied on the EM-DAT data base by CRED and OFDA (at: <www.cred.be/emdat> (11 July 2002). *Traffic accident statistics* came from the *World Disaster Report 1998* (IFRC 1998: 20-31). *Estimates of deaths due to HIV-AIDS* rely on Barnett and Whiteside (2001).

12 Ben Wisner: "Goma, Congo: City Air Makes Men Free?"; RADIX website, 2002; at: <<http://www.radixonline.org/nyiragongo.htm>>.

- Civilian/military relations in 'complex' emergencies;
- Relations with war lords, local elites, and the 'legitimate' national army;
- Ways to move from relief to recovery, and to development (Wisner/Blaikie/Cannon/Davis 2004);
- Internationally acceptable standards of assistance;¹⁴
- Mobilization of international support for relief.

Conflicts have continued to exacerbate natural extreme events such as flooding in the Malagasy Republic (2002) and in Sri Lanka (2002), drought in Afghanistan (2002), and the volcanic eruption in east-

13 Macrae (2001); Overseas Development Institute (ODI): "Humanitarian Practice Network"; at: <<http://www.odihpn.org/>>; Anderson (1999); Piroette/Husson/Grunewald 1999.

14 Sphere Project, *Humanitarian Charter and Minimum Standards*. 2nd ed.; at: <<http://www.sphereproject.org/>>; see also material by Ben Wisner and others in the section of RADIX on: *Standards for Preparedness and Response*; at: <http://online.northumbria.ac.uk/geography_research/radix/standards.htm>, and Ben Wisner: "Disasters: What the United Nations and its World Can Do", in: *United Nations Chronicle*; at: <http://www.un.org/Pubs/chronicle/2000/issue4/0400_p6p.htm>.

ern Congo (2002) mentioned above. In 2005, the way conflict has complicated recovery from the tsunami in Sri Lanka is a vivid example.¹⁵ At the same time, in Zimbabwe resilience to drought has been undermined by chaotic years of farm nationalizations and famine relief denied to opponents of the ruling party.¹⁶

15.3 Interaction of Violent Conflict with Natural and Technological Hazards and Management Efforts

Violent conflict interacts with natural hazards and technological hazards in a wide variety of ways.

15.3.1 Violent Conflict as Root Causes of Social Vulnerability

In violent conflict situations today 90 per cent of the casualties are suffered by civilians. This contrasts with around 50 per cent during the Second World War and only 5 per cent during the First World War (Wisner/Blaikie/Cannon/Davis 2004: 3–5). In addition to death and injury, the civilian population often finds its normal livelihoods disrupted, leading many into more hazardous means of obtaining the necessities of life. Women and children are particularly affected by these stresses (Wiest, Mocellin, Motsisi 1994). Prostitution as a desperate means of livelihood combined with rape and sexual slavery has contributed to the explosion of HIV/AIDS in some parts of Africa (Wisner/Blaikie/Cannon/Davis 2004: 185–192). In extreme cases famine (Wisner/Blaikie/Cannon/Davis 2004: chap. 4) may be the result as in Bengal in 1943, Biafra (the Ibo-speaking breakaway territory of south eastern Nigeria) in 1969, Cambodia in the mid-1970's,

Angola and southern Sudan in the 1980's and 1990's, and Darfur, Sudan in the early 2000's.

15.3.2 Institutional Weaknesses: Past Violent Conflict and Natural Hazards Producing a Downward Spiral

This is evident in the case of Central America where Guatemala, Nicaragua, Panama, and El Salvador all have societies shaped by violent conflict. In the case of El Salvador, few of the elements of the 1992 peace accords had been implemented when hurricane Mitch hit the region in 1998. Contentious issues concerning land tenure and reform of the police and judiciary bear directly on social welfare and economic development. These issues were still not settled when two earthquakes struck in January and February 2001, killing more than one thousand people, injuring more than eight thousand and causing damages valued at \$2.3 billion. Forty per cent of the country's health centres were destroyed and one-third of the schools. 150,000 homes were destroyed another 185,000 damaged (Wisner 2001).

Because of institutional weaknesses, El Salvador was unable to make effective use of the international assistance for multi-hazard mitigation made available by the Stockholm group of donors to the whole region affected by hurricane Mitch. Had it done so, damage and loss from the 2001 earthquake might have been less (Wisner 2001). Since then the poorest rural population has suffered hail and drought, both devastating food crops, as well as the collapse of the world price for coffee. Small farmers and landless labourers have suffered most. Caught up in a similar vicious spiral, half a million poor rural Nicaraguans have crossed the border into Costa Rica seeking work. These immigrants are likely to live in places and in conditions that expose them to risks such as flooding, landslides, and disease.

Such a mass movement of poor people may be interpreted as motivated by a 'pull factor', namely economic opportunity, and not the 'push factor' exerted by violent conflict (Loescher 1993: 16–17). To some extent, that is true; however, one has to place the economic and institutional weaknesses of Nicaragua and other countries in the context of long histories of civil war.

15 By contrast, the tsunami seems to have provided an opening for mediation by Finland in the decades' long violent conflict between the Free Aceh Movement and the government of Indonesia, and a peace agreement was announced in July, 2005 (see: "Indonesia, Aceh Rebels Reach Deal", in: *Japan Times*, 18 July 2005, p. 1).

16 BBC News: "WFP Warns of Zimbabwe Food Crisis", 1 July 2005; at: <<http://news.bbc.co.uk/1/hi/world/africa/4639909.stm>>, in which World Food Programme director, James Morris, is quoted: "the greatest humanitarian crisis we face today [is] not in Darfur, Afghanistan or North Korea, but in southern Africa... [where, as in Zimbabwe] a lethal mix of Aids, recurring drought and failing governance is eroding social and political stability."

15.3.3 Displacement of Large Numbers of People in War and Other Violent Conflicts Leading to New Risks.

There were 9.2 million refugees in the world in 2005, down from roughly 10 million official refugees in the world in 2003 and 12 million in 2002.¹⁷ These numbers exclude ‘internally displaced’ people who have not crossed a national border while seeking refuge. Most of these refugees are fleeing violence. In many cases they face new risks that include exposure to disease and unfamiliar hazards in new rural or urban environments.

Deadly outbreaks of cholera and other communicable diseases affected displaced persons who fled the genocide in Rwanda and, earlier, the civil war that led to the creation of Bangladesh (Wisner/Blaikie/Cannon/Davis 2004: 176-177); Wisner/Adams 2003). In Alexandra Township in Johannesburg, South Africa, refugees from the civil war in Mozambique were among the poorest residents who lived in locations most highly exposed to flash flooding (Wisner 1995).

In addition, when international refugees are finally repatriated to their home countries, they often end up in new locations – not their original homes, and these locations are sometimes hazardous. In this entire situation, women, children, and the elderly are among the most vulnerable people (Diaz 1994: 49-50; Turshen/Twagiramariya 1998; Walker 1994; Moser/Clark 2001).

15.3.4 Violent Conflict Interfering with Relief and Recovery Assistance

The civil wars and instances of violent conflict in Africa during the 1980’s and 1990’s often challenged the ability of humanitarian agencies to provide essential relief to the civilian population. In Sudan UNICEF was able to negotiate ‘corridors of tranquillity’ during its so-called ‘Operation Lifeline Sudan’ (Minear 1991). However, more commonly arrangements for relief and recovery assistance have been ad hoc, unreliable, and rapidly changing, as they have been more recently in Afghanistan, Iraq, and Darfur in Western Sudan. Worse than this, there is some evidence from case

17 United Nations: “Global number of refugees dropped 14 per cent in 2002”, 20 June 2003; at: <<http://www.hrea.org/lists/refugee-rights/markup/msg00346.html>>; UNHCR: 2004 *Global Refugee Trends*, Geneva: UNHCR (17 June 2005); at: <<http://www.unhcr.ch/cgi-bin/texis/vtx/events/opendoc.pdf?tbl=STATISTICS&cid=42b283744>>.

studies, mostly in Africa so far, that middlemen and war lords actually profit from and wish to perpetuate a ‘relief economy’ in which they are able to trade relief goods they steal or divert for guns or use relief aid they come to acquire to ‘buy’ support among civilians (Keen 1994; Duffield 2002).

15.3.5 Difficulty for Participatory Methods Empowering and Engaging Socially Vulnerable Groups During Violent Conflicts

This effect of violent conflict is a particularly important challenge to ‘integrated disaster management’. An integrated approach to disaster management has much in common with what the UNDP calls a ‘developmental’ approach to humanitarian assistance.¹⁸ In both cases the goal is not only to address the specific crisis at hand – an earthquake, flood, factory explosion, or a violent conflict – but to do so in a way that builds capacity to mitigate or to prevent a future occurrence. In both cases, the role of local knowledge and capabilities is important; hence participatory methods based on trust are vital tools (Wisner (1995, 2003).

But in violent conflict situations people are less inclined or able to take part in such ‘bottom up’ efforts – be they directed toward preventing damage from future natural hazards or toward peace-making. In the case of the work by the Red Crescent Society with Palestinian refugees, there has been some success in empowering ordinary people in the assessment of their own vulnerabilities, capacities, and resources in a systematic way. However, this is likely to be an exception that proves the rule that under intensely violent conditions participatory and developmental approaches are very difficult (IFRC 2002: chap. 6).

It is important in this context to make a clear distinction between ‘conflict’ and ‘violent conflict.’ The author’s position – shared by many who work in the field of development studies and peace research – is that the process of sustainable human development is necessarily conflictual (Wisner 1988: chap. 1-2). That is, human beings have different objective material interests as well as subjective understandings of their needs. However, the vast majority of these conflicts are resolved directly by local mechanisms of negotiation and mediation.¹⁹ Such conflicts are normally

18 UNDP, n.d.: *Building Bridges Between Relief and Development* (New York: UNDP): at: <<http://www.undp.org/erd/archives/bridges.htm>>.

non-violent. These are verbal dispute-based conflicts whose resolution logical reasoning-based arguments, persuasion and debate as well as negotiation and bargaining work to a large extent. By contrast, violent conflict tends to by-pass or even to shut down local mechanisms for conflict resolution.

15.3.6 Difficulty of Applying Existing Knowledge for Mitigation of Risk from Extreme Natural Events during Violent Conflict

Over the past three decades a very large knowledge bank has grown as regards preparedness, mitigation, warning, and response to natural and technological hazards. Flood and cyclone warning systems have improved (Zschau/Kueppers 2002). So also have early warning systems of food emergencies based partly on satellite surveillance of pasture and croplands and partly on field data routinely reporting market prices and the nutritional status of children.²⁰

However, violent conflicts disrupt the communication necessary to make application of this knowledge effective. Advances in hydrological modelling and the use of current information and communication technologies (ICTs) make management of large river basins feasible. But tensions among the 12 nations within the basin of the Nile make common management difficult, even in the absence of overt warfare. The same could be said of other large river basins such as those of the Mekong, or the Euphrates.²¹

It is not only current violent conflicts that complicate the practice of integrated disaster management. A long history of conflicts, as for example in southern Africa, leaves behind weak infrastructure and institutional arrangements. Such a history may have played a

role in the breakdown in communications from authorities in Zimbabwe and Zambia who released water from dams on the Zambezi River that took Mozambicans downstream by surprise during the floods in 2000 (Christie/Hanlon 2001).

15.3.7 Violent Conflict Diverting National and International Financial and Human Resources from Mitigation of Disaster Risk

On the national scale a good example is Ethiopia. During its state vs. state war with Eritrea during the 1990's, Ethiopia let its national famine early warning system deteriorate. Resources were used for war and not for such social investments as maintenance of the food monitoring system that had been put in place following the famines of the 1980's. In 2003 the Ethiopian government was 'surprised' by a widespread food emergency that it should have been able to detect much earlier (Westing 1999).

On the international scale, donor attention was so fixated on post-war Afghanistan and Iraq that little attention was given to a fulminating combination of HIV/AIDS, flood, and drought in southern Africa, among other 'under-reported' humanitarian emergencies,²² a distortion of course compounded by donor fixation by the Asian tsunami in 2004. It was only in 2005 with the G8 meeting in Gleneagles (UK) and the massive, international 'Make Poverty History' citizen movement²³ that donors began to redress this distorted focus.

15.3.8 Violent Conflict Destroying Infrastructure and Intensifying Natural Hazards: Flooding, Drought, or Epidemic Disease

Among the infrastructure targets in recent conflicts have been irrigation systems, dams, levees, roads, bridges, water treatment plants, refineries, pipelines, and electricity systems. Such destruction may rapidly erode public health and also throw large numbers of people into unemployment. Both these effects increase a population's vulnerability to future hazards.

19 On the existence and efficacy of local conflict resolution in Africa, see the lessons reviewed at a 2001 workshop sponsored by West African Network for Peacebuilding; at: http://www.wanep.org/lessons_learned.htm.

20 USAID. Famine Early Warning System <http://www.fews.org/>; Margaret Buchanan-Smith. *What is a Famine Early Warning System? Can it Prevent Famines?*; at: <http://www.esig.ucar.edu/ijas/ijasno2/smith.html>.

21 Alhance (1999); A.R. Turton, "Southern African Hydro-politics: Development Trajectories of Zambezi Basin States and South Africa", Paper presented to the 2nd Southern Africa Water and Wastewater Conference "Water Africa", 15-19 September 1997, Harare, Zimbabwe. MEWREW Occasional Paper No. 7; at: <http://www.gtz.de/gwpgtz/Africa/occo7.pdf>.

22 Rory Carroll, "40 million starving 'as world watches Iraq'", in: *Guardian Unlimited*, 9 April 2003; at: <http://www.guardian.co.uk/Print/0,3858,4644012,00.html>.

23 See: Make Poverty History; at: <http://www.makepovertyhistory.org/>.

In the case of Iraq, the destruction of water treatment and distribution systems, drainage and sanitation facilities, and electricity supplies during the first and second wars in that country contributed to health hazards that cost the lives of more than half a million children. During the first Gulf War, the U.S. destroyed electricity supplies, shutting off power to hospitals and water treatment facilities. This began a series of disastrous events that undermined public health. Transportation networks were also targeted, so that distribution of food and other essential items to Iraq's primarily urban civilian population was disrupted. As a result, there were 47,000 avoidable child deaths within eight months of the 1991 war (CESR 2003; Savage 2002).

The effect of sanctions during the years following the first Gulf war added to these initial stresses on the most vulnerable groups of civilians. Iraq's rank in the UNDP's Human Development Index fell from 96 to 127. That fall set an unenviable record as the most rapid decline in human welfare in recent history. Between 1990 and 1999, Iraq's under-five mortality rate increased by more than 150 per cent to 131 per 1000 live births (Savage 2002a: 4). By 2005, occupied Iraq had still not been able to restore its basic infrastructure due to frequent terror attacks and instability. Twenty per cent of the cost of contracted reconstruction work goes for private security for the work force and consulting engineers.

15.3.9 Violent Confrontations Impacting on Vegetation, Land, and Water, and Undermining Sustainable Development

The use of depleted uranium as shell casings by U.S. and British forces during the two wars with Iraq have contaminated large areas of northern Kuwait and southern Iraq with radioactive dust (Westing 2003). In 2005, the date crop in Iraq was at risk from insect infestation because insecticide dusters had been destroyed in the wars. Chemical defoliants were used by the U.S. in Southeast Asia during the Vietnam War. In such cases there may have been long-lasting health and economic effects (Westing 1972, 1976, 1989).

Unexploded explosives and land mines make some agricultural land unusable in post-war regions, where there are on-going efforts to remove land mines in 90 countries (Westing 1977, 1980a, 1984, 1985).²⁴ Water has also been contaminated by acts as diverse as sabotage of oil terminals by Saddam Hussein in 1991 and the aerial spraying of coca fields by the U.S. during its so-called 'war on drugs'.²⁵ In addition, the

presence of large numbers of displaced persons and refugees in dense concentrations can cause local de-vegetation and soil erosion (chap. 9 by Rechkemmer; Black 1998).

15.3.10 Poorly Managed Disasters Creating, Prolonging, or Exacerbating Violent Conflicts

The nine points reviewed so far have focused the impact of violent conflict on the vulnerability of people to natural hazards and the ability to manage or cope with natural hazards. However, poorly managed disasters may also create the conditions for violent conflict. Popular discontent with government response may lead to short term rioting or to longer term attempts to change the regime. Regime change following disasters cannot be caused by mismanagement or perception of mismanagement in a clear cut way because of time lag and the existence of grievances and contradictions prior to and after the extreme event in question.

For example, the Sandinista rebellion was well underway when Managua was destroyed by an earthquake in 1972. It took another seven years for the Somoza dynasty to be overthrown in that country; however, widespread disgust at perceived looting of international relief funds and allocation of reconstruction contracts to Somoza cronies contributed to an increase in support for the Sandinistas. In a similar way, mismanagement of the earthquake in Mexico city and its aftermath in 1985 is cited by many observers as the 'beginning of the end' of the PRI hegemony first in the capital city (in 1997) and then in the nation (in 2000).²⁶

24 The *Land Mine Monitor Report 2002* documents some progress in de-mining and in destruction of land mines, but it also indicates that there are still 230 million land mines in the arsenals of 94 countries; at: <<http://www.icbl.org/lm/2002/findings.html>>.

25 Documentation of the environmental and health consequences of the Indo-China wars and first Gulf War are available in Austin and Bruch (2000a). A longer-term perspective of the role of chemical weapons is available in Russell (2001).

26 Bell Gale Chevigny: "A Shock to the System", in: *AlterNet* (19 September 2005); at: <<http://www.alternet.org/katrina/25516/>>, citing Poniatowska (1995). Also see Richard Olson: "The Mexico City 1985 Earthquake Disaster and Emergent Organizations: A Case Study", Natural Hazards Research and Applications Workshop, Boulder, CO, July, 2000; at: <<http://www.colorado.edu/hazards/workshop/2000/s37.html>>.

There are other ways disaster can affect violent conflict. The so-called ‘complex emergencies’ in Africa almost always involve drought or another natural trigger for food insecurity in populations that have little resilience. Such violent conflicts are often prolonged by the ability of belligerents to loot or obtain partial control over emergency food aid with which they barter for weapons or feed their fighters (Keen 1994; Duffield 2002; Smillie/Minear 2004: 108–114).

The question remains, do disasters triggered by extreme natural events actually cause violent conflict? Some scholars believe there is evidence that natural resource scarcity may cause violent conflict (Homer-Dixon, 1999). The examples most often produced concern water, arable land, pasture, and forests, and there is controversy over the relative importance of scarcity versus formal (state) and informal institutions, norms, and power.²⁷ Although the range of natural events that may trigger disasters certainly includes drought, and others such as coastal storms and locust plagues may temporarily deny people arable land or pasture, the causal nexus is not clear. Prolonged drought in Australia is not associated with violent conflict on any large scale, while in Somalia or northern Kenya it may. Why is this? The answer probably lies in the domain of institutions that are used to cope with water shortage. Also it is very important to distinguish between livestock raiding as a form of violence normally limited by cultural norms (FAO 2001a) and inter-state conflict over water rights (Ohlsson 1998/99).

15.4 Practical Implications and the Way Forward

A series of international conferences have defined ‘integrated disaster management’ as a set of risk reduction efforts that proceed by “integrating risk policy making with infrastructure development, communication, social networks and economic and financial

planning.”²⁸ In an urban context this implies “integrating disaster/risk policy making with urban development, land use, communication networks, economic/financial planning, human security, cultural heritage preservation and institutional realities.”²⁹ Above all, an ‘integrated’ approach to disaster management is “a multidisciplinary approach ... involving not only scholars ... but also practitioners in ... public policy making at the national and community level, and community and NGO representatives.”³⁰ The United Nations also has asserted a strong link between disaster risk reduction and sustainable development (UN/ISDR 2002).

What should be clear from the previous section is that violent conflict affects in very specific ways each and every element in these definitions of integrated disaster management. So, in the face of such systematic blockage of such efforts in times of war, other situations of violent conflict, and often in post-war conditions, what can be done?

An analysis of these practical implications can be divided into two parts – those regarding humanitarian practice and those concerning professions whose practice is prevention and mitigation of hazards.

15.4.1 Providing Disaster Relief

The first group of professionals face a task of coordination, negotiating the complex issue of civil-military relations mentioned earlier as well as the challenge of providing assistance in ways that contribute toward local capacity in the future. The United Nations has laid out the basic requirements for effective humanitarian assistance. These are a set of ‘core protection principles’ adopted by the U.N. Security Council in 2002.³¹

- *Access to Vulnerable Populations:* Facilitate safe and unimpeded access to vulnerable populations as the fundamental prerequisite for humanitarian assistance and protection.

27 See critiques of Homer-Dixon by McDonald (1999), Hartmann (2003), Hartman/Hendrixson (2005) and a better balanced, holistic view of the relationship between environment and security provided by the research programme on Global Environmental Change and Human Security (GECHS); at: <<http://www.gechs.org/>>. The Crisis States Research Centre at the Development Studies Institute, London School of Economics also takes a much more nuanced approach to the origins and consequences of violent conflict; see: <<http://www.crisisstates.com/>> and their four key themes at: <<http://www.crisisstates.com/themes/index.htm>>.

28 DPRI 2001, ‘Purpose and Topics’; at: <<http://www.iiasa.ac.at/Research/RMS/dpri2001/topics.html?sb=1>>.

29 Second Annual IIASA-DPRI Meeting 2002, ‘Purpose and Topics’, at: <<http://www.iiasa.ac.at/Research/RMS/dpri2002/topics.html?sb=1>>

30 *ibid.*

31 U.N. Security Council, 2003: “Plight of civilians in armed conflict remains considerable, grave problem, USG for Humanitarian Affairs tells Security Council”. 20 June; at: <<http://www.reliefweb.int/w/Rwb.nsf/s/C0BB61CED9D0B67885256D4B00722621>>; see also Annan (2002).

- *Separation of Civilians and Armed Elements:* Maintain the humanitarian and civilian character of camps for refugees and internally displaced persons.
- *Justice and Reconciliation:* (1) Put an end to impunity for those responsible for serious violations of international humanitarian, human rights and criminal law. (2) Build confidence and enhance stability within the host state by promoting truth and reconciliation.
- *Security, Law and Order:* Strengthen the capacity of local police and judicial systems to enforce law and order.
- *Disarmament, Demobilization, Reintegration and Rehabilitation:* Facilitate the stabilization and rehabilitation of communities.
- *Small Arms and Mine Action:* Facilitate a secure environment for vulnerable populations and humanitarian personnel.
- *Training of Security and Peacekeeping Forces:* Ensure adequate sensitization of multinational forces to issues pertaining to the protection of civilians.
- *Effects on Women:* Address the specific needs of women for assistance and protection.
- *Effects on Children:* Address the specific needs of children for assistance and protection.
- *Safety and Security of Humanitarian and Associated Personnel:* Ensure the safety and security of humanitarian, United Nations and associated personnel.
- *Media and Information:* (1) Counter occurrences of speech used to incite violence. (2) Promote and support accurate management of information on the conflict.
- *Natural Resources and Armed Conflict:* Address the impact of natural resource exploitation on the protection of civilians.
- *Humanitarian Impact of Sanctions:* Minimize unintended adverse side effects of sanctions on the civilian population.

15.4.2 Preventing Future Disasters

Those professionals whose prime concern is integrated disaster risk management – and not management of conflict and protection of civilians in conflict situations – may also draw some other implications from the foregoing analysis.

- *First, they should design early warning systems and other programmes for risk reduction in ways*

that are robust even under the stresses of violent conflict.

Joanna Macrae, coordinator of the Humanitarian Network run by the Overseas Development Institute in Britain, has noted that in many countries the challenge is not this or that crisis, but more or less continuous “chronic political emergencies” (Macrae 2001: 156). She denies that in most cases there is a clear-cut ‘post-war reconstruction’ phase during which development-as-usual can be practiced. She sees a much more chaotic situation.

Therefore, if the application of knowledge from engineering, earth science, hydrology, meteorology, public health and other disciplines is to be long-lasting and effective, contingency plans for the resilience of systems in the face of political instability and even violent conflict have got to be built in from the beginning. A corollary is that early warning systems and other risk reduction ‘technologies’ cannot simply be additions and provided from the top-down by specialist expatriates or centres of excellence. Technologies, systems, and designs for a safe society must be developed in partnership with end users who know the demands and stresses of the real environment in which these innovations will have to be implemented. Among those stresses is violent conflict.

- *Thus, a second implication is that capacity needs to be built deeply among the end users and stakeholders.*

An example of such an approach is the flood early warning system set up with assistance of Swedish SIDA in one river basin in Guatemala. It does not rely on warning messages from the capital city or an academic institution. Trained villagers take stream flow measurements and monitor rainfall with simple instruments and send their observations to the local town using solar powered radios. In the town, other trained volunteers use software on a lap top computer to model the flood hazard and give the warning. During hurricane Mitch in 1998 no one was killed in this part of Guatemala, despite flash flooding that killed hundreds elsewhere in the country and thousands in Honduras and Nicaragua.³² A very similar system also saved lives in northern Honduras during Mitch (Wisner/Ruiz/Lavell/Meyreles 2005).

The effects of violent conflict and its long-term consequences must also be faced by practitioners in more developed countries (MDCs). People fleeing violent conflict such as illegal immigrants and asylum-seekers, who find themselves in large cities in Europe, North America and elsewhere may be highly vulnera-

ble to natural hazards, but they are very difficult for professionals to contact. This is because of language difficulties as well as a lack of trust. In the case of the World Trade Center, possibly as many as 500 illegal immigrants, many of them from war-torn areas of Latin America, were killed.³³ In the aftermath of the 1994 Northridge earthquake in Los Angeles, illegal immigrants avoided hospitals and recovery services for fear of deportation (Bolin/Stanford 1998, 1998a).

- *The third implication is that efforts should be made to implement and institutionalize risk reduction and disaster management systems in ways that address disparities and grievances that may lead to violent conflict.*

This point may be considered more controversial than the first two. One might ask if this is where specialist engineers and the like should not cross the line into 'political' activity. In answer to this doubt, one should consider the fact that the cycle of poverty and marginalization is often perpetuated by drought, flood, crop pests, human and livestock disease. Health professionals who find themselves working in similar circumstances are sometimes the first to link peace making with health,³⁴ so why not consulting engineers, agronomists, or foresters? If, for example, one is in the situation of a consulting engineer, for example, giving advice about a large city's water supply, is this not the perfect opportunity to suggest an extension of the system into the low-income squatter settlement adjacent to the city centre? If one begins to look for opportunities to use risk reduction to reduce or eliminate disparities that are among the root causes of violent conflict, it is surprising how many opportunities there are. Among these opportunities are the occa-

sions where similarity in human suffering faced by two hostile countries provides a window of opportunity for diplomatic breakthroughs or at least humane contact. Ilan Kelman has begun to collect such examples as the exchange of relief aid between Turkey and Greece - erstwhile enemies - on the occasion when they both suffered earthquakes within a brief period. Kelman refers to these openings as 'disaster diplomacy'.³⁵

15.4.3 Recovery from Disaster

To date there has been little cross fertilization and collaboration among specialists working on post-conflict recovery and those planning and facilitating post-disaster recovery. They have lessons and approaches to share. Two generalizations suggest themselves.

- *Post-conflict recovery has been concerned with building trust and communication and institutions with too little emphasis on physical infrastructure and livelihoods.*

In his review of post-conflict development programmes in El Salvador, Boyce found that something as basic as land for farming had been neglected (Boyce 1996) although this balance is slowly being reassessed (Maiese 2003).

- *Post-disaster recovery has tended to dwell on the 'bricks and mortar' aspects of economic and infrastructural reconstruction with not enough emphasis on building trust, communication, and institutions.*

These 'softer' psychological and social aspects of recovery have been slow to enter a domain usually controlled by engineers and economists but it is slowing developing (Wisner/Blaikie/Cannon/Davis 2004: 253-266; Natural Hazards Center 2001).

15.5 Conclusion

War and violent conflict certainly complicate the challenges of integrated disaster management in a number of ways. However, professionals can take these complications into account in order to increase the chance that policy advice, programming, project planning, design, and training activities will be robust enough to

32 The Guatemala examples is documented in IFRC (2002: 52). The author is grateful to John Twigg, Benfield Greig Centre for Hazard Research, University College London for reminding me of this case study. For more on the potential of the ICTs, and their robustness (due, in large part, to their decentralized use), see Ben Wisner, 'Disaster Preparedness and Response: Why is the Phone Off the Hook?', Invited paper for the European Telecommunications Resilience & Recovery Association Inaugural Conference (ETR2A), Newcastle-upon-Tyne, UK, 11-13 June 2003.

33 Asociacion Tepeyac, New York City; at: <<http://www.tepeyac.org/>>.

34 The "Peace Through Health" initiative at McMaster University in Canada identifies and studies a series of ways health work can build peace; see: <<http://www.humanities.mcmaster.ca/peace-health/AboutPtH/AboutPtH.htm>>.

35 See: *Disaster Diplomacy*, the website at Cambridge University maintained by Ilan Kelman since 2001; at: <<http://www.disasterdiplomacy.org/>>.

survive the chaos of violent conflict situations. More ambitiously, it is also possible that integrated disaster management can help to reduce the social and economic disparities – especially the differential exposure to disaster risk – that divides people in fragile societies and can lead to violent conflict. Finally, the common humanity that unites people, no matter what their professional disciplines or national origins, call them to support the United Nations and to work for peace at a time when unilateralism and so-called pre-emptive war threaten to tear up the fabric of world order.

Disaster reduction work in the 21st Century should not lose its ability to be inspired by such large visions, nor should practitioners lose the courage to speak truth to power in pursuit of the vision of a peaceful, just, and sustainable world.

16 AIDS as a Human Security Challenge

Nana K. Poku and Bjorg Sandkjaer

16.1 Introduction

The causes of human insecurity and suffering in the contemporary world are a major concern of this volume. If security is concerned with the achievement of basic human needs (CHS 2003), then HIV/AIDS poses the foremost challenge to the attainment of security in Africa. Though the exact mechanisms through which the epidemic is unfolding are not fully mapped and understood, it has a non-linear impact on state-society relations. As such, it serves to aggravate existing weaknesses by curtailing the range of options open to policymakers for expanding economies and achieving stated development goals sufficient to arrest underdevelopment on the continent.

In the most heavily affected countries the ramifications of HIV/AIDS are evident in the deterioration in social welfare indicators, such as life expectancy, literacy and primary school enrolment that had been improving for several decades. HIV/AIDS is reducing the capacity in all social and economic sectors, as a result of the mortality and morbidity of highly skilled and experienced people who cannot be replaced quickly or easily, but only after long periods of training and skill acquisition. General levels of education fall as enrolments decline among children who lose parents as a result of HIV/AIDS. In some hard hit communities, the epidemic is leading to a retreat into subsistence production in agriculture as a result of reductions in the economically active population. In turn, these declines in economic activity are reducing levels of tax revenue, which lowers the capacity of the public sector to undertake its functions at a time of dramatically increased demand for public services in health, education and training.

The net effect of the proceeding processes is the systematic erosion of the ability of all affected societies to safeguard the stock and flow of vital human capacity needed to sustain socio-economic development and political stability. The ability of nations, therefore, to improve the well-being of their citizens, build strong and

stable societies, and expand opportunities for all is threatened by the HIV/AIDS. The situation is complicated because many high HIV prevalence countries (especially in Africa) were performing poorly before HIV/AIDS gained a foothold.

The issue as to how HIV/AIDS affects society and in the process undermines its ability to sustain the vital human capital needed for sustained human development in Africa is the core preoccupation of this chapter. Using a human security framework (16.2), the chapter charts the rise of the HIV epidemic (16.3), explores the impacts of AIDS (16.4) and, based on primary research, postulates the possible ramifications on sustained human development in the years to come (16.4).

16.2 Human Security and HIV/AIDS

In the context of globalization, the threats posed to many people are of a wider variety, of lower intensity and less well-defined than what was previously perceived as security threats. Human security provides a framework for understanding these threats as they affect ordinary people and communities, rather than posing direct threats to states. Concomitant with this is a recognition that globalization brings into sharp focus the ways in which different categories of people are marginal to the states in which they live and the various forms of insecurity confronting them. It follows that human security represents a conscious attempt to relocate the security discourse, to move it from the impersonal terrain of inter-state relations and to embed it in a global social structure composed of humanity. In the process, the concept enables the analyst to challenge the notion of two separate worlds in which domestic security is set against the contrasting insecurity in the global political arena.

The *United Nations Development Programme* (UNDP) puts the position this way: "The concept of security has for too long been interpreted narrowly: as security of territory from external aggression, or as

protection of national interest in foreign policy or as global security from threat of nuclear holocaust ... forgotten were the legitimate concerns of ordinary people who sought security in their daily lives" (UNDP 1994: 22). The UNDP critique is clear and powerful. By placing the poor, the disadvantaged, the voiceless, the underrepresented and the powerless at the core of the security agenda, the human security discourse recognizes that for the majority of the people in the world, apparent 'marginal' or 'esoteric' concerns - such as environmental, food and economic security - are far more real and immediate threats to their daily survival than interstate wars.

Currently, most analysts, following the 1994 UNDP definition, agree that human security encompasses both 'freedom from want' and 'freedom from fear'. 'Freedom from want' describes a condition of existence in which basic material needs are met, and in which there is a reasonable expectation that protection will be afforded during any crisis. Similarly, 'freedom from fear' describes a condition of existence in which human dignity is realized, through protection from poverty and violent threat. The human security agenda, therefore, is concerned with the protection of human life and dignity in the modern world.

Nowhere has the importance of this agenda been more strongly embraced than in Africa. Here, the human security agenda offers a powerful voice for a coalition of actors to demonstrate in the most dramatic way the exposure of vast numbers of people, not only to the dangers of violence from contending bands of warriors and bandits in a manner reminiscent of medieval times, but also to hunger and disease on a cataclysmic scale. Here, the level, numbers and intensity of civil conflict spreading across the continent illustrate the lack of 'freedom from fear'. In 2005 over half the countries on the continent and twenty per cent of the population were affected by conflict (World Watch Institute 2005). During the previous decade over six million people were estimated to have died and over twenty million displaced as a direct result of conflict (Médecins Sans Frontières 2005). Human rights abuses in Angola, Ethiopia, Nigeria, or Zimbabwe, genocide in Rwanda or Sudan, and a whole range of outrages against civilians on all sides in the wars of Liberia and Sierra Leone are all cases in point. Progress on one front is so often accompanied by regression on another; as a faint glimmer of hope begins to emerge in the appalling conflicts in Sudan with the signing of the Comprehensive Peace Agreement and the Darfur Peace Agreement, the situation in So-

malia deteriorates, threatening to draw in Ethiopia (Rupiya/Nhema 2008).

Whatever the cause, it is the innocent - not necessarily aligned with any side - who suffer in their millions. The conflicts over the remains of Sudan, which has driven 1.5 million people from their homes (UNHCR 2006a), particularly highlight the plight of a population without protection from external or internal forces and yet at the same time falling prey to the remnants of the very state that was once supposed to be their protector. For millions of Africans therefore, the chief security threat is often the very government under whose sovereignty they live, either through the use of power and oppressive policies, or as a result of the governments' incapacity to sustain the infrastructure of life for the vast majority.

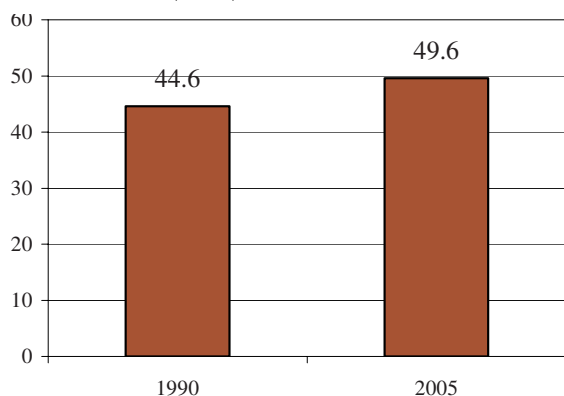
According to recent data from the *African Development Bank* (AfDB), some 80 per cent of the 'low human development' countries - these are countries with high population growth rates, low income, low literacy, and low life expectancy - in 2005, were located in Africa (AfDB 2005). There are only ten African countries in the middle category - Algeria, Botswana, Egypt, Gabon, Libya, Mauritius, Morocco, Seychelles, Swaziland and South Africa, five of which have a combined population of just 4.6 million - Mauritius, Seychelles, Botswana, Gabon and Swaziland. The remaining 43 countries on the continent are in the low human development category. There are 55 countries in this latter category, which means African countries account for a staggering 78 per cent of the countries classified as having attained low human development globally. Even more telling, is that, of the 30 countries with the lowest human development indices, 26 (or 87 per cent) are African.

The same report's celebrated headline growth of 3.5 per cent in GDP in 2005 compared to 3.2 per cent in 2004 (AfDb 2005) belies the systematic decline observable in real per capital GDP growth from 1.0 per cent to 0.8 per cent in the same period. In developmental terms, this means that the combined economies of Africa actually shrunk by 0.2 per cent in 2005. All other regions are already outperforming Africa, and efforts to redress this poor performance over the past two decades have not been successful. In 2004, for example, the average *Gross National Product* (GNP) per capita in the *Organization for Economic Co-operation and Development* (OECD) countries was \$28,086 compared with \$528 in Africa (OECD 2006). This means that the industrialized countries are roughly 51 times wealthier than African states. Assuming that the OECD countries could stop

stretching this development gap further, and hoping that African economies could grow at an annual rate of 3.5 per cent over the coming years, it would still take the continent some 135 years to reach today's level of wealth enjoyed by OECD countries.

Not surprisingly, poverty has increased at a faster rate on the continent than anywhere else in the world. With just over a tenth of the world's population, the continent is home to one third of the world's poor persons. Four of every ten of its inhabitants living in what the World Bank (2000: 12) classifies as 'a condition of absolute poverty.' More worrying still, as the only continent in the world, Africa has experienced an *increase* in poverty and hunger over the last fifteen years or so (figure 16.1). The number of people living on less than a dollar a day increased from 227 million in 1990 to 313 million in 2005, and the very poor are getting poorer. In the same period, the number of hungry people also increased in Africa, by a staggering 34 million. Of the children under five in sub-Saharan Africa who are underweight, the proportion decreased somewhat (from 32 to 31 per cent from 1990 to 2003), but in absolute terms, the numbers rose from 29 million to 37 million (UN 2005).

Figure 16.1: Percentage of Africans living on less than a dollar a day. **Source:** Authors, using data from UN (2005).

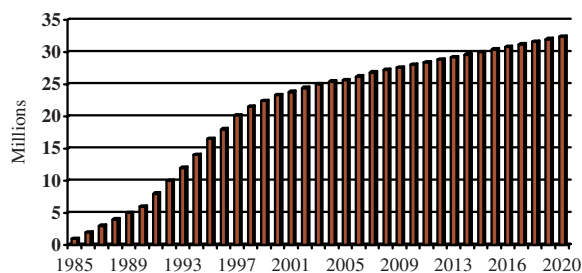


If current trends continue, by 2015 Africa will account for 50 per cent of the poor of the developing world [up from 25 per cent in 1990] (World Bank 2005). During the 1990's the region experienced a decline in GDP per capita of 0.6 per cent per annum, and because economic growth was highly skewed between countries, approximately half the total population is actually poorer in 2004 than in 1990. Income and wealth distributions are extremely unequal in many countries, and with improved growth rates such ine-

qualities are likely to increase rather than to diminish (World Bank 2003).

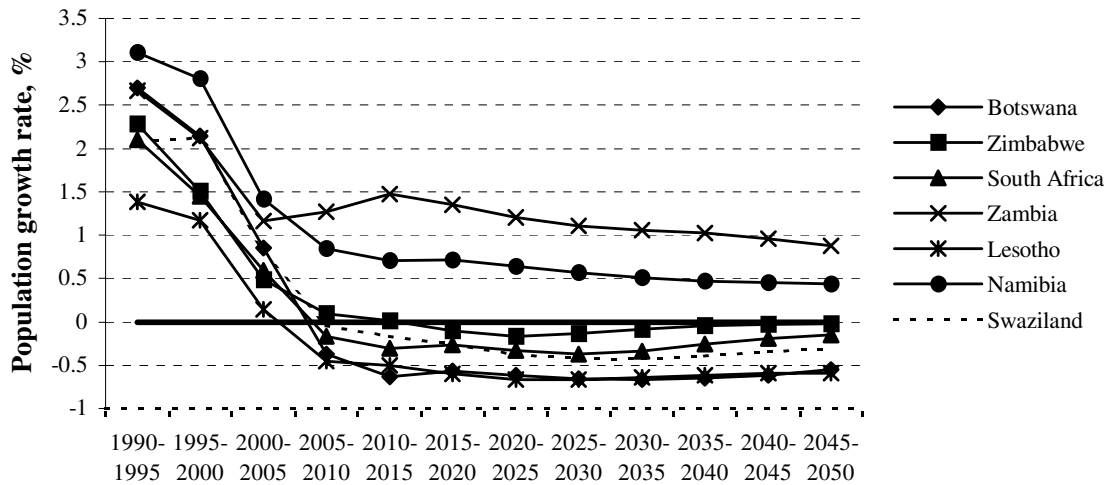
Whatever the causes of Africa's crisis, about which there is quite legitimately a considerable debate, it is hard to escape the fact that governments on the continent have largely failed in their duty of care to their citizenry. As a result, Africa now stands as the most marginal continent in the world. If we remove territorial boundaries from our cognitive map, we are left with a picture of a people across the continent attempting to meet their basic needs within the hostile and unpredictable environment of violence and political instability. Households are striving to secure these needs in conditions of extreme adversity, as governments and state managers either fail to, or are unable to, pursue policies that would ensure their protection for entrenched poverty.

Figure 16.2: Number of People Living with HIV/AIDS in Sub-Saharan Africa. **Source:** Authors, calculated using data from the World Bank (2005).



A tragic manifestation of this failure has been the states' inability to protect ordinary people from both 'freedoms from fear' (violence) and 'want' (poverty). The resulting fragmentation and dislocation of societal structures has made millions of Africans vulnerable to contracting HIV/AIDS. By all accounts, the African continent has been the most severely affected by the HIV/AIDS epidemic (UNAIDS/WHO 2006). With just over 14 per cent of the world's population, the continent is home to about 60 per cent of all people living with HIV - 25 million at the end of 2005. During the same year an estimated 3 million people in the region were newly infected with HIV, while 2 million died of AIDS - joining the estimated 20 million Africans already claimed by the epidemic. A quarter of the people in the region infected with HIV are young (aged 15-24 years) and three quarters of those are girls and young women. As the epidemic matures, the prevalence rates are expected to more or less plateau towards 2020. However, this does not necessarily mean that the epi-

Figure 16.3: Impact of HIV/AIDS on population growth for selected southern African states. **Source:** Authors, using data from UN/DESA Population Division (2005).



demographic has 'slowed down'. Prevalence measures the proportion HIV infected in the population at a given time, and this will be a function of the number of infections, but also of the number of AIDS deaths. Stable prevalence may mask a situation where the number of new infections offsets the number of deaths – not a 'slowed down' epidemic at all! However, as a measure of proportion infected prevalence does provide a useful measure, and as can be seen in figure 16.2, the number of HIV infected in Sub-Saharan Africa (SSA) is projected to steadily increase to just above 30 million in 2020 (see chap. 17 by Benz).

In the majority of southern African countries, at least one in six adults is currently HIV positive and the likelihood of a 15-year-old woman dying before the end of her reproductive years is expected to quadruple from around 11 per cent in the early 1980's to over 40 per cent in 2010 (Ngoma/Le Roux 2008). If it is assumed that five people within an immediate African family are directly affected by the death of a family member from HIV/AIDS, then some 200 million Africans are closely affected by the epidemic. To this number one needs to add those less directly affected in extended families, colleagues at work, close friends in faith and other communities – perhaps a doubling of those directly affected to give a total of some 200 million at the lowest estimate. A staggering proportion of Africa's people – possibly half the entire population – feel the effects of the epidemic.

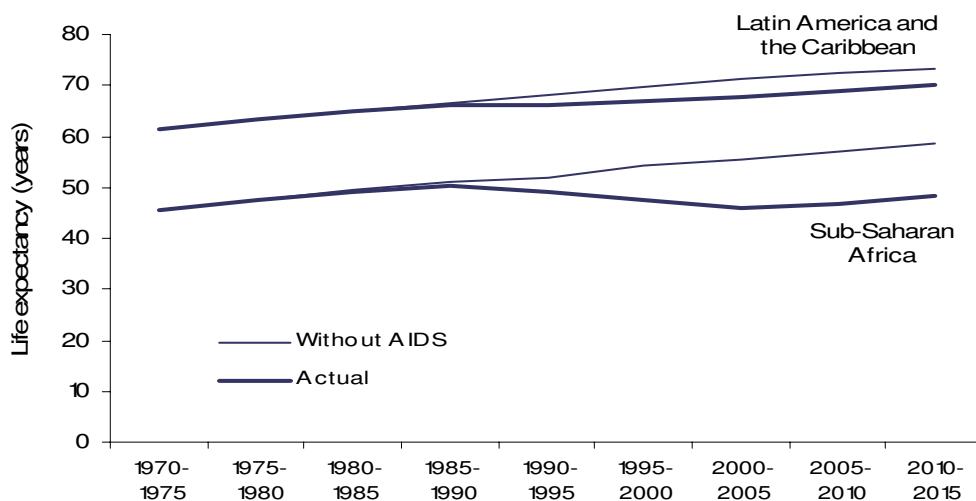
As a result of these demographic changes, there will be fewer people, especially in the productive 20 to 50 year old age groups, to attend to social reproduction and contribute to the management of national affairs whether in government, business, reli-

gious or social life. The growing number of HIV/AIDS-related illnesses and deaths in society will quickly undermine achievements in reducing death rates. Estimates made earlier in the epidemic's history projected some slowing of population growth rates. However, as the epidemic has become more intense and extensive, experts estimate that countries in southern Africa will experience a loss of population, as more people die than are being born (figure 16.3). By 2010, it is predicted that the population of Botswana, South Africa and Zimbabwe will decline by about 1 per cent per year. Without AIDS, the population would have grown by between 1.0 and 2.0 per cent in these countries (UN/DESA Population Division 2005).

AIDS-related deaths are occurring especially among young and middle-aged adults, between the ages of 24 and 50. Women tend to die in the younger age brackets (20–35 years old) while men tend to die in the older age brackets (30–45 years old). Infants, too, are dying at an increasing rate because they acquire HIV/AIDS before they are born or shortly thereafter. In 1990 infant mortality in Zimbabwe was 54; in 2005 the rate had risen to 62. In Kenya, infant mortality in 1990 was 67, in 2005 it was 69. Without AIDS infant mortality would have continued to decline in both countries (UN/DESA Population Division 2005).

As infants and young adults die at increasing rates, overall life expectancy will dramatically decline (figure 16.4). As of 2005, life expectancy in Botswana was less than half of what it would have been without AIDS. In Zimbabwe, life expectancy is 40 years instead of 69 as it would have been in the absence of AIDS. Seven sub-

Figure 16.4: Impact of HIV/AIDS on life expectancy at birth, 1970-2015. **Source:** Authors, using data from UN/DESA Population Division (2005).



Saharan African countries (Angola, Botswana, Lesotho, Malawi, Mozambique, Rwanda, and Zambia) have life expectancies below 40 years. Each of the countries, except for Angola and Mozambique, would have had an estimated life expectancy of 50 years or more without AIDS (UN/DESA Population Division 2005).

The epidemic is restructuring the population. Age distribution in societies is changing dramatically, with fewer infants, young children and young adults than would be the case without HIV/AIDS. The implications are several. Fewer children mean a smaller pool of future human resources to take part in national development. Older adults will be proportionally more numerous and will have to take on new responsibilities to care for children and generate income. There will be fewer young and middle-aged adults to provide income and raise families. Families, businesses and nations will have a smaller number of adults to count on for leadership and management.

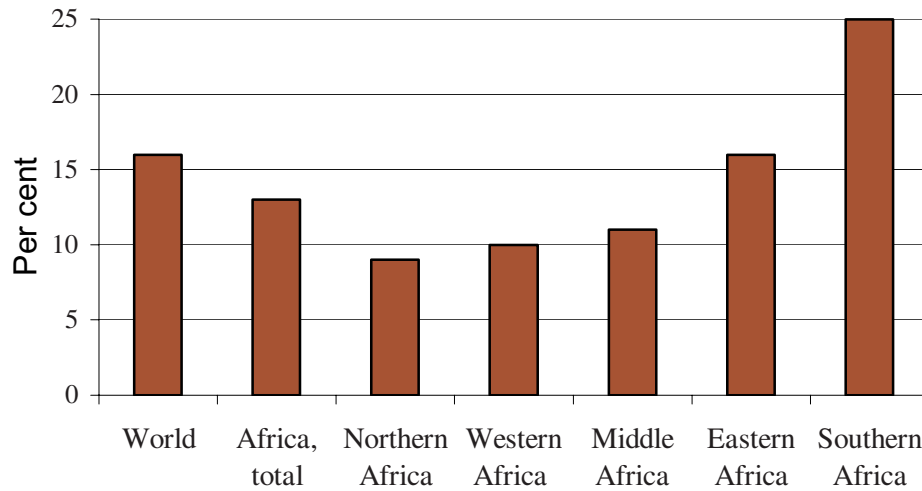
16.3 Impact of HIV/AIDS on Sustainable Development

A strong feature of Africa's HIV epidemic is that it clusters within families, often resulting in both parents being HIV-positive, and in time falling sick and dying. Given the overall levels of poverty, most families have a reduced capacity to deal with the effects of morbidity and mortality: these include the cost of drugs - when available - to treat opportunistic infections, the cost of transport to health centres, reduced household productivity through illness and diversion

of labour to caring roles, loss of employment through illness and job discrimination, funeral and related costs, and so on. In the longer term most households never recover even their initial level of living, since their capacity is reduced through the loss of productive family members through death and the sales of any productive assets they once possessed. As a result, a true process of immiseration is now observable in many parts of Africa, particularly in southern Africa. This image from a field worker in Zambia illustrates the challenge:

In the field you are often led into somebody's home. The first thing that hits you is that the patient will be on the floor. If that household was not poor before HIV/AIDS infected somebody, then by the end of the first few years, poverty will come to the household as all of their assets are sold off to pay for healthcare. Children have been taken out of school - daughters, particularly - to become caregivers. Invariably, the person you have come to see will be on the floor without a blanket or a pillow. If you look around that mud hut for food, you won't see it, and you won't smell people cooking. There is no food (Poku 2005: 24).

There is thus enormous strain on the capacity of families to cope with the psychosocial and economic consequences of illness, such that many families experience great distress and often disintegrate as social and economic units. Even where they do not, by eliminating the breadwinners - often both parents - the process further exposes the rest of the family members to poverty, which then increases their chances of contracting the virus. This is particularly so for young women, who will often be forced to engage in com-

Figure 16.5: Women in Parliament 2004. **Source:** Population Reference Bureau (2005).

mercial sexual transactions, sometimes as casual sex workers, as a survival strategy for themselves and their dependants.

Indeed, the need to integrate gender issues is nowhere more essential and urgent than in the programme and activities on HIV/AIDS. This is because women play a central role in the economy and society of countries in the region, and their capacity to do so is being undermined by HIV and AIDS. An old Chinese proverb states that 'Women hold up half the sky', but in the case of African women they possibly hold up a larger share than this. The centrality of women's social and economic role is not at all reflected in either their representation at the political level, in parliaments or cabinets, nor in the senior ranks of company managers and executives; certainly not in their share of ownership of wealth or their levels of income. Taking the example of parliaments, despite an increase, women are still under-represented in political decision-making structures in both North Africa and Africa south of the Sahara (16.5).

However, despite the lack of reflection of women's centrality in these measures, they are the backbone of social and economic life: they account for an overwhelming share of agricultural labour, especially in the non-measured sectors of agriculture; their domestic work involves essential activities such as water collection, fuel-wood gathering, food processing, processing of agricultural commodities for sale such as beer brewing; they also are responsible for the upbringing and socialization of children, including the passing on of essential skills to the next generation; and they undertake the care of household members, especially the sick, a task which has ex-

panded dramatically in the era of HIV/AIDS. All of these activities undertaken primarily by women are threatened by the HIV/AIDS epidemic, and the consequences for society are extremely serious.

A note of caution must be entered here: to acknowledge the synergistic relationship between poverty and vulnerability to HIV is not to conclude that AIDS itself is a nutritionally based disease. Equally, it is important not to deny that HIV is sexually transmitted across the African continent and causes AIDS. The argument is rather that any disease in Africa, however transmitted, must be placed in the context of the continent's human insecurity. The epidemic compounded a downward spiral whereby existing social, economic and human deprivation produces a particularly fertile environment for the spread of HIV. In turn, the HIV epidemic compounds and intensifies the deprivation already experienced by people across the continent. In this sense, AIDS is more than a disease. It is also much more than a public health crisis. AIDS in Africa is a development crisis of the highest magnitude.

One of the most widely used indicators of development is the Human Development Index of UNDP. This is an unweighted index of three variables: life expectancy, a measure of purchasing power per capita, and educational attainment. It is argued that such an index is a preferable indicator of development and as a broader aggregate is better than GDP as a measure of human progress. All three components of the HDI are affected by the HIV epidemic. Life expectancy is reduced, possibly very significantly by HIV/AIDS due to increasing levels of under 5 and adult mortality. As also is the rate of GDP growth through decline in the

savings and investment rates, and reductions in the labour force [both in quantity and quality]. It is also the case that educational attainment is worsened by lower rates of educational attendance due to falling enrolment of children affected by HIV/AIDS, together with attrition of educational personnel due to losses of teachers, administrators etc. which has adverse consequences in terms of the educational capacity.

Data on components of the HDI vary in quality and comprehensiveness between countries in the region and this causes problems in making comparisons in terms of the HDI. For some countries, such as Botswana, which has good surveillance systems for HIV and for other indicators such as educational enrolment, the HDI probably measures well what is happening to human development - including the impact of HIV/AIDS since this will be reflected in data relating to economic growth, life expectancy and education. This may be less true for other countries within the region where data is less comprehensive and may not in all cases reflect what is actually happening to the three variables in the HDI.

Nevertheless, with these caveats it is still instructive to review the trends in the HDI for member countries as another indicator of the impact of the HIV epidemic on sustainable development (see table 16.1). Countries with an HDI value above 0.500 fall into the 'medium development group' and those below into the 'low development group'. On the basis of 2006 levels of the HDI a significant proportion of the countries in the region fall into the latter category, reflecting high levels of poverty, low levels of literacy and low and falling life expectancy.

A comparison of the changes in the levels of the HDI for individual countries between 1995 and 2006 is instructive: of the nine countries for which there is data, no less than six of them show declines in the value of the HDI. For the three countries that do not show a decline (Tanzania, Malawi and Mozambique) there are sound reasons for doubting the quality of the underlying data used in constructing their HDI values. Data revisions that are under way for these three countries will almost certainly lead to a revaluation of their HDIs which will confirm a worsening of their human development performance over the past decade.

What is less evident from the levels of the HDI is what has been happening to the relative ranking of the various countries, and here there have been significant changes - in large part due to HIV/AIDS. Every country, apart from Angola, suffers a fall in its HDI rank between 1996 and 2006 (table 16.1). The changes

Table 16.1: Human Development in selected African countries. **Source:** UNDP (2006).

Country	HDI ranking – 2006	HDI value – 1995	HDI value – 2006
South Africa	107	0.714	0.695
Namibia	122	0.610
Swaziland	125	0.615	0.577
Botswana	126	0.653	0.572
Zimbabwe	128	0.597	0.551
Lesotho	132	0.574	0.535
Tanzania	151	0.422	0.440
Zambia	153	0.468	0.433
DRC	155	0.431
Angola	161	0.403
Malawi	163	0.362	0.400
Mozambique	170	0.310	0.322

in rankings over such a short time are in a few cases very significant. For example Botswana moves from a rank of 71 in 1996 to 126 in 2006 [largely a reflection of the large decline in life expectancy], while South Africa also shows a decline over the same period from 100 to 107. The other two countries where significant declines have taken place in relative human development are Zambia and Swaziland, for reasons which are also largely related to the effects of HIV and AIDS, although in the case of Zambia the decline also reflects sharply falling GDP per capita due mainly to non-AIDS related causes.

16.4 HIV/AIDS: The Biggest Development Challenge

The importance of human capital for the achievement of sustainable development is recognized by all development practitioners. In part this capital is the outcome of social processes undertaken privately, usually by families, and in part it is the outcome of formal activities undertaken by the state in the public education and training system, and private institutions such as enterprises and churches. Whatever the source of the investment in human capital it is essential for the processes of development. Because the HIV epidemic is concentrated in the working age population, both men and women, and may be affecting disproportionately those with better education and skills, there is

occurring in many African countries an immense loss of human capital. Both the stock of human capital is suffering attrition, but so is the flow of those who are educated and trained.

These developments have consequences for all forms of social, economic and political activity, and thus will have implications for the totality of human development. It is therefore logical to expect HIV/AIDS to further intensify poverty in many countries on the continent. Until recently, the most common method for projecting this effect was to estimate the effects by projecting the impact of the epidemic on Gross Domestic Product (GDP) (Kambou/Devarajan/Over 1992; Cuddington 1993; Cuddington/Hancock 1994; Abt Associates 2000; Arndt/Lewis 2000; Whiteside/Sunter 2000; Arndt 2002; Barnett/Whiteside 2002, Drouhin/Touzé/Ventelon 2003). This work typically found that HIV/AIDS will reduce economic growth but only by modest amounts. It is now, however, widely accepted that the method of projection has an important shortcoming as it does not take fully into account the reduction in welfare due to the loss of family members. Recent work attempts to address these shortcomings by using a broader definition of welfare that includes the monetary value of the changes in life expectancy along with per capita income.

Key among these works is a World Bank study which argued that after allowing for inter-generational losses of human capital (and knowledge), the projected macroeconomic effects of HIV/AIDS will be severe (Bell/Devarajan/Gersbach 2003). To illustrate the dynamics of this impact, take the case of a family on an island that is affected by AIDS. Most economic models that were used to project the impact of the epidemic would project that the survivors would enjoy higher per capita income. However, this result neglects the welfare of the family members who died on account of AIDS and the (likely) lower welfare of the surviving members. Especially important are the following two effects: First, the loss of human capital cripples the capacity of countries to develop an effective response to the HIV/AIDS. Because the education sector and the health sectors are keys to implementing prevention programmes in school and providing medical care, the loss of human capital increases the odds that the HIV/AIDS epidemics will remain stronger and last longer than otherwise. Second, the increased mortality among those meant to pass on information erodes the transmission of knowledge across generations. Over time declining human capital and lower investment combine to re-

duce the productivity growth on which long-term per capita income growth depends. This in turn reduces the children's ability to invest in their children's education and so on.

These inter-generational effects were already widely noted, especially in relation to the effects of HIV/AIDS on agriculture.¹ The study mentioned above, however, represents a watershed for the World Bank: to this point, its research had concluded that the macroeconomic impacts of HIV/AIDS would be limited (Ainsworth/Over 1994; Arndt/Lewis 2000; Bonnel 2000). The recent research cannot, however, be the last word. Under conservative assumptions, the conclusion is then that Africa's mortality changes already imply an economic cost of HIV/AIDS equal to 15 per cent of 2000 GDP. This translates into a decline in income of 1.7 per cent per year from 1990 to 2000 (Bloom/Canning/Jamison 2004), which exceeds previous estimates based solely on the loss of output due to the epidemic. In the case of a typical African country with a prevalence rate of 20 per cent, recent estimates from the Commission on HIV/AIDS and Governance in Africa suggests that GDP could be 67 per cent less than otherwise at the end of a twenty-year period. One implication of this is that high prevalence countries will sink into greater poverty.

The process above raises the following social and fiscal challenges for sustainable development in developing regions. First is the threat of worsening inequality: if the children left orphaned are not given the care and education enjoyed by those whose parents remain uninfected, there will be increasing inequality among the next generation of adults and the families they form. Social customs of adoption and fostering, however well established, may not be able to cope with the scale of the problem generated by a sharp increase in adult mortality, thereby shifting the onus onto the government. The government itself, however, is likely to experience increasing fiscal problems and so be unable to fully finance this additional task. Second, by killing mainly young adults, AIDS seriously weakens a country's tax base, and reduces its ability to finance public expenditures, including those aimed at accumulating human capital, such as education and health services not related to AIDS. In this way, the damaging impact of HIV/AIDS on economic growth over

1 See for details: FAO (1996); Decosas (1996); Cohen (1997); du Guerny (1999); UNAIDS (1999, 2001); McPherson (2001, 2002a); Piot/Pinstrup-Andersen (2002); de Waal (2002); Somerville (2002); Stokes (2003); Hertford (2003)

the longer run is intensified. As a result, national finances will come under increasing pressure. Slower economic growth means slower growth of the tax base, at the same time as governments face growing demands to treat the sick and care for orphans. It will also distort development spending on other areas, since it will be necessary to use valuable resources in 'defensive' or socially unproductive ways.

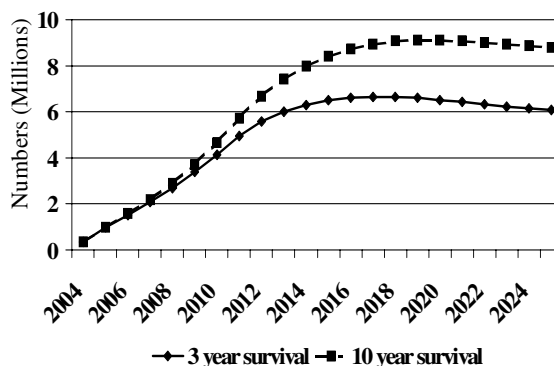
With such potentially devastating economic effects, the mitigation of the epidemic becomes as important as controlling the spread of the disease itself. But in a context where access to health care is already low, the delivery of mitigation services looks set to pose, perhaps the most daunting challenge of all. In the absence of HIV/AIDS, the population group aged 15–49 accounts for about 20 per cent of all deaths. But with AIDS the mortality rate of the adult population increases sharply. How much the mortality rate increases has been a subject of considerable debate in Africa due to the lack of adequate statistics on the causes of death. In the absence of such data two alternative methods exist. The first is to project the AIDS-related increase in mortality on the basis of a mathematical modeling of the epidemic. Applying this approach to *sub-Saharan African* (SSA) countries suggests that HIV-related deaths represented 30 per cent of all deaths during the period 1996–2001.² An alternative method is to estimate the increase in mortality directly from the excess deaths that can be attributable to AIDS. In the case of South Africa, this method indicates that about 27 per cent of the deaths recently observed in South Africa were HIV-related (Groenewald/Nannan/Bourne/Laubscher/Bradshaw 2005), which is quite consistent with the first approach.

The reason why HIV/AIDS has such an impact on mortality can be understood from the typical characteristics of the HIV epidemic. In a typical African country adult mortality was around 7 per 1000 before the advent of HIV/AIDS. A stable 7 per cent HIV prevalence rate (average for SSA) would therefore increase the death rate of the whole population by about 20 per cent.³ For the more heavily infected countries with an HIV prevalence rate of 20 per cent, the increase would be much larger of the order of 80

per cent⁴. Quite clearly, the impact on health services is likely to be substantial. If as an approximation, one assumes that the demand for health care is proportional to mortality rates, the demand for health services would increase by about 20 to 80 per cent in sub-Saharan Africa.

If antiretroviral treatment delivers its promise of longer lives, it will substantially increase the numbers of people living with AIDS. An important reason is the increase in life expectancy made possible by antiretroviral drugs. Figure 16.6 shows the increase in the number of people treated with antiretroviral drugs under two assumptions. The first one is that the percentage of people with access to treatment would increase from 8 per cent of those in need of treatment to 80 per cent over the long-term. The second one is that treatment would extend lives. If lives are extended by three years, the number of people under treatment would increase from 300,000 in 2004 to 6 million in sub-Saharan Africa by 2015. But if treatment provides a gain of ten extra years of life, the number of people under treatment would reach 9 million over the long-term.

Figure 16.6: Number of Adults Receiving Antiretroviral Treatment in sub-Saharan Africa. **Source:** Simulation based on Salomon/Hogan/Stover/Stanecki/Walker/Ghys/Schwarländer (2005). It is assumed that the per cent in need receiving ART increases from 8 per cent in 2004 to 80% in 2012 and remains at 80 per cent until 2025.



- 2 Bradshaw/Groenewald/Laubscher/Nannan/Nojilana/Norman/Pieterse/Schneider/Bourne/Timaues/Johnson (2003).
- 3 Under the assumption that the median time from infection to death is 10 years, adult mortality would increase by 7 per 1000 or 100 per cent. As the group aged 15–49 typically accounts for 20 per cent of number of deaths in the absence of AIDS, the aggregate mortality would increase by 20 per cent.

- 4 With an HIV prevalence of 20 per cent, adult mortality rises from 7 to 27 deaths per 1000 or 386 per cent, which translates into a 77 per cent increase in the total demand for health services.

16.5 AIDS and Instability

The AIDS epidemic provides a powerful reminder of how the demilitarization of security thinking in global politics should, in no way, be mistaken to imply that the issues at stake have any fewer ramifications for state security and – in some cases – survival. These harrowing statistics of prevalence, mortality and demographic changes only indicate the wider reach and impacts of the epidemic. If it is assumed that five people within an immediate African family are directly affected by the death of a family member from HIV/AIDS, then some 200 million Africans are closely affected by the epidemic. To this number needs to be added those less directly affected in extended families, colleagues at work, close friends in faith and other communities – perhaps a doubling of those directly affected to give a total of some 400 million at the lowest estimate. Thus a staggering proportion of Africa's people – something like half of the entire population – personally feel the effects of the epidemic.

As many countries are still in a relatively early stage of the HIV epidemic, the long term political ramifications are unclear, but it is possible that it might act as a destabilizing force in many countries. Already, in some countries the epidemic poses, with increasing immediacy, the challenge of how democratic transitions can continue amid prevalence levels as high as 10, 20, and 30 per cent of adult populations. Participation is affected through two channels: morbidity and mortality. Increasing mortality among the electorate has the immediate effect of reducing the number of people who can vote. Through morbidity large sections of people are disenfranchised either because they are ill themselves or are looking after family members, friends or community members who are incapacitated by the epidemic. It follows that if political participation is adversely affected by the epidemic, then so will legitimacy, accountability and the ownership of political processes and outcomes over the *longue durée*.

That the epidemic is concentrated in regions already undergoing tenuous economic transitions only heightens the risk of state failure. As the human resources and capacity of government ministries and agencies are lost to HIV/AIDS, the ability of the state to carry out its functions is impaired (figure 16.7). To date, one of the most significant inquiries into the impact of HIV/AIDS on governance systems is the work of the UN *Commission on HIV/AIDS and Governance in Africa* (CHGA). CHGA found that HIV/AIDS undermined the capacities of local and district

governments, through loss of both staff members and volunteers. The fact that local and district political organizations personal leadership of one or a handful of energetic and well-networked individuals leaves them highly vulnerable to the loss of such key staff members. By the same token, the pandemic may witness reduced readiness to participate in all forms of public life including elections. There may also be pressure on local organizations, such as community-based organizations to focus on the pressing requirements of AIDS care, so that other important activities – for example human rights education – are scaled back or abandoned.

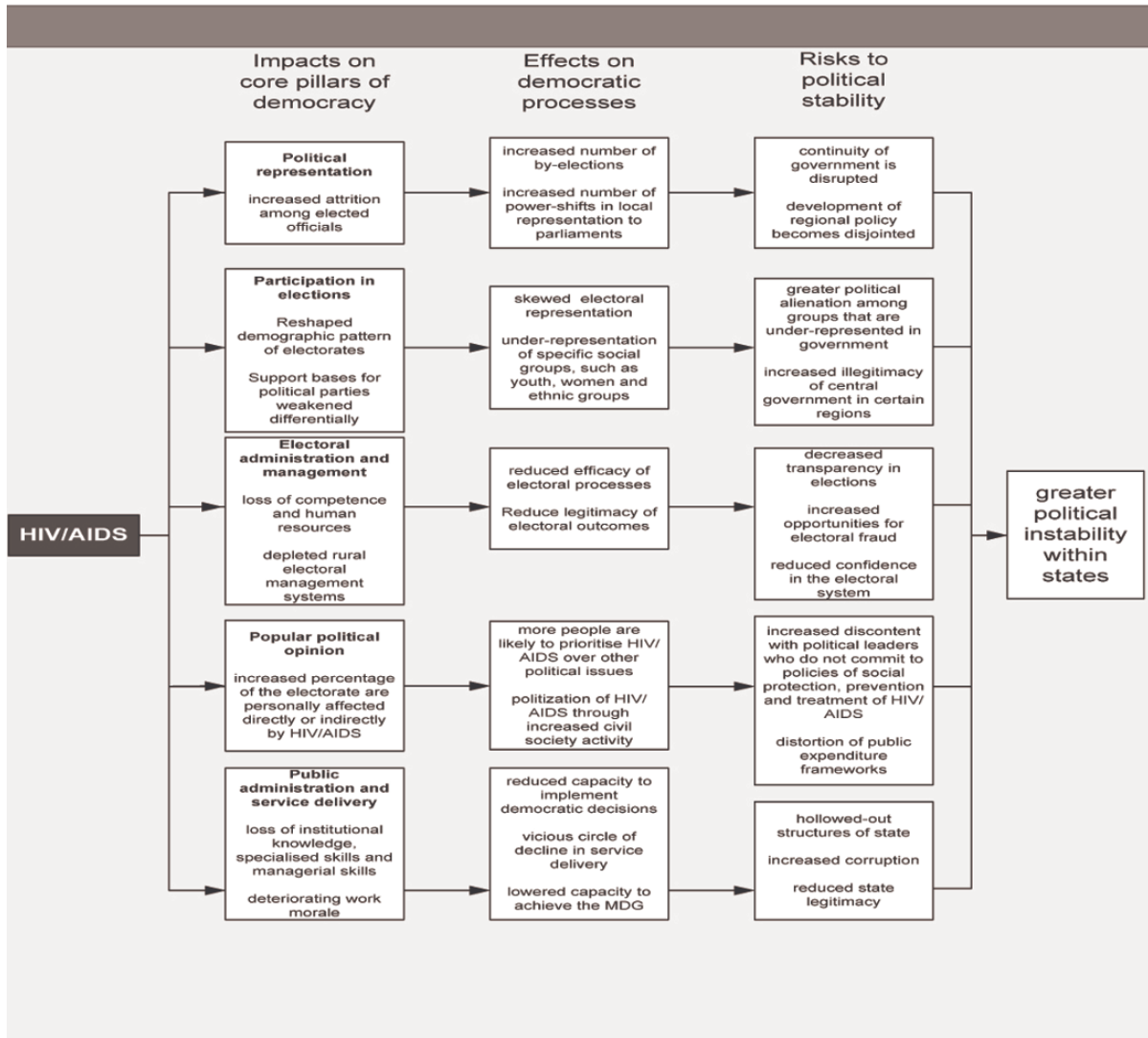
What the CHGA findings confirm is that, across the continent the structures of government remain, but the ability to govern is diminished. Some authorities refer to this situation as the 'hollow states hypothesis'. The concept refers to the existence of state systems, but the inability of the state to fulfil its stated responsibilities and functions. It implies a weak state, without the ability to provide sustained leadership across society. It further implies a state relying largely on the support of those who receive some benefit from its existence. Finally, it implies a form of governance in which the state is unable to adequately interact with citizens through democratic institutions.

In many African countries, the losses of human capacity are likely to leave states less capable of protecting and providing for their citizens, thus failing a core function of effective governance, with ramifications for both political legitimacy and stability in the years to come. But, just as the epidemic endangers pillars of nation-states, so too does it strike at the pillars of international stability and governance. A more direct security threat is that AIDS induced weak states may become havens for new enemies of global order. Such states give extremist groups freedom of operation, with dangerous consequences for global order.

16.6 Conclusion

Slowly and belatedly, we are awakening to the full implications of the HIV/AIDS epidemic in Africa. As the data and analysis provided in this chapter clearly demonstrate, this is an epidemic like no other. It is quite simply the most important issue in sub-Saharan Africa for the coming decade, bar none. It has already set in motion processes that will transform the continent's political, economic and social structures for ever, destabilizing societies and eroding human security. Sadly the world, and in particular, African govern-

Figure 16.7: Conceptual framework for impacts of HIV/AIDS on democratic processes. **Source:** The authors.



ments are simply not set up to deal with the ramifications. There is a conspicuous reluctance by institutions, both African and donor, to develop institutional mechanisms for dealing with the challenge. There is a tendency for HIV/AIDS to become an add-on to other ‘more urgent’ demands. There is also a well-demonstrated tendency to discount the darker ramifications of the epidemic, especially in view of the fact that other disasters (notably famines) have repeatedly failed to kill the huge numbers of people predicted by the media and some relief agencies.

It is all too increasingly apparent, however, that HIV/AIDS is different: the figures are real, and there cannot be the rapid ‘bounce back’ to a version of normality quickly afterwards. The impact of AIDS on human resources and institutional capacity means that it

will be necessary for African governments and their development partners to prioritize ruthlessly. Although the proximate cause of the epidemic is sexuality, the underlining societal causes are much broader and familiar. Across Africa, poverty structures not only the contours of the pandemic but also the outcome once an individual is infected with HIV. Thus, until poverty is reduced there will be little progress with either reducing transmission of the virus or creating an enhanced capacity to cope with its socio-economic consequences. This will require some political courage, and the sacrifice of some other ideals and aspirations.

The next step has to be the development of policies and programmes that address the interrelationships between poverty and development and actually

to put in place those activities that can make a difference for development outcomes. Central to these activities are programmes that address poverty today so as to facilitate socio-economic development tomorrow. Herein lays Africa's predicament: how to achieve the sustainable development essential for an effective response to the pandemic under conditions where the epidemic is destructive of the capacities essential for the response – namely, killing the most economically productive members of the continent's people. Simple answers to this problem do not exist, but recognition of its nature is a step towards its solution.

Policy makers, donor organization and institutions on the continent, such as the African Union, need to focus their energies on doing just two or three things, each of them relevant to combating the epidemic, rather than trying to do everything from industrial development to judicial reform. This is not a blueprint for abandoning social development in favour of HIV/AIDS programming. On the contrary, the political energies required for overcoming the epidemic can be drawn from these other, longer-established social agendas. A symbiosis between long-standing demands such as education, food security or local democracy and HIV/AIDS will enable both aims to be met.

Sophia Benz

17.1 Introduction

It is increasingly argued that HIV/AIDS might threaten the internal and external security of severely affected societies, for example through the loss of military personnel,¹ through rising crime rates associated with the increasing number of AIDS orphans,² and especially through its destabilizing economic impact.³ Thus, HIV/AIDS can be viewed as an indirect cause of conflict due to its direct impact on social, political, and economic variables decisive for the outbreak of conflict. Although various studies have explored this issue⁴, the question whether and how far AIDS may affect political stability, lead to state failure, or even to

the outbreak of conflict requires empirical examination in the coming years as the epidemic unfolds and the necessary AIDS-death data become available.

However, what can be empirically analysed at this point is the reverse-causal effect or the question whether conflict experience impacts on HIV-prevalence rates. Below, the key arguments of a study will be introduced which examines decisive mechanisms linking HIV/AIDS and conflict experience.⁵ In addition, main results of the corresponding quantitative analysis are presented before some policy conclusions are drawn from these results.⁶

In accordance with the theme of this book the overall aim is to illustrate how HIV/AIDS as a health issue interacts with conflict or war experience. Recognizing the HIV/AIDS epidemic as a non-traditional threat to security highlights the importance of a widened and deepened definition of security. In addition, debating and analysing the links between HIV/AIDS and political instability helps to answer the question

1 See: UNAIDS (1998); Ngoma/Len Roux (2007); for a discussion of the impact of HIV/AIDS on democratic governance, internal stability, social fragmentation, political polarization, and the risk for ethnic violence see: USIP (2001: 6, 7; 2001a); Fourie/Schönteich (2001: 12); Gupta-Sapir/van Panhuis (2002: 24–36); Manning (2002).

2 See: Schönsteich (1999: 1, 3); Fourie/Schönteich (2001: 14, 5); Pyne-Mercier (2001); Machel (2000).

3 See: Collier/Hoeffler (2000); Mills/Shillcut (2004); Evans (2004); van der Gaag (2004); Brown (1997); Altmann (1999); Bonnel (2000); Fourie/Schönteich (2001); Gupta-Sapir/van Panhuis (2002); Ouattara (2004).

4 See: Davis/Kuritsky (2002); Davis/Iqbal/Zorn, (2003); Ghobarah/Huth/Russett (2003); Hankins/Friedman/Zafar/Strathdee (2002); Murray/King/Lopez/Tomijima/Krug (2002); Levy/Sidel (1997); Goyer (2001); Van der Heijden (1997); Schönsteich (1999); Machel (2001); Fleshman (2001); Burkhalter (2002); Gupta-Sapir/van Panhuis (2002); Leaning (2003); Connolly/Heymann (2002); Smith (2002); Cossa/Gloyd/Vaz/Folgora/Simbine/Diniz/Kreiss (1994); Amowitz/Reis/Lyons/Vann/Mansaray/Akinsulure-Smith/Taylor/Iacopino (2002); Mabey/Mayaud (1997); Santos-Ferreira/Cohen/Lourenco/Matos-Almeida/Chamaret/Montagnier (1990); Carballo/Frajnzgier (2001); Carballo/Nerukar (2001); ICAD (2001); Sharma (2003); Hsu/du Guerney (2003); Nanayakkara/Guy (2003); Salama/Laurence/Nolan (1999); McInnes (2006), Elbe (2006).

5 The term ‘conflict’ refers to the concept of ‘armed conflict’ as defined by Gleditsch/Wallensteen/Eriksson/Stollenberg/Strand (2004): “Armed conflict is a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths” (Gleditsch/Strand/Wilhelmsen 2004: 3). For the purpose of analysis armed conflict is later categorized into ‘minor armed conflicts’ with at least 25 battle-related deaths per year and fewer than 1,000 battle-related deaths during the course of conflict, ‘intermediate armed conflicts’ with at least 25 battle-related deaths per year and an accumulated total of at least 1,000 deaths, but fewer than 1,000 per year, and ‘wars’ with at least 1,000 battle-related deaths per year (see Gleditsch/Strand/Wilhelmsen 2004: 4).

6 The extended version of this study is available at: <<http://www.ub.uni-konstanz.de/kops/volltexte/2005/1473>> and has been submitted to the University of Konstanz in partial fulfilment of the requirements for the MA degree in Politics and Management (Diplomarbeit). The statistics package used is: STATA 8.0, 6.0.

as to how far health initiatives can be used as peace initiatives, as well as the question of how far peace initiatives might play a role in improving overall health. As the results of the quantitative analysis indicate that countries' prior conflict involvement significantly correlates with higher HIV-prevalence, this supports the importance of health interventions in conflict and peacekeeping settings. In addition, these results suggest that peace initiatives have a vital role in promoting health and indirectly contribute to stop the HIV virus from spreading.

17.2 The Theoretical Argument

Theoretically, the study is based on the 'Jaipur Paradigm', enlarged by a micro-foundation as well as a conflict dimension. The Jaipur Paradigm is a social epidemiological approach which explains differences in the progress of HIV/AIDS epidemics through variations in countries' socio-economic susceptibility and vulnerability to the disease.⁷ According to this approach, countries' susceptibility and vulnerability is determined by only two factors: their level of wealth and the degree of social cohesion or income inequality.⁸ Elsewhere it is argued that at least one dimension of the social cohesion concept (a strong civil society protecting human rights) associates with less vulnera-

bility to HIV-infection. Separatism, fragmentation, and marginalization decrease the capacity for action of socially isolated individuals living in areas with low social capital.⁹ In addition, health information and innovative behaviour (e.g. condom use) may also diffuse more rapidly in communities that are cohesive and whose members trust each other. At the individual level, social capital may influence health behaviour by establishing social identities and societal norms, which are collectively negotiated and which promote healthy behaviour, trust, and respect. Others argue that members of cohesive and trusting communities are more likely to experience high levels of perceived self-efficacy and empowerment, which increases the likelihood that they will engage in health-protective behaviour. Finally, social capital may also lead to the development of and accessibility to health care services.¹⁰ Thus, social capital facilitates collective action and eventually leads to policies which are more likely to benefit and protect all citizens.

Empirical evidence derives from a study by DeHoltgrave and Crosby (2003) that examines poverty, income inequality, and social capital as predictors of state-level AIDS rates in the US. Social capital is found to be the strongest predictor of both STD and AIDS rates, and the authors conclude that membership in social organizations protects against risky sexual behaviour. Although a study from South Africa that examines only the civic participation aspect of social capital suggests that the type of organization to which one belongs makes a difference (Campbell/Williams/Gilgen 2002), there is support for the 'Jaipur Paradigm' in the HIV/AIDS literature and for the thesis that levels of social cohesion, social capital, wealth or income inequality correlate with HIV/AIDS.¹¹

According to the Jaipur Paradigm, especially poor countries with little social cohesion face high levels of susceptibility to HIV-infection and high levels of vulnerability to its impact. These countries often experi-

7 Susceptibility refers to the level of risk for HIV-infection in a particular social environment, defined as those aspects of a society which make it more or less likely that an epidemic will develop. In contrast, vulnerability refers to those aspects of a society which influence the likelihood that an epidemic will have a serious impact on social and economic organizations (Barnett/Whiteside/Decosas 2000: 1099).

8 The concept of social cohesion refers to (1) the absence of latent social conflict (in form of income inequality, racial/ethnic tensions, disparity in political participation or other forms of polarization), and (2) to the presence of strong social bonds or high levels of "social capital" (Kawachi/Berkman 2000: 175). Thus, cohesive societies are those that are richly endowed with stocks of social capital, which is associated with informal sociability, social trust, civic involvement in public affairs, high levels of volunteerism, and the existence of a vivid community organizational life. The authors of the Jaipur Paradigm themselves note that social cohesion may be an expression of cultural homogeneity, it may be the product of good governance and a strong civil society, it may be related to a prescriptive religious culture, or it may be the result of a controlling authoritarian political system or military dictatorship (Barnett/Whiteside/Decosas 2000: 1100).

9 See Putnam's measure of social capital as described by DeHoltgrave/Crosby (2003): "The measure is a combination of 14 variables that span the domains of community organizational life, involvement in public affairs, volunteerism, informal sociability, and social trust" (DeHoltgrave/Crosby 2003: 62).

10 See: Mann (1999); DeHoltgrave/Crosby (2003: 62); Kawachi/Berkman (2000: 179-180, 184-185); Campbell/Williams/Gilgen (2002: 51); Deneke/Faltis/Hildebrandt/Trojan (1991); Poundstone/Strathdee/Celentano (2004: 26).

11 See: Over (1998); Mahal (2001); DeHoltgrave/Crosby (2003); Kawachi (2000).

ence civil war or economic collapse, and although it may take time for the epidemic to develop, it will eventually reach very high levels. Their lack of social cohesion and an unequal distribution of wealth render an effective response difficult. Thus, HIV-prevalence levels are also predicted to remain high.

Although the 'Jaipur Paradigm' greatly improves our understanding of the AIDS epidemic by adding this decisive socio-economic explanatory dimension, the approach is not without its weaknesses. It has been especially criticized because it lacks a sound micro-foundation and only implicitly assumes that the level of wealth and social cohesion is somehow causally related to the HIV-transmission, and therefore individual risk behaviour. Interpreting a population-based association between socio-economic variables and national HIV-prevalence, and inferring a causal effect on individual-level processes is, however, problematic.

Therefore, a micro-foundation is added by relying on socio-psychological approaches that state that individual health risk behaviour is determined by the following factors: the individual's perceived threat or susceptibility to the disease, the individual's cost benefit calculation as benefits of taking a preventive action need to outweigh the perceived barriers or costs, and finally demographic, socio-psychological, and structural factors (or environments) which act as external barriers or motivators to individual risk behaviour. The specific application of this approach to the AIDS epidemic is the so-called "AIDS Risk Reduction Model".¹² This model argues that in order to change risk behaviour individuals need to move across three stages: first, they need to recognize and label their behaviour as high risk. This phase is influenced by the individual's knowledge of sexual activities associated with HIV-transmission or aversive emotional states such as high levels of distress. Already at this point it becomes clear that these variables are negatively affected by conflict experience. Secondly, individuals need to commit themselves to reduce high-risk behaviour. This is for example influenced by the perceived costs and benefits of behavioural change, the perceived self-efficacy as well as social factors (such as group norms and social support). Again, these variables are negatively affected by conflict experience. Finally, there comes the 'taking action stage', which is influenced by prior experiences with problems and solutions, informal or formal help (e.g. from social

networks), the individual's level of self-esteem or the resource requirements of acquiring help. Again, conflict experience negatively impacts on these factors. Additionally, this stage is heavily influenced by the sexual partner's beliefs and behaviour and the individual's ability to communicate verbally with this partner. Thus, it becomes clear that especially conflict-related rape acts as a massive barrier.

Socio-psychological models include an important component of reasoned action. However, these approaches also leave room for external (macro-) factors to influence actions and the cost/benefit calculations of individuals. These external variables, among them the macro-variables of the 'Jaipur Paradigm', become decisive in linking macro-environments to individual health risk behaviour.

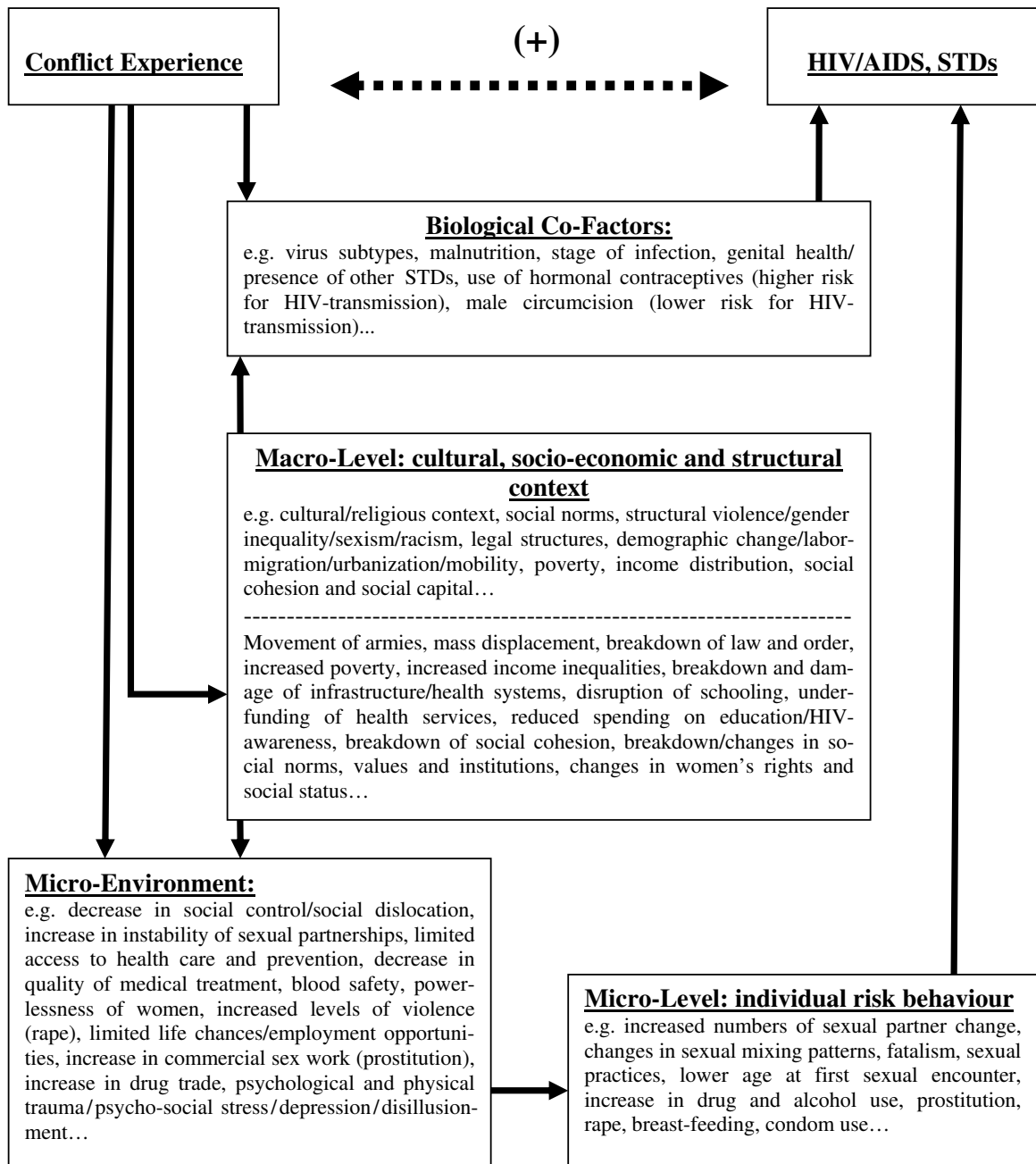
Taken together, it is assumed that there are four types of determinants of the epidemic: (1) *macro-environmental factors* (wealth, income distribution, or conflict experience), (2) *micro-environmental factors* (access to health care or level of social control), (3) *behavioural factors* (sexual mixing patterns and condom use) and (4) *biomedical co-factors* (stage of the epidemic, existing virus subtypes, STDs). It is further argued that factors at different levels of analysis interact. Changes in macro-level conditions affect micro-environments of individuals that affect lifestyle and individual health risk behaviour.

Finally, conflict experience fits into the 'Jaipur Paradigm' because it not only results in the breakdown of all social cohesion and poverty, but also because it impacts on societies' susceptibility and vulnerability to HIV/AIDS independently of its effect through wealth, social cohesion or income distribution. Thus, there exist a wide range of macro effects which are associated with conflict involvement. Most importantly, conflict results in increases in the disparity in income, in the breakdown of social cohesion, and declining levels of wealth. The mobility of populations (soldiers, refugees, Internally Displaced Persons (IDPs)) increases, health care and education systems break down, are damaged or at least under-funded, and social values rapidly change (e.g. women's status as they become refugees). In addition, institutions, law, and order break down, and biological co-factors of transmission (malnutrition, presence, of other STDs and the existence or emergence of virus subtypes) become prevalent.

These changes at the macro-level affect micro-environments of individuals in several ways. People face refugee existence associated with individual depression and increasing levels of violence and powerless-

12 For more information see at: <http://www.cominit.com/hiv aids/change_theories.html>.

Figure 17.1: The Final Theoretical Model. **Source:** Benz (2005).



ness of women. They face decreases in social control and increases in commercial sex work, but at the same time decreasing access to health care and deteriorating health care systems, a lack of preventive health education or increases in drug trade. This in return impacts individual health risk behaviour. Drug and alcohol use increase, sexual mixing patterns change, sexual partnerships become unstable, the number of different sexual partners increases while condom use

becomes less likely, and rape increasingly occurs. At the macro level high national HIV-prevalence rates may be observed. Figure 17.1 once again summarizes the theoretical model, which explains the linkage between conflict involvement and HIV-prevalence levels.

In summary, the three identified main mechanisms linking conflict experience with high HIV-prevalence are the effect of conflict on infrastructure, the effect of conflict experience on civilians who become

uprooted and face increased risk of HIV-infection, and third, the so-called ‘Trojan Horse Hypothesis’, which directly links the spread of HIV/AIDS to the mobility of soldiers. Only the latter of these mechanisms shall now be described in detail.

17.3 ‘Trojan Horse Hypothesis’: HIV in the Military

Although data indicate wide country specific ranges, they indicate significantly higher HIV-prevalence rates among the armed forces. In South Africa, for example, 60 per cent to 70 per cent of military personnel are infected; at a military police base in northern KwaZulu-Natal, a 90 per cent infection rate was found (Kirk 2000). Others mention infection rates among the military in Malawi of 75 per cent and in Zimbabwe of 80 per cent - approximately three times as high as average rates among the adult population (ICAD 2001: 2). Even in peaceful Botswana, one in three members of the military have been tested HIV-positive (UNAIDS/WHO 2004a: 176). Estimates of HIV-prevalence among the military in Angola and the Democratic Republic of Congo range between 40 per cent and 60 per cent (VanBeelen 2003: 6). The same author notes that 50–60 per cent of all beds in the Kenyan Armed Forces Memorial Hospital are occupied by military personnel with HIV/AIDS-related infections and that at least 6–10 soldiers die each week as a result of AIDS.

Data from a rural blood bank in Mozambique revealed that 39 per cent of military blood donors were HIV-positive, compared to 15 per cent of non-military donors (VanBeelen 2003: 7, 6). The proportion of reported HIV-cases in the military is also comparatively high in El Salvador (Wollants/Schoenenberg/Figueroa/Shor-Posner/Klaskala/Baum 1995: 129) as well as Cambodia and Thailand (Carballo/Frajnzgier 2001: 19). Although HIV-prevalence levels in the military forces are still low, HIV-prevalence in military recruits also alarmingly increases in Vietnam (Gorbach/Ryan/Saphonn/Detels 2002: 41). The government of Ethiopia found that only 5.5 per cent of tested military personnel were HIV-positive, which is less than the national prevalence of 10.6 per cent. However, Renaud (2002) points to the hidden factor that most soldiers had been screened prior to entry into the army and those with HIV had been rejected. In addition, the length of stay in the military averaged only 10 months, meaning that the HIV-positive conscripts had become infected very fast (Renaud 2001: 15).

The UN summarizes that even during peacetime, soldiers have STI rates two to five times greater than those of civilian populations. Those rates can rise up to 50 times higher during armed conflict (UNAIDS 1998: 3). Where data are available, this leads to figures such as 20 to 40 per cent HIV-positive soldiers in Sub-Saharan African countries, with rates of 50 per cent to 60 per cent in a few cases where the virus has been present for over 10 years and average adult prevalence is already very high (UN 2001c: 2; Nogoma/Len Roux 2007). Accurate figures on infection rates of various rebel groups and militias do not exist but may be expected to be high. Over (1998) finds that for the average developing country, reducing the military size from 30 per cent to 12 per cent of the urban population would reduce sero-prevalence among low-risk urban adults by about one per cent (Over 1998: 48).

High susceptibility of military forces to HIV-infection has been attributed to their work environment,¹³ their relatively low levels of maturity combined with high levels of testosterone (Fourie/Schönsteich 2001: 7), their high levels of sexual activity (VanBeelen 2003: 6), and the military’s professional ethos, which tends to excuse or even encourages risk-taking on and off the battlefield, also in regard to sexual behaviour (UNAIDS 1998). Additionally, aggressiveness is often abetted by high levels of alcohol and drug consumption (Fourie/Schönsteich 2001: 7). Trauma and brutalization caused by day-to-day experience of violence, frustration, apathy, loneliness, and dispiritedness have also been identified to lead to an increase in sexual violence (ICAD 2001; Hankins/Friedman/Zafar/Strathdee 2002: 2246; Smith 2002: 11).

This is supported by a UN study (2001: 2) and the finding that young men who staff armed forces are main perpetrators of sexual abuse and exploitation in settings of war and conflict. Thus, sexual violence and rape committed by soldiers e.g. in Sierra Leone, Rwanda, and Liberia¹⁴ become an important factor linking HIV/AIDS and conflict. Systematic mass rape used by regular and state armies as a weapon against civilians during wartime has also been undertaken in Uganda, Bosnia, Mozambique, Sri Lanka, Burma, Somalia, and the Democratic Republic of Congo.¹⁵

13 E.g. deployment to unsettled areas with exposure to socially disrupted settings where STIs may abound, a high possibility of infection through wounds and contaminated blood, etc. (see: Goyer 2001: 13).

14 See: Amowitz/Reis/Lyons/Vann/Mansaray/Akinsulure-Smith/Taylor/Iacopino 2002; Astill 2000; Donovan 2002; Swiss/Jennings/Aryee/Brown/Jappah-Samukai/Kamara/Schaack/Turay-Kanneh 1998.

Among the objectives are spreading terror and fear, inflicting psychological damage, disabling the enemy by destroying the bonds of family and society, or even ethnic cleansing (Shanks/Schull 2000: 1153). Systematic sexual molestation, mutilation, and rape of women and girls during the Rwandan genocide were integral to the plan to annihilate the Tutsi population. "Among the weapons of choice calculated to destroy while inflicting maximum pain and suffering was HIV. Eyewitnesses recounted later that marauders carrying the virus described their intentions to their victims: they were going to rape and infect them as an ultimate punishment that would guarantee long-suffering and tormented deaths" (Donovan 2002: 17). In the capital of Rwanda, HIV-prevalence among pregnant women from rural areas rose up to 24 per cent in 1995, which is said to be a result of rape and displacement during the 1994 genocide.¹⁵ The UN estimates that between 250,000 and 500,000 rapes were committed, gang rape was common, and that there were many incidences of women being abducted and held for long periods as sex slaves. Of the women who survived these attacks 70 per cent are estimated to have been infected with HIV (AI 2004: 3, 6). Burma is mentioned as another example, where soldiers' practice of raping ethnic minority women in conflict areas has attributed to the spread of HIV (Burkhalter 2002: 3). In addition, HIV-infection is also found to be strongly associated with the movements of military personnel and rape in Liberia (UNAIDS/WHO 2002: 35), as well as in Nigeria and Uganda (Fleshman 2001; Van der Heijden 1997; Smallman-Raynor/Cliff 1991).

A related problem is the growth of local sex industries in response to demand from military bases. As military service often includes lengthy periods spent away from home, personnel are looking for ways to relieving loneliness, stress, and the build-up of sexual tensions. It is also mentioned that the military culture uses the purchasing of sex as part of bonding among soldiers (VanBeelen 2003: 6). In addition, military personnel bring a degree of steady income into impoverished rural areas where men are off fighting or

have fled. This can translate into an increase in the number of women who turn to prostitution to survive during and after conflict.¹⁷

The UN study warns that even in peacetime, the likelihood of unsafe commercial sex appears to rise in the presence of military bases and units (UN 2001c: 2). Evidence comes from Cambodia (UNAIDS 1998), Sierra Leone (UNAIDS/WHO 2002: 35), or Thailand (VanLandingham/Suprasert/Sittitrai/Vaddhanaphuti/Grandjean 1993). The potential for the spread of the HIV-virus from the prostitutes over soldiers into the population of non-prostitutes is considerable, because men visiting prostitutes often have non-prostitute partners.¹⁸ Machel (1996) and Elliott (1996) both find that even children become victims of prostitution following the arrival of peacekeeping and foreign military forces. Female child soldiers, who are forced to be 'wives' or sex slaves to one or several boys or men in their unit in Sierra Leone, Liberia or the Democratic Republic of Congo are particularly vulnerable to STIs, HIV, and unwanted pregnancy through rape and sexual exploitation (Renaud 2001: 6).

These described mechanisms illustrate how the HIV-virus uses combatants as 'Trojan Horses' to spread itself among the civilian population surrounding military bases and to enter low-prevalence areas. Given the fact that HIV-prevalence levels within the military forces are extremely high, especially increasing prostitution and rape committed by soldiers become decisive mechanisms linking HIV/AIDS and conflict experience. In agreement with Robert Shell, the hypothesis that HIV is spread by troops is called the 'Trojan Horse Hypothesis' (Shell 2000: 12, 2002). In general, the mobility of soldiers during warfare results in a mix of people with high- and low-risk behaviour that otherwise might not mix. Thus, armies moving between high- and low-prevalence countries become primary vectors for transmitting the disease, and serve as a 'bridge population'.¹⁹ Thus, the pres-

15 See ICAD (2001: 2); Salama/Laurence/Nolan (1999); Human Rights Watch (1995); Shanks/Schull (2000: 1153); Swiss/Giller (1993); Swiss/Jennings/Aryee/Brown/Jappah-Samukai/Kamara/Schaack/Turay-Kanneh (1998); Smith (2002: 8); Swiss (1999); Wax (2003); Elliott (1999). See also McGinn (2000) for an overview on case studies regarding sexual violence in conflict settings.

16 See at: < <http://www.unaids.org/security/Issues/conflict.html>>.

17 See: Hankins/Friedman/Zafar/Strathdee (2002); Goyer (2001: 16); Astill (2000); Machel (1996: 34, 35); UNAIDS/WHO (2002: 35); UNAIDS (1998).

18 See: VanLandingham/Suprasert/Sittitrai/Vaddhanaphuti/Grandjean (1993: 311); see also: Lowndes/Alary/Meda/Gnintoungné/Mukenge-Tshibaka/Adjovi/Buvé/Morison/Kanhonou/Anagonou (2002) for evidence on Benin.

19 This is not a new phenomenon. The military has played a significant role in the spread of other infectious diseases in the past, such as the Influenza Epidemic of 1918/1919 or the spread of Smallpox and Syphilis in the fifteenth and sixteenth century (see: Shell 2000: 9).

ence of armies recruited from high-prevalence countries has an immense impact on domestic HIV-prevalence rates in areas of conflict. However, soldiers recruited from low-prevalence countries (e.g. Angola) but posted in areas where HIV-prevalence is high (e.g. Congo) also spread the disease in their communities when returning home.²⁰ Considering the determination that a soldier's sero-status is a major consideration in being demobilized or mustered out, there is urgent need to recognize this serious public health threat. Definitely, similar logic applies to returning refugees and internally displaced people (DeHulsters/Barreto/Bastos/Noya/Folgosa/Fransen 2003: 77; UNAIDS/WHO 2004; Williams/Martin 2002; Spiegel/Nankoe 2004: 22).

Based on the above it appears reasonable to expect that conflict involvement leads to a difference in countries' HIV-prevalence rates. More specifically, the main hypothesis of the following quantitative analysis states that prior conflict involvement associates with high HIV-prevalence levels.

17.4 Modelling HIV-Prevalence: A Quantitative Analysis

The dependent variable of the corresponding quantitative analysis is therefore adult HIV-prevalence as the percentage of the whole adult population (15–49 years old) estimated to be HIV-positive and alive by the end of 2003.²¹ The HIV-data are taken from the UNAIDS/WHO report on the global AIDS epidemic, released on 15 July 2004. The estimates of late 2003 are presented with ranges (low and high estimates), called 'plausibility bounds'.²² This should reflect the uncertainty in estimates and provides an additional test for the robustness of the coefficients of the conflict variable.

The key independent variable is 'prior conflict involvement' which proxies many of the previously mentioned variables associated with high HIV-prevalence rates (such as increasing prostitution, rape, and mobility of refugees and soldiers). The indicators refer to data compiled by Gleditsch, Wallensteen, Eriksson, Stollenberg, and Strand (2004), and measure the number of conflicts involved, the number of wars, intermediate and minor conflicts involved, the duration

of conflict involvement, the time since the last conflict involvement, and conflict involvement of neighbouring states. As conflicts taking place before 1995 can hardly be linked to people still alive and tested HIV-positive at the end of 2003, they have been excluded from the analysis.

Results of the bivariate analyses indicate significantly higher mean HIV-prevalence for countries which have been involved in conflicts and for countries surrounded by neighbours with high war involvement. Additionally and surprisingly, countries with a medium duration of conflict involvement show a significantly higher mean HIV-prevalence compared to the group of countries with a very short or long duration of conflict involvement. This points to a non-linear effect. Therefore, it might be that initially, HIV-prevalence is increasing with the duration and intensity of conflict involvement (due to increasing prostitution, rape, mobility of soldiers, or collapsing health and education infrastructure).

However, very extensive and intense conflict involvement might be associated with again declining HIV-prevalence due to isolating side effects. It can be argued that very extensive and intense conflict involvement 'quarantines' countries, "limiting people's exposure to the outside world and, consequently, to carriers of HIV". Angola, Liberia, Sierra Leone, and southern Sudan belong to the group of 'war-torn'

20 This has been the case with Nigerian peacekeepers returning from Sierra Leone and Liberia (see Alban et al. 2000) or with returning South African veterans and exiles (see: Shell 2000: 7, 12).

21 The age range (15–49 years old) captures those who are in their most sexually active years. While the risk for HIV-infection continues beyond 50 years the vast majority of people who will become infected are likely to have done so by this age. Thus, it is necessary to point out that the data used exclude HIV-positive adults over the age of 49 who might have become infected during the study period. However, most of the developing countries with particularly high HIV-rates (where this could have resulted in the exclusion of a large number of people) have life expectancies lower than 49 years. Thus, this age cut should not be too problematic as the total number of adults over the age of 49 who are HIV-positive and still alive, is expected to be very low. Additionally, HIV-positive children aged 0–14 are also not covered by the data. However, most of them are likely to have acquired the virus via mother-to-child-transmission. As the mothers' infection might be associated with conflict related factors and as mothers are most likely over the age of 15 and, therefore, already captured by the data, the exclusion of children is a means of avoiding double counting.

22 For more information on the estimation and application of the plausibility bounds, see: Grassly/Morgan/Walker/Garnett/Stanecki/Stover/Brown/Ghys (2004) or Walker/Grassly/Garnett/Stanecki/Ghys (2004).

Box 17.1: Functional Form of a Multiple Regression Analysis

The analysis applied is based on a simple multiple regression equation of the following functional form:

$$Y = b_1 * x_1 + b_2 * x_2 + \dots b_k * x_k + c + e, (1)$$

where Y is the true dependent variable, the b's are the regression coefficients of the corresponding x (independent/control) terms, c is the constant or intercept, and e is the error term reflected in the residuals.

countries with nevertheless low HIV-prevalence relative to surrounding countries due to conflict-related isolation (UNAIDS/WHO 2004a: 178, 180; Spiegel/Nankoe 2004: 324). Other factors, particularly related to very extensive and intense conflict experience that might reduce the pace of infection are decreasing casual sex associated with trauma and depression, the long-term disruption of sexual networks, increasing death rates among high-risk groups (soldiers) or heavy involvement of international humanitarian aid agencies.

The conducted multiple regression analysis models this assumed non-linear, inverse u-curve relationship. Other statistical problems, such as bivariate- as well as multivariate-multicollinearity, have also been taken care of. Additionally, the underlying structure of the HIV-data and heteroscedasticity both require a transformation of the dependent variable. Missing data have been replaced, eleven cases needed to be dropped²³, and the final sample contains 197 countries. Additionally and to allow for the isolation of the impact of conflict involvement, factors previously shown to affect HIV-prevalence must be controlled. Thus, the final statistical model explains HIV-prevalence through countries' education levels, their level of wealth and income inequality, the pace of urbanization, the lagged HIV-prevalence rates, a youth bulge variable, a cultural context variable, the key independent variable which is prior conflict involvement, its squared term in case of non-linearity, and finally the proportion of neighbours involved in war.²⁴ Additional information on data sources as well as measurement of all variables included in the analyses is given in Table 17.2 in the Annex.

23 Deleted cases with missing values on more than six out of fourteen indicators used to measure the control variables are: Aruba, Bermuda, Channel Islands, Faroe Islands, French Polynesia, Greenland, Isle of Man, Liechtenstein, Mayotte, Virgin Islands, and West Bank and Gaza.

24 For more information on technical details, as well as the theoretical justification for the inclusion of the control variables see at: <<http://www.ub.uni-konstanz.de/kops/volltexte/2005/1473>>.

17.5 Does Conflict Experience Significantly Correlate with Higher HIV-Prevalence?

Generally, R²-values of the models given in Table 17.1 in the Annex are very high, which indicates that the models explain up to 68.57 per cent of the variation in HIV-prevalence. Results also clearly indicate that countries' own prior conflict involvement exerts a statistically significant and positive effect on HIV-prevalence. The expectation that the type of conflicts involved (wars, intermediate or minor conflicts) is important with regard to its impact on HIV-prevalence cannot be supported. Instead, involvement in all types of prior conflicts significantly correlates with higher HIV-prevalence. The comparatively strong effect of the number of minor conflicts on HIV-prevalence might be explained by the fact that low intensity conflict involvement is correlated with a medium duration of conflict involvement, which itself correlates positively with HIV-prevalence.

Secondly, any type of a country's own conflict involvement exerts a much stronger (and positive) effect on HIV-prevalence at home compared to a much weaker (and negative) effect of neighbouring war involvement on HIV-prevalence in bordering nations. For instance, increasing the proportion of neighbours involved in war by one standard deviation would result in a decrease of HIV-prevalence at home by only -0.13 standard deviations, whereas increasing a country's own number of conflicts involved by one standard deviation increases the transformed dependent variable (HIV-prevalence) by 0.43 standard deviations (see Model 6, Table 17.1 in the Annex). This points to the importance of intra-state, conflict-related mechanisms, such as increasing mobility of soldiers and internally displaced people, or increases in the incidence of rape and prostitution. The spread of HIV to neighbouring countries via international, war-related effects, such as refugee flows, might be less important. International spillover effects might be offset by the isolating effect of neighbouring war involvement, as mobility and trade between countries is reduced and the spread of the virus across borderlines is hin-

dered. Negative economic spillover effects are probably already captured by the variable measuring the level of wealth.

There is also preliminary support for the inverse u-curve relationships between the duration of conflict involvement and HIV-prevalence, and between the peacetime since the last conflict involvement and HIV-prevalence. However, intense conflict involvement (in terms of battle deaths and measured through the number of wars a country has been involved in) is associated with a steadily increasing HIV-prevalence. Thus, it is rather extensive conflict involvement (in terms of duration) instead of intense conflict involvement (in terms of battle deaths), which exerts a significant, non-linear effect on HIV-prevalence. This is explained by the fact that particularly long-term conflict involvement is associated with isolating effects and a delaying impact on the spread of HIV-infection, which might not be the fact in cases of frequent and intense, but relatively short war involvement.

Finally, highly significant and positive coefficients are found for the lagged HIV-prevalence variable, which indicates strong temporal dependence in HIV-data. Results also indicate that the higher the proportion of males aged 15–49 years, the lower HIV-prevalence levels are. This might be explained by a problem of reverse causation: although the existence of a large sexually active and highly at risk population increases societies' susceptibility to the disease, young adults are also most likely to die of AIDS. As expected, the higher the level of education the lower HIV-prevalence levels are. However, the effect of education on HIV-prevalence remains comparatively weak. This might be due to the presence of other variables in the same specification (e.g. level of wealth or urbanization) which partly capture the effect of education. The strength of the effect of income inequality on HIV-prevalence is comparable to the strength of the effect of the education variable. Again, coefficients are highly significant even when mediating variables (e.g. the level of poverty, educational attainment or levels of urbanization) are controlled. This supports a contextual effect of income inequality on HIV-prevalence. The coefficients of the cultural variable measuring the proportion of Muslim or Jewish population are also highly significant and show the expected negative sign. Higher levels of urbanization are generally correlated with higher levels of HIV-prevalence. However, the pace of urbanization seems to make a difference. In particular, rapid urbanization might be associated with lower HIV-prevalence because it avoids long periods of short-term rural-urban labour migra-

tion. High levels of per capita health expenditures are not significantly correlated with lower HIV-prevalence, which might again be due to an endogenous relationship. That means although high levels of health spending might be related to lower HIV-prevalence due to better prevention and controlling options, the level of HIV-prevalence vice versa affects the level of health spending.

Last but not least, tests of robustness as well as robust regression results support these outcomes. For example, using low estimates of HIV-prevalence to measure the dependent variable or using a smaller sample ($N=151$), which excludes those countries for which HIV-data are missing, does not change the significant results found for the conflict variables. The strength of effects only slightly changes. There are also no signs of bias in the data due to systematic missing cases. A corresponding measurement error hypothesis which states that the level of uncertainty in HIV-estimates correlates with the fact that countries have been involved in conflict could not be supported. Results from robust regression analysis also further support the main hypothesis. The exclusion of identified multivariate outliers does not result in a significant change in the values of regression coefficients.²⁵ Instead, R^2 -values drastically increase and the coefficients of the conflict involvement variables stay or become even more significant. Again, and beside the lagged HIV-prevalence rates, the conflict variable contributes most to the predictive power of the models. Illustrating the relative strength of this effect requires a comparison of the so-called standardized beta-coefficients. This reveals that for example the exclusion of the dummy variable measuring a country's own war involvement from the analysis would reduce the R^2 -values and predictive power of the models by as much as 11.41 per cent, whereas an exclusion of the variable measuring the proportion of Muslim or Jewish population only results in a reduction of R^2 of about nine per cent. Excluding the variables measuring the level of health expenditure, the pace of urbanization, income inequality, the level of education, the proportion of young male adults or neighbouring war

25 Identified 'multivariate outliers' (cases with an unusual combination of values on the dependent as well as independent variables and a value of cook's $D > 4/\epsilon(N)$) in every of the 12 calculated robust regression analyses are Somalia, Laos, Zimbabwe, Lesotho, Botswana, Swaziland, the Maldives, and Vanuatu. North Korea has been identified as a multivariate outlier in nine, the Philippines in seven, Pakistan in four, and Sri Lanka in two out of the twelve robust regression analyses.

involvement would reduce the R^2 -values by only four to six per cent. Alone the lagged HIV-prevalence rates add more predictive power to the model than the conflict variable.

17.6 Policy Implications and Conclusions

In general, these results have important implications for AIDS forecasting and control in countries which have been involved in conflicts. The significant effect found for conflict involvement on HIV-prevalence confirms the importance of key health interventions in conflict and peacekeeping settings. Especially countries recovering from armed conflict need to integrate responses to AIDS in their recovery programmes (e.g. in humanitarian assistance or demobilization programmes). For example, there is urgent need to test outgoing but also incoming military personnel, as well as to counsel and prepare HIV-positive soldiers for demobilization and a return to civilian life. Confidential or voluntary counselling and testing in armies and peacekeeping forces needs to be expanded, health care for soldiers needs to be improved, and secrecy, stigma, and shame that cloak the epidemic particularly in the army need to be offset. However, uniformed services can also be excellent agents of change and an important human resource to build on for advocacy and social mobilization efforts through HIV/AIDS prevention training (UNAIDS 2002; UNAIDS/WHO 2004a: 177). They are generally perceived as role models, particularly for young people in their society. In addition, the military has strong traditions of organization and discipline, which gives them an 'organizational' advantage in the fight against HIV/AIDS.

More specifically, these results indicate that HIV/AIDS treatment and prevention programmes in conflict or post-conflict settings should focus on countries which have been involved in a large number of different conflicts, and on countries with a medium duration of conflict involvement. Particularly the impact of less intense forms of conflict involvement on HIV-prevalence should not be underestimated.

With regard to its effect on HIV-prevalence, it also seems to be of importance how development takes place. Increasing levels of urbanization are expected to be positively correlated with HIV-prevalence rates. However, the pace of urbanization seems to make a difference. Similarly, increasing income levels are negatively correlated with HIV-prevalence rates. How-

ever, the level of income inequality is also of importance. And finally, rising education levels are also expected to be associated with lower HIV-prevalence – as long as this does not result in increasing income inequalities.²⁶

In summary, it is important that structural interventions be developed with a view to the socio-economic and political determinants of HIV-risk, as well as the macro-impacts of AIDS epidemics. However, political scientists rarely study the linkage between politics and health, and "(...) there is [also] massive disinterest amongst AIDS researchers in such macro-analyses of the epidemic" (Altmann 1999: 561). Others mention that the potential of structural interventions for HIV-prevention has received only limited attention to date although in practice, many individual-level interventions have only had limited impact at the population level (Myer/Morrioni/Susser 2003: 191).

26 See also Whiteside/Hickey/Ngcobo/Tomlinson (2003: 35–6), who agree with the conclusion that there is not a simple causal relation between the epidemic and poverty/development. According to them, part of the answer may also lie in the type of economic growth (rapid or slow, equally or unequally distributed).

Annex

Table 17.1: Results of Final OLS Regression Analyses (with HIV-Prevalence as the dependent variable). **Source:** The author.

Model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Conflict measure	conflict dummy	war dummy	short duration	medium duration	high duration	No. of conflicts	No. of conflicts, extended sample
Parameter:							
Conflict Involvement	.073 *** (.013)	.070 *** (.014)	-.073 *** (.013)	.038 ** (.019)	.068 *** (.015)	.015 *** .434 (.002)	.010 *** .409 (.001)
Income Inequality (x27)	.003 *** (.001)	.003 *** (.001)	.003 *** (.001)	.002 ** (.001)	.003 *** (.001)	.004 *** .263 (.001)	.004 *** .263 (.001)
HIV_{t-2} (x33)	.015 *** (.002)	.015 *** (.002)	.015 *** (.002)	.014 *** (.002)	.015 *** (.002)	.014 *** .370 (.002)	.015 *** .375 (.002)
Youth Bulge (x25)₁	-1.377 *** (.344)	-1.511 *** (.346)	-1.377 *** (.344)	-1.569 *** (.368)	-1.629 *** (.384)	-1.928 *** -.298 (.324)	-2.107 *** -.326 (.332)
Culture (x23)	-.151 *** (.020)	-.112 *** (.021)	-.151 *** (.020)	-.147 *** (.022)	-.129 *** (.020)	-.067 *** -.175 (.021)	-.073 *** -.190 (.021)
Level of Education (x28)	-.003 *** (.001)	-.002 *** (.001)	-.003 *** (.001)	-.003 *** (.001)	-.003 *** (.001)	-.001 ** -.192 (.001)	-.002 *** -.230 (.001)
Urbanization (Pace) (x20)	-.012 ** (.005)	-.012 ** (.005)	-.012 ** (.005)	-.015 *** (.005)	-.012 ** (.005)	-.008 -.092 (.005)	-.010 ** -.115 (.005)
Health Expenditure ln(x24)	-.012 * (.007)	-.018 *** (.007)	-.012 * (.007)	-.021 *** (.007)	-.006 (.007)	-.009 -.065 (.010)	-.008 -.056 (.009)
Neighbouring Conflict (x31)	-.094 ** (.037)	-.110 *** (.038)	-.094 ** (.037)	-.117 *** (.039)	-.093 ** (.038)	-.092 ** -.134 (.036)	-.093 ** -.135 (.036)
Observations (N)	197	197	197	197	197	197	197
R-squared	0.6588	0.6477	0.6588	0.6099	0.6404	0.6857	0.6804
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Root MSE	.078	.079	.078	.083	.080	.075	.075

Model	Model 8	Model 9	Model 10	Model 11	Model 12
Conflict measure	No. of intermediate conflicts	No. of minor conflicts	No. of wars	Years in conflict, extended sample	Peace duration, extended sample
Parameter:					
Conflict Involvement	.029 *** .351 (.005)	.038 *** .463 (.006)	.040 *** .290 (.008)	-.036 *** -.926 (.009)	-.057 *** -1.498 (.012)
(Conflict Involvement)²	–	–	–	.005 *** .980 (.001)	.007 *** 1.494 (.001)

Income Inequality (x27)	.004 *** . <i>.239</i> (.001)	.004 *** . <i>.280</i> (.001)	.003 *** . <i>.193</i> (.001)	.004 *** . <i>.224</i> (.001)	.004 *** . <i>.236</i> (.001)
HIV_{t-2} (x33)	.015 *** . <i>.384</i> (.002)	.014 *** . <i>.357</i> (.002)	.014 *** . <i>.370</i> (.002)	.014 *** . <i>.353</i> (.002)	.014 *** . <i>.351</i> (.002)
Youth Bulge (x25)₁	-2.030 *** . <i>-.314</i> (.335)	-2.089 *** . <i>-.323</i> (.334)	-1.474 *** . <i>-.228</i> (.344)	-1.920 *** . <i>-.297</i> (.363)	-1.883 *** . <i>-.291</i> (.349)
Culture (x23)	-.093 *** . <i>-.241</i> (.021)	-.057 ** . <i>-.148</i> (.023)	-.093 *** . <i>-.242</i> (.021)	-.133 *** . <i>-.346</i> (.021)	-.118 *** . <i>-.307</i> (.021)
Level of Education (x28)	-.002 *** . <i>-.269</i> (.001)	-.001 * . <i>-.154</i> (.001)	-.002 *** . <i>-.324</i> (.001)	-.003 *** . <i>-.388</i> (.001)	-.003 *** . <i>-.376</i> (.001)
Urbanization (Pace) (x20)	-.013 ** . <i>-.127</i> (.009)	-.005 . <i>-.061</i> (.005)	-.012 ** . <i>-.143</i> (.005)	-.012 ** . <i>-.147</i> (.005)	-.015 *** . <i>-.174</i> (.005)
Health Expenditure ln(x24)	-.012 . <i>-.010</i> (.007)	-.003 . <i>-.036</i> (.007)	-.013 * . <i>-.135</i> (.007)	-.014 * . <i>-.146</i> (.007)	-.020 *** . <i>-.213</i> (.007)
Neighbouring Conflict (x31)	-.074 ** . <i>-.108</i> (.037)	-.101 *** . <i>-.147</i> (.036)	-.125 *** . <i>-.182</i> (.037)	-.080 ** . <i>-.116</i> (.040)	-.075 * . <i>-.110</i> (.039)
Observations (N)	197	197	197	197	197
R-squared	0.6709	0.6782	0.6530	0.6346	0.6454
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000
Root MSE	.077	.076	.077	.081	.080

Standardized beta-coefficients are shown in italic figures; Standard errors are shown in parentheses; * Indicates that the result is significantly different from zero at the 10% level, ** Indicates that the result is significantly different from zero at the 5% level, *** Indicates that the result is significantly different from zero at the 1% (or less) level

Model 1 uses a dummy for conflict involvement as the key explanatory variable

Model 2 uses a dummy for war involvement as the key explanatory variable

Model 3 uses a dummy for short duration of conflict involvement (<1 year) as the key explanatory variable

Model 4 uses a dummy for medium duration of conflict involvement (1-5 years) as the key explanatory variable

Model 5 uses a dummy for high duration of conflict involvement (6-8 years) as the key explanatory variable

Model 6 uses the number of conflicts involved (x1) as the key explanatory variable

Model 7 uses the number of conflicts involved, including unclear cases of conflict involvement (x10), as the key explanatory variable

Model 8 uses the number of intermediate armed conflicts involved (x3) as the key explanatory variable

Model 9 uses the number of minor armed conflicts involved (x4) as the key explanatory variable

Model 10 uses the number of wars involved (x2) as the key explanatory variable

Model 11 uses the years spent in conflict, including unclear cases of conflict involvement (x11), as the key explanatory variable, as well as (x11)² to model a non-linear relationship

Model 12 uses the years since last conflict involvement, including unclear cases of conflict involvement (x12), as the key explanatory variable, as well as (x12)² to model a non-linear relationship

Table 17.2: Measurement and Data Sources (all variables). **Source:** The author.

HIV-Prevalence Measures / Dependent Variable			
Variable	Measure	Source	
` Adult HIV-prevalence rates ´	Adult HIV-prevalence rates (% of the whole adult population (15- 49 years old) estimated to be HIV positive in the end of 2003, (y1)	UNAIDS/WHO, 2004 Report on the Global AIDS Epidemic	
	Low estimates of HIV-prevalence rates, end of 2003, (y2)		
	High estimates of HIV-prevalence rates, end of 2003, (y3)		
Conflict Involvement Measures / Key Independent Variable			
` Conflict involvement ´	Total number of all types of conflicts (wars, intermediate and minor conflicts) a country was involved in between 1995 and 2002, (x1)	Gleditsch et al. (2004) (2.1. version of the dataset on armed conflicts 1946–2001, dataset on unclear cases of armed conflicts 1946–2001, and dataset on armed conflicts active in 2002)	
` Conflict involvement, extended sample ´	Total number of all types of conflicts a country was involved in between 1995 and 2002, including unclear cases of conflict involvement, (x10)		
` War involvement ´	Total number of wars a country was involved in between 1995 and 2002, (x2)		
` Involvement in intermediate armed conflicts ´	Total number of intermediate armed conflicts a country was involved in between 1995 and 2002, (x3)		
` Involvement in minor armed conflicts ´	Total number of minor armed conflicts a country was involved in between 1995 and 2002, (x4)		
` Years spent in conflict (duration of conflict involvement) ´	Total number of years a country spent in conflict between 1995 and 2002 (each country's involvement in at least one conflict (minor armed conflict, intermediate armed conflict, or war) in each year was coded as a one, non-involvement as a zero), (x5)		
` Years spent in conflict, extended sample ´	Total number of years a country spent in conflict between 1995 and 2002, including unclear cases of conflict involvement, (x11)		
` Peace duration ´	Total number of years since last conflict involvement (whether this has been a war, intermediate, or minor conflict), (x9)		
` Peace duration, extended sample ´	Total number of years since last conflict involvement, including unclear cases of conflict involvement, (x12)		
` Average number of wars neighbouring countries have been involved in ´	Total number of wars neighbouring countries have been involved in between 1995 and 2002 divided through the number of neighbours (x17)		
` Percentage of neighbouring countries experiencing war ´	Total number of neighbouring countries experiencing war between 1995 and 2002 divided through the number of neighbours (x13)		
Measurement of the Control Variables			
Variable	Measure		Source
` Population Size ´ (analytical weight)	Total population of urban and rural areas in millions at mid-2003, (x18)	UNPD, World Urbanization Prospects, 2003 Revision	
` Urbanization ´	Total percentage of urban population in 2003, (x19)	UNPD, World Urbanization Prospects, 2003 Revision	
	Average annual rate of change (%) of the urban population from 1995 to 2000, (x20)		
` Population Density ´	Total number of people per sq. km in 2002, (x21)	World Bank, 2004 WDI	

Table 17.2: Measurement and Data Sources (all variables). **Source:** The author.

‘Culture’	Proportion of Muslim or Jewish population in 2003 (x23)	CIA, 2003 World Factbook
‘Economic development and wealth’	2002 gross national per capita income (in thousands) converted to international dollars using purchasing power parity rates, (x22)	World Bank, 2004 WDI
	Average per capita total expenditures on health at international dollar rate from 1997-2001, (x24)	WHO, 2004 World Health Report
‘Youth Bulge’	Proportion of males age 15-49 in the total population in 2003, (x25)	CIA, 2003 World Factbook
‘Income Inequality’	Gini index of income distribution, (x27) (survey years range from 1992-2002).	UNDP, 2004 Human Development Report
‘Education’	Adult literacy rates (% of all 15 years old and above) in 2002 (level of education), (x28)	UNDP, 2004 Human Development Report, HDI
	Average ratio of literate women to men, 15-24 year old, 1995-2003, (disparity in education), (x29)	UN Statistics Division, see http://millenniumindicators.un.org
‘lagged HIV-prevalence rates’	Adult HIV-prevalence, end of 2001, (x33)	UNAIDS/WHO, 2002 Report on the Global AIDS Epidemic

18 Preparing for Low-Frequency, Extreme Natural Hazards: Contributing to Human Security by Enhancing 'Freedom from Hazard Impact'

Janos J. Bogardi, Jörn Birkmann, Niklas Gebert and Neysa J. Setiadi

18.1 Introduction

In contrast to daily risks, low-frequency but extreme natural hazard events are often seen as the lowest priority risk (Cannon 2006). However, the fact of increasing extreme natural events in the light of global environmental and climate change (IPCC 2007) implies that there is an emerging necessity to get prepared for hitherto low-frequency, but extreme hazard events. The occurrence of mega-disasters such as the Indian Ocean Tsunami in 2004 and Hurricane Katrina in 2005 demonstrated the horrifying impacts of such extreme hazard events on the people exposed causing a tremendous threat to human security. High death tolls with large numbers of *Internally Displaced People* (IDP) and the destruction of critical infrastructures causing social disruptions and long term development retardation are the consequences.

On the other hand, it has opened a window of opportunity to promote preparedness even in regions which have not experienced extreme hazard events in the last decades.

Enhancing human security by promoting preparedness and resilience of societies confronted with natural hazards is an important step forward meeting the challenge of "freedom from hazard impact" as one of the three dimensions of human security (Brauch 2005: 23; 2005a). In contrast to frequent hazards and risks that people face and might experience daily, getting prepared for low-frequency, extreme hazard events is a major challenge (18.3).

The chapter examines these challenges and outlines new approaches on how natural hazards and global environmental change can be assessed with concepts of human security. In this regard, a key concept is vulnerability (18.2). The chapter presents a case study assessing community preparedness to tsunami, which shows that even communities which have not

experienced any major tsunami event for decades are getting prepared (18.4). The preparedness assessment takes into consideration: knowledge and attitude (awareness), policy and guidelines, emergency planning, warning system and capacity mobilizing resources. The results underline that individuals and households already have a good knowledge of the tsunami, whereas the actions and coping capacity in terms of emergency planning and resource mobilization are still insufficient. Important preparedness activities were carried out initially by NGOs and later on also by the local government.

Overall, the chapter shows the difficulties of raising awareness and getting prepared for low-frequency, but extreme hazard events and shows, drawing on the example of the city of Padang in Sumatra, where these activities are currently being carried out. The assessment approach also provides insights for measuring preparedness even in regions which have not experienced a major hazard event for decades (18.5).

18.2 The Concepts 'Human Security' and 'Vulnerability'

18.2.1 The Human Security Concept

UNDP (1994: 23) defined human security as "safety from such chronic threats as hunger, disease, and repression and protection from sudden and hurtful disruptions in the patterns of daily life." In the wake of a new wave of dramatic crises at the turn of the millennium, the report *Human Security Now* (CHS 2003), launched by the Commission on Human Security at the 2000 UN Millennium Summit, proposed a new, people-centred security framework. Hence, human security is no longer regarded as a function of a state's ability to counter external threats by military means

(CHS 2003: 2f). Accordingly, two visions have emerged to address major challenges for tackling human insecurity: 'freedom from want' (economic and societal security dimension) and 'freedom from fear' (political security dimension) (CHS 2003: iv). Although the protection of societies from environmental hazards was already mentioned in UNDP's (1994: 23) conceptualization of 'freedom from want', the environmental dimension is not addressed in depth. In the light of global environmental change, the increase in extreme natural events – such as floods, droughts, heat waves, storms, etc. – and the growing number of *Internally Displaced People* (IDP) due to natural hazards (Lambert 2002; Lonergan 1998), Bogardi and Brauch (2005) argue that human security should encompass three conceptual pillars: 'freedom from fear', 'freedom from want', and 'freedom from hazard impact' (Brauch 2005: 23).

Under the conditions of global environmental change, and especially climate change (IPCC 2007), the former ideas of being able to control or steer nature are revealed as a false perception of security. New security paradigms are needed that take into account the global nature of environmental change as well as the complexity of coupled human-environment systems (non-linear processes). Among other things, this implies that focusing on the hazard alone is not sufficient. In the past few decades the mainstream of scientists and practitioners felt confident of being capable of managing extreme natural events with the help of what they assumed to be sophisticated technical means of protection. However, particularly the predicted impacts of climate change – such as sea-level rise, e.g. for countries like Egypt (Nile Delta) or the Maldives (UNDP 2006a: 57) – show the serious limitations of previous technical security measures. Therefore it is necessary to shift the focus from the hazard paradigm to the prevention and reduction of the vulnerability of societies confronted with natural hazards.¹

Although vulnerability research to sudden-onset and creeping hazards can still be considered as a relatively new research field for many disciplines, and particularly as a transdisciplinary concept (Bohle 2007), different scientific communities have developed their own understanding of what vulnerability stands for as a scientific concept (Brauch 2005; Birkmann 2006; Thywissen 2005).

While in development research and in the social sciences the 'livelihood framework' (Chambers and Gordon 1992, DFID 1999; chap. 36 by Bohle) and the model of the 'double structure of vulnerability' (Bohle 2001) were developed and used as key concepts to better understand and frame the vulnerability of societies to natural hazards, the disaster community mainly adapted frameworks which focus on vulnerability as a solely negative characteristic which increases the likelihood of harm and damage (Davidson 1997; Bollin/Cárdenas/Hahn/Vatsa 2003).

In contrast, the 'double structure of vulnerability' by Bohle (2001) outlines that vulnerability does not only encompass fragility; it also implies an internal side of being able to cope with the impact of extreme events. The livelihood framework puts emphasis on the examination of potential root causes, particularly the lack of access to certain assets on the part of some people (for an in-depth discussion of the livelihood approach, chap. 36 by Bohle).

Interestingly, a third school has broadened the picture and even views vulnerability as a characteristic within coupled human-environment systems. This approach defines exposure and resilience as components of vulnerability (Turner/Kasperson/Matson/McCarthy/Corell/Christensen/Eckley/Kasperson/Luers/Martel-lo/Polsky/Pulsipher/Schiller 2003).

A fourth school, illustrated by the holistic approach to vulnerability and risk, considers exposure and susceptibility, socio-economic fragilities and lack of resilience as vulnerability components. It uses complex system dynamics to represent vulnerability within a risk-management cycle (Cardona 1999, 2001; Carreño/Cardona/Barbat 2004, 2005a, 2005b).

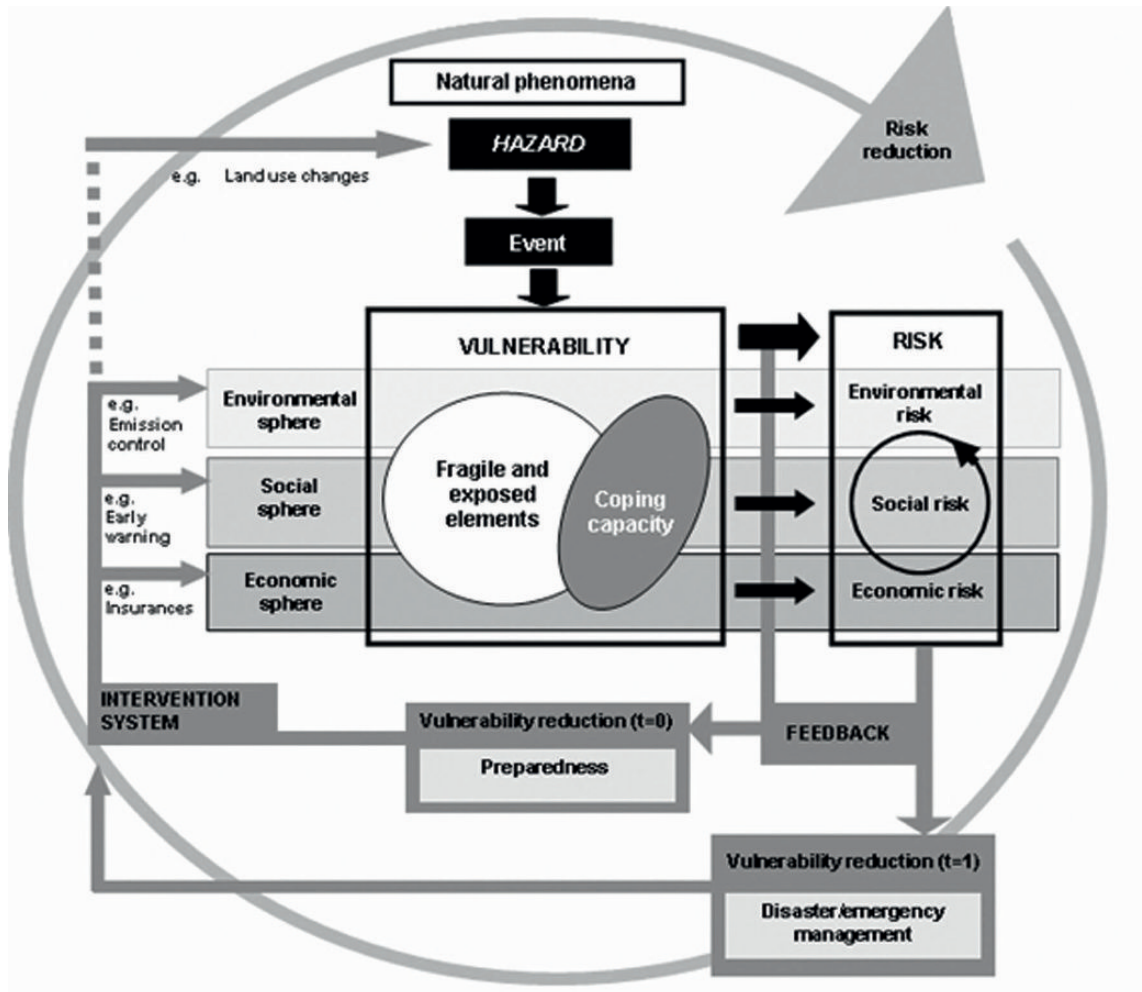
UNU-EHS conceptualized vulnerability as encompassing exposure, susceptibility and coping capacity. Moreover, it is important not to limit the analysis of vulnerability to one dimension, such as economic vulnerability. Rather, it is crucial to link vulnerability reduction and sustainable development by integrating a social, an economic and an often overlooked environmental dimension into the framework for vulnerability assessment (see figure 18.2).

18.2.2 The BBC Conceptual Framework for Social Vulnerability

The acronym 'BBC' is linked to conceptual work done by Bogardi/Birkmann (2004) and Cardona (1999/2001), which served as a basis for this approach. It emerged from three discussions on: a) how to link vulnerability, human security and sustainable

1 For details see the website of the United Nation University, Institute for Environment and Human Security, Bonn (Germany); at: <www.ehs.unu.edu>.

Figure 18.1: The BBC conceptual framework. **Source:** Birkmann 2006: 34, based on Bogardi/Birkmann (2004) and Cardona (1999, 2001).



development (Bogardi/ Birkmann 2004; Birkmann 2006: 34); b) the need for an integrated approach to disaster-risk assessment (Cardona 1999, 2001; Carreño/Cardona/Barbat 2004, 2005a, 2005b); and c) from the broader debate on developing causal frameworks for measuring environmental degradation in the context of sustainable development (e.g. OECD 1992: 6; Zieschank/Nouhuys/Ranneberg/Mulot 1993: 144).

The BBC framework understands vulnerability as a dynamic process, which goes beyond the estimation of damage and the probability of loss. It promotes a problem-solving perspective by simultaneously analysing probable losses and the deficiencies of various exposed susceptible elements (e.g. social groups) and their coping capacities as well as potential intervention measures (feedback-loop system) within all three key spheres of sustainable development (social,

economic and environmental spheres; see Birkmann 2006). The BBC framework – as a meta-framework – outlines two potential ways of reducing disaster risk and vulnerability: first through preventive measures, and second through disaster management.

Preventive measures are generally introduced before events strike societies; these could range from raising awareness, moving people out of hazardous zones, or improving the resilience of households or environmental services to hazard impacts (actions in $t=0$). However, we have to acknowledge that the public media and also political responses often focus solely on disaster management as a way of improving disaster preparedness. As seen in the case of Hurricane Katrina, the international media reports primarily on disasters and disaster management, rather than on potential options to reduce vulnerability before hazard events strike a specific region at risk. Although

disaster-management capacities are important for limiting the impact of catastrophes and managing the crisis, the BBC conceptual framework shows the essential role of anticipating risk and taking actions before hazardous events might cause a disaster ($t=0$) (see figure 18.1). The improvement of disaster- and emergency-response capacity ($t=1$) is necessary; however, it is merely one part of the picture and often occurs at the end of the chain (Birkmann 2006). Instead, forward-looking and pro-active interventions are needed (preparedness, mitigation) in order to reduce vulnerability.

18.3 Preparedness and Risk Priorities

Mega-disasters such as the Indian Ocean Tsunami in December 2004 and Hurricane Katrina in 2005 in the United States dramatically revealed the need for better preparedness on the part of households exposed to low-frequency natural hazards. However, can one really prepare people for these events? Increasing the preparedness of people to hazards which they have not yet experienced in their life times is a major challenge for research, development planning and disaster-risk reduction.

One precondition for societies to be capable of developing pro-active intervention tools and becoming prepared for future hazards and environmental changes, such as the various impacts of climate change, is to perceive a potential hazard and the vulnerable conditions as a risk to its society. Although the authors view risk mainly as a result of the interaction between a hazard and vulnerable conditions (e.g. UN/ISDR 2004), another crucial question for human security is: How are risks perceived and judged?

Various groups of actors perceive and judge risks differently due to differences in knowledge (e.g. awareness through experience), education and cultural norms and values, leading to the conclusion that the perception of risk is socially filtered (Jungermann/Slovic 1997: 201).

The Indian Ocean Tsunami and the current efforts to establish effective early warning systems in Indonesia² and Sri Lanka demonstrate the fact that preparedness measures are seen as an important element to reduce the potential catastrophic impact of extreme natural phenomena, such as earthquakes and tsuna-

mis. Sudden-onset hazards, such as tsunamis, floods or hurricanes, receive much attention in the media, particularly if they cause a disaster.

Nevertheless, there are still major gaps between international media reporting and the effective preparedness and awareness of people exposed particularly to low-frequency but extreme hazardous events. In the political arena one can still observe that major funding and actions often only take effect after a disaster has occurred, rather than beforehand. Besides the necessity to change the political response away from reaction to preparedness and adaptation, it is equally important to address the individual preparedness of people exposed to low-frequency but extreme hazard events.

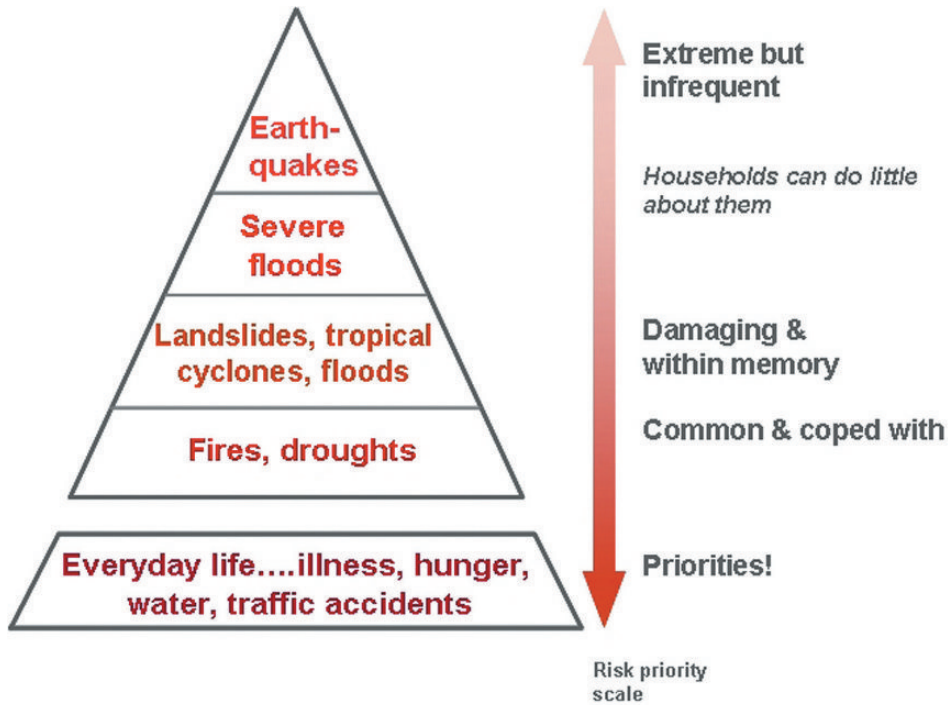
Especially in developing countries, and particularly in rapidly growing cities such as Jakarta, Dhaka or La Paz, the poor and the most vulnerable households are still settled in high-risk zones. The awareness and preparedness of these groups is often lacking. Even if they have some knowledge regarding potential consequences of low-frequency hazards, one has to consider that poor households, particularly in developing countries, often face various risks at once; consequently, natural hazards are only one component of their daily exposure to risks.

Cannon (2006) concludes that natural hazards are often not at the top of people's priorities. Therefore, changing people's perception of risk - and in turn their behaviour - is essential, but in reality very difficult. This is true with respect to low-frequency natural hazards, but also for more frequent hazards (e.g. flooding) that people simply learn to cope with (Cannon 2006).

Cannon argues that households might be capable of doing very little about extreme - but infrequent - natural hazards, such as strong earthquakes and tsunamis. "In most places for most people (whether in California, Florida or Vietnam or Philippines etc.) the most important division is between the benefits of a location for the pursuit of everyday life and livelihoods, and the risks that affect and threaten those livelihood assets on a regular basis. Thus, all over the world hundreds of local risk assessment surveys carried out by NGOs, e.g. Red Cross/Crescent, people hardly ever mention the risks higher up the hierarchy, and will emphasis everyday risks. They prepare for and cope with shocks and hazards such as illness, hunger, water shortage rather than preparing for low-frequency events" (Personal Communication, Cannon 200). Figure 18.2 exemplary illustrates that e.g. severe floods, landslides, tropical cyclones, etc., which might

2 See for details the website of the German-Indonesian Tsunami Early Warning System (GITEWS) project at: <www.gitews.de>.

Figure 18.2: The Risk Hierarchy. **Source:** Adapted from Cannon (2006: 11). Permission was obtained from the copyright holder.



cause major damage, are placed in the middle of the hierarchy and are classified as being present in collective memory; they are not, however, necessarily seen as a priority. In addition, the authors argue that the priority setting of households in terms of risk reduction and the ability to cope correlates with the frequency, magnitude and experience of various shocks and hazards.

Changing people’s perceptions of risk is crucial in order to take action to mitigate the impacts particularly of low-frequency but severe natural hazards, such as tsunamis. According to the logic of the risk hierarchy it is difficult to increase awareness and preparedness with regard to low-frequency but extreme events, thus more research is needed to explore how to prepare people exposed to low-frequency natural hazards.

It is interesting to note that, particularly after the devastating Indian Ocean Tsunami (December 2004), awareness raising and preparedness activities are being undertaken in communities which have not experienced a major tsunami within the last 100 years. Such case studies are an interesting laboratory for concepts of human security, disaster-risk reduction and sustainable development, since, generally speaking, awareness and preparedness for low-frequency

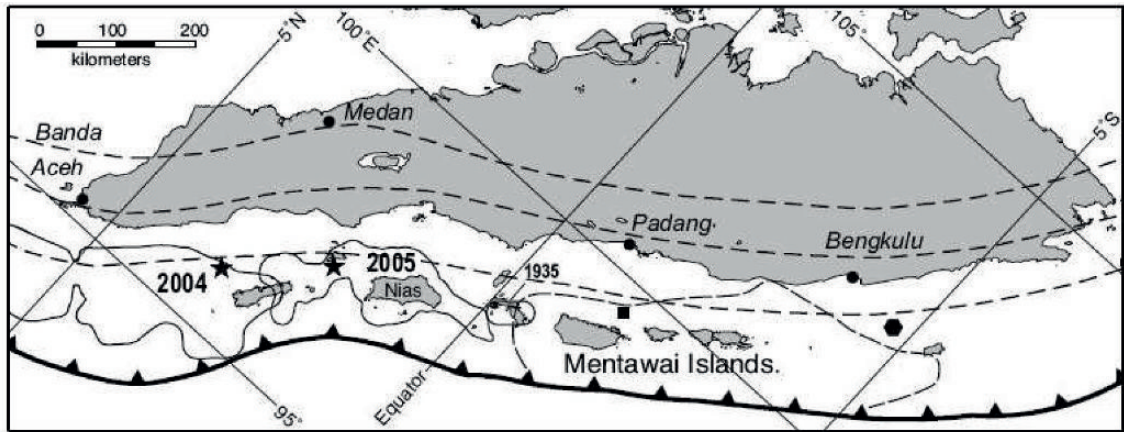
hazards – particularly hazards which have not been present in the lifespan of one generation – are rare.

Additionally, a major challenge is the selection of appropriate mitigation and preparedness measures against these low-frequency but extreme events in the context of fragile livelihoods. Birkmann and Fernando (2008) outline in their study on revealed and emerging vulnerabilities in Sri Lanka after the December 2004 tsunami that also new vulnerabilities were generated by inappropriate intervention and mitigation strategies. They come to the conclusion that more emphasis has to be given to local assessments and context specific mitigation and preparedness measures. The challenge of identifying and developing appropriate mitigation and preparedness measures after the devastating Indian Ocean Tsunami – also in communities which were slightly affected – will be illustrated in a case study focusing on the assessment of awareness and preparedness undertaken in the city of Padang in Indonesia. The city of Padang is highly exposed to future tsunami risks in Indonesia. Its citizens experienced a major tsunami in 1833 for the last time.

The analysis of awareness-raising and preparedness activities to the low-frequency hazard in Padang will address the following questions:

- How prepared are people with regard to hazards they did not experience?

Figure 18.3: Map of recent and plausible future sources of Sumatran tsunamis. **Source:** Borrero/Sieh/Chlieh/Synolakis (2006: 19674). Permission was obtained from the copyright holder.



- What are the sources and stakeholders that contribute to increased awareness on the part of people to these low-frequency hazards?
- What are the potential indicators and criteria to measure the level of preparedness?
- What are the major challenges for building resilience to low-frequency hazards?

18.4 Case Study: Preparedness for Tsunami Risk in Padang City, Indonesia

The impact of the 2004 tsunami on the Aceh coast of Sumatra has evoked widespread concern about a similarly devastating tsunami on other populated Indonesian coasts. Although the island of Sumatra encompasses a shore line of 4,868.9 km³, of which only about 600 km (13 per cent) was heavily impacted by the December 2004 tsunami (Shofiyati/Dimiyati/Kristijono/Wahyunto 2005), the mega-disaster and its echo in the international and national media also created awareness in communities that had not faced major damage. The city of Padang is seen today as a future hotspot of tsunami risk. It is one of the most plausible localities for a tsunami of disastrous proportions in the near future (Borrero/Sieh/Chlieh/Synolakis 2006; figure 18.3).

Padang is the third biggest city in Sumatra with a population of about 800,000. It is the capital city of the West Sumatra Province of Indonesia. It is situated directly on the coast of the Indian Ocean and is highly

exposed to potential tsunamis in the future. Padang city has experienced various natural disasters, such as floods, landslides and storms. Although no major tsunami has impacted Padang within the last 170 years (Natawidjaja/Sieh/Ward/Cheng/Edwards/Galetzka/Suwargadi 2004), concerns on tsunami occurrence have risen in the community after the traumatic tsunami of 2004 in the neighbouring Aceh province. It is estimated that 50 per cent of Padang's population live in the areas with an elevation of 0–5 meters above sea level and would be severely affected by a major tsunami impact (BPS 2004). The critical infrastructures, medical services, schools, public offices, as well as transportation networks, are also often constructed parallel to the coastline; this results in high exposure to potential tsunami waves. The recent earthquake happening in southern Sumatra in September 2007 with the magnitude of 8.4M_w⁴ and its several shocks thereafter caused observable damages and also small tsunamis in some areas in Padang. This triggered panic among the population (UNOCHA 2007). This event has once more demonstrated the necessity of the city of Padang to prepare itself for low-frequency but extreme natural events.

18.4.1 Assessment of Community Preparedness to Earthquake and Tsunami

A methodology to measure community preparedness for earthquakes and tsunamis was developed and tested by UNESCO and the *Indonesian Science Insti-*

3 Wikipedia online (2007): "Sumatra"; at: <<http://id.wikipedia.org/wiki/Sumatera>> (15 April 2007).

4 USGS website; at: <<http://earthquake.usgs.gov/eqcenter/eqinthenews/2007/us2007hear/>> (12 September 2007).

tute (LIPI) in co-operation with other scientific and local institutions⁵ (Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo 2006). Besides the city of Padang, the methodology and assessment approach for community preparedness were tested in *Kabupaten Aceh Besar*, as an example of a region having experienced the tsunami in December 2004, and *Bengkulu*.

In the context of the community-preparedness assessment, the following definition of preparedness is used:

Measures which enable governments, organizations, communities and individuals to respond rapidly and effectively to disaster situations. Preparedness measures include the formulation of viable disaster plans, the maintenance of resources and the training of personnel (Carter 1991: 213).

It focuses primarily on the capability to carry out an emergency action and a fast response, which encompasses the sequence of actions a moment prior to the event or during the event (disaster management). These actions and activities include early warning (warning dissemination and response to the warning), action during the event – such as rescue, saving assets, evacuation, action immediately after the event, such as search and rescue (SAR), evacuation, temporary shelters, emergency treatment, public kitchen, emergency aid, damage assessment and a recovery plan for the critical infrastructure.

Through participatory approaches, involving various stakeholders such as government agencies, academics and NGOs, five critical factors were identified as the most important parameters for the assessment of community preparedness (Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo 2006: 13–14):

1. *Knowledge and attitude towards disaster risk*

Knowledge is considered as a main factor and key for preparedness. Particularly the experience of the 2004 tsunami in Aceh and the 2006 tsunami in Pangandaran, southern Java, showed the importance of knowledge on natural hazards. For example, during the sudden low tide, a lot of people in the coastal area in Aceh ran to the sea to gather up

fish, rather than understanding the threat of the formation of a tsunami wave.

2. *Policy and guidelines*

Relevant policies that significantly influence preparedness comprise budgeting, organization, human resources and important facilities for public education, emergency planning, early warning and resource mobilization. These should be available in the form of regulations with clear job descriptions and operational procedures.

3. *Emergency plan*

Emergency plans are especially important regarding evacuation and search and rescue in order to minimize the number of victims.

4. *Warning system*

The warning system contains warning and information dissemination. This should also be supported by training and simulation of an appropriate response.

5. *Capacity to mobilize resources*

This means resources in the form of human resources, as well as financial resources (funding) and physical resources (facilities); the capacity to mobilize them is also considered to be a crucial factor.

In order to gain a better understanding of community preparedness, different stakeholders were identified and categorized. Based on the level of significance, responsibility and sensitivity, the stakeholders were divided into two groups: (1) main stakeholders (individual/household, government, school community); and (2) supporting stakeholders (community institutions, NGOs, professionals, private sector).

The assessment encompassed a combination of quantitative, qualitative and participative methods. The quantitative method focused on a questionnaire-based survey. The questionnaire contains a set of indicators for all five parameters, to be derived as indices for each parameter (knowledge and attitude, emergency planning, etc.). The index value was calculated using the following equation:

$$\text{Index} = \frac{\text{total score of the parameter}}{\text{The maximum score of the parameter}} \times 100$$

A composite index for each stakeholder – and eventually for the city – was calculated using a weighing system. The community preparedness level was categorized based on its index value. The values below 54 show insufficient or no preparedness, the values between 55 and 64 means that the community is almost prepared, and values above 65 show sufficient or high preparedness. In the following section, we focus on

5 The local institutions involved are academies such as *Institut Teknologi Bandung (ITB)*, *Andalas University* in Padang, and *Bengkulu University* in Bengkulu. This study was also supported by the UN/ISDR.

major findings of the assessment of preparedness at the household and at the government (disaster management) level.

18.4.2 Household Preparedness

Overall, the household survey encompassed 2,800 respondents in Padang city. The respondents were households living in several subdistricts close to the sea, with different levels of assessment framework, taking into consideration five parameters: (1) knowledge and attitude, (2) policy and guidelines, (3) emergency planning, (4) warning system, and (5) capacity of resource mobilization. For households, the parameter of policy and guidelines does not apply (see box 18.1).

Box 18.1: Household questionnaire content. **Source:** Authors based on Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo 2006. Summary of the authors based on components of the study's questionnaire.

- (1) Knowledge and attitude
 1. Definition of natural disaster
 2. Cause and indications of earthquake and tsunami
 3. Characteristics of seismic and tsunami resistant structures
 4. Response to strong earthquake and sudden low tide
 5. Source of information about earthquakes and tsunami
- (2) Emergency planning
 6. Action to rescue from the earthquake and tsunami
 7. Availability of emergency plan and equipment, such as evacuation route and places, emergency bags, simulation/exercise
- (3) Warning system
 8. Awareness of availability of a warning system in the region
 9. Response after receiving the warning
- (4) Resource mobilization
 10. Participation in preparedness activities
 11. Possession of savings, insurance, or land/house in other places
 12. Availability of relatives/friends to help in case of disaster

The overall results of the household-preparedness level are displayed in figure 18.4 differentiated according to the three different hazard zones. The hazard zoning was created by KOGAMI, an NGO that is actively involved in disaster-preparedness activities in Padang. The subdistricts were classified into three hazard zones according to their elevation above sea level: (1) prone zone (< 5 m), (2) alert zone (5–10 m), and (3) safe zone (>10 m). The preparedness evaluation shows that both the parameters of 'knowledge and attitude' as well as 'warning system' have relatively high values in all three zones. However, this knowledge does not seem to manifest itself in actions or in terms of the parameters 'emergency plan' and 'resource mobilization'. In general, the households in the hazard-prone zone show higher preparedness in plans and actions than the households in other zones

18.4.2.1 Knowledge and Attitude

The survey revealed that the knowledge of the individuals about natural disasters in general was good. Questions like "What natural event can cause a tsunami?", "What are the indications of a tsunami?", "What would you do if there was a sudden low tide?" were answered correctly by the majority of respondents. Additionally, a higher level of education correlated with higher values on the knowledge parameter (see figure 18.5).

Interestingly, the questions of "What is a natural disaster?" and "What are the reasons for a natural disaster?" implicitly capture the perception of natural disasters. For instance, in Aceh Barat, many people believed that the 2004 tsunami was a punishment from Allah for man's evil deeds and that it would not happen again in their lifetimes as long as they followed God's law. This attitude might have important implications for disaster preparedness activities. In Aceh Barat, the religious leaders were involved in approaching the people to get them prepared using a religious approach. However, this did not seem to be the case in Padang.

It is also important to examine the main source of information about tsunamis. Most of the people had heard about tsunamis from the media (TV, radio and newspapers). The survey also shows that social networks are an important source of information. About 77 per cent of the respondents acquired knowledge about the tsunami from their friends, family and neighbours. Differences were observed regarding the sources of information in the three zones, as shown in figure 18.6. In the prone zone, more people received information from posters, brochures, seminars, as

Figure 18.4: Indices of the household preparedness level in three different hazard zones. **Source:** Own figures based on data from Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo (2006). Permission was obtained from the copyright holder.

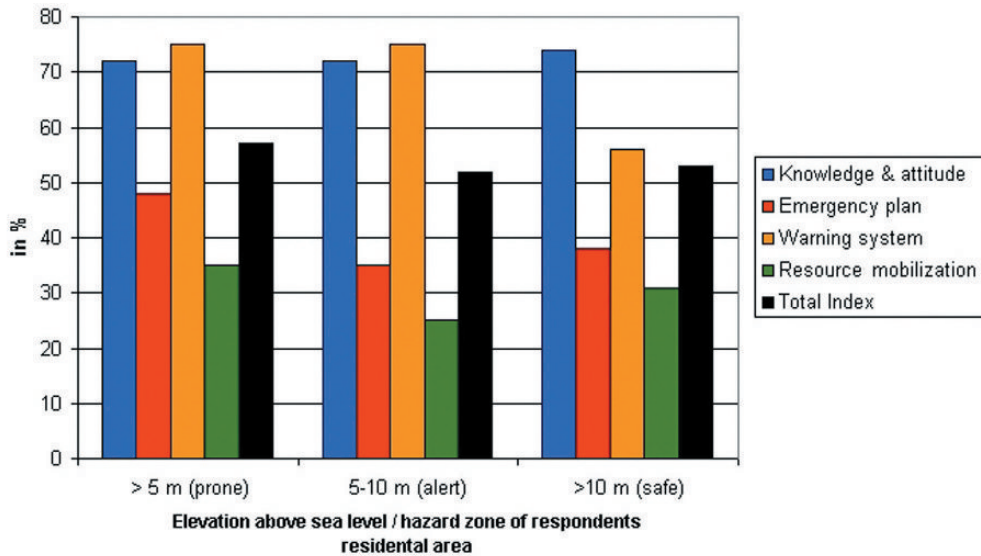
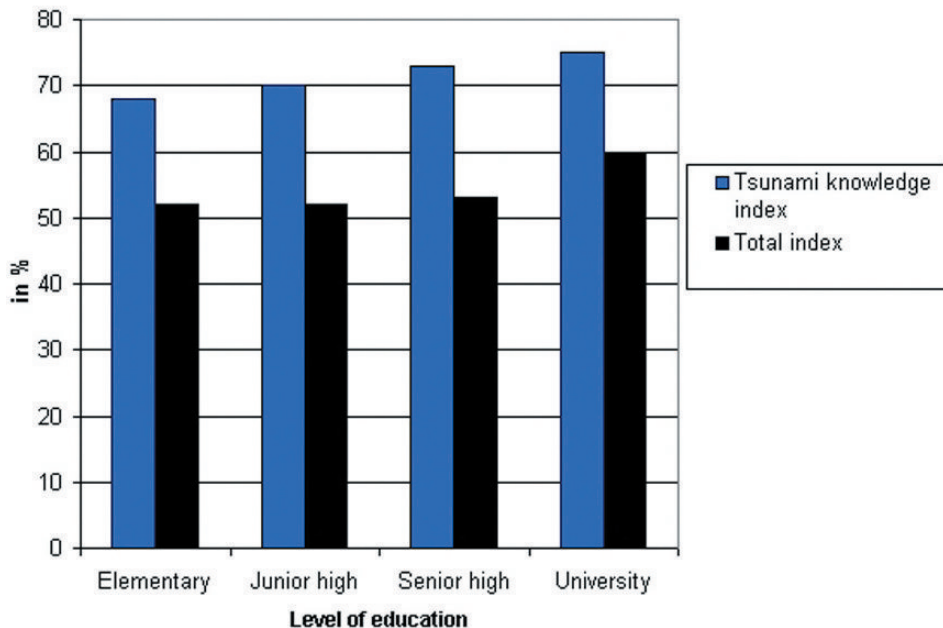


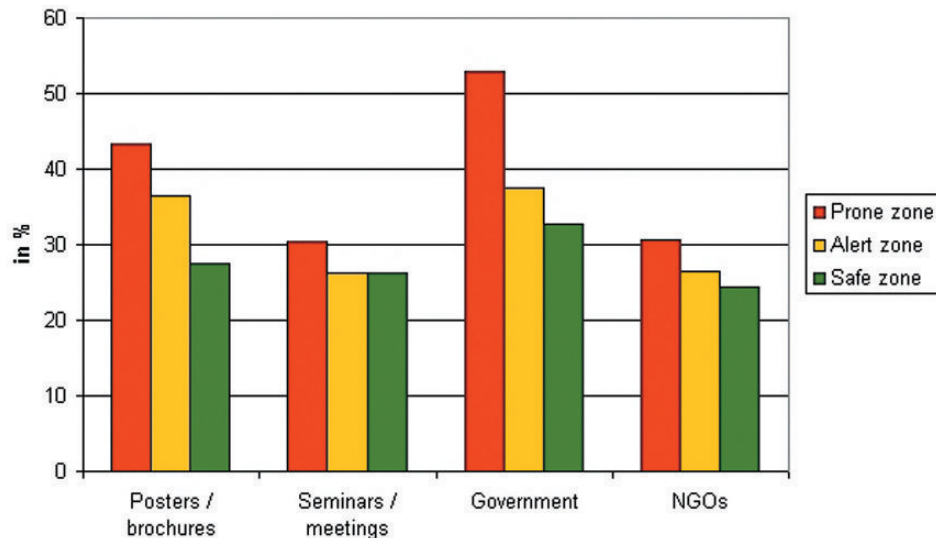
Figure 18.5: The knowledge and attitude index based on different levels of education. **Source:** Own figures based on data from Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/ Handayani/Bustami/ Daliyo/Fitranita/ Nagib/Ngadi/Kumoro/Rafliana/Argo 2006. Permission was obtained from the copyright holder.



well as from the government and NGOs, in contrast to the alert and safe zones. This might be due to the activities undertaken by NGOs - particularly KOG-AMI - and the local government to promote disaster preparedness on the part of those highly exposed to tsunami.

In order to promote and ensure awareness and knowledge on tsunami risk in the long term, particularly the role of schools in disaster education needs to be strengthened. The results of the assessment of the institution ‘school’ still showed a low level of preparedness. Presently there is no written education policy that supports the integration of preparedness for nat-

Figure 18.6: Sources of information about tsunamis and earthquakes from specific sources. **Source:** Own figures based on data from Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo (2006). Permission was obtained from the copyright holder.



ural disasters into the school curriculum. Another possible approach to long-term knowledge transfer in the community for such an extreme event (tsunami) is through storytelling and folk songs, as was practiced in Simeulue Island (Yogaswara/Yulianto 2006).

18.4.2.2 Coping Capacity in Terms of Individual Capacity and Actions

Besides the improvement of knowledge about tsunami, special preparedness measures are undertaken – particularly by the households in the prone zone – such as developing a family evacuation plan (51 per cent). Some households (23 per cent) in the prone zone were also planning to resettle to a safer location. However, the preparedness in terms of the current availability of an emergency plan and equipment was in general insufficient.

The capacity for financial resource mobilization was relatively low and insurance did not appear to be a known measure for the households (only 19 per cent of the respondents had insurance), while the social network seems to be a valuable asset. About 75 per cent of the respondents stated that they had friends/relatives who were ready to help them in case of disaster (Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo 2006).

18.4.3 Government Level - Disaster Management

18.4.3.1 Policy and Guidelines

Policy regulations supporting disaster management exist at the city level to a certain degree. In Padang there are ongoing efforts with respect to disaster-mitigation policies, whereas action plans and technical guidelines are not yet available. The coordinating unit for disaster management (*Satlak PB*) in Padang still existed as an *ad hoc* unit with only limited authority to develop and implement technical guidelines. Commitment in the form of funding allocation for disaster management was not yet in evidence. In addition, the land-use plan for the city of Padang for the period 2005–2015 contained a commitment to disaster preparedness, and yet it had not taken into account tsunami and earthquake-related aspects. .

18.4.3.2 Emergency Planning and Early Warning System

Although the policies and guidelines still need to be improved, the emergency planning parameter of the government of Padang city was considered ‘good’, since it was proven to contain all the elements of an emergency plan (see box 18.2). In contrast, the availability of these elements at the *Kecamatan* level was still incomplete.

Early warning technology is planned for Padang city using sirens and buoys. The sirens are to be installed in the telecommunication towers and buoys

Box 18.2: 14 indicators for assessing emergency planning for the city government. **Source:** The authors.

1. Hazard map and evacuation map
2. Evacuation places
3. Buildings prepared for temporary rescue locations
4. Disaster command centre
5. Operating procedure from command centre
6. Disaster-management training in command centre
7. Storage of emergency materials
8. Procedure and plan of materials provision in emergency
9. Search and Rescue team (SAR)
10. Evacuation system/ambulance in SAR unit
11. Electricity supply for emergency
12. Communication network for emergency
13. Water supply for emergency
14. Heavy equipment

will be used for warning the public. This is not yet optimal since the *Kecamatan* government had no access to the early warning system of the city government. Also no agreed mechanism exists for disseminating warnings to the community. (Hidayati/Permana/Pribadi/Ismail/Meyers/Widayatun/Handayani/Bustami/Daliyo/Fitranita/Nagib/Ngadi/Kumoro/Rafliana/Argo 2006).

18.5 Conclusions

The presented assessment in Padang defines ‘preparedness’ as a bundle of measures that enables a rapid and effective response to disaster situations, focusing primarily on saving lives and dealing with the immediate impacts caused by earthquakes and/or tsunamis. Thus, mirroring the conceptual set-up and results of the preparedness study in Padang against the concept of human security and the BBC-framework, the study does not primarily focus on disaster prevention orientated at the goal of ‘freedom from hazard impact’. According to the BBC-framework the main focus of the study was the analysis of disaster management capacities related to preparedness within the event ($t=1$). By comparison, the BBC conceptual framework focuses on a more pro-active approach to risk reduction and defines preparedness in a broader sense, which entails the reduction of vulnerability and the implementation of adaptation strategies before an event strikes the community ($t=0$). The assessment of options for introducing preventive measures ($t=0$), e.g. moving parts of a city out of its exposed zone, do not only aim at sav-

ing lives but also saving disruptions of sustainable livelihoods as desired outcomes of a preventive intervention system $t=0$ (BBC-framework). In this context the accepted residual risk for low frequency - high impact hazards is a matter of political negotiation. By promoting a culture of disaster prevention rather than solely emergency and disaster management, the intersections of all three dimensions of human security become evident: Preventing the loss of livelihoods (instead of solely lives) also has effects for achieving ‘freedom from fear’ and ‘freedom from want’. In this sense appropriate vulnerability assessments indirectly refer to state service delivery deficiencies by identifying economic, environmental and societal deficiencies (deprivation) and inequities (entitlements, power relations) as well as capacities that constitute a society’s human insecurity to hazard impacts. Hence, vulnerability assessments can be a strong tool for providing information about the qualitative state and intersections of all three dimensions of human security. Both vulnerability and disaster preparedness assessments can act as a basis for long-term resilience strategies developed by exposed communities to low frequent, but extreme natural hazards, such as tsunamis.

Nevertheless, managing change and promoting a culture of resilience is not an easy task. Awareness is a precondition for change, preparedness a precondition for mitigating the effects of disasters but they are not sufficient to meet the goals of human security. When people face various risks in their everyday struggle to secure their livelihoods, the incentive and the effort to bring about societal change in awareness, preparedness and prevention should come from civil institutions and governmental authorities rather than from the people themselves. Therefore, managing institutional change (new norms, laws, and policy instruments, informal rules) to prevent governance failures and to improve societal capacities to achieve sustainable risk reduction requires the introduction of specific instruments like institutional learning and institutional memories. However, the role of the state as a change manager poses a dilemma between its service delivery obligation and capability, since particularly in developing countries, also decision-makers and government administration have only very limited capacities, and resources to set up and implement appropriate prevention activities (exposure reduction, land use change), for example due to the chronic lack of financial resources and due to their lack of change management capacity. Thus, tackling the root causes of human insecurity by promoting good (local) governance is also essential for pursuing ‘freedom from hazard impact’.

The example of the city of Padang illustrates these difficulties towards 'freedom from hazard impact'. Due to the fact that sustainable prevention requires a substantial societal reconfiguration, it is an ambitious goal and needs time. Therefore, creating a culture of resilience requires as a first step the promotion of awareness and also preparedness. NGO (KOGAMI) has started the effort to raise awareness among its citizens and to address the importance of being prepared for tsunami risks in the future. Thus, the case study for Padang shows that civil society has the potential to generate problem solving capacities, to transform structures, and to help to promote a culture of disaster preparedness. A functioning civil society and a democratic system, where organized actors are able and allowed to articulate their interests, are key to sustainable risk reduction and for achieving human security. Due to increased public awareness and consequently public pressure - e.g. generated by NGOs like KOGAMI, as well as by the media and international activities - also the city administration of Padang realized the importance of getting prepared for a tsunami. Further research is needed to explore the linkages and correlation among the degree of awareness, and the level of preparedness and prevention in Padang and Indonesia ($t=1$ and $t=0$; BBC-framework).

Moreover, the general perception that low-frequency hazards are a matter one can do only little about must be reconsidered. This means mega-disasters can also create the momentum for change, if other regions are getting prepared. In this regard, measuring and assessing awareness and preparedness is a challenge and a prerequisite for improving the promotion of disaster resilient communities and a starting point for strengthening human security in facing natural hazards.

The current situation in Padang, and also in Indonesia, provides hope that these processes of promoting disaster preparedness will continue, while, by contrast, in Sri Lanka - particularly in East Sri Lanka - the civil war increases the vulnerability and the lack of recovery and preparedness after the mega-tsunami 2004.

18.6 Recommendations

Based on this analysis, the following recommendations may be drawn:

- Getting prepared for low frequency, but extreme natural hazards requires knowledge and awareness about existing risks. Continuous and long-term

risk communication is an essential means to build risk perception and aid preparation for not-experienced events. Governments and other social institutions should emphasize integrating disaster preparedness into day-to-day decision-making. Institutional capacity-building measures should be implemented by government agencies and non-government organizations involved in disaster management and public education.

- In order to reduce disaster risk in the long term, adaptation strategies are crucial. This implies, for example, that preparedness strategies should be integrated into land-use planning.
- Indicators for community preparedness assessment still need to be improved and used more frequently. Locality factors to be assessed should not be limited solely to disaster management aspects; rather, they need to take into consideration the susceptibility and coping capacity of the people at risk.
- Early-warning systems are important measures to reduce the risk of natural hazards. However, in order to ensure that the early warning chain is working, consideration of the situation of the respondents is crucial. In-depth knowledge of the characteristics of the people exposed and various vulnerable groups needs to be obtained through a vulnerability assessment. This information and local knowledge need to be made available for building better early warning systems. In the context of tsunami preparedness, e.g. an early warning system for Indonesia (GITEWS) is currently being developed and, in addition to this, the project 'Last-Mile' develops a decision support system for better evacuation in a tsunami case for the city of Padang.⁶
- Although both projects also significantly address the technical issues of warning systems, it is important to note that particularly UNU-EHS is responsible for carrying out sub-national and local vulnerability assessments (for more detail see website UNU-EHS). This will hopefully ensure that the design of early warning systems, as well as the development of evacuation plans, takes the most crucial component into account: the most vulnerable groups and people who should respond appropriately to a future early warning.

6 For the GITEWS-project see www.gitews.org, for information on the "Last Mile" project please contact Neysa J. Setiadi.

19 Environmental Refugees and Environmental Distress Migration as a Security Challenge for India and Bangladesh

Imtiaz Ahmed

19.1 Introduction

People move, but not always voluntarily. Involuntary movement of people, particularly across national borders and for reasons of political, religious, racial or ethnic persecution, is what constitutes a refugee population. Currently, the UNHCR figure shows that there are 9.2 million refugees, although the total 'population of concern' to UNHCR totals over 19 million, and this in addition to refugees includes asylum-seekers, returnees, internally displaced persons, and stateless people (UNHCR 2005: 2). This figure however does not include the people who have been uprooted for environmental causes and have ended up having a fate similar to those of conventional refugees. Critics maintain that there are 25 million people worldwide who have been uprooted for environmental reasons, that is, from floods, toxic spills, desertification, hydroelectric projects, soil erosion, land degradation, and other environment related disruptions (Myers 1993; Raina/Chowdhury/Chowdhury 1997; Baker 2001). The latter figure is evidently higher than that for conventional refugees. And it is this group of people - uprooted and impoverished or as Essam El-Hinnawi maintains, 'those who had to leave their habitat, temporarily or permanently, because of a potential environmental hazard or disruption in their life-supporting ecosystems' - who have earned the dubious distinction of being called 'environmental refugees' (El-Hinnawi 1985). The plight of such refugees, particularly with respect to their birth in Bangladesh and later on their crossing over to India, and the subsequent security challenges they pose for both India and Bangladesh, is what we intend to highlight in this chapter.

The chapter is divided into eight sections. Section one is the introduction (19.1). Section two addresses the meaning of environmental refugees, more specifically how they are different from migrants and conventional refugees (19.2). Section three reflects on the

issue of distress migration from Bangladesh to India, focusing particularly on the so-called 'illegal' flow of people (19.3). The environmental problems faced by Bangladesh and how they contribute to distress migration, including the flow of environmental refugees across the border, will be highlighted in section four (19.4). Section five will take up the fate of environmental refugees as 'stateless persons', particularly in the backdrop of the fact that both Bangladesh and India tend to disown them as citizens of their respective countries (19.5). Section six will then take up the issue of India's policy of fencing or barbed wiring the borders to stop the flow of what it regards as 'illegal' migrants from Bangladesh (19.6). The issue of what is to be done will be taken up in section seven, while the final section will include some concluding remarks (19.7 and 19.8 respectively).

19.2 Conceptualizing Environmental Refugees

Floods, famines, and large families combine and create an environment not conducive to the sound and sustainable habitability of human life and living. But the gap between such direct ecological factors (save, of course, the issue of large families) and the consequences of modern development is not that great. There is a growing literature which suggests that many of the environmental problems that we are now facing have resulted from *man-made* structures (Jacobson 1988; Durning 1989; Renner 1989; Shiva 1989; Kritz 1990; BMU 2002; Brauch 2002; Simms 2003). Even in the case of acts of God, like floods and droughts, often the dire consequences are the result of crude human exploitation of nature. Put differently, modern (*mal*) *development* often leads to environmental insecurity. The latter could be further divided into three. The first is the lack of 'water security,' or more precisely, the lack of having fresh

water, which results from the drying up of rivers and waterbeds, although at times it could result from excessive flood waters and water logging, including sea level rise from global warming (Pielou 1998; Ahmed 1999a; Brauch 2002; Brown 2004).¹ Often the lack of water security leads to conflicts or 'water wars' (de Villiers 1999; Shiva 2002). The second is the want of 'land security', related directly to the degradation of soil and the incapacity of the population to harvest any further. The last one is the lack of 'food security,' arising partly from a combination of water and land insecurities, and partly from the excessive growth of population and lack of employment (Sen 1981; Dreze/Sen/Hussain 1995; Brown 1998). If the country is small in size, the situation becomes even more precarious because the victims cannot move to other parts of the country. Consequently, they end up becoming 'environmental refugees' in neighbouring states, which often leads to conflicts not only between the sending and receiving states but also between the people of the receiving state and those who have joined them as environmental refugees.

Environmental refugees often carry the burden that is otherwise implied in the word 'refugee'. In fact, once the victims, whether arising from political persecution or environmental insecurity, become refugees there is no way to distinguish the actual experience that they go through. All of them in reality *live a life* of a refugee, that is, in constant fear, uncertainty, and immense poverty. Moreover, if the victims are compelled to leave their original habitation for reasons of land or food insecurities, it becomes almost impossible for them to return to their home unless effective measures are taken to ensure their survivability. In such a situation, 'the compulsions to flee', 'fear to return', or even 'crossing international borders' - the existing international criteria for becoming a refugee - remain no less pressing factors for the birth and growth of environmental refugees.

Environmental refugees, however, differ from migrants or migratory trends normally found in history. The UNHCR is also clear on this:

Millions of people have been forced to leave their homes because the land on which they live has become uninhabitable or is no longer able to support them. ... The terminology for describing environmentally in-

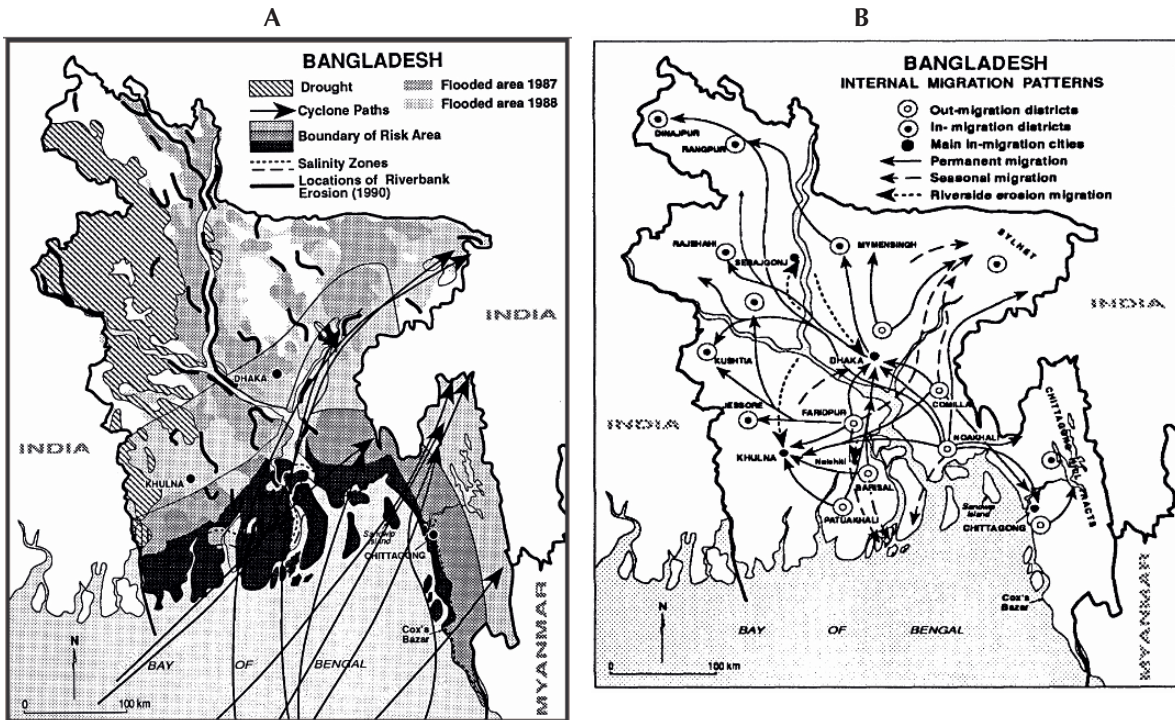
duced migration is controversial. For many observers, 'migration' does not convey the fact that the people affected are *forcibly* uprooted. To call them refugees seems to convey more accurately that they left their homes involuntarily, for reasons not of their own choosing (UNHCR 1993; Black 2001).

But then some continue to use 'migrants' and 'refugees' interchangeably. There is, however, a need to maintain the distinction between the two lest the term 'refugee' be diluted and made economic and taken to mean some historical patterns of population movement. In fact, the UN Convention on the Protection of the Rights of All Migrant Workers and their Families is quite precise in its definition of migrant worker: "a person who is to be engaged or has been engaged in a remunerated activity in a State of which he or she is not a national" (Pkhakadze 2005: 67). Just as precise is the definition provided by the UN Department of Economic and Social Affairs: "A person who moves to a country other than that of his or her usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes his or her new country of usual residence. From the perspective of the country of departure the person will be a long-term emigrant and from that of the country of arrival the person will be a long-term immigrant" (Pkhakadze 2005: 67). There is, indeed, no sense of involuntariness on the part of the person in both these definitions, which is otherwise a critical marker for a 'refugee'. In the case of environmental refugees the involuntariness arises not from political persecution, as would be the case with conventional refugees, but from environmental disruptions, including man-made (mal) developmental interventions and structures. There is also a need to distinguish between 'legal' and 'illegal' migrants. While the former stands for those who had crossed the border with valid documents, the latter generally refers to those who had either crossed the border *without* valid documents or were previously legal migrants but have now 'overstayed' the period for which valid documents were issued to them.² Problems however arise when there is no *legal migration regime*, not even provisions for work permit or options for changing citizenship be-

1 In the case of Bangladesh there is a gruesome prediction that 17% of its land will disappear by 2100 because the sea level would in all probability rise by a metre as a result of global warming, giving rise to even greater water insecurity. See: Brauch (2002).

2 One good example of 'legal' migrants would be the Bangladeshi workers, now numbering more than a million, in the Middle East, Southeast Asia, Europe, and North America. The 'overstayers' (that is, following the lapse of the period for which valid documents for temporary residency and work permit were issued) would fall into the category of 'illegal' migrants, the discussion of which however is beyond the scope of this chapter.

Figure 19.1: Maps of Bangladesh, **A:** Climate-related Natural Events, and **B:** Internal Migration. **Sources:** A: Ericksen/Ahmad/Chowdhury (1996: 264); B: Ericksen/Ahmad/Chowdhury (1996: 245). Permission was obtained.



tween the concerned countries. In such cases the concept of ‘illegal’ migration becomes a misnomer. The environmental distress migration from Bangladesh into India is a good example in this context.

19.3 Distress Migration from Bangladesh to India

Bangladesh’s precarious situation, conditioned greatly by natural calamities and underdevelopment syndrome, is well known. Floods, famines, large families coupled with the possibility of sea level rise have driven people from one place to another, not only within the country but also across international frontiers (see figure 19.1). According to Lester Brown, “Even a one metre rise in sea level would inundate half of Bangladesh’s riceland, forcing the relocation of easily 40 million people. In a densely populated country with 144 million people, internal relocation would not be easy” (Brown, 2004: 2). In fact, one finds the number of people crossing over to India increasing during periods of environmental disasters. In 1974–1975, for instance, when Bangladesh was devastated by a combination of flood and famine, one witnessed heavy ‘illegal’ flow of people to India. According to estimates provided by the Indian census, the

number of people who had crossed the border ‘illegally’ from Bangladesh to India totalled 1,729,310 in 1961–1971 and 559,006 in 1971–1981 (Gupta/Chakrabarty/Bandyopadhyay 1994: 3). The latter figure, however, excludes Assam, which according to one semi-official estimate is around 600,000 in 1971–1981 period (Franda 1982: 235). This figure probably is too high, but then even if we add them, the total ‘illegal’ flow of people does not exceed that of 1961–1971.

Although the post-independence ‘illegal’ flow of people to India is not high, particularly compared to the 1961–1971 periods and also in the context of the 4096.70 km Indo-Bangladesh border, it has already caused great alarm amongst the Indians, particularly in the political and intellectual circles. In this connection, Sanjoy Hazarika pointed out:

Out-migration from Bangladesh over the years has had a severe impact on the ethnic, linguistic, religious, economic, and ecological fabric of northeast India and West Bengal, regions that share a common frontier with Bangladesh. ... India views the migrants as a potential security risk, whatever their reasons for migrating. Intelligence reports indicate that illegal migrants are pliable and easy to use in smuggling, in trans-border gangs, and in information-gathering for extremist groups (Hazarika 1993: 55).

Table 19.1: Reasons for leaving Bangladesh (multiple responses). **Source:** Author's Survey (1997).

Response	Khulna-Sathkhira	Rajshahi	Dinajpur	Nilphamari	Total (%)
Lack of environmental security					67.0
Poverty	19	29	12	33	23.25
Better Accommodation	16	23	15	19	18.25
Ecological	7	8	4	5	6.0
Livelihood	42	10	2	24	19.5
Minority insecurity	0	11	19	0	7.5
Social (Property-related, violence; marriage; prostitution; etc.)	16	11	16	14	14.25
Smuggling	0	8	0	0	2.0
Better education	0	0	8	5	3.25
Join relatives	0	0	24	0	6.0

This has further been complicated by the suggestion that the post-independence flow of people is the result of religious persecution, directed mainly against the Hindus. In support of this contention, Amalendu De pointed out that the Muslim population in Bangladesh had increased from 76.9 per cent to 88.3 per cent in 1951-1991 periods, whereas Hindu population during that period had dropped from 22.0 per cent to 10.5 per cent (De 1994: 1). This suggested that the Hindus in bulk, suffering from insecurity, had left Bangladesh for India.

But a closer exposition of the population flow reveals something else. Table 19.1, for instance, shows that a high percentage of people leave Bangladesh for reasons of environmental insecurity, which includes, amongst others, poverty, lack of accommodation, direct ecological factors, and lack of decent livelihood.

Looking at the high percentage of the population flow from the Khulna-Sathkhira and Rajshahi regions (western Bangladesh), one is led to believe that water insecurity is mainly responsible for producing refugees. In this context, the case of the Ganges water dispute, particularly the Farakka Barrage and how it has led to the drying up of Bangladesh in the winter season, is well known.³ As Ashok Swain pointed out:

It is true that the Ganges water dispute is an excellent case study of an inter-state conflict where two state-

3 For a closer exposition, see Government of the Peoples Republic of Bangladesh (1976); Hannan (1980); Abbas (1982); Islam (1982); Begum (1987); Miah (1989); Verghese (1990).

Table 19.2: Original home of environmental refugees.

Source: Author's calculation from a survey conducted by Ranabir Samaddar of Maulana Azad Institute of Asian Studies (Calcutta: 1996).

District	% of Total
Faridpur	19
Rajshahi	17
Dhaka	13
Khulna	10
Thakurgaon	10
Pabna	8
Jessore	6
Gopalganj	5
Magura	5
Panchagram	4
Dinajpur	2
Barisal	1
Total	100

actors are striving to acquire scarce water resource by rationally calculating their interest in a zero-sum situation. However, the resulting environmental destruction in a vast region of Bangladesh has added another important dimension to it. The loss of agriculture, closure of industries and navigation facilities, drop in fish catching, dying of valuable forest resources, disappearance of land due to river bank erosion and devastating floods, have no doubt, resulted in the loss of source of living of a large number of populace in Khulna and some parts of Rajshahi region of Bangladesh, which seem to necessi-

Figure 19.2: Map of Bangladesh. Source: Georgia Tech Bangladesh Student Association; at: <www.gtbsa.org/?p=bd>. Permission was obtained.



tate their migration from the homeland in the pursuit of their survival (Swain 1996). While Swain’s contention can hardly be brushed aside, it would be folly to think that the Farakka alone is responsible for the flow of environmental refugees, and that there is no such movement of people from

other areas of Bangladesh. Table 19.2 provides a clear indication that the matter is not that simple: The high flow of environmental refugees from Rajshahi and Khulna regions to India can definitely be blamed on Farakka. But then, Dhaka, Thakurgaon, and Faridpur also have a high flow of people to India,

and none of these areas are directly affected by the withdrawal of water at Farakka (figure 19.2). There are other environmental disruptions reproducing environmental refugees. I will have more to say about this shortly.

Again, one must not have the impression that the flow of environmental refugees is linear, that is, simply from Bangladesh to India. In fact, a sample survey of the squatting population, numbering around 180 in the city of Dhaka showed that 1.11 per cent of the squatters came from regions other than Bangladesh, mainly from Myanmar and India (see Jahan/Khan/Akter/Parvin/Khatun/Zaheda 1996: 19). The forced eviction of the Rohingyas from Myanmar and the regional and global security implications of their protracted status as a refugee or stateless community certainly fall in the category of conventional refugee studies (Ahmed 2004). But then environmental issues such as drought during the winter season in the Arakan region of Myanmar has further complicated the situation, forcing many Rohingyas to cross over to Bangladesh in search of work and humanitarian support (Ahmed/Dasgupta/Sinha-Kerkhoff 2004). Not so different is the flow of people from West Bengal (India) to Bangladesh during the time of excessive flooding, as has been the case with the flood in 2000 when several hundred Indian nationals took refuge in Bangladesh (Ahmed 2002: 434). That some of them would slip into the mega capital city of Dhaka and end up as environmental refugees cannot be ruled out. Environmental disruptions reproducing environmental refugees therefore are multilayered and complex. Let me return to the case of Bangladesh.

19.4 Environmental Reasons for Distress Migration

It is important to keep the complex combination of insecurities (water, land, and food) in mind lest one starts believing that the resolution of the Ganges water dispute would stop the 'illegal' flow of people across the border. In fact, even after the signing of the Farakka Agreement between Bangladesh and India in 1997, the flow of environmental refugees did not stop. Anyone familiar with the situation, particularly the areas of concern, knows very well that such a thing is not going to happen. There are other, and equally critical, environmental factors operating here as well.

Let us take the case of the 1998 deluge, for instance. A serious concern throughout the 1998 flood period has been the lack of work for many of the af-

ected, particularly of the able-bodied people. This is indeed an irony, for while there is so much work to be done in the affected areas, many of the affected are practically without work for months! At one point of time, there was lack of work in almost all of the affected areas, from Kurigram to Kishoreganj, Comilla to Chapai-Nawabganj, Gaibandha to Gopalganj. And this continued to be so as late as November (that is, 4–5 months after the flood first began), although the extent of the no-work syndrome was greater in the most affected areas that mostly border the banks of the mighty Brahmaputra and Jamuna.

At the time of flooding, however, the testimony of having no work on a massive scale, somewhat ironically, lies in the low price of essential goods. The price of rice in Kurigram, for instance, came around Taka 14 per kg, markedly lower than the price of rice in Dhaka or even in Benapole (around Taka 20 and 24 per kg respectively). While in normal circumstances this would have been a cause for celebration for the people of Kurigram, it was actually the result of the no-work syndrome or the lack of purchasing power that had prevailed for many months in those areas.

But why is there no work to be found? I guess a part of the answer lies in the governmental introduction, albeit under pressure from international donors and the modernist scientific community, of a new cropping pattern in the country, which effectively replaced the age-old method practised in Bangladesh. As Nazrul Islam noted,

The cropping pattern [in Bangladesh] was intricately adjusted to the deltaic conditions. Through a process of natural selection, the people of Bangladesh developed the amazing varieties of *bona aman*, which can grow twenty feet tall or even higher to withstand deep flooding. These miraculous paddy stalks just float in water and can grow up to a foot in twenty four hours just to keep pace with the fast rising level of flood water. These capabilities of *bona aman* are yet to be matched by anything produced by modern plant breeding. Bangladeshi farmers also developed *ropa aman* to adjust to the brief time period that is usually available between *aus* harvest and arrival of floodwater (Islam 1999: 86).

With the introduction of the High Yielding Variety (HYV)⁴, the flood centric varieties, like *bona aman* and *ropa aman*, became less attractive and less financially rewarding to the farmers. The HYV, given its de-

4 It may be mentioned that the area under HYVs increased from 14 per cent in 1973 to 54 per cent in 1993. Moreover, over 90 per cent of the *boro* crop is now in HYVs.

Table 19.3: Incidence of Distress Selling (percentage of villages). **Source:** Sen/Hashemi/Ahmed (1998); also Ahmed (1999b: 38).

	Whether Distress Selling Increased Compared to the Normal Period					
	Land		Domestic Animal		Other Assets	
	Yes	No	Yes	No	Yes	No
Severe	59.0	41.0	87.1	12.9	73.8	26.2
Moderate	59.8	40.2	87.9	12.1	71.8	28.2
Normal/No Affect	44.2	55.8	73.5	26.5	56.3	43.7

pendence on fertilizers and controlled irrigation, can hardly survive in the midst of big floods. Since many of the affected, under active governmental support, left the former cropping pattern for the latter, it is not surprising that they are left without work, and consequently with meagre purchasing power once the flood comes in and drowns their HYV crops. In a situation like this, they can do one or two of the following things.

Firstly, they could start using their savings. The governmental machinery is absolutely inefficient in this respect, particularly when it comes to the issue of savings of and for the poor. In Bangladesh, this task has been performed with some success by the non-governmental organizations (NGOs). In fact, this is precisely what the major NGOs, including the *Grameen Bank*, opted for, providing the long-time borrower full access to her/his past savings. But then again, this has an obvious limitation, for the volume of such savings for each individual or household is not that great.

Secondly, they could take up distress selling. In a nationwide field survey on 15,467 villages carried out by members of *Nagarik Durjog Mokabila Udyog* (a civil response body formed during the flood), it was found that the incidence of distress selling was considerably high at the time of the flood (table 19.3).

Since there is no governmental plan to offset such selling or even regulations for receiving fair price by the distressed seller, often a severe flood comes as a boon to the moneylender and those in the position to buy such things. At times, the highly governmentalized banking system (both public and private, with the possible exception of the trustee-managed *Grameen Bank*) accelerates this process by demanding collateral from the affected persons.

Finally, they could migrate. This could be of two types, internal as well as external. In October, a random survey conducted by a non-governmental organization found that 9 per cent of the village households in the flood-affected areas are totally looked after by

women, implying that their husbands had left the villages in search of work.⁵ Hossain Zillur Rahman (1998) carried out a survey on the floating population of Dhaka and found out that 20 per cent of them were recent migrants. Of the immigrants, fifty-two per cent indicated 'lack of work,' while eight per cent mentioned 'prevailing hunger situation' as reasons for coming to Dhaka. But this is only one side of the migration.

At times, with unprecedented floods in both Bangladesh and India (particularly in West Bengal and Assam), migration criss-crosses both ways. Given the prompt availability of international relief in Bangladesh, one should not be surprised if some distressed people from West Bengal or Assam are found crossing over to Bangladesh. This is precisely what happened during the flood in West Bengal (India) in 2000 as indicated earlier.⁶ And the case no doubt remains the opposite when relief fails to reach the flood-affected border areas of Bangladesh timely and substantially. Moreover, it is not unlikely that population pressure on this side of the border and well-established networks on the other side of the border would lead more Bangladeshis to settle in India than the other way round.

But the above mainly pertains to the issue of water insecurity arising from massive flooding. The 'drought factor' is no less precarious. Take again the case of HYV and the need for pesticides and controlled irrigation. Much of the success related to HYV production, as Peter Rogers pointed out, rested on the "shift from dependence on high-risk monsoon crops to reliance on low-risk irrigated crops grown in the dry sea-

5 Oxfam, Dhaka, conducted the survey during the 1998 flood.

6 In 2000 the flood in West Bengal (India) forced several hundred Indian nationals to take refuge in Bangladesh. BDR (Bangladesh Rifles, the border security force) took care of Indian nationals numbering 2,382 who stayed in relief camps. Less is known about those who did not make it to the relief camps. See: Ahmed (2002: 434).

son from November to May” (Rogers/Lydon/Secler/Pitman 1994: 17). But this shift could be made possible mainly by combining HYV cultivation with expanded irrigation using groundwater and shallow tube wells (STWs).

Excessive pumping of groundwater, particularly in the dry season and that again if it continues for two consecutive seasons, could bring disaster by emptying the aquifers and making the groundwater table to fall. Critics believe that the fall of the groundwater table is the main cause for the dramatic increase of arsenic in water in Bangladesh.⁷ It is not difficult to see that HYV cultivation could lead to land degradation not only for the use of fertilizers but also, and at times more importantly, for having the bad luck of not being accompanied by sufficient river-inundation for replenishing the underground aquifers. The consequence is quite predictable and that is, once land becomes degradable the farmers react almost in the manner of facing an excessive flood. Many end up as internally displaced persons at home or as environmental refugees across the border. The plight however does not end there.

19.5 Environmental Refugees as Stateless Persons

In the case of population movement between Bangladesh and India there is a specific scenario. Indeed, those who cross the border for environmental reasons and are referred to as environmental refugees turn overnight into stateless persons! But why ‘stateless’ when evidence suggests that they have all moved ‘illegally’ from Bangladesh into India or, as is the case with a section of the squatters in Dhaka, from India into Bangladesh? The case of the latter, that is, impoverished and uprooted Indians moving into Bangladesh is less known and is also numerically insignificant, therefore it is less taken up in public fora. As for the former, the government of Bangladesh has consistently denied any ‘illegal’ movement of people from Bangladesh into India. Indeed, in the midst of governmental politicking, with the Bangladesh government disowning the environmental refugees as ‘citizens’ of the country and the Indian government calling them ‘illegal migrants’ and taking measures to push them out of India, the victims of environmental disruptions, including (*mal*) *development*, end up losing protec-

tion from both countries. In this context, one Indian critic noted:

There is already in India a strong feeling against ‘outsiders’. If it is Bangladeshis (i.e. the so-called illegal migrants from Bangladesh) in Assam, it is Chakmas (i.e. the hill people who had crossed over to India in 1960s following the construction of Kaptai Dam in the Chittagong Hill Tracts in Bangladesh) in Arunachal who arouse xenophobic passion. There is no official confirmation of Operation Pushback under which innocent citizens have been taken away from their homes in the dead of the night, their heads shaven, driven to the Indo-Bangladesh border under humiliating conditions, and then ‘pushed’ across without any proof of illegal migration or any agreement with the Bangladesh government....

A disturbing feature of the current situation is the virtual silence and even complicity of the Indian government. No official effort has been made to demystify the greatly exaggerated figures of Bangladeshi migration. Instead, alleged Bangladeshis have been summarily deprived of ration cards, struck of electoral rolls, and threatened with deportation, apart from harassment by the police and communal elements in the lower level of the bureaucracy (Navlakha 1997: 357–358).

The bulk of the environmental refugees, in fact, end up as stateless persons, always in constant fear of being caught and sent to jail in India or worse, pushed back into Bangladesh where the Bangladesh security forces are all the more ready to stop their entry and push them back to India.

This is precisely what had happened with the *Bedes* (a community of snake-charmers), although the latter could hardly be dubbed as environmental refugees. The case however is an eye-opener, for it only showed the plight of the impoverished and somewhat uprooted *Bedes* trying to cross the border without valid documents. In fact, the *Bedes*, being a nomadic community, kept on crisscrossing the Indo-Bangladesh border without valid documents since the time of partition, but in February 2003 they suddenly found themselves trapped in “no-man’s land” for neither India nor Bangladesh would allow their (re) entry (Chattopadhyay 2003; Ganguly/Saksena 2003). After six days of being ‘huddled together in the severe cold’ and without food (figure 19.3) and following international concern and civil uproar in both India and Bangladesh, the issue was finally resolved, albeit without the world knowing how, as one critic commented:

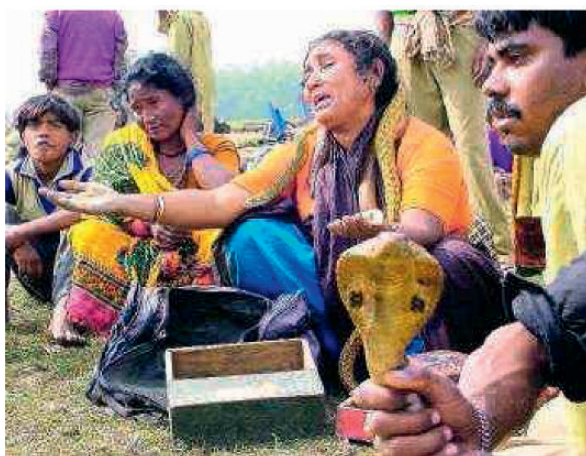
To the relief of the two States, the 213 people stranded in the no man’s land between Bangladesh and India at Satgachi in Cooch Behar vanished mysteriously on February 6 (in 2003). They had been there for a week, India saying they were illegal immigrants and should be

7 See: Islam (1999: 88); see also UNEP (2001: 4); Chowdhury (2001: 67–89).

pushed back and/or not allowed entry. Bangladesh refused to accept that they were its citizens, demanding proof and refusing to 'take them back'.... And then on the morning of 6 February, the BSF (India's border security force) found that the group of 213 had disappeared. Everyone breathed a sigh of relief. The Indian external affairs minister surreally commented: "Snake charmers cannot spoil our relations. We can get over these problems if Bangladesh acknowledges the fact and decides to talk" (Samaddar 2004).

No one could tell whether they ended up becoming Indians or Bangladeshis or remained as *Bedes* as ever! Indeed, this became all the more difficult because the Bangladesh government 'strongly refuted' the Indian government's claim that the former had formally accepted the snake charmers (Ramachandran 2005: 3). The fate of the environmental refugees, in the light of their being denied citizenship by both India and Bangladesh, remains no different.

Figure 19.3: A snake charmer among the 213 people stranded at Satgachi, West Bengal, pleads for food, on February 4, 2003. **Source:** *Frontline*, 20,4 (February 2003): 15-28. Permission to reproduce the photo was obtained from the copyright holder.



It may be pointed out that, save for Sri Lanka, none of the South Asian countries ever took formal measures to grant citizenship to the stateless.⁸ In this connection, one may cite the fate of earlier (pre-1971) en-

vironmental refugees - the Chakmas and Hajongs in Arunachal Pradesh (India). While having arrived in India from the erstwhile East Pakistan (now Bangladesh) in 1964 following the construction of the Kaptai Dam, the Chakmas and Hajongs in Arunachal Pradesh still remain 'stateless' after over 40 years, and this despite having a Supreme Court ruling in their favour. In fact, in the *National Human Rights Commission vs. State of Arunachal Pradesh*, the Supreme Court of India, while referring positively to the content of Section 5 (1) (a) of the Indian Citizenship (Amendment) Act, ruled in 1996 that the Chakmas and Hajongs fulfilled the requirements of the Act. The Court then affirmed the right of these people to apply for citizenship and ordered the state government to take necessary steps to facilitate their registration. Despite this overwhelming *legal* backing, the Chakmas and Hajongs still remain stateless and are increasingly the targets of the local population as well as of the state government. Currently, the plight of environmental refugees is even more severe.

19.6 A Fence to Contain Environmental Refugees?

The Indian government under the supervision of the Ministry of Home Affairs decided to fence the entire Indo-Bangladesh border at an estimated cost of Rs. 1,134 crore.⁹ The project is stipulated to end by March 2007. The fencing of Bangladesh will include a combination of actual border fencing (2409 km) and border roads (797 km). The actual border fencing will be at its maximum (1021 km) in West Bengal and the least in Assam (71.5 km). Tripura, Mizoram and Meghalaya will have 736 km, 400 km, and 198 km of fenced borders respectively. Fenced and cordoned, where will the environmental refugees go now (figure 19.4)? Critics, however, have already pointed out: "No number of barbed wires, fences or machine guns...can stop the movement of the desperately poor to where they think they may find food and shelter" (Swami 2003). Moreover, a photojournalist from Guwahati (India) once told me that it takes only Rs. 10 (the cost of a pair of scissors) to cut through the fencing of Rs. 1,134 crores! But then he went further and said: "Who is exploiting whom? Since the so-called 'illegal immigrants' are exploited heavily by the locals (low wages, more work hours, inhuman living conditions, and the

8 Under the Grant of Citizenship to Stateless Persons Act, No. 5 of 1986, the government of Sri Lanka is obliged to grant citizenship to 469,000 persons of Indian origin, and also to any residue of stateless persons of Indian origin in Sri Lanka. For a detailed exposition of the citizenship laws of South Asian countries, see, Ahmed 2002-2003.

9 One crore = ten million.

Figure 19.4: Indian government's construction of fence on Indo-Bangladesh border. **Source:** BBC News/South Asia, Tripura, Tuesday, 28 June, 2005; at: <www.bbc.com>; Photos by Bapi Roy Choudhury. Permission was obtained from the copyright holder.



like) it is time that Bangladesh demand compensation from India for their time and labour!”¹⁰

Samir Guha Roy of the Indian Statistical Institute, Kolkata, however, finds the estimates of ‘illegal’ Bangladeshis in India “motivatedly exaggerated”. After cross checking population growth and decline rates of the Indian States as well as that of Bangladesh, Roy goes on to state:

A close examination of demographic statistics proves conclusively that it is not the refugees from Bangladesh but the influx of migrants from neighbouring Indian states that has caused West Bengal’s population problem.... A break-up of the estimated total immigrants of 16 lakh or so during 1981–91 reveals that the share of the Bangladeshi migration to West Bengal was 9.1 lakh. The rest i.e. 7 lakh constitute inter-state movements. In other words an annual average of 91 thousand Bangladeshi nationals might have crossed the international border during the decade but how many of them were identified and pushed back is not known. It is possible that a portion of these immigrants returned on their own to their place of origin.¹¹

Speaking on the issue of deportation and almost extending Roy’s contention, Hannan Mollah, the CPI (Marxist) member, once commented in the Indian Parliament that “most of the Bengali-speaking people being deported from Maharashtra had gone to Maharashtra from Howrah and other districts of West Bengal”. Furthermore, he alleged that “usually police demanded rupees 2000 to 2500 from each of the detained Bengali-speaking people for their release. If they failed to give that amount the police kept them behind the bar for 10 to 15 days following which they were taken to border and pushed into Bangladesh” (Ahmed 2005). But the issue of internal migration could hardly dissuade the pro-Indian state scholars

from suggesting the incredible influx of the Bangladeshis. As one recent commentator stated:

This foreign trip is probably the cheapest in the world. For less than Rs. 2,000, including the cost of your ‘tour operator,’ you can actually buy yourself a safe passage and a future in India – if you are Bangladeshi. What’s more, for some small change, you cannot only settle down in whichever part of India you choose to but also be counted as part of a vote bank. Since a Bangladeshi national is culturally similar to a Bengali, he or she can easily pass off as an Indian, an identity that’s quickly fortified by fictitious ration cards that cost as little as Rs. 200. Illegal Bangladeshi immigration has grown manifold over the years. Police estimates – and there are few to come by – peg the total number of illegal immigrants in India at over a crore. Ideally, a strict vigil at the borders is called for to ward off infiltration and nip the problem in the bud.¹²

Environmental refugees are now reified in terms of ‘police estimates’ and ‘over a crore’ figures. This is not to suggest that there is no ‘illegal’ flow of people, although the term ‘illegal’ here, as indicated earlier, is a misnomer. There could be illegality only when there is something legal. In the case of Bangladesh and India, and also Pakistan, save marriage (if we were to believe Sushma Swaraj and the BJP [Bharatiya Janata Party, the main opposition party] even Sonia Gandhi fails to fulfil the criteria of citizenship in full), there can be no legal migration. Both the Nehru-Liaquat Pact of 1950 and two decades later the Mujib-Indira Agreement of 1972 have territorialized and frozen the issue of citizenship. The 1972 agreement, in fact, made 25 March 1971 as the cut off point for considering citizenship between India and Bangladesh.

Migration in South Asia otherwise has meaning only in the sphere of *illegality*. Interestingly, in the

10 Interview with the author, 9 September 2004.

11 Ahmed 2005. One lakh is one hundred thousand.

12 Seema Kamdar: “Illegal Influx: Bright lights beckon Bangladeshis”, in: *Times News Network*, 5 April 2004; see also: Gillan 2002. One ‘crore’ is ten million.

Figure 19.5: The fence on the Indo-Bangladesh border. **Source:** Photos by Bapi Roy Choudhury and Shubhashish Roy. Permission was obtained from the copyright holders.



case of India there is one novel exception, and that is, the Gurkhas of Nepal who join the Indian Army have the option of claiming Indian citizenship.¹³ So much for democracy and people's power over governments and institutions! But more importantly, not to have any movement of people or migration across the Indo-Bangladesh border would be unnatural. India and, for that matter, also Bangladesh would turn sterile and die if the flow of people between these two countries ever stopped. And since the door of legality is practically shut off the only option for the environmental refugees is the hazardous journey across the barbed-wire fences aided by none other than criminal elements and even non-state militant groups. The latter only adds to the insecurity, indeed, not only of the person in plight but also of the state and the region.

19.7 What is to be Done?

In view of the collapse of environmental security, it is quite clear that the politically constructed modern

majoritarian state has lost its will to support and nurture the material aspirations not only of the minority community but also of a sizeable section of the majority community. Indeed, threatened by water, land, and food insecurities, the members of both majority and minority communities are willing to risk the life of a 'displaced person' or 'refugee' than live a life of an imbecile in the place they were born and brought up. This is, indeed, a great tragedy. In this context, it is high time for the public and the politicians alike to rethink development, to find ways to ensure a living condition that is free from man-made disasters and the ruthless exploitation of nature.

It is difficult to offer a precise plan for rethinking development. The best we could do is to point out the things that are required to be nurtured here. In order to make 'development' more indigenous, for instance, there ought to be more creative efforts in combining water and people, the two resources that Bangladesh has in plenty (Razzaque 1981).

One such effort, indeed, could be in the area of *mud-housing*, where creative intervention could resolve not only the housing problem in a more environment-friendly manner, but also lead to the proper dredging of the river beds which could greatly reduce

13 The author is grateful to Admiral (ret.) Ramadas for sharing this information.

the possibility of floods during the rainy season. But this is only one aspect of the problem related to development. Serious imaginative interventions are required in the field of industry, transportation, state security, and other modern sectors if the rethinking development agenda is to be materialized.

Immediate and imaginative interventions are also required in the border areas. In fact, the refugee flow will continue if one side of the border remains weak and poor, while the other side remains relatively better off. It is important, therefore, that identical socio-economic, environmental, and even educational projects are undertaken on both sides of the border to meet the immediate demands of the people residing there. On this matter, NGOs on both sides of the border must participate freely, for the chances of their success are more than the highly structured governmental interventions.

There could also be Indo-Bangladesh *civil watch groups* to monitor population movement across the border. Such groups may be government sanctioned for them to have some credence and access to confidential information, including the power to interview and investigate, in the border areas. It may be mentioned that given the paramount role of the border security forces of both India and Bangladesh, often poor and marginalized civilians are fired upon and killed while crisscrossing the border. The yearly toll of such deaths is indeed tragic. According to a report published by *Odhikar*, a human rights organization in Bangladesh, 76 Bangladeshis, mostly peasants and cattle breeders, were killed by the BSF and Indian miscreants in the border area in 2004 (Ahsan 2005). In April 2001 the BDR (Bangladesh Rifles) also fired upon Indian security forces and killed 16 of their soldiers. Indeed, quite astonishing is the fact that while civil groups of both India and Bangladesh are very active in critiquing governmental *internal* policies, they remain suspiciously silent when it comes to inter-state relations and *external* policies. Given the magnitude of the issue, including the rise in the number of environmental refugees, a greater role of civil groups alongside the government could lessen the tension and killing in the border area.

I also think that it is high time to look for alternatives in resolving water insecurity, for example, building 'water catchment' for conserving water when the latter is plenty (i.e. during rainy season, floods, etc.). If this can be made viable, and there is no reason why it should not, given the level of technological development on water catchment, it would surely take away much of the dependency syndrome that Bangladesh

so acutely suffers from when dealing with the issue of water sharing with India. It may not be out of place to point out that the Ganges as a whole is fast drying up for reasons of modern development and increasing population pressure. I do not foresee a time in the recent future when the Ganges will have plenty of water to share around. I do see a politics, however, on the question of sharing the Ganges, which, I believe, is more catered towards reproducing a pro-majoritarian or inversely communalized hegemony in both India and Bangladesh. In this context, water catchments could bring an end to such politics, making development more central to the demands and livelihood of the people.

Moreover, there is a need for revitalizing the culture of *living with floods*. With the frequency of big floods coming down to a decade there is an urgent need to reorient our present mode of living into something that is more flood or water centric. Imtiaz Ahmed, Ajaya Dixit, and Ashis Nandy (1997: 10-11) have tried to highlight this need for reorienting our life and living, while working together on a *South Asian Manifesto on the Politics and Knowledge of Water*. As we collectively maintained,

Till now, the approach to water management and water development has been fragmentary. Not only has it dealt with sea, river and groundwater separately, it has been 'land-centric'. Water management, we believe, should centre on water; it must be based on the recognition of the wholeness of water and its intrinsic function in nature. A comprehensive view also demands critical interventions in the curricula at all levels of education. The principal challenge is, therefore, to integrate the global and the local, to alter the structure and nature of current decision-making models, and the educational context within which they are generated, not only to accommodate a plurality of views, but also to generate options that would reflect the larger reality of water in nature and human society.

The range of activities that can be expected from such reorientation of things is immense. Not only will it provide a space for including a more sensible and topographically relevant cropping system, something that we have discussed earlier, but also a mode of settlement based on the long lost principle of 'dig-elevate-dwell'. The latter refers to a practice in Bengal going back over thousands of years where people in order to construct houses first dug ditches and then used the excavated earth to elevate the land. Houses were then constructed on this elevated land (Islam 1999). In the process, they also succeeded in making new ponds and dredging the silted canals, particularly during the dry season, which must have worked to their benefit

at the time of flooding. It is high time that we make use of this age-old wisdom, albeit with proper innovations to meet the current state of living.

The reorientation of things will also allow us to reinvent and rebuild the much required water-based communication system, flood-free housing structures, flood-time schooling, and many more. Only a timely investment in a culture of *living with floods* would allow the Bangladeshi to transform the current curse that so frequently accompanies the floods and make our life more liveable in the midst of the not-so-natural floods. Since the current government is ill equipped to carry out such an investment, the onus of carrying out this immense task lies with all those concerned and the affected millions.

Finally, there is also the need to *democratize* development. This could come in two ways. First, we need to effectively and creatively make use of the diverse or pluralist understanding and practices of development that is so much present at the international level, even within the World Bank itself. In practical terms, what we need is a thorough knowledge of whatever is taking place in both developed and developing countries. This will put us in a position to effectively bargain for our own development strategies whenever we are fed up with one particular policy prescription provided by international donors. Creating development lobbies in the developed countries, both at government and grassroots levels, falls within the range of this activity. At the same time, there is a need for greater donor responsibility, particularly on the part of the developed countries, including the World Bank. This is because often their developmental initiatives, including the building and financing of large dams and newer irrigation measures, as indicated in the case of Bangladesh, go on to create environmental insecurity and environmental refugees. Second, we need to provide space for alternative development scenarios to be practised in Bangladesh. In this context, 'Yunusonomics' (i.e. the economics and developmental practices of Muhammad Yunus of Grameen Trust) needs to be further explored and brought into mainstream discussion, including the building of alternative economics curricula at the primary, secondary, and tertiary levels on the basis of his paradigmatic vision and experience.

19.8 Concluding Remarks

Several conclusions can easily be reached. From a conceptual perspective, with regard to environmental dis-

tress migration and environmental refugees, and not to mention the crisscrossing of people along the Indo-Bangladesh border, 'security' can no longer be defined in military terms, not even within the familiar 'realist' notion of national security. In fact, 'environmental security' along with 'human security', 'social security', and 'gender security' has now come to inform and influence the understanding of security not only within the national domain but also regionally and internationally. Even the concept of 'environmental refugees' has now attained more specificity, understood and defined differently from conventional refugees and migrants. This is a healthy sign for it creates space to opt for policies qualitatively different from those practised in containing and eradicating problems arising from conventional refugees and economic migrants.

From a theoretical vantage point, the relationship between environmental distress migration and environmental refugees is hardly linear. Rather, the two are product of a complex structure consisting of (mal) development, environmental disruptions, population growth, lack of space, and an obsession with national security. The projected impacts of climate change, including global warming and the rise in sea level, have the potential of further exacerbating the plight of environmental refugees. The multifaceted nature of the problem makes it clear that segmentalized and fragmented interventions would do little to redress the situation. What is required is a comprehensive approach keeping the complexity in mind.

What do these results imply for policy options? Given the widespread lack of familiarity of policymakers on issues related to the environment and also at times serious lack of attention towards the impoverished and uprooted segment of the population, there is a tendency on the part of the state machineries to fall back on the age-old 'realist' resolution of the problem. India's policy of fencing its border with Bangladesh to contain environmental refugees or what it deems as 'illegal migrants' is a good case. But such a policy while (probably) helpful in containing a military threat or a known enemy requiring quarantine can prove immensely destructive when the 'threat' is non-military and the quarantine not only impossible, rather an act more against a friend than anything close to an enemy. Apart from having a psychological bearing on the people of an otherwise friendly country, the barbed-wiring of the border creates further hardship for environmental refugees. This calls for an innovation in policymaking in the age of environmental insecurity and post-nationality. Indeed, nothing

short of creative and bold interventions would stop the reproduction of environmental refugees and the state of insecurity arising out of it.

20 Environmental Scarcities and Civil Violence

Thomas Homer-Dixon and
Tom Deligiannis¹

La Paz (Bolivia). Bolivia's president declared a state of emergency today, following a week of widening unrest that left three people dead in fresh clashes between police and demonstrators. The move came after a week of protests over rising water rates, unemployment, and other economic difficulties plaguing the Andean country of eight million people.²

Nairobi (Kenya). Fourteen people were killed and 13 seriously injured in Tana River District, Eastern Kenya, on Sunday when tensions between Orma and Pokomo communities over the use of land and water resources erupted into violence. . . . Some 70 people have now been killed over the last year as a result of repeated clashes between the communities, and Pokomo elders have claimed that the Orma have been accumulating firearms in preparation for more attacks.³

Santiago Xochiltepec (Mexico). All over the state of Oaxaca, where a quarter of the breadwinners earn less than \$5 a day, people fight over who owns the land, the water, the trees. In the absence of governmental authority these disputes become deadly. The killing of 26 men from Santiago Xochiltepec, population 650, took place Friday night on a darkening dirt road outside Las Huertas, population 700. The attackers lay in ambush with automatic weapons.⁴

Kafr Kila (Lebanon). [Here] on this scarred frontier of enemy states, water is everything, and Lebanon's plans to pump water from Wazzani Springs has set off a new round of tension with Israel. . . . Last month, Mr. Sharon issued his most explicit threat. Should Lebanon start pumping water from the Wazzani, the Prime Minister said at a cabinet meeting: "we shall have to take measures."⁵

20.1 Introduction

Scarcities of vital environmental resources – especially of cropland, fresh water, and forests – are contributing to significant violence around the world. These *environmental scarcities* rarely cause wars among countries, but they do generate severe social, economic, and political stresses inside countries. When combined with certain other factors, these stresses, in turn, boost the likelihood of sub-national insurgencies, ethnic clashes, and urban unrest.

Such internal or *civil* violence is particularly harmful to developing countries, because they tend to be far more dependent on environmental resources and far less able to buffer themselves from the social impacts of environmental scarcities. While instability, dislocation, and mass violence may affect poor countries most, policymakers and citizens in the industrialized world ignore it at their peril. It can harm rich countries' national interests by threatening their trade and economic relations, entangling them in complex humanitarian emergencies, provoking distress migrations, and undermining the political cohesion of key regions, which can then become havens for transnational terrorism.

These issues were examined in detail between 1989 and 1998, when the University of Toronto, working with several American organizations and foundations, brought together over 100 experts in fifteen

1 This chapter summarizes the research of the Toronto Group, conducted during the 1990's. An earlier version of this chapter by Thomas Homer-Dixon originally appeared in Kennedy/Riggs (2000).

2 AP: "Bolivia Calls An Emergency After Protest Over Water": in *The New York Times*, 9 April 2000: 8.

3 IRIN: "Fourteen Killed in Tana River Clashes", in: *U.N. Integrated Regional Information Networks (IRIN)*, 20 November 2001; online at: <http://www.irinnews.org/report.asp?ReportID=15412&SelectRegion=East_Africa&SelectCountry=KENYA>.

4 Tim Weiner: "87 Orphans Will Be Told of the Killers Next Door", in: *The New York Times*, 4 June 2002: A4.

5 Somini Sengupta: "In Israel and Lebanon, Talk of War over Water", in: *The New York Times*, 16 October 2002: A10.

countries to participate in three major research projects.⁶ The research of this ‘Toronto Group’, as it has become known, studied the links between scarcities of environmental resources – especially of cropland, fresh water, and forests – and mass violence, including insurgencies, ethnic clashes, urban unrest, and rural banditry.

This chapter provides an overview of the Toronto Group’s research findings about how environmental scarcity can contribute to causing conflict. The first part of the chapter places the work of the Toronto Group into the context of research since the end of the Cold War on revised conceptions of security, outlines the research questions that guided the project, and lists the Group’s key findings (20.2). Part two provides an overview of why renewable resources are crucial for the livelihood survival of hundreds of millions of people globally (20.3). Part three outlines the Toronto Group’s conception of environmental security – how demand, supply, and distributional dimensions of human interaction with renewable resources can lead to scarcity and undermine human well-being (20.4). Two types of social effects from environmen-

tal scarcity are particularly important, according to the Toronto Group – resource capture, and ecological marginalization. These social effects are described in part four, with illustrations taken from some of the Toronto Group’s case studies (20.5). Part five describes the linkages between the social effects of environmental scarcity outlined by the Toronto Group and different types of sub-national violent conflict, placing these links into the context of the core causal model of the Toronto Group (20.6). This section also asserts the highly contextual, and highly interactive nature of environmental scarcity-conflict linkages. Part six acknowledges that societies often overcome scarcities through technological or social change, but goes on to argue many societies either lack the capacity to alleviate the impact of environmental scarcities, or that environmental scarcities can actually undermine a society’s ability to apply needed ingenuity (20.7). The chapter concludes with recommendations to address the impacts of environmental scarcity (20.8).

20.2 Toronto Group’s Research and Debates about Environmental Security

The Toronto Group’s research emerged from both the calls for a redefinition of security concerns to include the environment in the last decades of the Cold War, and the rethinking of security policy that took place among scholars and government officials following the collapse of the Soviet bloc.⁷ Throughout much of the Cold War, security thinking was largely the concern of academics and specialists in government security establishments. While their focus was mainly on the use of military force as an instrument of national policy, policymakers often used a much more expansive definition of security than security studies scholars.⁸ At various times, the consequences of environmental scarcities and population change were evaluated at the highest level of the US security bureaucracy during the Cold War.⁹ However, these issues were often a component of general or regional assessments of security considerations, and were overshadowed by the perceived military threat from the USSR. Greater concern among security thinkers about the consequences of population growth and human-in-

6 The first project on *Environmental Change and Acute Conflict* (1990–1993) was jointly sponsored by the American Academy of Arts and Sciences in Cambridge, Massachusetts, and the Peace and Conflict Studies Program of the University of Toronto. It brought together a team of forty experts from four continents to conduct a preliminary study of the links between environmental stress and conflict. The second project on *Environmental Scarcities, State Capacity, and Civil Violence* (1993–1997) followed directly from the first. It sought to determine if scarcities of cropland, forests, water, and other renewable resources are decreasing the capabilities of governments in the developing world and, if so, whether this raises the probability of widespread civil violence such as riots, ethnic clashes, insurgency and revolution. The third project on *Environment, Population and Security* (1994–1996) was a joint effort of the Peace and Conflict Studies Program and the American Association for the Advancement of Science in Washington, DC. It gathered, evaluated, and disseminated existing data on causal linkages among population growth, renewable resource scarcities, migration, and violent conflict. Additional details about the work of the Toronto Group, case studies, and thematic papers can be found at the University of Toronto’s Trudeau Centre for Peace and Conflict Studies, at: <<http://www.trudeaucentre.ca/research-pioneeringresearch.html>>; the key summative publications of the project include the following: Homer-Dixon (1991, 1994, 1999); Homer-Dixon/Blitt (1998); Schwartz/Deligiannis/Homer-Dixon (2001).

7 The discussion in this section is particularly focused on the North American context of debates about security and the expansion of security to include environmental concerns.

duced environmental change evolved with both the growth of the environmental consciousness in the 1970's and the reduction of Cold War tensions in the late 1980's.¹⁰

The end of the Cold War stimulated a vigorous debate about the nature of threats in the post-Cold War era, and the future direction of security thinking. A number of scholars questioned the traditional focus on issues surrounding the use of conventional and nuclear military power; this work built upon the pioneering arguments of a small number of scholars from the 1970's and 1980's.¹¹ These revisionist voices argued that newly emerging or overlooked threats like ethnic conflict, economic decline, environmental degradation, emerging infectious diseases, or the proliferation of nuclear, biological, and chemical weapons, demanded greater attention from security studies scholars, and that the concern with questions of conventional and nuclear conflict had led to overly narrow definitions of 'security'.¹²

Debates among practitioners and scholars about the definition of security and the place of the environment in that definition remained fluid throughout the

1990's. In the United States, a concerted, and largely inconclusive, effort was made at the time to integrate concerns like the environment into national security policymaking in order to take advantage of the favourable political climate in Washington, DC.¹³ Consensus also remained elusive among scholars. The divide expanded beyond traditionalist and revisionist views defining security. Instead, scholarly opinion displayed a continuum of views - from those adamantly opposed to expanding the scope of research to encompass issues outside of the practice of conventional and unconventional war, to those who accepted an inclusive view of the nature of threats like environmental scarcity and the types of conflict in the post-Cold War era worthy of concern.¹⁴ Some traditionalists within the field were afraid of diluting the focus of security studies, while others refused to accept that environmental issues had any bearing on research about the use of military force.¹⁵ Deudney (1999: 189, 192-194) for example, argued that thinking of environmental change as a national security threat would create a "conceptual muddle rather than a paradigm shift, ...because the traditional focus of national security - inter-state

8 The historical record of US national security policy thinking during the Cold War is a good example - and probably represents the general trend, rather than a case of American exceptionalism. The working definitions of "national security" used by policymakers in the US were generally expansive during most of the Cold War, compared with those used by North American security studies scholars. US policymakers regularly included issues such as economic threats in their reviews of threats to national security, for example (see Leffler 1992). Baldwin (1995: 121-122) notes, however, that expansive working definitions of national security used by most scholars at the start of the Cold War appeared to give way to concerns surrounding the military instruments of statecraft as the Cold War reached its height in the 1950's and 1960's. Useful reviews of thinking among security studies scholars during this period include Prins 1991, Walt, 1991, and Baldwin 1995. An excellent discussion of the meaning of national security to US policymakers during the early Cold War period can be found in Leffler (1992).

9 On concerns about population growth in the third world, see: Connelly (2000, 2001). As well, US documents on the concern over population issues and water scarcity can be found in, US Department of State (1999); at: <http://www.state.gov/www/about_state/history/vol_xxxiv/index.html>. The documents released in the FRUS volume are only a small sample of those currently available to scholars in US archives.

10 Dabelko (2003) provides a good overview of these developments.

11 Seminal early arguments about redefining "security" can be found in Brown (1977), Ullman (1983), and the World Commission on Environment and Development (1987). A thorough account of these developments can be found in Dabelko (2003, chap. 2 and 3). Challenges during the 1990's to the traditionalist views of Walt (1991) can be found in Kolodziej (1992). In addition to Baldwin (1995), other articles from the 1990's exploring whether conventional interpretations of "security" should be enlarged, include Wyn Jones (1995), Krause (1996), Lipschutz (1996), and Betts (1997). An overview of this thinking, including reviews done by North American governments, is provided by Florini and Simmons (1998).

12 Scholarly work from this period arguing for the place of the environment in security concerns includes Stoett (1994), Perelet (1994), Stern (1995), Dabelko/Dabelko (1995), Matthew (1995), Dabelko (1996), Pettiford (1996), Shaw (1996), Dabelko/Simmons (1997), Matthew (1997). Dabelko (2003) also provides a comprehensive overview of this thinking.

13 These developments are covered in detail by Dabelko (2003).

14 This analysis was reflected by the scope of discussions on the direction of security studies during a roundtable on "Security Studies for the 21st Century", held at the 40th Annual Convention of the International Studies Association, Washington, DC, 18 February 1999.

15 On the fear of the dilution of security studies, see Betts (1997: 27).

violence – has little to do with either environmental problems or solutions”.

Some of the most pointed critiques, however, come from scholars in environmental studies and development studies. Most acknowledged that the diversity of research in the nascent field of environmental security displayed a healthy interest in academic and policy-making circles about the role of the environment. However, some feared that the consequences of *securitizing* the environment far outweighed the benefits of wrapping a package of environmental concerns with the environmental security concept.¹⁶ Concerns also arose about the wisdom of opening environmental problems to military institutions dominated by a culture of secrecy, and eager for new roles and missions with the evaporation of the Soviet threat.¹⁷ As well, some worried that the multifaceted nature of the term ‘environmental security’ exposed it to far too much rhetorical and political abuse.¹⁸ Instead of debating about threats to environmental security, Conca (1998) argued that policymakers in the developed world should focus on the root causes of destructive global environmental change – our own wasteful, high-consuming industrial societies (Conca/Princen/Maniates 2001). Similarly, Dalby (1996, 1999a, 2000, 2002) warned that the use of the term ‘environmental security’ could perpetuate the exploitative patterns of economic relations and resource use that underlie many of the world’s environmental woes (Peluso/Watts 2001). To Deudney (1999: 202), melding existing concerns about national security with environmental problems was misguided because such an approach bolstered the state-centric concept of nations now dominant in world politics, while simulta-

neously threatening to undermine the most important challenge to this traditional system – the construction of an emergent ‘earth nationalism’ necessary to deal with global ecological problems. Apprehension ran deep among this group of critics about the misappropriation of the idea of environmentalism.

Critiques of the term environmental security thus emerged from an unlikely alliance between some traditionalist scholars in security studies and their ideological opposites in development and environmental studies. General fears about the misapplication by policymakers of conceptions of environmental security link these critical voices together.

Among those scholars who accepted an expanded focus for security studies to include issues related to the environment, by the mid 1990’s many began to regularly employ the term ‘environmental security’ to describe their field. According to a survey by Geoffrey Dabelko (1996), topics examined under the ‘environmental security’ domain included:

1. Environmental degradation or depletion as a threat to human health and human well-being stemming from competition with disease causing micro-organisms; from declining standards of living; from declining agricultural outputs; from increased pollution; from increased ultraviolet radiation; and from economic instability and decline;
2. Environmental degradation or depletion stemming from military preparation for armed conflict; from the conduct of armed conflict; and from the disposal of military waste;
3. Environmental scarcity as a cause of political instability or violent conflict;
4. Institutional infringement on the principle of sovereignty to mitigate environmental degradation;
5. Military and defence intelligence institutions monitoring and enforcing international environmental agreements; gathering, analysing, and disseminated scientific data on the national environment; responding to mitigate environmental crises and disasters; implementing environmental sustainability programmes; guaranteeing access to natural resources; spinning off environmental cleanup technologies; and protecting national parks and reserves.¹⁹

The sheer diversity of definitions and research agendas encompassed under the term ‘environmental security’ no doubt led to the environment being one of the most contested topics in the debates about expanding the traditional focus of security studies.

16 See Deudney (1990), Levy (1995), Dokken/Graeger (1995), Waever (1996), Elliott (1996), Graeger (1996), Lipschutz (1996) Gleditsch (1998). A number of important European scholars were particularly prominent among this group.

17 This concern has probably lost much of its impetus in the wake of terrorist attacks in the United States in 2001.

18 For example, Ken Conca (1998: 40) argued that, “Despite its weak performance on environmental cooperation, the [Clinton] administration has undertaken a concerted effort to repackage the environment as a security issue. Although sometimes touted by environmentalists as a way to generate attention and action, the linking of environmental problems to national security and ‘strategic’ American interests is deeply troubling. It distorts the problem, blurs underlying responsibility, legitimizes coercion, and diverts attention from where action is most badly needed.” See also Conca (1994).

Compared to the vast array of conceptual and thematic issues involved in the expanded domain of environmental security, a number of researchers in the early 1990's chose to focus instead on the narrower goal of identifying the causal linkages between environmental change and violent conflict. These scholars side-stepped debates about including environmental change as a *security* concern in favour of further research on the evidence and nature of a causal connection between environmental change and violent conflict. Two projects were particularly prominent in the 1990's: the Zurich-based Project on Environment and Conflict (Bern-Zürich Group), led by Günther Bächler and other scholars from the Swiss Peace Foundation and the Centre for Security Studies and Conflict Research; and a series of studies headed by Thomas Homer-Dixon of the University of Toronto's Peace and Conflict Studies Program (Toronto Group).²⁰ Both the Bern-Zürich Group and the Toronto Group explored a large number of individual case studies in order to map the linkages between environmental change and violent conflict. Information exchange was common between the two projects, though direct cooperation was limited by the fact that each pursued different approaches to exploring environment-conflict linkages. The Bern-Zürich Group assembled a typology of environmental conflicts "inductively drawn from a set of about 40 area studies" (Bächler 1999:

35), while the Toronto Group explored a small number of hypothesized connections between environmental scarcity and conflict through several case studies (Homer-Dixon 1991, 1994, 1995a).²¹ In the end, the findings of the Bern-Zürich Group and the Toronto Group are complimentary and reinforce each other about the positive relationship between human-induced environmental change and violent conflict (see chap. 21 by Mason, Hagmann, Bichsel, Ludi and Arsano).

The Toronto Group's projects did not aim to identify all the factors that cause violent conflict around the world, but rather sought to determine whether a specific factor - environmental scarcity - can be an important cause of violent conflict. The research of the Toronto Group was guided by three key research questions (Homer-Dixon 1999: 6). First, can environmental scarcity contribute to violent conflict? If yes, how can it contribute to conflict? And, finally, is this contribution important? These questions frame the summary of the Toronto Group's work below.

The Toronto Group's findings can be summarized by seven points:

1. Environmental scarcity is a significant cause of violence in developing countries.
2. The links between environmental scarcity and violence are usually indirect; therefore, scarcity's role as a cause of violence is often not recognized.
3. Environmental scarcity is neither a necessary nor sufficient cause of violence (there is, in fact, no identifiable, non-trivial necessary and sufficient cause of any type of human violence); rather, environmental scarcity is always one component of a complex, multivariate set of causes. The relationship between these causes is invariably synergistic.²²
4. The response of political, social, and economic systems to such stresses is almost always nonlin-

19 The diversity of research perspectives in the new field of environmental security at that time is well represented in the Woodrow Wilson Center's *Environmental Change and Security Project Report*, which published its first report in 1995 under the editorial guidance of P.J. Simmons. Geoffrey Dabelko became editor in August, 1997, and has since then continued to present a broad diversity of environmental security concerns in the Project's publications. The full text of all volumes is available online at: <http://www.wilsoncenter.org/index.cfm?topic_id=1413&fuseaction=topics.publications>. In one form or another, Dabelko (2003) traces the intellectual roots of most of these 'expanded' concerns to the late 1960's.

20 The ENCOP project produced a number of publications. See Bächler (1999); Bächler/Böge/Klötzli/Libiszewski/Spillmann (1996a); Bächler/Spillman (1996b, 1996c). Although Homer-Dixon was the lead researcher in the environmental scarcity research project centred at the University of Toronto, over 100 experts from 15 countries also participated in various stages of three separate research projects. Details of the work of the Toronto Group can be found at the website of the University of Toronto's Trudeau Centre for Peace and Conflict Studies: <<http://www.trudeaucentre.ca/research-trudeaucentreresearch.html>>.

21 See: Bächler/Böge/Klötzli/Libiszewski/Spillmann (1996a); Bächler/Spillman (1996b, 1996c) for explanations of ENCOP's research approach and the results of their case studies. Bächler (1999) provides a synthesis of ENCOP's findings. Chap. 2, in particular discusses their methodological approach in the context of other environment-conflict literature. The Toronto Group's methodological approach is outlined in Homer-Dixon (1991, 1994).

22 The Toronto Group's view of the causal role of environmental scarcities is discussed in greater detail in Schwartz/Deligiannis/Homer-Dixon (2001), and Homer-Dixon (1999): 104-106 and 169-176.

ear, and therefore predicting the specific incidence of violence is usually impossible.

5. The violence that environmental scarcity helps cause tends to the sub-national, diffuse, and chronic; outright 'resource wars' are unlikely. Nonetheless, this violence may have significant security implications for the United States and Western countries.
6. This violence may also disrupt a society's adaptive mechanisms, contributing to downward, 'locked in' spirals of economic crisis, institutional disintegration, and further political violence.
7. The incidence of such violence will increase in the future, because a large fraction of the world's population will remain dependent on renewable resources for day-to-day needs; because interacting demand, supply, and distributional pressures will produce an inexorable worsening of local resource scarcities; and because national economic, political, and social institutions in the South are often too weak to provide an effective collective response.

In many cases, critics of the Toronto Group's work (and critics of similar work elsewhere) have grossly misrepresented the Group's findings and conclusions, often labelling them as simplistically Malthusian. They have implied, and sometimes stated explicitly, that the Toronto Group has proposed deterministic, mono-causal models of the relationship between environmental stress and violence.²³ The reality is very different: the Toronto Group's arguments are complex, subtle, and probabilistic.

23 Notable critiques of the Toronto Group's work can be found in Levy (1995), Deudney (1999), Barnett (2001), Gleditsch (2001), Goldstone (2001a), Le Billon (2001), Peluso/Watts (2001), de Soysa (2002). Responses from the Toronto Group to various critiques can be found in Homer-Dixon and Levy (1995/1996), Homer-Dixon (1999), Schwartz/Deligiannis/Homer-Dixon (2001); Homer-Dixon (2003). Additional commentary and debate about the work of the Toronto Group can be found in the various issues of the Woodrow Wilson's *Environmental Change and Security Project Report*, which can be accessed online at: <http://www.wilson-center.org/index.cfm?fuseaction=topics.home&topic_id=1413>.

20.3 Critical Role of Environmental Resources

Scholars have long considered that negative impacts on standards of living or quality of life might play a role in instigating civil violence and revolutions.²⁴ The Toronto Group's research into environment-conflict linkages began by hypothesizing that human pressure on natural resource endowments and the patterns of use of those resources could impact on a society's material well-being and thus contribute to the outbreak of violent conflict.²⁵ The key roles played by these resources for billions of livelihoods around the world are briefly outlined below.

Those of us living in the developed world may easily forget that the well-being of about half of the world's population of 6.5 billion remains directly tied to local natural resources (MA 2005; chap. 3 by Lee-mans). Rural areas are home to about two-thirds of

24 Useful reviews of literature on the causes of revolution, including the role of material well-being or grievance factors, can be found in Foran (1997), Goldstone (2001b). The *Political Instability Task Force* (PITF) (formerly known as the State Failure Task Force) also explores the impact of quality of life indicators as a part of a general causal model of conflict, and has empirically tested variables to represent quality of life indicators, such as infant mortality, for several years. This variable is discussed in various reports of the PITF, which can be found online: <<http://globalpolicy.gmu.edu/pitf/index.htm>>.

25 Homer-Dixon (1991) surveyed the existing research theorizing about environment-conflict linkages, and proposed a preliminary analytical framework and research agenda to explore the possible relationships. Using this framework, and drawing on the literature of conflict theory, he suggested several hypotheses about how the social effects of human-induced pressure on renewable resources could contribute to conflict. Homer-Dixon (1991: 78): "I propose that poor countries will in general be more vulnerable to environmental change than rich ones; therefore, environmentally induced conflicts are likely to arise first in the developing world. In these countries, a range of atmospheric, terrestrial, and aquatic environmental pressures will in time probably produce, either singly or in combination, four main, causally interrelated social effects: reduced agricultural production, economic decline, population displacement, and disruption of regular and legitimized social relations. These social effects, in turn, may cause several specific types of acute conflict, including scarcity disputes between countries, clashes between ethnic groups, and civil strife and insurgency, each with potentially serious repercussions for the security interests of the developed world."

the world's poor, and most depend on agriculture for a substantial portion of their livelihoods (IFAD 2001, WRI 2005)²⁶; a large majority of these people are smallholder farmers, including many who are subsistence or semi-subsistence farmers (which means they survive, in large part, by eating what they grow). Biomass fuels like wood, charcoal, straw or dung are the main source of energy for over 2.5 billion people – over 40 per cent of people on the planet, and more than 50 % of people in developing nations; at least one billion more rely on such fuels for a part of their primary energy needs (IEA 2006; Homer-Dixon 2000; Lamb 1995). Over 1.1 billion people lack access to clean drinking water; many are forced to walk far to get what water they can find (MA 2005).²⁷ About 1.5 billion people rely upon wild fish for their main source of protein; however, three quarters of the world's fish stocks are either fully exploited, overexploited, or significantly depleted (FAO 2004).

The livelihoods of billions of people around the world depend upon renewable resources like cropland, forests, fish, and water supplies. Unlike non-renewable resources such as oil and iron ore (Klare 2001), renewables are replenished over time by natural processes. In most cases, if used prudently, they should sustain an adequate standard of living indefinitely. Unfortunately, in many regions where people rely on renewables, they are being depleted or degraded faster than they are being renewed. From Gaza (Homer-Dixon/Blitt 1998) to the Philippines (Kahl 2006) to Honduras (Stonich 1993), the evidence is stark: aquifers are being overdrawn and salinized, coastal fisheries are disappearing, and steep uplands have been stripped of their forests leaving their thin soils to erode into the sea.

Currently, the human population is growing by about 1.2 per cent a year on a base of just over 6.5 billion (UN 2005). This figure peaked at about 2 per cent between 1965 and 1970, and has fallen since then. In recent years, fertility rates have dropped surprisingly fast in most poor countries; women are having,

on average, significantly fewer children. But it is wildly premature to declare, as some commentators have, that the problem of the population explosion is behind us. The largest cohorts of girls ever born have yet to reach their reproductive years, which ensures tremendous momentum behind global population growth. So even under the most optimistic projections, the planet's population will expand by almost a third, or by about two billion people, by 2050, with most of this growth eventually concentrating in the urban centres of a handful of developing countries (see chap. 12 by Lutz).

The real economic product per capita is also currently rising by about 1.0 per cent a year.²⁸ Combined with global population growth, the Earth's total economic product is therefore increasing by about 2 per cent annually. With a doubling time of around thirty years, today's global product of about US \$ 30 trillion should exceed US \$ 50 trillion in today's dollars by 2025.

A large component of this two-thirds growth will be achieved through yet higher consumption of the planet's natural resources. In the absence of significant changes to current policies, a further decline in the total area of high-quality cropland will occur, along with the widespread loss of remaining primary forests (MA 2005; FAO 2006a). By 2030, about 2.7 billion people will still rely upon biomass for their primary energy needs (IEA 2006). A continued degradation and depletion of rivers, aquifers, and other water resources, and the further impoverishment of wild fisheries may also be observed (MA 2005).²⁹

Regional scarcities of renewable resources are already affecting large populations in poor countries. But during the last two decades, global environmental problems, especially climate change and stratospheric ozone depletion, have received more attention in the popular media in the industrialized world. The social and economic impacts of these global atmospheric problems, in particular of climate change, may eventually be very large, but these impacts will probably not

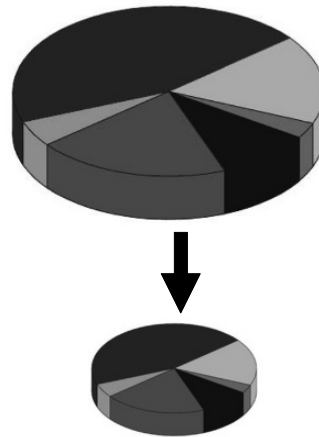
26 Measuring poverty is tricky and controversial. One measure counts those people worldwide who consume less than one dollar a day – they are dollar poor (in constant dollars). By this measure, in 2001, between 1.1 billion and 900 million poor people live in rural areas (IFAD 2001, MA 2005), while about 2.7 billion live on less than \$ 2 dollars per day (WRI 2005).

27 MA 2005 reports that, "Water scarcity affects roughly 1–2 billion people worldwide. Since 1960, the ratio of water use to accessible supply has grown by 20 % per decade."

28 Estimates vary depending upon which dates one uses to calculate the average and whether or not one only uses GDP data or some other composite estimate. According to data listed by Van den Berg (2002), between 1820 and 1998, real GDP per capita increased at around 1.3 % per year. If one only examines the period 1950 to 1998, however, the real GDP per capita growth rate was around 2 %. Criticisms about the usefulness of using GDP to measure material wellbeing have led the UNDP to develop the Human Development Index instead (see UNDP 2006).

Figure 20.1: Supply-induced scarcity. **Source:** The authors.

- A human-induced decline in the quantity or quality of a renewable resource leads to worsening supply-induced scarcity.
- Unsustainable human impacts on resources reduce the overall size of the resource pie over time – the pie gradually gets smaller.
- Continual cropping of the same field without rotating crops, for example, will gradually erode the productive capacity of the field by depleting certain necessary minerals and organic matter in the soil. Its productive capacity will be diminished.



be decisively clear till well into this century. And climate change is most likely to have a major effect on societies (Brauch 2002, 2003; Schwartz/Randall 2003, see chap. 59 by Dalby/Brauch/Oswald and chap. 98 by Oswald/Brauch/Dalby in this volume), not by acting as an isolated environmental pressure, but by interacting with other long-present resource pressures, such as degraded cropland and stressed water supplies. While global atmospheric problems are important, policymakers, the media, and the public in rich countries should focus more of their attention on regional environmental scarcities of cropland, water, and forests in poor countries.

20.4 Sources of Environmental Scarcity

The Toronto Group limited its research on environment-conflict linkages to renewable resources that are essential for rural livelihoods. Research on the impact of human-induced pressure on these frequently limited renewable resources is thus different from work

done by the ‘abundance school’ of environmental conflict researchers, who have mostly explored the impact of ‘greed’ conflicts over locally abundant, but globally scarce resources (often non-renewables) like minerals, precious metals, oil, and high value timber.³⁰ The findings of the abundance school are complimentary to the research of the Toronto Group, but describe different types of human-environment relationships, with somewhat different processes operating to generate instability and conflict.³¹

The impact of human-induced pressure on renewable resources is encapsulated by the Toronto Group in the tripartite term environmental scarcity (Homer-Dixon 1999).³² Environmental scarcity is caused by the degradation and depletion of renewable resources (e.g. a specific tract of cropland), the increased demand for these resources, and/or their unequal distribution. Population growth and increased per capita resource consumption can cause depletion and degradation, which can in turn produce a decrease in total resource *supply* or, in other words, a decrease in the size of the total resource ‘pie’.

29 The Millennium Ecosystem Report noted that, “The use of two ecosystem services – capture fisheries and fresh water – is now well beyond levels that can be sustained even at current demands, much less future ones. At least one quarter of important commercial fish stocks are over-harvested (high certainty). From 5% to possibly 25% of global freshwater use exceeds long-term accessible supplies and is now met either through engineered water transfers or overdraft of groundwater supplies (low to medium certainty). Some 15–35% of irrigation withdrawals exceed supply rates and are therefore unsustainable (low to medium certainty)” (MA 2005: 6).

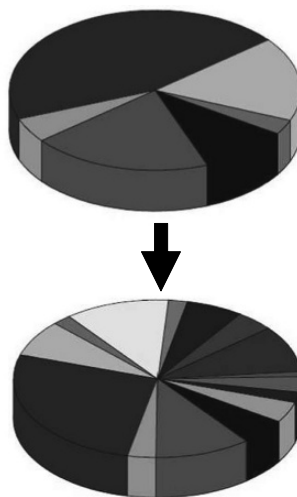
30 See: Ballentine/Sherman (2003); Collier (2000); Collier/Elliott/Hegre/Hoeffler/Reynal-Querol/Sambanis (2003); de Soysa (2002); Le Billon (2001, 2001a); Renner (2002); Ross (2003).

31 Efforts by de Soysa (2002) to characterize environment-conflict research as a debate between ‘greed’ or ‘grievance’ perspectives is thus erroneous, since the different types of conflict describe different human-environment interactions, and they can often operate in the same region, and at the same time.

32 See Homer-Dixon (1999: 47–72), for a full description of the theoretical development of the idea of environmental scarcity.

Figure 20.2: Demand-induced scarcity. **Source:** The authors.

- Demand-induced scarcities are caused by the effects of population growth, which reduces a resource's per capita availability by dividing it among more and more people.
- More people means that you have to divide the pie into smaller and smaller slices for everyone.
- Increased consumption is also a cause of demand induced scarcity, whether as a result of higher demand in local markets or from distant markets



But population growth and changes in consumption behaviour – either locally or in distant markets – can also cause greater scarcity by boosting the *demand* for a resource. So if a rapidly growing population depends on a fixed amount of cropland, the amount of cropland per person – the size of each person's slice of the resource pie – falls inexorably. In many countries, resource availability is being squeezed by both these supply (figure 20.1) and demand (figure 20.2) pressures.

Scarcity is also often caused by a severe imbalance in the distribution of wealth and power that results in some groups in a society getting disproportionately large slices of the resource pie, while others get slices that are too small to sustain their livelihoods.

Such unequal distribution – or *structural* scarcity (figure 20.3) – is a key factor in virtually every case where scarcity contributes to conflict. Often the imbalance is deeply rooted in institutions and class and ethnic relations inherited from the colonial period. Often it is sustained and reinforced by international economic relations that trap developing countries into dependence on a few raw material exports and facilitates the capture of these resources by local, national, or international elites. It can also be reinforced by heavy external debts that encourage countries to use their most productive environmental resources – such as their best croplands and forests – to generate hard currency rather than to support the poorest segments of their populations.

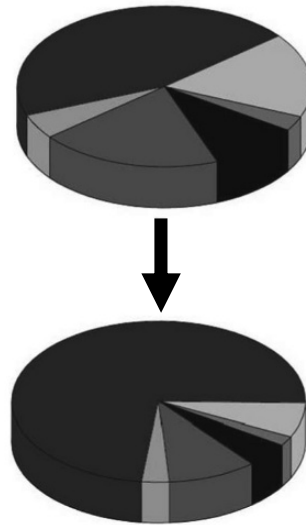
Some critics have argued that by including distributional issues in its definition of environmental scarcity, the Toronto Group makes the concept so broad that it becomes useless. For instance, conflicts solely

over the distribution of resources cannot, according to this criticism, be classed as environmental conflicts. The argument is misguided. Uneven distribution of resources never acts on its own as a cause of conflict: its impact is always a function of its interaction with resource supply and demand. Indeed, resource distribution is only important because the resources people want are in finite supply. The Toronto Group found that problems of declining resource supply and rising resource demand were always intimately entangled with uneven resource distribution (Schwartz/Deligianis/Schwartz 2001: 275–276). Demand linkages can often be traced to global resource markets and high levels of consumption by consumers in the developed world. But the impacts of these linkages are often expressed through interactive scarcity impacts in developing nations.

If the causes of violence are to be explored, a resource's *absolute* supply is not interesting. What we should investigate, rather, is the resource's supply *relative to*, first, demand on the resource, and, second, the social distribution of the resource. The relationships between supply and demand and between supply and distribution determine people's actual experience of scarcity, and under any practical hypothesis, it is these relationships that influence the probability of violence. For this reason the Toronto Group included demand and distributional aspects in its definition of environmental scarcity.

Figure 20.3: Structural scarcity. **Source:** The authors.

- Environmental scarcity is often caused by a severe imbalance in the distribution of wealth and power that results in some groups in a society getting disproportionately larger slices of the resource pie, whereas, others get slices that are too small to sustain their livelihoods.
- Such unequal distribution – or what Homer-Dixon calls structural scarcity – is a key factor in virtually every case of scarcity contributing to conflict examined by the Toronto Group



20.5 Resource Capture and Ecological Marginalization

In the past, analysts and policymakers have usually addressed these three sources of scarcity – supply, demand, and structural – independently. But the Toronto Group’s research shows that they interact and reinforce each other in extraordinarily pernicious ways. Two patterns of interaction are particularly important: *resource capture* and *ecological marginalization*.

Resource capture occurs when powerful groups within a society recognize that a key resource is becoming scarcer (due to both supply and demand pressures) and use their power to shift in their favour the regime governing resource access. This shift imposes severe structural scarcities on weaker groups (Homer-Dixon 1999).³³

In Chiapas, Mexico, for instance, worsening land scarcities, in part caused by rapid population growth, encouraged powerful landowners and ranchers to exploit weaknesses in the state’s land laws in order to seize lands from *campesinos* and indigenous farmers. Gradually these peasants were forced deeper into the state’s lowland rain forest, further away from the state’s economic heartland, and further into poverty. In the mid-1990’s, Zapatista insurgents rose against land scarcity and insecure land tenure. The insurgency rocked Mexico to the core, helped trigger a peso cri-

sis, and reminded the world that Mexico remains – despite the pretences of the country’s economic elites – a poor and unstable developing country (Homer-Dixon/Blitt 1998).

In the Jordan River basin, Israel’s critical dependence on groundwater flowing out of the West Bank – a dependence made acute by a rising Israeli population and salinization of aquifers along the Mediterranean coast – has encouraged Israel to restrict groundwater withdrawals on the West Bank. These restrictions have been far more severe for Palestinians than for Israeli settlers. They have contributed to the rapid decline in Palestinian agriculture in the region, and, ultimately, to rising frustrations in the Palestinian community (Homer-Dixon/Blitt 1998).

Ecological marginalization occurs when grave inequality in resource distribution joins with rapid population growth to drive resource-poor people to exploit ecologically marginal areas, such as upland hillsides, areas at risk of desertification, and tropical rainforests (Homer-Dixon 1999).³⁴ Higher population densities in these vulnerable areas, along with a lack of the capital and knowledge needed to protect local resources, causes local resource depletion, poverty, and eventually further migration, often to cities.

Ecological marginalization affects hundreds of millions of people around the world, across a wide range of geographies and economic and political systems. We see the same process in the Himalayas, Indonesia,

33 See Homer-Dixon (1991, 1999: 74–77), for a theoretical description of the development of this idea.

34 See Homer-Dixon (1991, 1999: 77–79), for a theoretical description of the development of this idea.

Central America, Brazil, India, China, and the Sahel (Stonich 1993; Homer-Dixon 1999; Suliman 1999).

For example, in the Philippines an extreme imbalance in cropland distribution between landowners and peasants combined with high population growth rates to force large numbers of the landless poor into interior hilly regions of the archipelago. There, the migrants used slash and burn agriculture to clear land for crops. As more millions arrived from the lowlands, new land became hard to find; and as population densities on the steep slopes increased, erosion, landslides, and flash floods became critical. During the 1970's and 1980's, the resulting poverty drove many peasants into the arms of the communist New People's Army insurgency that had a stranglehold on upland regions. Poverty also drove countless others into wretched squatter settlements in cities like Manila (Kahl 2006).

20.6 Links to Civil Violence

Unequal resource distribution, expanding populations, and land degradation spurred decades of social instability in highland Peru, and helped cause the Sendero Luminoso insurgency (Mitchell 1991). Scarcity-induced resource capture by Moors in Mauritania ignited violence over water and cropland in the Senegal River basin, producing tens of thousands of refugees (Homer-Dixon 1991; see also chap. 51, 54 by Kipping). In Haiti, forest and soil loss has worsened a persistent economic crisis that generates strife and periodic waves of boat people (Homer-Dixon 1999). And land shortages in Bangladesh, exacerbated by fast population growth, have prompted millions of people to migrate to India – an influx that has, in turn, caused ethnic strife in the state of Assam (Homer-Dixon 1999; see chap. 19 by Ahmed).

In South Africa, severe land, water, and fuel wood scarcities in the former black homelands have helped drive millions of poor blacks into squatter settlements around the major cities. The settlements are often constructed on the worst urban land, in depressions prone to flooding, on hillsides vulnerable to slides, or near heavily polluting industries. Scarcities of land, water, and fuel wood in these settlements provoke inter-ethnic rivalries and violent feuds among settlement warlords and their followers. This strife jeopardizes the country's transition to democratic stability and prosperity (Homer-Dixon/Blitt 1998).

In the state of Bihar, India, skewed land distribution has combined with rapid population growth and

significant soil degradation to produce some of the country's most crippling shortages of cropland. As a result, the last three decades have seen vicious conflicts between marginal farmers and landless labourers, on one side, and middle and upper caste farmers who still own relatively abundant land, on the other. The cycle of violence has polarized Bihar's society and progressively weakened its institutions, from its court system and universities to its financial and agricultural bureaucracies. As the second most populous state in the country, Bihar's chronic political crisis reverberates in the national capital, New Delhi, and has contributed to instability in the country's governing coalition.

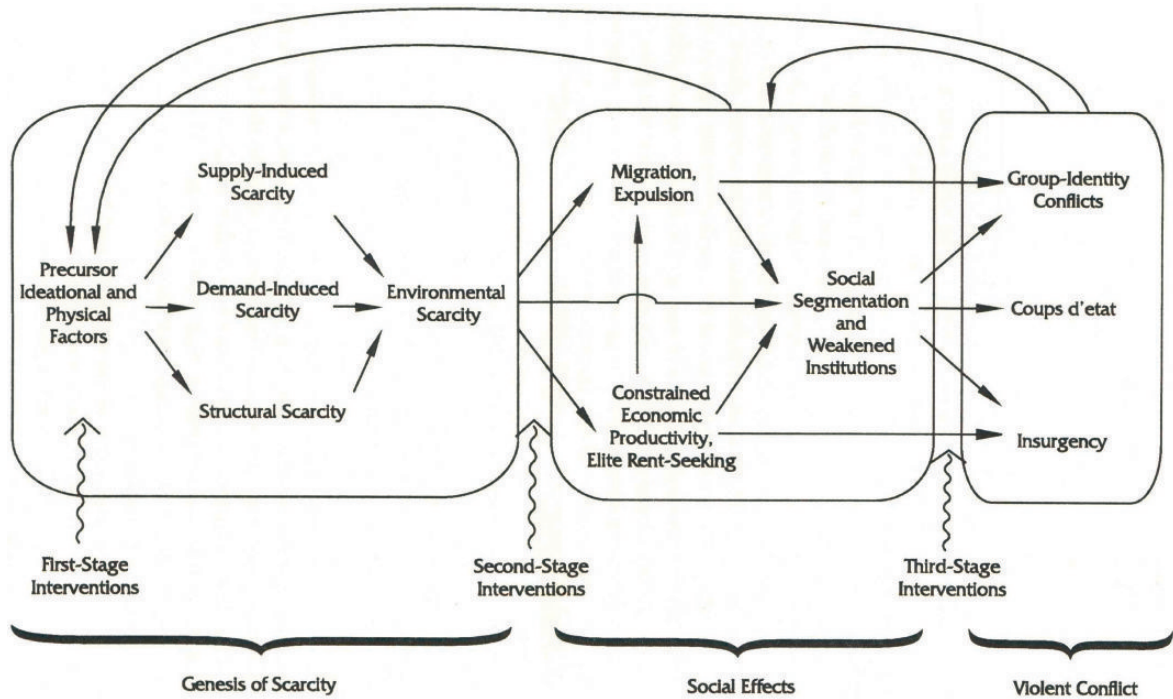
In Pakistan, shortages and maldistribution of good land, water, and forests in the countryside have encouraged millions of the rural poor to migrate into major cities, such as Karachi and Hyderabad. The conjunction of this in-migration with high fertility rates is causing city populations to grow at an astonishing 4 to 5 per cent a year, producing fierce competition – and often violence – among ethnic groups over land, basic services, and political and economic power. This turmoil exacts a huge toll on an already struggling national economy (Homer-Dixon/Blitt 1998).³⁵

Close study of such cases shows that severe environmental scarcity can produce a number of identifiable 'intermediate' social effects: it restricts local food production, aggravates poverty of marginal groups, spurs large temporary or permanent migrations, enriches elites that capture resources, deepens divisions among social groups, and undermines a state's moral authority and capacity to govern. Marginal groups that directly depend on renewable resources find themselves trapped in a vice between rising scarcity on one side and institutional and policy failures on the other. In many cases, these social impacts are aggravated and amplified by weak or dysfunctional governance capacities in developing states. These long-term, tectonic stresses can slowly tear apart a poor society's social fabric, causing chronic popular unrest and violence by boosting grievances and changing the balance of power among contending social groups and the state.

Figure 20.4 illustrates the Toronto Group's core model of causal links between environmental scarcity and violence. Environmental scarcity is mainly an *indi-*

35 Details of many of these cases can be found on the website of the Trudeau Centre for Peace and Conflict Studies.

Figure 20.4: The Toronto Group's Core Model of the Causal Links between Environmental Scarcity and violence.
Source: Homer-Dixon (1999).



rect cause of violence. It contributes to harsh social effects - from worsening poverty and massive migrations to deeper cleavages among ethnic groups and weakened states - that in turn help produce violence. Scarcities can also trigger adaptive responses by subsistence or semi-subsistence farmers that in turn worsen or exacerbate social tensions. Analysts often interpret these social effects of environmental scarcities as the conflict's principal causes, thus overlooking scarcity's influence as an underlying stress.

Moreover, environmental scarcity is never a sole or sufficient cause of such crises. It always interacts with other economic, political, and social factors - which the Toronto Group calls 'contextual factors' - to produce its effects. In the Filipino case (Kahl 2006), for example, the lack of clear property rights in upland areas encouraged migration into these regions and discouraged migrants from conserving the land once they arrived. And President Marcos's corrupt and authoritarian leadership reduced regime legitimacy and closed off options for democratic action by aggrieved groups.

The key contextual factors that can interact with environmental scarcity to produce violence fall into two categories: those that influence the adaptability or resilience of a society when faced with severe environmental scarcity, and those that influence the likeli-

hood of violence should adaptation fail. The former category includes the efficiency of a society's markets (especially whether market prices reflect the true scarcity of environmental resources), the administrative and political capacity of the state (especially its economy from outside influences), the abundance and quality of the society's social capital, and the strength of cultural sentiments of responsibility to the commonweal (Homer-Dixon 1999: 114-125). The latter category includes the character and depth of ethnic and class divisions within a society; the concept of justice held by groups challenging the state; the resources and organizational capacity of challenger groups, political elites, and the state; and quality of leadership within challenger groups and the state (Homer-Dixon 1999: 142-147).

Since the relationship between environmental scarcity and such contextual factors is interactive, it is often impossible to determine the relative weight or power of environmental scarcity as a cause of violence in specific cases. But this does not mean that environmental scarcity is always an unimportant cause. A large proportion of the world's population is almost completely reliant on local cropland, water, and forest supplies for its daily existence. Sceptics (Gleditsch 2001) usually underestimate the extent to which much of humankind still depends on its natural environ-

ment and therefore underestimate the social stress that environmental scarcity can cause.

Although contextual factors are often critical to the development of violence, policymakers must realize that they can neither adequately understand nor respond to many important cases of civil violence around the world – like the Filipino insurgency or the chronic instability in Haiti – if they do not take into account the *independent causal role* of environmental scarcity. Some sceptics (Levy 1995, Gleditsch 2001, Peluso/Watts 2001) claim that environmental scarcity's contribution to conflict merits little attention, because scarcity is wholly a result of political, economic, and social factors, such as failed institutions and policies. Since these factors are the ultimate causes of conflict, policymakers trying to prevent conflict should focus on them and not on scarcity (Homer-Dixon 1999: 17–18).

But the Toronto Group's research has identified three reasons why such arguments are incomplete at best (Homer-Dixon 1999: 16–18, 104–106; Schwartz/Deligiannis/Homer-dixon 2001: 278). *First*, environmental scarcity often reciprocally influences the political and economic character of social systems – as, for example, when it stimulates resource capture by powerful elites or competition among narrow social coalitions that impedes institutional and policy reform. This reciprocal influence can affect the very contextual factors – market structure, state capacity, strength of social capital, and the like – that interact with environmental scarcity to cause violence. *Second*, environmental scarcity is partly a function of the character of a society's physical environment – whether, for instance, that environment is robust or fragile – a factor that is, in important respects, independent of human activities. And *third*, if severe environmental damage becomes irreversible or requires many decades to repair, it can become a permanent source of social stress; even if the political and economic factors that originally contributed to the damage are fixed, it remains an independent burden on the society.

In the end, the Toronto Group concluded that environmental scarcities help generate chronic, diffuse, subnational violence. In other words, it helps generate violence that is mainly *internal* to countries. This is not the type of violence that analysts commonly assume will occur when critical resources are scarce – that is, simple-scarcity 'resource wars' among countries, in which scarcity directly stimulates one country to try to seize the resources of another. Instead, the Toronto Group's research led them to conclude that two categories of internal violence were most likely

stimulated by environmental scarcities: first, scarcity would deepen social cleavages and stimulate population migration, leading to ethnic clashes; and secondly, scarcity would affect economic productivity and, in turn, people's livelihoods, the behaviour of elite groups, and the ability of states to meet these changing demands, thereby helping to cause increasing civil strife like insurgency, banditry, and coups d'état (Homer-Dixon 1999: 5, 136–148).

Recent events have also led us to revise somewhat our earlier dismissal of the impacts of environmental scarcities on localized conflicts. As the news reports highlighted above illustrate, we have come to appreciate the pernicious impact of small scale, localized violence that have strong links to environmental scarcity. Although often lacking the visibility of national insurgencies, these local conflicts, multiplied many times over around the world, are maiming and killing significant numbers of people and destabilizing many developing states. In some cases, these disputes are encouraged and manipulated by elites to further their own corrupt rule (Kahl 2003, 2006).

These various manifestations of environmentally-induced sub-national violence are exactly the kinds of violence that bedevil conventional military institutions. Globally, conventional armies are pinned down and often utterly impotent in the face of inter-ethnic violence or attacks by ragtag bands of lightly armed guerrillas and insurgents. Analysts frequently fail to see that environmental scarcity is a contributing factor behind many of these conflicts. This may become a more powerful influence in coming decades because of larger populations and higher per capita resource consumption rates.

Although this internal violence may not be as conspicuous or dramatic as wars among countries, it can have broad implications. The changing nature of the international system – heightened economic interdependence, easier long-distance travel, and increased access to arms – makes previously insignificant regions of interest to policymakers. Crises in small countries, such as Haiti, often create serious foreign policy difficulties for developed countries, and large and significant countries – including Pakistan, China, India, and Indonesia – are not immune to the severe stresses environmental scarcity generates.

Major civil violence within states can affect external trade relations, cause refugee flows, and produce humanitarian disasters that call upon the military and financial resources of developed countries and international organizations. Countries destabilized by civil violence often fragment as they become enfeebled

and as peripheral regions are seized by renegade authorities and warlords. Their regimes might avoid fragmentation by becoming more authoritarian, intolerant of opposition, and militarized; they might also try to divert attention from domestic grievances by threatening neighbouring states.

20.7 Limits of Adaptation

Sceptics often respond that environmental scarcity rarely contributes to conflict, because human societies show great capacity to adapt to resource scarcity, especially through market mechanisms (Simon 1996). When a resource becomes scarce, its price increases, which encourages conservation, substitution, and technological innovation. Scarcity also encourages institutional adaptations, such as changes in property rights that raise incentives to conserve and innovate and that reduce the hardship scarcity produces.

It is true that scarcity often stimulates useful technological and social changes. Yet a society's ability to adapt to rising scarcity depends on the relationship between its requirement for ingenuity³⁶ to respond to this scarcity and its supply of ingenuity (Homer-Dixon 1999: 107–126). Societies in which requirement outstrips supply face an *ingenuity gap* (Homer-Dixon 2000); they will be unable to adapt adequately to environmental scarcity and will, consequently, be vulnerable to scarcity's harsh social effects, including economic dislocation, migrations, social cleavages, state weakening, and – ultimately – violence.

In the next decades, population growth, rising average resource demand, and persistent inequalities in resource access ensure that scarcities will affect many environmentally sensitive regions with unprecedented severity, speed, and scale. Ingenuity requirements will therefore rise rapidly. But this situation need not lead to crisis, since, by changing prices and incentives, scarcity often does stimulate a flow of ingenuity sufficient to meet the rising need.

But there are several reasons why this beneficial response may not occur in some poor societies. The prerequisites for effective adaptation to scarcity often do not exist: states are weak, bureaucracies incompetent, judicial systems corrupt, research centres under-

funded, and property rights unclear. Markets often do not work well: prices in most developing countries – especially for water, forests, and other common resources – do not adjust to reflect accurately rising scarcity, and therefore incentives for entrepreneurs are inadequate. Low levels of education, technological capacity, and financial capital also depress the supply of ingenuity. Finally, environmental scarcity can actually undermine the ability of developing societies to generate social and technical solutions to scarcity. Under certain circumstances, scarcity mobilizes narrow coalitions and powerful elites to block the institutional reforms that could reduce the scarcity's broader social impact.

Positive economic, social, and technological responses to environmental scarcity are therefore not guaranteed. Some societies will adapt well, others will not. In coming decades, worsening environmental scarcities in many regions will further exaggerate the world's already gaping differentials between rich and poor societies and between the powerful and weak people within those societies. The world's wealthy regions should not assume that they will be able to wall themselves off from turmoil in societies that do not adapt well to scarcity. We are living cheek by jowl on this planet now. We are all next-door neighbours.

20.8 Recommendations

We are passing through a moment in history when political and economic events are fluid, and social structures are more malleable than they have been for decades. This situation provides opportunities for reform of our economic, political, and social systems, but it also presents dangers. Many of the choices we make during the next years – even small ones – will have large consequences far into the future. And the future is sometimes not as distant as it seems: well over one third of the people currently alive will still be alive in 2050. The children around us today will live with the consequences of the decisions we make today.

Each case of environmentally induced conflict is complex and unique: each has a specific ecosystem, history, culture, economy, set of actors, and set of power relations among these actors. Policy tools available in one case will not be available in another, for wholly idiosyncratic reasons. Successful policy intervention therefore requires customization based on a careful analysis of the character of the specific case and of the policy tools available in that case.

36 *Ingenuity*, as used here, consists of ideas for new technologies and new and reformed institutions. The requirement for ingenuity refers to the new ideas and institutions required to overcome the impacts and effects of environmental scarcities. (Homer-Dixon 2000).

Yet it is possible to make four general points about policy interventions in this area. *First*, there is no single solution or ‘magic bullet’ that will always break the links between environmental scarcity and violence. The causal systems in question encompass huge numbers of interacting variables; interventions must therefore operate at many points to capitalize on these systems’ natural synergies. Policymakers need to implement a broad and integrated set of responses at the international, regional, national, and community levels.

Second, early intervention is generally better than late intervention. If policymakers wait till widespread violence has broken out, it will probably be too intractable, too complex, and too charged with emotion to resolve. In addition, environmental scarcity tends to produce diffuse and sub-national violence of a kind that our conventional military institutions do not, in general, handle well. Policymakers should therefore emphasize proactive interventions that break the early links in the causal chains described here.

Third, policy responses do not have to be capital-intensive: they can be simultaneously effective and relatively inexpensive. Examples include greater support for non-governmental organizations that are rehabilitating local environmental resources, and for research on crops that can grow with eroded soil and polluted water.

Fourth and finally, effective policy interventions will not necessarily be unique or special. The analysis above simply presents another set of reasons for a range of interventions – from selective debt relief to enhancement of indigenous technical capacity – that many experts have long believed necessary to produce humane and rapid economic development in poor countries around the world.

21 Linkages Between Sub-national and International Water Conflicts: The Eastern Nile Basin

Simon A Mason, Tobias Haggmann, Christine Bichsel, Eva Ludi and Yacob Arsano

21.1 Introduction¹

Water conflicts in transboundary rivers systems have been the object of a growing literature and ongoing debates among scholars of political science, international relations and political geography. The subject is approached from two main angles: 1) if, how and under what conditions does water scarcity lead to violent conflict or even war (Starr 1991; Homer-Dixon 1999; Libiszewski 1999; Toset/Gleditsch/Hegre 2000; Lonergan 2001)?² 2) how can international rivers be managed and water conflicts be mitigated (Trolldalen 1992; Biswas/Kolars/Murakami/Waterbury/Wolf 1997; Waterbury 2002; Wolf 2000, 2002a)? The 'water wars' hypothesis that partly shaped the first question could not be substantiated and should therefore be dismissed. There is an increasingly wide consensus that water scarcity does not lead to war (Allan 1997; Trondalen 1997; Wolf 1998; Amer/Arsano/El-Battahani/Hamad/Hefny/Tamrat 2005). Water scarcity, however, may be a politically destabilizing factor that can lead to political tensions and hinder sustainable development. Violent conflicts over scarce water are

more likely to be found on the sub-national level than on the international level (Wolf 1998). This article focuses on the second question, how conflicts over the use of scarce water resources can be mitigated. The aim of the article is to improve the transformation of international river conflicts through the systematic assessment of the linkages between the local, national, international and global level. *Linkages* refers to the interaction between the system (e.g. international river conflict) and its sub-system (e.g. local conflict) and super-system (e.g. global food market). The main argument of this chapter is that these linkages are often neglected in the analysis of international river conflicts, based upon which faulty mitigation strategies are then initiated. One exception is the article by Giordano et al (2002). According to these authors, there is a link between interstate and intrastate relations over water resources, but the nature of this link and the degree to which it is present varies considerably by country and region (Giordano/Giordano/Wolf 2002). The linkage approach seems to be especially relevant in river basins characterized by two factors, first, where some of the riparian countries experience water stress (i.e. less than 1700 m³/person and year) and due to this they import food from the global market, and second, where weak economies and political instability make the management of water conflicts difficult. The Nile, Euphrates, Jordan, and Senqu are examples. The Nile Basin is used in this article to demonstrate the proposed conceptual approach. This linkage approach to conflict is in line with the reconceptualization of security after 1990. Security studies were 'deepened' to no longer exclusively focus on the national state as the key actor, but rather to highlight the interaction between the local, national, international and global actors and levels.

The present chapter is in part a continuation, in part a major refocusing of the 'Swiss group's' research on environment and conflicts that began with the Environment and Conflicts Project (ENCOP) in 1992

1 The research for this paper was carried out within the Individual Project 7 (Environmental Change and Conflict Transformation) of the Swiss National Centre of Competence in Research (NCCR) North-South: Research Partnerships for Mitigating Syndromes of Global Change, co-funded by the Swiss National Science Foundation (SNF) and the Swiss Agency for Development and Cooperation (SDC).

2 Examples of water conflicts and management events are listed in these two databases: 1) Wolf, Aaron T., 2000: "Transboundary Freshwater Dispute Database, International Water Events Database 1948-1999", International Events 2000, Oregon State University, at: <<http://ocid.nacse.org/cgi-bin/qml/tfdd/eventsearch.qml>>; 2) Gleick, Peter, 2000: "Water Conflict Chronology", September 2000 version, at: <<http://www.worldwater.org/conflict.htm>>.

(Baechler/Böge/Klötzli/Libiszewski/Spillmann 1996). ENCOF's *environmental induced conflict* definition focused on the degradation of the environment as a cause of violent conflict – similar to the first question above. Subsequent research projects focused on how to deal with conflict (also non-violent) over the use of resources and the environment – similar to the second question above.³

The reason for the conceptual refocusing after ENCOF was due to the limitations of its definition in relation to questions of multi-causality and the systemic nature of conflict (Mason/Spillmann 2003) and the problems related to the assumption that the 'environment' determines human behaviour (Hagmann 2005). Some of the case studies of ENCOF, e.g. Libiszewski (1995) on cooperation over the Jordan River, had already moved on from the original environmental induced conflict hypothesis (Libiszewski 1992: 13). Thus the refocusing of research from 'environmentally induced conflicts' to the 'management of conflicts over the use of resources and the environment' was influenced by case study findings that pointed to the need of better understanding the relationship between (non-violent) water and land use conflicts and cooperative sustainable development (Baechler/Spillmann/Suliman 2002; Arsano 2004; Mason 2004; Arsano 2005). Research showed that armed conflicts are more directly related to non-renewable resources such as oil, and 'lootable' resources such as diamonds or coltan, rather than to the degradation of the environment or scarcity of water or land (Ross 2004). Nevertheless, there is also continuity in the 'Swiss group's' approach. This mainly entails a process-tracing, case study methodology (Schwartz/Deligiannis/Homer-Dixon 2001) and close cooperation with academics and practitioners in the actual case study regions.

The *conflict transformation approach* towards water and land use that replaced the environmentally induced conflict paradigm is presented in Baechler (2002) and Mason (2004). A conflict transformative approach sees the development potential in conflicts, conflict is a 'transforming agent for systemic change' inherent in all societies, manifest on all levels of social interaction (Lederach 1995: 18). Its key tenets in this context are: 1) the need for direct participation of af-

ected actors in the conflict management process, 2) approaches from the natural and social sciences need to be combined in transdisciplinary research, and 3) any results developed in the participatory approaches need to be institutionalized.

After some nine years of research using the conflict transformation approach in relation to water and land conflicts, lessons have been learned concerning the participatory approach. The publications of Amer, Arsano, El-Battahani, Hamad, Hefny, and Tamrat (2005), Arsano and Tamrat (2005), Hamad and El-Battahani (2005), as well as of Hefny and Amer (2005), are examples of joint research and conflict analysis of an international river basin carried out by researchers and practitioners from the region. The second and third points on transdisciplinarity and institutionalization are still underdeveloped. Further open questions are: 1) The conflict transformation approach has not yet sufficiently addressed the question of how to deal with power asymmetries between conflict actors and the role of 'oppression' in conflict (Deutsch 2002), and 2) The approach has not adequately addressed the linkages between different conflict system levels. The last point is addressed here as it is missing in a large number of conflict case studies (Homer-Dixon/Blitt 1998) and statistical analyses of conflicts using aggregate country data (Toest/Gleditsch/Hegre 2000).

The chapter is structured as follows: first we introduce our conceptual model with its *physical* water linkages between the sub-national, national and international systems of an international river basin, and its *political* conflict/cooperation linkages between the same levels. The conceptual model is then applied to the case of the Nile Basin in the following section. The article concludes with a summary of the advantages of the linkage approach when attempting to mitigate water conflicts.

21.2 The Linkages Approach: Addressing Physical and Non-Physical Links

Competition over freshwater in international river basins affects three interdependent levels. First, the natural river basin can be viewed as a system, where riparian countries of the same basin agree, dispute and/or negotiate over who gets which quantity and quality of water, in the following referred to as the *international level*. Second, the riparian countries and regions represent subsystems, where different sectors

3 These projects included: *Environment and Conflict Management* (ECOMAN) 1996-1999; *Environment and Cooperation in the Nile Basin* (ECONILE) 1999-2004 and NCCR North-South "Environmental Change and Conflict Transformation" 2001 ongoing.

and territorial units compete for their share within these countries. We refer to this as the *sub-national level*. Third, global food production and markets can be seen as a super-system, in that water scarce countries import water in the form of food ('virtual water') and thus mitigate water related tensions on the regional or national level, this is called the *global level*. In terms of conflict analysis, the allocation of water between and within countries raises the question how forms of cooperation (or conflict) on the international level reinforce conflict (or cooperation) on the sub-national level and vice versa. A central question is whether and through which pathways water and conflicts and cooperation over scarce resources are transferred - 'shifted' - from one level to another, and what the implications are for conflict mitigation.

Conflicts can be differentiated according to their intensity ranging from 'competition' to 'violent conflict' as well as a number of other criteria according to the outcomes, actors, level or scale, duration or the issues involved in conflict. While a number of definitions have aimed to grasp violent environmental conflicts (Libiszewski 1992; Homer-Dixon 1999; Gleditsch 2001), here a more generic definition is adopted focusing on conflict prevention and transformation. We define environmental conflicts as interactions between at least two actors (individuals or groups) over the use of natural resources and the environment, where at least one of the actors is negatively affected by this interaction, and the other actor intended or ignored these negative impacts that resulted from his/her actions (adapted from Coser 1956; Trolldallen 1992; Glasl 2002). This follows a conflict analysis⁴ approach, encompassing different levels of intensity between interdependent actors involved in resource use, in this case, freshwater in transboundary river basins. Conflicts over the use of resources and the environment need to address both the socio-economic and political dimensions and the physical, ecological dimensions, thus our distinction between physical and non physical linkages.

The relationship between the content and the context is a key question in a systems approach (Bateson 1972: 518). The relationship between the international

river conflict (the 'content') and the sub-national or global conflict/cooperation (the 'context') is referred to as *linkage*. The delineation of what is content and context entails subjective elements, as the observer is part of the system observed (von Foerster 1981). The acknowledgement of this key aspect clarifies many misunderstandings regarding conflicts in relation to the environment. Dalby (2007), for example, states that violence in relation to the environment is a matter of "... the control of relatively abundant resources in poor economies." If the system boundary is delineated on a global level, a resource such as gold, diamonds or oil is not abundant, but scarce, else there would be no incentive to gain control over it. Regarding water, it is relatively abundant on the global level, but relatively scarce in numerous regions. Thus, the subjective delineation of a system decides if a resource is scarce or abundant, rather than the physical availability of the resource.

What are the *physical linkages* between the systems of an international river basin?⁵ This article focuses on water quantity; this means water for food, as 70 per cent of the world water withdrawal is used for food production (SEI 1997). The linkages between the sub-national and international arenas are all related to the transport of water, either in the form of water or in the form of food, i.e. 'virtual water' (Allan 1997). It takes about 1000 litres to produce 1 kg of bread, and 15000 litres to produce 1 kg of beef, thus transporting food is a very efficient way of transporting water (Allan 1997; Yang/Zehnder 2002; Yang/Reichert/Abbaspour/Zehnder 2003). All stakeholders in a river basin are related to each other in an upstream-downstream relationship as they are dependent on the same water as it flows from source to river mouth. Physical water linkages may either be natural, as water rains and flows downstream, or influenced by human behaviour, if water is diverted, dammed, withdrawn or transported as food.

What are the *socio-economic and political linkages* between the systems of an international water basin? Dyadic relationships between actors competing for water uses in river basins are empirically observable on different, politically and historically constituted

4 The goals of conflict analysis are a structured approach to conflict dynamics, a full understanding of the critical issues or 'breaking points' that determine the course of conflict, the identification of optimal opportunities for intervention, the determination of adequate intervention steps, and the understanding of escalation and de-escalation phases (Fisher/Abdi/Ludin/Smith/Williams/Williams 2000).

5 A river basin is the area of land from which all surface run-off flows through a sequence of streams, rivers and lakes into the sea at a single river mouth, estuary or delta. Directive 2000/60/EC of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive). In: *EEA multilingual environmental glossary*, at: <http://glossary.eea.eu.int/EEAGlossary/R/river_basin>.

levels; namely in local, national and international arenas. To simplify, the article distinguishes between sub-national and international and global 'water conflict systems'. The first includes non-state and state actors of the same national territory while the latter refers to conflict between different national governmental (and sometimes non-governmental) organizations. The third level concerns the political economy of global food markets. These water conflict systems are characterized by the involvement of diverse actors, from intergovernmental bodies to local communities and by varying degrees of cooperation and conflict intensity, from interstate tensions over water allocation to acute conflict over property rights between villagers. In addition to water as a physical resource linking actors of different levels, the transfer of non-material and symbolic resources (e.g. political legitimacy or the cultural-religious meaning of rivers) relate these different levels with each other in interdependent conflict systems (see also McGinnis 1999). On a more abstract level, these material and non-material linkages are shaped by principles concerning *how* the resources are transferred from one level to another. Governance, for example, including policies, regime type and opportunities for political involvement, link the different water conflict arenas by structuring the behaviour and strategies of actors. Such structuring factors influence actors confronted with the choice of adopting means to defend their resource-related interests.

Thus, the political linkages between conflict and cooperation over water resources on the sub-national and international levels can be conceptualized as three distinct, yet often complementary key processes in interdependent conflict systems. Firstly, conflicts and cooperative relations between actor groups over resources can be *transferred* from the sub-national level to the international level and vice versa. Thus for example conflict on the international level 'spills over' - is transferred - to conflict on the sub-national level. A second form of linkage is when conflicts are *transformed* into cooperative relations.⁶ A third form of linkage is when cooperative relations *escalate* into non-violent or violent conflicts. The linkages should not be understood in terms of linear cause and effect, but in terms of circularity and dynamic processes - transfer, transformation, escalation - leading to changes in the conflict system which in turn is shaped by a number of context and proximate factors.

6 Terminology refers to 'conflict transformation' approaches (Bush/Folger 1992, Lederach 1995, Reimann 2001).

21.2.1 Factors Influencing Linkages

Past empirical research has identified and studied a number of factors significantly influencing the dynamics of international river conflicts and cooperation. These can be divided into context factors, that are harder to influence directly, and the more malleable proximate factors, directly influencing water relations between and within riparian states. *Context factors* include the natural availability of water resources⁷, the level of economic and political integration and existence of non-environmental conflicts in the region⁸, the symmetry of power between riparian countries⁹, the number of riparian states¹⁰, the economic development of the riparian states and the world market for agricultural products (Durth 1996; Allan 1997; Marty 2001; Wolf 2002a). *Proximate factors* include: national policies affecting water management and water allocation to different sectors¹¹, international policies, the institutional¹², legal setting in the river basin, and the form of extra-basin involvement, and political participation of different actor groups on the sub-national and international level related to water management and allocation (Delli Priscoli 1996; Trondalen 1997; Libiszewski 1999; Wolf 2002a; Mason 2004). From the standpoint of conflict mitigation, proximate

7 Water dependency is calculated as the percentage of internal renewable water resources of the total actual renewable water resources, i.e. dependency on rainfall outside of a state's territory. See: AQUASTAT, *FAO's Information System on Water and Agriculture*, at: <<http://www.fao.org/ag/agl/aglw/aquastat/main/index.stm>>.

8 The more non-environmental conflicts, the more difficult it is to resolve water conflicts, as tensions between the countries are already sensitive. Examples are given in: Mason/Spillmann (2003).

9 According to Frey (1984), conflict is more likely if the downstream riparian state is highly dependant on water and is powerful in comparison to the upstream riparian state. Recent developments in the Nile Basin and Euphrates/Tigris basin contradict this argument, however. The downstream country is always geographically weaker. A powerful downstream country (economically, diplomatically and militarily) can partly compensate the geographical weakness. This may lead to power symmetry that can enable cooperation, as in the Nile Basin. An upstream country (e.g. Turkey), that is also economically more powerful than the downstream country (Syria, Iraq), has little incentive to cooperate, and the downstream country has little leverage to influence the upstream country.

10 The more riparian states, the harder the coordination task. This is one reason why Egypt is interested in a unified Sudan.

Figure 21.1: Countries of the Nile Basin. The Nile Basin includes two main sub-basins: the Eastern Nile Sub-basin (Egypt, Ethiopia, Eritrea and Sudan) and the Equatorial Lakes Sub-basin (Burundi, Dem. Rep. of Congo, Egypt, Kenya, Rwanda, Sudan, Tanzania and Uganda). The country borders do not represent officially recognized country borders. **Source:** From Amer et al., 2005 © EAWAG, Duebendorf, 2005; reproduced with permission of Eawag.



factors are of special interest to our analysis as they are less static than context factors and are (partly) explicative of the dynamics of conflict and cooperation in different water conflict arenas. The proximate and

context factors only *implicitly* influence the linkages between an international system and its sub- and super-system. The following case study focuses *explicitly* on the factors influencing the linkages in an international river basin. First, the Nile conflict on the international level regarding the water allocation between the countries in the Eastern Nile Basin is presented, as is typically done in international river case studies.

12 Wolf (2002a: 15) remarks that "... it is when the rate of change within a basin exceeds the institutional capacity to absorb that change when we find tensions".

Then two water conflict/cooperation linkages are explored: 1) linkage between the sub-national and the international systems through projects planned on the international level but implemented on the sub-national level, and 2) linkage between the global food market system and the international river system, through the trade in 'virtual water'.

21.3 International Conflict and Cooperation in the Eastern Nile Basin

The Nile River is shared by ten countries (Egypt, Sudan, Ethiopia, Eritrea, Tanzania, Uganda, Burundi, Rwanda, D.R. Congo, and Kenya, figure 21.1) and is home to more than 160 million people; its population is growing by 2-3 per cent per year. Measured at Aswan, the Nile River has a yearly flow of 87.1 km³/year¹³. 86 per cent of the Nile's water at Aswan stems from the Ethiopian highlands in the Eastern Nile Basin, the rest originates mainly from the watersheds of the equatorial lakes (Waterbury 2002). Many countries in the Nile Basin are highly dependent on the Nile's water, as they are situated in an arid or semi-arid region. More than 95 per cent of Egypt's water stems from the Nile, this means that it depends on rainfall outside of its territory. Egypt has therefore always closely observed Ethiopia's water development plans. Ethiopia's irrigation plans are of great concern since they could reduce the water flow in the Nile. Currently, Ethiopia's economic capacity does not yet allow full implementation of its irrigation plans (Mason 2004). Rain-fed agriculture, upon which Ethiopia's food production depends at the moment, is un-

reliable because of the unpredictability of the seasonal rains.¹⁴

The national capacity to address the water development needs of the Nile countries is limited. The civil war in Sudan, civil war in Ethiopia and the interstate war between Ethiopia and Eritrea during the second half of the 20th century are indications of the political instability in the region. On the international level, the absence of a basin-wide water agreement has caused tensions between the riparian states and hindered access to international development support. Egypt and Sudan uphold the validity of the 1959 agreement that was signed by these two countries¹⁵; the upstream countries, however, do not consider it to be relevant for them. Many international development banks require the consent of downstream countries before financing development projects on international rivers, thereby protecting the geographically weaker downstream states. A lack of consent from the downstream states can hinder development upstream, one of the main concerns of Ethiopia.¹⁶ The conflict between Egypt and Ethiopia over water rights is at the core of the Nile conflict in the international arena. Sudan, the country between Egypt and Ethiopia plays an important role in the Eastern Nile Basin, as it is dependent on good relations with both countries. Recent developments towards cooperation in the Nile

11 Negative externalities resulting from industrial or municipal pollution are generally easier to mitigate than those resulting from irrigation, as water is consumed. A water treatment plant can improve the water quality, but water that is consumed in irrigated agriculture is lost through evapotranspiration. Irrigated agriculture is responsible for 70 per cent of the global water withdrawal, while the industrial sector consumes 20 per cent and the municipal sector 10 per cent only (SEI 1997). Water used for hydroelectric power production (HEP) can also lead to conflicts. Since water used for HEP is a question of timing and not one of absolute quantity, it is generally less contentious than large irrigation schemes.

13 See: SHI, 1999: *World Water Resources and Their Use*, State Hydrological Institute (SHI), Russia and UNESCO, at: <http://espejo.unesco.org.uy/part%604/_1_africa/index.htm>, 1 January 2002.

14 The periodic fluctuations in the Nile's flow is demonstrated by the two extremes of 1916 with a water flow of 120 km³/year, and 1984 with a flow of 42 km³/year measured at Aswan (Collins 1990: 402).

15 Agreement between the Republic of the Sudan and the United Arab Republic for the full utilization of the Nile waters signed at Cairo Egypt, 8 November 1959. Food and Agriculture Organization [cited 15 March 2002], at: <<http://www.fao.org/docrep/W7414B/w7414b13.htm>>, 2 July 2002.

16 "Although the need has always been there, Ethiopia has failed to develop its water resources to feed its needy population, mainly because of a lack of the required financial resources. Policies of international financial institutions like the World Bank, which have made it difficult for upper riparian countries to secure finance for development projects without the consent of the downstream riparian countries, have a significant contribution in this regard. (...) The downstream riparian states, therefore, have maintained the right to veto the development endeavors of the upstream states. As a result, upper riparian countries are naturally left with little choice other than to resort to a reciprocal measure of unilateralism", Lemma, S., 2001: "Cooperating on the Nile: Not a Zero-sum Game", in: UN Chronicle, vol.,1. (March): 65, at: <<http://www.un.org/Pubs/chronicle/2001/issue3/0103p65.html>>, 4 July 2002.

Basin resulted from Egypt accepting a discussion on a basin wide legal framework, and Ethiopia accepting a start for cooperation on a project by project basis (Mason 2004). The Nile Basin Initiative (NBI) was launched in Dar es Salaam in February 1999 by the Basin countries as a transitional forum to facilitate these cooperative efforts with the aim of a binding basin-wide institution in the future.¹⁷

21.3.1 Linkage Between Sub-national and International Systems

Many plans to augment the total amount of available water in the Nile Basin through supply-side¹⁸ projects hinge around the evaporation losses in the Sudd swamps¹⁹ in Sudan or in the swamps of the Baro-Akobo/Sobat, on Ethiopian territory. Through canals, the retention time of water in the swamps can be reduced, and less water is then lost to evaporation.²⁰ The two examples, the historic one in Sudan and the planned one in Ethiopia are presented below.

As part of the agreement of 1959 between Sudan and Egypt on the 'Full Utilization of the Nile Water', the two countries decided to build the Jonglei Canal I and share the net benefit of 4.7 km³/year water (3.8 km³/year measured at Aswan) equally between each other (Collins 1990: 317). 267 km of the 300 km long Jonglei Canal were built, when the bucket wheel used to dig the canal was destroyed by the Sudan People's Liberation Army in 1983, the year the second civil war broke out (Collins 1990: 401). Economic, political and historical disparities between the North and South, actor groups channelled by ethnic and religious differences, and competition over the access to water, land and oil are some of the factors fuelling this war (Suliman 1999c). John Garang, later to become head of the Sudan People's Liberation Army, wrote his PhD at Iowa University on the Jonglei Canal, mainly criticiz-

ing the limited development strategies, which would make it benefit Northern Sudan and Egypt, rather than the local populations where the project was to be implemented (Collins 1990: 383). The project did not have the support of many groups in South Sudan and it was also debatable internationally, since the impacts on the environment²¹ and local population were unclear (Howell/Lock/Cobb 1988).

In summary, there was no compensation for the water that was to be 'transported' from the local Sudd area in South Sudan to the North Sudan and Egypt. Furthermore, the local communities were not involved in the planning process. Water that evaporated and was thus part of the sub-national eco- and social-systems was to be used in the North, without sufficient compensation and political participation. Thus cooperation between North Sudan and Egypt over water, neglecting the needs of people in South Sudan, escalated into conflict on the sub-national level.

In the framework of the Nile Basin Initiative, the 'Baro-Akobo Multi-Purpose Water Resources Sub-Project' in Gambella, south-western Ethiopia on the Ethiopian-Sudanese border is planned (NBI 2001). The three countries, Egypt, Sudan and Ethiopia have agreed on building a canal through the swamps of the Baro-Akobo River, allocating the additional water to Egypt and Sudan, and allocating an equal amount from the Blue Nile River to Ethiopia.²² It seems that some lessons were learnt from the Jonglei Canal experience, one of the main ones being that the project has to benefit the people directly affected and that they need to be involved in the planning process. Thus besides increasing the water yield, the multi-purpose project aims at the production of hydroelectric power and irrigation projects, by which livelihoods and income opportunities in the sub-basin shall be enhanced. Broad stakeholder consultation and involvement in the identification, planning and design phases are planned. The preparation of the project is estimated to cost 3 million USD, and the implementation to be more than 400 million USD (NBI 2001: 25-26).

Some questions remain, however. In the Gambella national regional state that would be affected by the Baro-Akobo/Sobat project nothing has been done so

17 NBI, 2002: Nile Basin Initiative, About the NBI, History of NBI, Update Nov. 2002, at: <<http://www.nilebasin.org/>>.

18 Supply side water management indicates efforts to increase the water available for withdrawal. Demand-side management indicates efforts to increase intra- or inter-sector efficiency, to make better use per unit of water withdrawn.

19 19200 km² in 1980 (Howell/ Lock/Cobb 1988).

20 Projects on the Upper White Nile to build canals through the wetlands of Sudan are estimated to be able to increase the total amount of available water by 18 km³/year (Jonglei I: 3.8, Jonglei II: 3.2, Machar Marshes: 4, Bahr el Ghazal: 7 (Whittington/McClelland 1992).

21 Whittington and McClelland (1992) calculated the opportunity costs of the Jonglei Canal I project at 500 million USD per year or about 5 billion USD lump sum, suggesting that international agencies could pay for the upkeep of Europe's most important southern range for migratory birds.

22 Interview with an Ethiopian academic, Addis Ababa, April 2001.

far regarding land re-allocation since the overthrow of the Derg regime in 1991. Pastoralists view land and other natural resources including water as communal property in pastoral areas and all the communities have equal rights to use land, which are controlled and managed by identifiable groups at the local level. The communities have established their own socially accepted rules to use and manage resources collectively even if these are not formally recognized by the government. As 85 per cent of the Gambella people are directly dependant on the Baro-Akobo river system for cultivation, livestock production and other supplementary food collection such as fish, any project planned at the international and national level will have a direct impact at the sub-national and local level.²³ In addition to regarding linkages between the local and national level, there are also conflicts between different actors on the local level (e.g. between agribusiness vs. small land-holders). The power asymmetry between the stakeholders on the local level greatly shapes these conflicts, as different actors have different interests and means regarding land and water use, depending on their access to financial, political and human capital.

In view of the Jonglei canal experience, the linkage approach must be considered in future water development projects. If water is channelled and taken out of the local system, how can the local people be compensated and included in the decision making process? Since the systems of property rights are different (communal property managed at the local level on the one hand, and government or private property rights for agro-businesses on the other hand), classical compensation in the form of land or money is not likely to satisfy the local needs adequately. As there are already tensions between the local groups in the area, as well as between the local lowlanders and the formal government of Gambella, who are linked to the central government of Ethiopia, the Baro-Akobo project could escalate already existing conflicts²⁴ if it is not planned and implemented with utmost care.

21.3.2 Linkage Between the Global and International Systems

Already today 15 km³/year are imported into the Nile Basin from the global system in the form of 'virtual water', i.e. water embedded in food (Mason 2004). As water becomes scarcer, it may be reallocated between sectors according to its highest economic value, an example of inter-sector efficiency increase. Food is imported, for example, allowing for less water to be used in the agricultural sector. This saved water can then be used in the industrial sector where it yields a higher economic return. Table 21.1 shows that Egypt is the main cereal importer into the Nile Basin, with 130 kg per capita and year. Egypt produces about 60% of its cereals and imports the rest, mainly from the USA (Yang/Zehnder 2002). While the virtual water strategy makes economic sense in the case of Egypt, potential negative effects on Egypt's social and political stability (decreasing employment in the agricultural sector) must be considered.

The situation is different for Ethiopia that imports food as food aid, not because it is water scarce, but because its weak economic and political situation have hindered the use of its available water resources. Egypt on the one hand, and Sudan and Ethiopia on the other hand, demonstrate that different strategies are required for a country to be food secure. If a country experiences physical water scarcity²⁵ like Egypt, virtual water is an important part of the solution (see Table 21.1). If a county experiences economic water scarcity, like Sudan and Ethiopia, virtual water is not an adequate strategy; rather the institutions and infrastructure to use the primary available water resources should be developed. While food aid in Ethiopia (about 11% of national cereals production) helps household food security in rural Ethiopia, inappropriate food aid interventions may increase dependence on the household and national level. Mid-term strategies include stabilization of agricultural yields, long-term strategies involve diversification away from rainfall dependent livelihoods (Devereux 2000).

23 Interview with Moges Shiferaw, Zurich, June 2003.

24 Ethiopia: The Gambella Conflict - Structures and Prognosis, 2004. Wirenet independent analysis, practical management, UK. at: <<http://www.unhcr.ch/cgi-bin/texis/vtx/publ/open-doc.pdf?tbl=RSDCOI&cid=4186616c4&page=publ>>.

25 Countries experiencing 'physical water scarcity' do not have enough primary water resources to feed their population. Countries suffering from 'economic water scarcity' have sufficient water resources to meet their additional primary water supply, but need additional storage and conveyance facilities to make use of the naturally available water. Most of these countries face severe financial and development capacity problems (International Water Management Institute at: <<http://www.iwmi.cgiar.org>>).

Table 21.1: Food security in the Nile Countries. **Source:** Mason (2004), based on data from: a) FAO (2000b); b) FAO (2000d); c) FAO (2000c); d) UNDP (2000). Human Development Index includes indicators for life expectancy, adult literacy, combined primary, secondary, tertiary gross enrolment ratio and Gross National Product per capita; and e) UNFPA (2002).

	Proportion of population undernourished 1996-1998 (a)	Reasons for food emergency (FAO 2000) (b)	Annual cereal import per capita 1989-98 (pop. 1998) (c)	Human Development Index value 1997 (d)	Population in millions 2002 (e)
Burundi	65%	Civil strife, population displacement	6.21	0.324	6.7
D. R. Congo	60%	Civil strife, population displacement	8.05	0.479	54.3
Egypt	5%	No information	128.69	0.616	70.3
Eritrea	65%	War-displaced people and returnees, drought	64.86	0.346	4
Ethiopia	50%	Drought, large number of vulnerable people, internally displaced people (IDP)	9.18	0.298	66
Kenya	40%	Drought	22.41	0.519	31.9
Rwanda	40%	Insecurity in parts	18.61	0.397	8.1
Sudan	20%	Civil strife in the south	23.16	0.475	32.6
Tanzania	40%	Successive poor harvests in several regions	6.80	0.421	36.8
Uganda	30%	Civil strife in parts, drought	3.14	0.404	24.8

In summary: Water is brought into the Nile system in the form of food, and it is compensated for, i.e. Egypt pays for it, and farmers in the USA are interested in exporting cereals. There is economic participation of those involved, e.g. the American farmers, and political participation through their government in shaping world trade regulations. Thus the transfer of water from the global system into the international Nile system transforms the conflict between the countries of the Nile and makes cooperation possible. If Egypt would have to be self-sufficient by growing its own food for a growing population and remain dependent on the waters of the Nile for this, then the tensions towards the upstream countries would be much greater. Virtual water explains why water scarce countries do not go to war (Allan 1997). However, Egypt is also concerned about becoming too dependent on food exporting countries, and any political strings tied to such imports. To ease such concerns, various ideas have been proposed: a regime that buys the

wheat and sells to water scarce counties without geopolitical strings attached (Ohlsson 1999: 239) or a private company that does the same thing (Yang/Zehnder 2002).

One more water conflict mitigation strategy deserves mention here, as it can ease the need for moving water across the local, national and international systems. This strategy concerns demand-side management, i.e. increased efficiency in irrigation or rain fed agriculture. There is greater benefit per unit of water withdrawn or unit of rain that has fallen, if less water has to be withdrawn and thus upstream-downstream conflicts both on a sub-national and international level can be eased. According to Egyptian estimates, an additional 20.9 km³/year could be made available through recycling water, by changing irrigation techniques and adopting water efficient crops and cropping patterns (El Quosy/Tarek 1999: EGY-18.8). This is equal to 30% of the water that is being used at present in Egypt (Mason 2004).

21.4 Conclusions

The Eastern Nile case indicates that the success of international river development projects depends to a large degree on how people are affected by such projects on the sub-national level can be compensated and involved in the decision making process. The difficulties involved with such supply-side projects need to be carefully assessed in relationship to the alternative opportunities of demand-side projects. Examples of demand-side projects in the Nile case are increased efficiency in irrigation in Egypt, greater yields by developing rain-fed agriculture in Ethiopia, or the possibility for economically strong countries such as Egypt to import food from the global market. Concerning the transformation of international river conflicts in general, and the Nile river in particular, the linkage approach calls for dialogue processes between grassroots and government actors ('vertical dialogue') and between governments ('horizontal dialogue'), long term demand-side management through increased efficiency and inter-sector reallocation of water, stabilization of the world food markets, and adequate compensation mechanisms for peoples directly affected when water is taken out of a sub-system.

The two elements of (economic) compensation and political participation are central to the linkage approach - similar to Allan's (2003a) fourth and fifth water management paradigms. A key result of our case study, therefore, is the following hypothesis: If water is taken out of a system (physical linkage) without compensation and without the participation of the people directly affected (economic and political linkage), conflict escalates or is transferred across the systems. Inversely, water conflicts are transformed or cooperation is transferred across systems, when water is brought into a system or is withdrawn and compensated, and this compensation happens with the participation of the people affected. This hypothesis needs to be tested in other river basins to verify its generality.

More generally, the article argues that environmental conflicts always deal with physical and non-physical dimensions. These are thus the two types of links researchers and practitioners need to focus on. Generally, a 'deepening' of security studies is understood as focusing on other actors besides the nation state. The approach presented here goes a step further, rather than only focusing on further actors (e.g. human security instead of national security), there are indications that security studies need to focus on the *links* between the actors (and their respective levels), rather than just on the actors themselves. Specifically

regarding environmental security, the relations between the physical and non-physical linkages should be highlighted. For water and land resources, the concept of 'virtual' land and water is helpful to trace the physical linkage throughout their entire 'life-cycle'. People eat virtual land and water when they consume food. This can be part of the solution, i.e. in physically water scarce countries, that import food and therefore have less pressure on national or international river resources. On the other hand, it can also be problematic, when the production or marketing of food is related to conflicts that are ignored because the food is consumed far away. For resources such as oil or 'lootable' resources such as diamonds, gold or coltan, the actual resource can be traced from its mining, transportation, marketing to its consumption - often in the affluent countries. The socio-economic and political linkages that go hand in hand with the physical linkages are often harder to trace. Market regulation through political participation of people directly affected is needed to shape the physical linkages: be this in the case of the Nile a pastoralist in South Sudan, a high-land farmer in Ethiopia, a city dweller in Khartoum, a peasant farmer in North Egypt, or a high-tech farmer in the US.

On a conceptual level, the linkage approach to conflicts over the use of resources and the environment fills one of the gaps often found in case study approaches or statistical analyses using national data. This gap entails focusing on the content, the 'conflict', and its causes, rather than on how the 'conflict' is related to its context - both on a sub level (e.g. local conflict dynamics) and super level (e.g. global markets). The added value of the linkage approach is not only to understand conflict as being influenced by its context, but to place this relationship at the heart of the analysis. If these links are addressed, the number of management options increases. Water as a physical resource 'trickling down' and sometimes 'spilling over' these different arenas serves to demonstrate some of the questions involved.

22 Extractive Industries and the Environmental Aspects of International Security

Saleem H. Ali

22.1 Introduction: Redefining Security

Soon after the end of World War I, the French oil executive Senator Berenger in a historic dinner speech alongside the distinguished British diplomat Lord Curzon stated that “as oil had been the blood of war, so it would be the blood of peace” (cited: in Yergin, 1991: 183). These words continue to echo in contemporary discourse about the environment and security, yet they are often presented with strong political underpinnings. Among the resource conflict determinists, Michael Klare has been most strident in his writings with books whose titles, such as *Resource Wars* (Klare 2001) or *Blood and Oil* (Klare 2005) reflect the fervour of his argument. Following the tragic events of 11 September 2001, scholars such as Klare have argued that much of America’s national security strategy is focused on securing extractive resources, particularly oil. This resource determinism is presented on the one hand as a critique of US foreign intervention motivated by greed rather than need, while also highlighting the peril of relying on non-renewable resources. However, these writings are often politically charged and rarely offer a balanced critical analysis of the issues.

The aim of this chapter is simply to identify the fault lines among communities that are grappling with extractive industry projects, and how an environmental analysis of the issues can inform discussions of local, national, and regional security. After a critical definition of ‘security’ as perceived in environmental narratives, the relevance of extractive industries to this definition is discussed. Other chapters will address the economic and political aspects of this discourse in more detail as well.

The national security challenges of confronting environmental change were most acutely realized after the Cold War ended. The inclusion of ‘environmental security’ can be traced to the transitional period between Perestroika and the fall of the Iron Curtain,

when US and Russian researchers began to collaborate on environmental issues. In a joint article on ‘oceanic security’ authored by James Broadus of the Woods Hole Marine Policy Center in the United States and Raphael Vartanov of the USSR Academy of Sciences, the term environmental security was defined as follows: “environmental security is the reasonable assurance of protection against threats to national well-being or the common interests of the international community associated with environmental damage” (Broadus/Vartanov 1991).

But approaches to investigating environmental security actually range from the much broader focus on the relationships between environmental change and human security (‘freedom from fear’ and ‘want’) to the somewhat more specific focus on the linkages between environmental stress and violent (deadly) conflict. With respect to the latter approach, which constitutes the largest explicit research stream on environmental security, the debate has centred around whether and why environmental scarcity, abundance, or dependence causes militarized intra-national, international, and transnational conflict (Bächler 1998a; Klare 2001). The resource constraints presented by the ‘survival hexagon’ (Brauch 2002, 2003) often do not explain the emergence of conflict in mineral-rich areas and require a more integrative approach. Such an approach must look at macroeconomic concerns in congruence with micro-level decision-making by corporations, social movements of environmentalists, as well as government planners.

The environmental security discourse has come a long way since its origins in Cold War camaraderie. The field has been approached by natural scientists, social scientists and historians from across the world – empirically and interpretively. While different ideological strains have used the instinctive appeal of ‘security’ to further their cause, the seminal role of environmental factors in determining the fate of human societies (Diamond 2005) remains firmly entrenched.

22.2 Environmental Conflicts in Extractive Industries

The ecological harm caused by fossil fuel emissions, land degradation, and pollution of waterways is given a security dimension by many environmentalists. However, this critique has many underlying value judgments that need to be unravelled about extractive industries. This chapter attempts to provide a framework for analysing the extractive industries with a lens of international security, and clarifying some of the issues that are often conflated in the literature.

The term 'extractive industries' has various connotations, but for our purposes the extractive element suggests a degree of non-renewability at a human timescale. By this measure, the major natural resources that fall within this definition are minerals – solid, liquid, and gaseous. In addition, certain old growth forests are also classified as non-renewable because of the enormous temporal investment and care required for such forests to reach maturity. The issue of non-renewability also comes up often in the context of the use of the material for energy, whereby it is chemically altered, or the infrastructure required to generate the energy that may leave an unalterable impact on the landscape. By this measure, hydroelectric energy stations greater than 50 MW are often defined as 'non-renewable', because of their irreversible impact on the landscape and since often dams larger than this size cannot be restored after removal. This chapter will focus on mineral resources as the 'extractive industries', and also discuss the limitations of defining 'renewability' in this context.

There are primarily seven ways in which the international security aspect of extractive resources should be analysed:

1. *Resource dependence conflict*: The reliance on extractive resources for energy needs leading to national necessity for foreign intervention in case of threats to the resource. This is the argument that Klare and other resource determinists have made and indeed, the US government made during the first Gulf War in 1991. The security narrative in this case is particularly focused on oil and gas resources. It also focuses on not only the areas of extraction but also the transportation routes by which these resources reach demand centres, particularly oil and gas pipelines.
2. *Community conflicts and destabilization*: Environmental conflicts caused by non-renewable resource extraction or pollution in areas of extrac-

tion and transportation with communities leading to regional destabilization. Examples of this kind of security threat have been observed in cases such as the copper mine on the island of Bougainville in Papua New Guinea, which is believed to have contributed greatly to a secessionist movement on the island.

3. *Economic stagnation and security*: Dependence on export of extractive industries in source countries leading to economic stagnation through a loss of diversification in the industrial sector, excessive reliance on imported manufactured goods and an overall increase in the vulnerability of the economy. This effect is often described as the 'Dutch Disease', referring to the impact of oil exports on the Dutch economy during the 1960's. However, as was the case with Holland, this stagnation can be short term and does not always lead to conflict, though it can be a development challenge with potential security implications.
4. *Resource looting and conflict*: The portability or 'lootability' of certain extractive resources leading to a 'resource-capture', which causes internal economic disparities thus instigating or perpetuating intra-national conflicts. This is the most widely studied kind of resource conflict in Africa, and is often referred to as the 'resource curse' by environmentalists (Ross 2001a, 2001b). The causal mechanism by which this may occur could be due to either scarcity (shrinking pie effect) of a commodity leading to violent competition for survival or due to 'rapacious' onslaught over an abundant resource (honey pot or gold rush effect).
5. *Criminal cash flows from minerals*: The use of revenues from extractive industries to fund international terrorist networks due to their ease of smuggling and linkage to criminal cartels. The linkage between diamonds and other precious gems in West Africa and Al-Qaeda has been established by investigative journalists such as Farah (2004). This is perhaps the area that is most directly linked to the current global "war on terror", and of most policy relevance to the United States. However, the scale of these contributions to funding terrorist networks has not been empirically established.
6. *Monopsonistic power and security*: The domination of one firm as the sole purchaser of labour and services is referred to as monopsony (as opposed to monopoly where a firm is the sole seller of products). Extractive industries can have a profound impact on certain remote areas since they

are often the sole source of employment, infrastructure development, and tax contributions. This can often translate into political control that can be perceived as co-optation of the state apparatus.

7. *Mutual dependence and cooperation:* There is a potential for extractive industry projects to lead to collaboration between states and communities either due to need for joint capital investment or the passage of transportation infrastructure such as pipelines through different jurisdictions. However, this has not been empirically studied in much detail. Some interesting cases have emerged recently in this regard such as cooperation between India and Pakistan to allow for a gas pipeline from Iran to pass through Pakistan and reach demand centres in India.

Each of these dimensions of international security deserves attention; however, there is a cross-cutting environmental theme to all these possible causalities that first needs to be addressed. This chapter attempts to present the environmental dimension to this discourse on extractive industries and security, with an aim at finding clear policy prescriptions that can guide communities with extractive resource endowments.

Non-renewable resource extraction has been anathema to environmentalists because extraction of such a resource is, by definition, irreversible and hence leaves an indelible impression on the ecology of a region. However, extracting some non-renewable resources, such as metals, is often defended on the grounds that metals are recyclable and hence even though the extraction from the Earth is non-renewable, the material itself is more worthwhile than a non-recyclable substitute such as a composite plastic. This argument, nevertheless, ignores the fact that metals can also be oxidized and decay into forms that are not economically reusable, and certainly does not apply to energy minerals such as coal and uranium. Furthermore, the energy required for recycling must also be considered in any systematic analysis of impact. Perhaps more research on this issue is needed from an industrial ecology perspective to fully understand the life cycle impact of different materials for a specific use (Ayres/Simonis 1994).

There is also a continuing perception among Cornucopian researchers (Gleditsch 2003) that innovation, spurred by scarcity, will self-correct any potential depletion of the resource.¹ Modern technology has already led to the substitution of copper by fibre optics (produced from sand), and the substitution of iron by

ceramic materials and composites. In some cases materials technology has been advancing very rapidly in response to supply limitations signalled by rising prices for individual minerals. Moreover, the potential for recycling and conservation of less abundant minerals is enormous. The late economist Julian Simon extended this reasoning perhaps too optimistically to declare that even with the finite resources of minerals at our disposal, we can still say that the supply is infinite because we do not know the full potential of reserves and how they can be utilized. He compared the situation to a straight line segment which has a finite length, but which has an infinite number of points contained within it (Simon 1996, 1999).

The question of sustainability has been approached from diametrically different perspectives with reference to the mineral sector. Pro-mining forces tend to frame the issue as one of livelihoods, while anti-mining activists have framed it as an issue of resource depletion. The debate has thus been markedly polarized and reconciling these differences has been a challenge for policymakers and planners. Table 22.1 is an attempt to dissect the arguments on both sides.

The arguments on both sides of this debate are plausible, but often the result of any effort at planning for a mining venture results in positional entrenchment. Given the analysis in table 22.1, it appears that non-renewability of minerals is only an issue vis-à-vis sustainability if we believe that:

1. Keeping the resource in the ground is inherently valuable, and analogous to the preservation of biodiversity. However, since the resource in this case is inanimate and perhaps less consequential to food chains and other biological processes, the argument is often considered less convincing.
2. The environmental damage of the extraction process itself will cause irreversible damage and hence is contrary to any vision of sustainable development. In this case, the non-renewability is a derivative issue and the irreversible environmental impact is the primary issue. Therefore the damage should be compared to renewable resource extraction.

1 For an excellent review of the debate among resource economists about the market mechanisms for dealing with resource depletion concerns see (Auty 1999).

Table 22.1: Divergent Arguments on Sustainability of Mineral Extraction Activities. **Source:** The author.

Cassandran	Cornucopian	Evaluative Notes
<i>Non-renewable resource extraction:</i> Mineral ores cannot be replenished in the earth's surface over human timescales and thus reliance on them is risky and unsustainable. Energy needed to harness abundant minerals such as aluminium must also be considered.	<i>Non-renewable but Recyclable (at least metals):</i> Metals are elements and hence irreducible low entropy products that can be recycled rather than being 'regrown'.	<i>Highly dependent on type of mineral.</i> E.g. aluminium is both very abundant and easily recyclable, whereas nickel is much less abundant and requires complex product disaggregation for recycling. Also, is there intrinsic value to keeping minerals in the ground?
<i>Land Degradation is Irreversible:</i> Common forms of mining and beneficiation effluents scars the landscape in ways that leave it unproductive for future uses.	Economic output per land acreage is high: <i>While open-pit mining can leave permanent landscape scars, much of the use area is underground and productive land used is relatively small.</i>	Underground mining and leaching techniques may reduce the need for large-scale land degradation, though still require reclamation and monitoring after closure to prevent pollution and subsidence risks.
Supply Creating Demand: Corporate marketing is creating 'wants' of consumers. Such 'wants', rather than needs of society, are spurring investment in mining.	Demand Creating Supply: <i>Needs of remote communities and traditional demands of consumers are spurring investment in mining. Few alternative development trajectories for remote communities.</i>	Diamond and gem-stone demand may have been spurred by marketing. Gold demand can easily be met through recycling and bullion reserves, though the subsistence 'needs' of artisan gold miners and 'traditional' users of gold are prescient.
<i>Ephemeral Employment:</i> Mines usually have a life of a few decades and hence employment is not continuous and leads to deceptive economic indicators.	Evanescent but Catalytic: While mining operations may fold, satellite industries which they spawn can continue and perpetuate economic development.	Mining planners need to consider whether a new 'mining town' is viable following closure or a fly-in operation makes more sense. Highly dependent on derivative industries that could potentially evolve.
<i>Negative Impacts Outlast Closure:</i> Large financial investment is required to reclaim land after mining, as well as rebuilding economic and social capital of communities.	<i>Positive Impacts also Outlast Closure:</i> Infrastructure development, service sector jobs, and educated workforce are also a by-product of mining that outlive the life of the mine.	Closure planning must be part of the initial environmental impact assessment before the project commences, in order to ensure long-term viability of land-use.
Sustainability of Natural Capital Guides Development of Economic and Social Capital	Natural Capital is a means of Attaining Economic and Social Sustainability	Both views necessitate the viability of natural capital – whether for ornamental or instrumental purposes.

3. The dependence on the use of mined resources will lead to severe economic and social problems when they are eventually depleted, since there will be a paucity of production opportunities for alternatives.
4. The dependence of remote communities on a resource extraction as a sole means of livelihood will lead to economic stagnation after mine closure, and is thus not sustainable without a plan for subsequent development.

The sector of the mining industry that most closely meets these criteria is gold mining. It is highly disruptive to biogeochemical cycles because of the use of various chemicals in the extraction phase, even at the small-scale level and the level ratio of what is in the

ground to what is on land is unfavourable to arguments supporting mining.

22.3 National Institutions and Extractive Conflicts

Scholarly writings pertaining to reform of the extractive industries have unfortunately reached a point of positional entrenchment that is proverbially generating more heat than light. The World Bank's report: *Treasure or Trouble* (2002) and the reactions to its analysis exemplify this polarization most acutely. The report and the criticism offered by scholars such as Michael Ross (2001) and notable representatives from activist communities such as Friends of the Earth

(2001), miss the larger issue of scale and context in research analyses. The problem lies in the increasing reliance on macroeconomic data as a means of generating causality in cases where impacts and benefits of extractive industries are often highly localized. The World Bank study attempted to bring in a local flavour by including Egypt, China, and India in the analysis to show that despite the lack of importance of macroeconomic indicators, local (or domestic) areas do indeed benefit from extractive industries, thereby improving regional security. While this is an important insight, it is somewhat simplistic to aggregate conclusions about development trajectories.

Unfortunately, the Bank and its critics are both falling into the correlation trap. The country-wide data presented in macroeconomic analyses are only useful in telling us that mining investment is by no means a *sufficient* condition for economic growth, which is certainly a useful insight in some cases. However, the data cannot provide insights about whether resource extraction is a *necessary* condition for growth or lack thereof. Even in cases where there is negative growth, extraction of resources may still be a necessary condition for positive growth because of the effect of intervening variables such as ethnic strife.

What is more troubling about the criticism offered by environmentalists is their lack of alternative options in these cases. Would a cessation of mining in Liberia or Sierra Leone improve their economic plight and improve security? A careful historical analysis would be useful in such cases. Twenty years ago, Sierra Leone was not embroiled in civil war and mining was contributing favourably to the economy. The civil strife may have been exacerbated by the availability of ready cash from mining, but the problem then lies with the management of the resource in a changing socio-political context. What we need to understand is under what circumstances can the mineral sector be corrupted in ways that hamper growth and the diffusion of benefits?

There are two aspects to the resistance: i) normative resistance predicated on environmental impact and related concerns, ii) resistance to garner greater diffusion of economic benefits. While extractive companies should respect the right of communities to not want certain projects in their areas, activists should similarly respect the importance of communities to decide their own economic trajectory. In certain remote areas where communities have, for better or for worse, joined the market economy, mining can indeed be a source of tremendous economic benefits. It is disingenuous to try and hide this reality behind

macroeconomic indicators, just as it is misleading to hide localized impacts of a mismanaged mine behind corporate financial reports.

Rather than casting aspersions of methodological deception on one another, researchers, activists, and the development community need to focus on what communities want and what options are available to them. There are indeed cases where more viable alternatives to a mine may be feasible, but there will also be numerous cases in remote areas where mining will be the only viable option for economic development. The challenge in such regions then is to channel the monopsonistic and monopolistic power of the industry in a productive fashion to maximize benefits. Civil society, as manifest in various non-governmental organizations (NGOs), can certainly provide important guidance and quasi-enforcement to ensure that this power is appropriately wielded and not exploited. However, such constructive engagement is only possible when we move away from positional strategies and focus on the unique needs of each community where extractive enterprises are being considered.

22.4 Planning for Mines in Remote Areas: Considering Monopsony

In much of the public policy literature the concern with firm regulation tends to revolve around the notion of monopoly power. While mining firms in some cases have been accused of monopoly, particularly the diamond mining and processing firm DeBeers, the most significant issue that concerns mining projects in remote areas is not monopoly power but *monopsony* power. While the former refers to a market that is dominated by one *seller*, the latter refers to a market situation where one *buyer* is dominant. In remote areas, mining companies are often the sole source of income for communities and hence have monopsony power over labour.

Extractive industries are a kind of 'windfall development' similar to the establishment of a casino in an impoverished neighbourhood, ushering in a sudden influx of wealth to a community. However, extractive enterprises are a kind of windfall development that is very different from other projects, such as casinos, stadiums or army bases, because of its inherent obsolescence.

Therefore, in order for such a windfall development to be successful in the long run, it must be coupled with some other development strategy, otherwise the result is a proverbial 'mining ghost town' that

is sadly the scourge of many pristine landscapes. The extractive sector can only provide an opportunity for sustainable development if it is viewed as a proximate solution to day-to-day technological necessities, and not an end in itself. Historically, primary resource extraction industries have been considered sacrosanct by many governments and have received numerous subsidies. Clearly this has not provided companies an incentive to diversify and think in the long run about alternative services which they could provide in terms of recycling materials and investing in alternative material science research which employs renewable resources. This move would be congruent with the oil industry, which is now shifting gears to be considered an 'energy service' industry and investing in solar and other renewable forms of energy research.

Clearly these issues need to be addressed at all levels of governance. However, the international level is most salient in this context to prevent the proverbial 'pollution havens phenomenon'. Given the multinational nature of most mining companies, there needs to be some way of standardizing best practices in the mining sector. There should perhaps be a series of ISO (*International Organization for Standardization*) standards for non-renewable resource extraction industries, given their unique and obsolescent nature. Meanwhile regional, national, and local oversight of mining operations is also essential. Just as human rights are nowadays trumping the past primacy of 'sovereignty'. It is also likely that environmental issues will follow a similar path.

Extractive industries are often a 'leading sector' in the area where they exist, and should therefore be used to encourage other businesses to invest in the region. Since mines are usually located in remote parts of the world, it is difficult to get other manufacturing or service businesses in the area. A usual solution that is proposed is to develop a tourism industry (often in its most green incarnation as 'eco-tourism'). This is of course limited to the kind of terrain where the mine is located and is often not feasible.

Perhaps a preferable way of approaching this question is first to study and evaluate the lifestyle of the people before the mining activity, and to see how that 'pre-development' lifestyle could be improved *without* the 'windfall development'. Such an analysis would highlight some of the limiting factors that could be preventing a more sustainable yet inchoate sector from developing. For example, a poor agricultural economy may be deficient in appropriate farming technology to make it develop. Now, once this evaluation has been conducted, the 'windfall developer'

can institute measures to specifically target that sector for improvement through direct financial means or through technology transfer.

22.5 Security and Sustainability: Concluding Thoughts

Sustainability for our purposes is the attribute of a process that can harness a resource while allowing for replenishment of its base capital (natural, economic, and social) to meet future needs. The future needs of a community must be defined in terms of technological forecasting as well as physical resource constraints. Considerations include: social and community market economics. Social implementation of sustainable processes is important but must not overlook the reality that many projects which are socially satisfying can be utterly unsustainable from a physical perspective. Within the spectre of technological innovation, we cannot defy physical constraints. On the other hand, if there is social reluctance to a physically sustainable process, there is greater leverage to change social views through education, training, and economic means. Thus, the social concerns are important, but only after the physical sustainability of the project are fully understood.

So the question still remains: are extractive enterprises compatible with sustainable development and hence congruent with a long-term vision of security? The answer must consist of two parts: First there is no doubt that extractive industries under present technological conditions do have a certain degree of permanent impact on a region. Mineral industries also involve extraction of non-renewable resources. By these measures the answer at one level is No: mining is not sustainable. However, while the landscape may be permanently changed by extractive enterprises in certain ways, that does not necessarily mean that communities cannot thrive if projects are appropriately planned. Extractive enterprises can therefore be a prelude to sustainable development if the community is willing to absorb a certain degree of permanent impact. The key then is to be able to use extractive industries as an entry point towards a more stable industrial or service-based economy that is not inherently obsolescent.

Economic diversification is the operative word for both inter-state and intra-state security. This applies to countries diversifying their energy sources, as well as their industrial investment. Indeed, one of the less compelling aspects of the arguments of resource war

determinists regarding US security interests has been the ongoing diversification of US oil and gas sources. Furthermore, the US gets almost half of its oil from domestic sources, followed by the largest foreign contributors that are collectively its neighbours - Canada and Mexico.

American energy policy is trying to diversify away from dependence on Middle Eastern oil, and thus the argument that the US government is going to war in the region simply over oil sounds less convincing, especially given the high financial and human cost involved. Another interesting rebuttal to the resource war determinist is that dependence can often lead to more cooperation than conflict, as observed with water resource issues where hardly any conflicts over water resources have been documented in recent memory, despite much sabre rattling (Uitto/Wolf 2002). Hence the fact that the Taliban visited Texas and met with gas company executives before 11 September 2001, rather than fuelling conspiracy theories about conflict, could be considered a mark of how resource interests can potentially foster cooperation between two utterly different cultures. The key to a fruitful outcome depends on how governments in extractive countries handle their resource endowments, and what international mechanisms exist to moderate the wealth and woe that they might bring.

Education is a critical issue in many areas where windfall development is to occur and the establishment of schools and other vocational training programmes independent of their utility to the developers is critical. Hence a contingency development plan would be essential, particularly for projects of planned obsolescence, such as mining. Nevertheless, alternative development strategies should be strongly encouraged for any risky 'windfall development'. Such a system will likely require regulatory enforcement as it is a classic externality for the developer.

However, the specifics should remain flexible given the highly diverse nature of alternatives that may exist for various communities. Some examples of successes and failures in this context need to be further studied with the aim of testing various hypotheses regarding the efficacy of extractive industries and their influence on intra-state and inter-state security. These hypotheses are likely to focus on five areas: a) stakeholder engagement: negotiation versus consultation and transparency of the process, b) supply chain management of the mineral resource, c) pollution prevention and risk management systems, d) post-closure remediation and sustainable livelihoods, e) potentially cooperative linkages of projects through mutual de-

pendence. Clearly some of the process issues, stakeholder involvement in decision-making, organizational dynamics and implementation would need to be ironed out in order for such a system to be effective. However, extractive industry projects must not take place in a vacuum, and should be catalysts rather than reactants in the synthesis of development.

23 Energy Security: Conceptualization of the International Energy Agency (IEA)

Klaus-Dietmar Jacoby

23.1 Introduction

The creation of the International Energy Agency (IEA) in 1974 was directly linked to the oil price shock in 1973-1974. At that time, 16 member countries established the IEA as an autonomous body within the framework of the Organisation for Economic Co-operation and Development to implement an international energy programme.

The main aims of the energy cooperation among the now 26 member countries are:

- To maintain and improve systems for coping with oil supply disruptions;
- To promote rational energy policies in a global context through co-operative relations with non-member countries, industry and international organizations;
- To operate a permanent information system on the international oil market;
- To improve the world's energy supply and demand structure by developing alternative energy sources and increasing the efficiency of energy use; and
- To assist in the integration of environmental and energy policies.

Oil crisis management and the information system on the international oil market are the IEA's only short-term policy issues and instruments. Promotion of national energy policies, improvement of the world's energy supply and demand structure and the fostering of environmentally-related energy policies are more related to medium- and long-term tasks.

Both short-term and long-term policies and objectives have changed over time, with liberalization and globalization of markets and a different use of specific energies in sectors such as industry, transportation or electricity generation.

This chapter reviews the history and development of the IEA's energy security programme, from the lead-up to the 1974 Agreement on an International En-

ergy Programme (I.E.P.) signed by all IEA member countries, through subsequent modifications in the response mechanism enabling more flexible *co-ordinated emergency response measures* (CERM), also reviewing the IEA's coordinated actions during the oil supply disruptions of the 1991 Gulf War and in 2005 in response to disruptions caused by Hurricane Katrina. Emergency reserve stocks and demand restraint programmes are also detailed. The chapter then describes how changes in energy markets have led to broadening the scope of the IEA's energy security programme to considerations of security of gas supplies and electricity.

23.2 Evolution of the IEA's Concept of Energy Security

23.2.1 Origins in Security of Oil Supplies for Military Purposes

The origin of the notion of the need for oil stocks to be used for probably goes back to World War I, when Lord Admiral Winston Churchill first became aware of the need to procure fuel (in this case, coal) for his military fleet. In 1917, France experienced a rupture in oil supplies when its army required more petrol than was available, as most supplies were diverted for use in the Russian Revolution and by American submarines. Subsequently, in 1925, France imposed the requirement on its oil industry to reserve stock representing 25 per cent of the declared amount of oil delivered for consumption during the last 12 months, or 91.25 days of domestic consumption. In order to supply fuel for military operations during World War II, countries resorted to compulsory demand restraint programmes such as fuel rationing. As Germany had no indigenous oil production, it succeeded in a type of 'ersatz' [substitute] fuel switching by converting coal into a type of petrol.

23.2.2 Security of Energy Supply: Building up Oil Stocks

After Egypt's blockade of the Suez Canal in the 1950's European politicians became increasingly aware of the necessity to maintain oil reserves. The awareness of the need for governments to take responsibility in safeguarding their nations' access to oil supplies emerged in parallel with OECD countries' growing dependence on oil. From 1960 to the oil crisis of late 1973 was a period of rapid economic growth and burgeoning oil demand. GDP in OECD countries grew by 90 per cent, energy demand by a similar amount and oil demand by 120 per cent as transport demand boomed and oil cut into coal's markets as a furnace fuel. In the world as a whole, the period saw oil demand rise from rather more than 20 mb/d to a level approaching 60 mb/d., of which OECD demand accounted for two-thirds. With most OECD countries without domestic production, and North American oil production on a weak trend, OECD countries became heavily dependent on imports, mostly from OPEC countries, with the Middle East dominating.

By 1968, the six members of the European Economic Community (Belgium, France, Germany, Italy, Luxembourg, and the Netherlands) agreed to maintain a minimum level of crude oil stocks and oil products corresponding to 65 days of domestic consumption. In 1972, this obligation was raised to 90 days.

The oil price shock resulting from the end-1973 crisis had profound damaging effects on economies ending the period of rapid growth. From 1974 and for the rest of the 1970's, OECD countries and the world were stricken by high inflation, trade and payments imbalances, high unemployment and weak business and consumer confidence. Against this background, the U.S. Secretary of State called together the Washington Energy Conference in February 1974 which led to the establishment of the IEA in November 1974.

From its inception, the objectives of the IEA have focused on energy security, extending from responses to short-run oil emergencies and to long-term ameliorative solutions to the broader problems of reducing oil import dependence, promoting energy policy which supports energy efficiency and diversifying fuels. The IEA's initial stockholding obligation as formulated in 1974 was "to maintain emergency reserves sufficient to sustain consumption for at least 60 days with no net oil imports" [Article 2.1 of the Agreement on an International Energy Program (see IEA 1994, Appendix III)]. In 1975-1976, the Governing Board raised the minimum legal obligation from 60 to 90

days by stipulating incremental increases until the 90 days' level was achieved in 1980.

Throughout the 1980's and 1990's, the overall emergency reserve stock level of IEA net importing countries was well above 90 days, peaking at 193 days in 1986. It currently averages 114 days. The IEA used its stocks in 1990-1991 during the Gulf War, when it made 2.5 million barrels per day available to the market and most recently in 2005 to mitigate the disruptions in supply coming from the Gulf of Mexico caused by Hurricanes Katrina and Rita (see 23.5).

23.3 The IEA's Emergency Response Measures

The IEA now has 28 Member countries¹ which represent some 60 per cent of total world oil demand and include all old EU countries as well as two of twelve new EU countries (the Czech Republic and Hungary). Core commitments of the member countries under the I.E.P. Agreement include:

- The maintenance of oil reserves equivalent to at least 90 days of net oil imports;
- A programme of demand restraint measures to reduce national oil consumption by 7 to 10 per cent; and,
- To participate in an oil sharing system in a severe supply disruption using these tools.

In addition, member countries cooperate with the oil industry for advice and operational assistance in emergencies. The committee for the discussion and development of security policies and procedures is the IEA *Standing Group on Emergency Questions* (SEQ), which is comprised of representatives from our member countries, together with a representative of the European Commission as an observer. The SEQ makes recommendations to the IEA Governing Board for consideration and adoption and it is assisted by an Industry Advisory Board, which includes senior representatives of oil companies headquartered in IEA member countries.

1 IEA member countries include: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, the Republic of Korea, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Commission takes part in the work of the IEA.

For major international oil disruptions, the IEA founders established a treaty-based system for the physical sharing of oil (Emergency Sharing System) which requires members to build and maintain oil stocks, to plan for a carry out short-term reduction of demand for oil (called demand restraint in IEA terminology), and to gather and transmit emergency oil data (to enable the Agency to make sound emergency decisions) (IEA 1995: 69; 1999).

To reflect the evolution of energy markets since the IEA was established, its underlying I.E.P. Agreement treaty obligations to share oil in an emergency have been reinforced by a system of co-ordinated emergency response measures that can be readily calibrated to the circumstances at hand to permit more flexibility in emergency response, for example, during oil supply disruptions of less than 7 per cent of supply. *Coordinated Emergency Response Measures* (CERM) established a flexible framework for international consultations on co-ordinated stockdraw and other response measures in the event of an actual or potentially significant oil supply disruption. The formal sharing system has not been deployed to-date and CERM-based collective responses reflect the belief that, under normal circumstances, the global oil market is fully capable of determining the most efficient initial physical re-allocation of supplies in any given crisis scenario. Collective action utilizing stocks and other measures provides a strategic safety net to reinforce the market.

The original IEA plan and subsequent mechanisms integrated the following emergency response measures: stockdraw and allocation of oil (i.e. sharing among IEA member countries), demand restraint, fuel switching and surge production. The relative effectiveness of these various measures has changed over the years. With the privatization of oil companies in the 1980's and 1990's, there has been an increasing preference for more stocks to be held by public (i.e. government-controlled) agencies over industry in order to strengthen member countries' response capability. Despite the difficulty in quantifying the results of demand restraint measures apart from market effects, increasing attention has been given to ensuring legislative authorities mandating demand restraint measures to be activated during an emergency; these either reduce the amount of oil actually used by consumers or limit the amount of oil supply available to consumers (IEA *Emergency Management Manual* (EMM) ⁵1994, sect. 4.2). With the gradual shift in electricity generation from coal to oil and from oil to gas or nuclear power, the capability to switch from oil

to other fuels has been diminished. Surge production for IEA net exporting countries remains a possibility, although known oil reserves are diminishing in some of these countries.

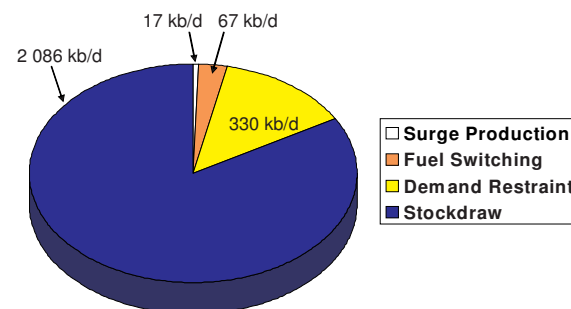
While stockdraw remains the main tool, the strength of the programme rests also on the IEA's impressive oil supply information systems and market analysis. A hidden asset is the effect of the market's awareness of the IEA's rapid response capability.

23.3.1 The IEA Coordinated Action in Response to the 1990-1991 Gulf Crisis

When the Iraqi occupation of Kuwait led to the United Nations embargo of all exports of oil from Kuwait and Iraq, resulting in a loss of 4.3 million barrels of oil per day from the market, about two-third of which directly affected IEA countries, at the time of the outbreak of hostilities in the Gulf ('Desert Storm') the IEA activated its Contingency Plan on 17 January 1991 to make available to the market 2.5 million barrels of oil per day. The biggest component of the response was stockdraw.

Figure 23.1: IEA Gulf War Contingency Response Plan.

Source: IEA.



23.4 Evolution of Oil Markets

By the mid-1990's, many changes in the oil market resulted in a renewed focus on assuring supply of oil in case of a disruption for both oil-producing and -consuming countries.

...the market has become more capable of immediate responses to disruptions, much more sophisticated in its operations, and more 'global' in its geographical reach. Spot market transactions ... now account for the bulk of international oil transactions. Price movements now become known almost instantaneously to a large number of market participants, making potential market reactions to supply disruptions and other market affecting events appear almost without delay (IEA 1994: 131).

The market became more global with increased production from non-OPEC producers, and output increased to keep pace with the booming U.S. and Asia Pacific economies. But OPEC's slow reaction in adjusting its production quotas to accommodate the Asian economic crisis of 1998 and U.S. economic downturn of 2000 made oil prices drop.

Emergency plans and procedures of the International Energy Agency and its member countries were reviewed and reshaped in anticipation that possible computer problems related to Y2K could seriously impact on energy security. This coincided with the Asian economic downturn and concomitant drop in oil demand and hence oil prices. Then, just as OPEC and non-OPEC producers had instituted lower production quotas to regain control of oil prices in 2001, the terrorist events of 9/11 raised fears that oil could again be used as a weapon.

23.4.1 The Geo-political Situation in the Late 1990's to the Present and the IEA

Other geopolitical events, along with perceived diminution of the ability of oil producers to compensate for a supply loss by using spare capacity, have acted to create a climate of uncertainty about future supply. In 2002–2003, problems in Venezuela led to a strike at *Petróleos de Venezuela SA* (PDVSA), causing Venezuelan production to plummet. Both social unrest in Nigeria, which affected that country's oil production, and the second war in Iraq in 2003 reinforced possible risks of a significant supply disruption. With spare capacity in oil-producing countries at historical lows and demand from fast-growing economies like China or India increasing, the market must find a new balance. In this context, economies are more vulnerable, as increasingly high oil prices could negatively effect economic growth. Also, because of tighter management of stocks due to technological innovation, even historically smaller supply disruptions could have significant market ramifications. Reminding the world of the existence of the IEA's collective stockpile through well-timed news releases serves to assuage the insecurity.

Until September 2005, there had been no need to draw on IEA's emergency stocks since 1991. But between these two times, the IEA actively monitored geo-political situations developed even quicker procedures for agreeing on and implementing an emergency response. Indeed, as scenarios evolved in the wake of 11 September 2001, followed by the strikes in Venezuela, unrest in Nigeria and war in Iraq, the IEA

Secretariat was carefully assessing the situation on a daily basis and kept in close contact with its member countries, the oil industry and strategic non-member countries. The IEA and its member countries were ready to act in coordination with oil-producing countries, in particular, with OPEC countries, and the markets knew it. For these reasons, the possible risk of a supply disruption was minimized and price spikes and their duration were limited.

The IEA has regularly carried out Emergency Response Exercises, which serve to train staff in administrations and industry in IEA emergency procedures as well as to give the opportunity for an in-depth exchange of views between experts from administrations and the oil industry to review procedures and to introduce, if necessary, new measures to react to market changes (IEA 2001). Since 2002, these exercises have included participants from major oil consuming countries outside the IEA, like China. In 2004, a special Emergency Response Exercise for non-member countries with the participation of delegates from China, India, ASEAN countries, Brazil and new EU member countries was held.

23.5 IEA Response to the Hurricane Katrina Oil Supply Disruption

Following the damage wrought in the Gulf of Mexico coast by Hurricane Katrina during the last week of August 2005, on 2 September 2005 the IEA Executive Director announced that all 26 IEA member countries would take collective action in response to the interrupted oil supplies. The IEA member and candidate countries plus the EU Commission unanimously supported this action to make available to the market 60 million barrels of oil for an initial period of 30 days. This agreement was achieved in less than ten hours from the time that the IEA Secretariat sent its initial assessment of the situation recommending the activation of an emergency response.² The IEA also consulted with major producers and the OPEC President, who also stated OPEC's commitment to make incremental oil available to the market to cope with the supply disruption resulting from the hurricane. This illustrates the flexibility and preparedness of the IEA in handling an international energy crisis.

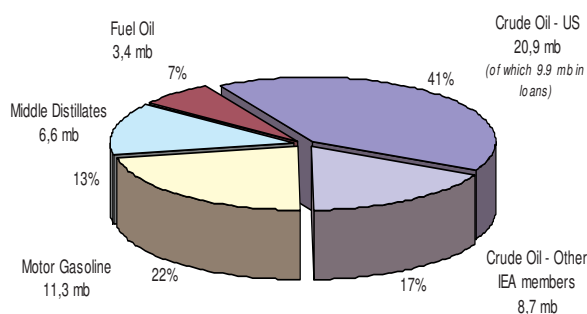
² This was an impressive record in political decision-making for an international organization, considering the time difference of 16 hours between member countries in the East and West.

During the months leading up to Hurricanes Katrina and Rita in the Gulf of Mexico, the global oil market had been very tight, with historically low spare oil production capacity. Oil prices had been pushed upward in mid-August 2005 by geopolitical issues, including the death of King Fahd in Saudi Arabia, tensions over the Iranian nuclear programme and ethnic unrest in Nigeria, as well as by downstream disruptions caused by fires and accidents at some U.S. refineries. The trend was further exacerbated by U.S. gasoline stocks falling to the low-end of the 5-year range.

By mid September 2005, member countries had pledged to make available to the market some 64 million barrels over the initial period of 30 days, the equivalent of 2.1 mb/d. The majority of member countries opted to reduce emergency stock. 94 per cent of the total volume of the response was to be achieved through the drawdown of either industry or government stocks, 3 per cent by demand restraint and 3 per cent by increased indigenous production. Within the total amount of stocks to be released by member countries, 65 per cent was to be crude oil and 35 per cent oil products.

By end-October of 2005, approximately 54 million barrels had been made accessible to the markets through all actions from IEA member countries related emergency stocks and increased indigenous oil production. This included stock volumes made available by the lowering of stockholding obligations on industry, as well as sales and loans from publicly held emergency stocks.

Figure 23.2: Stock release and increased production, 2005 IEA Collective Action. **Source:** IEA.



Some supplies offered from public stocks were not taken up by the market, largely accounting for the lower total response at the end of October than the volume of supplies initially pledged. This was because 1) American refineries shut in were not able to accept the crude oil offered and 2) shipping capacity for oil products from Europe was limited. While some 39

Table 23.1: Total IEA Response, 2005 IEA Collective Action. **Source:** IEA.

Total Oil (Overall Results in Million Barrels)	
Industry Stocks	22.5
Public Stocks (including 9.9 mb of SPR loans)	28.6
Total Stocks	51.1
Indigenous Production	6.4
Total	57.5 +

million barrels was initially pledged from public emergency reserves, slightly more than 17 million of this has been taken. However, when counted together with the loans from the US Strategic Petroleum Reserve, a total of nearly 29 million barrels were released from member countries public stocks by end October.

Increased indigenous production and the lowering of minimum stockholding requirements put at the disposal of industry an additional 25 million barrels. These amounts in effect allow a potential transfer of incremental oil supply, making previously unavailable volumes accessible to the market.

23.6 Response Potential

On the supply side, stocks are by far the most rapid and effective response measure to meet physical supply shortfalls or the threat of an imminent shortfall. The IEA stocks are for strategic use to avoid negative economic impacts of a severe supply disruption; they are not to be deployed as a means to manage the market.

As at 1 June 2005, total combined government-controlled and industry-held stocks in IEA countries were about 4 billion barrels. The IEA's net importing countries held an amount equivalent to 118 days of the previous year's net imports, but when stocks held by net exporting members are taken into account, stock coverage actually rises to the equivalent of 152 days of net imports, well above the minimum requirement of 90 days. The ready availability of stocks is important when OPEC spare capacity is unsure and commercial stocks are low. In this context the IEA Secretariat sees, with some satisfaction, a trend in member countries to create or increase government-controlled stocks in place of mandatory industry stocks. With the completion of the U.S. effort to fill its *Strategic Petroleum Reserve* (SPR) to its 700 million barrel capacity, the government-controlled reserves held by IEA members are at an all-time high of nearly 1.5 billion barrels. To put this in perspective, IEA govern-

ment-controlled reserves could compensate for a 2 mb/d supply loss for about 700 days, nearly two years. IEA members also hold over 2.5 billion barrels of commercial stocks.

Other response measures on the supply side, such as fuel switching or surge production, would not contribute as much now as in the past. An IEA internal survey (IEA 2001, internal restricted document) showed that only a few countries like the United States, Japan or Italy have a significant potential to switch from gas to oil or vice versa, a result of the trend to replace oil with natural gas in electricity generation. Nevertheless, the IEA is updating this fuel switching survey and will discuss the outcome and implications on short and long term policies. The capacity for surge production as a potential response to a global supply disruption has also diminished.

On the demand side, policies and measures to save oil have a relevant importance, particularly for the transport sector. Member countries are obliged by the IEP to have ready demand restraint programmes which may include light-handed measures to increase public transit usage, car-pooling, eco-driving, telecommuting (working at home) and speed limit reductions as well as more compulsory measures like driving bans and fuel restrictions. The IEA (2005) study, *Saving Oil in a Hurry*, evaluated the potential oil savings by various measures if implemented in all member countries with the conclusion that, *inter alia*:

- Car pooling and driving bans could save more than one million barrels per day.
- Speed limits, free public transit, telecommuting, compressed work week (fewer but longer work-days), driving bans (1 in 10 days) and eco-driving can save more than 500 000 barrels per day.
- Other measures such as reduced speed limits, encouraging use of public transit, telecommuting, compressed work week, driving bans and eco-driving could save more than 500 000 b/d.

23.7 Security of Gas and Electricity Supply

Oil is no longer the only fuel for which there would be serious ramifications if there were a supply disruption. Natural gas (IEA 2004) and electricity (IEA 2005, 2005b) have been added to the list in recent years. Local or regional electricity and gas supply disruptions, in particular in North America and Europe, have become a major concern to consumers, producers and energy administrations in most OECD

member countries. While some of these supply disruptions were caused by normal supply/demand patterns, external market events such as natural catastrophes also contributed to some. In addition, market liberalization was accompanied by poor market regulation, which contributed to making these energy sources vulnerable to geopolitical events. Lack of investment incentives could also contribute to insufficient energy security. With market liberalization, the responsibility for security of supply has to be defined and shared between all players involved, including governments, producers, suppliers, traders, regulators and customers.

In particular, the concept of security of gas supply has broadened beyond country borders. The external dimension of security of supply requires increased attention given the growing import dependency of most IEA member countries (figures 23.4, 23.5). While import dependency is not, in itself, a threat, it requires governments and companies to pursue their efforts to diversify natural gas supply (supply sources and mode of imports: pipeline gas vs. LNG) and transmission routes.

With the liberalization of the natural gas industry, the market is becoming more fragmented due to both the unbundling of activities and the entrance of newcomers into the market. The responsibility for security of supply must thus be defined and shared among all players involved, including governments, producers, suppliers, traders, regulators and customers. Policy makers have the responsibility of creating a framework for security of supply and defining the objectives for security of supply and the responsibilities of each market participant. For some countries, gas storage will be the most economic choice for ensuring security; for others, supply flexibility and diversity is adequate to ensure security.

The IEA (2004) published a comprehensive study on *Security of Gas Supply in Open Markets* and is involved in monitoring gas security in its member countries. It has also started a dialogue with member governments and the gas industry to review the changing concept of security of gas supply in open gas markets and the roles of the different stakeholders. However, it is the belief of the IEA that - once the framework and the role of the different players has been defined - governments should leave market players the choice of instruments and means to provide the required level of security of gas supply.

Electricity is also an increasing concern for supply security, as several shortfalls in recent years in OECD countries all over the world have shown. Similar to

Figure 23.3: Oil import dependence in IEA [Import dependence has been calculated as (net imports)/(total primary energy supply + bunkers)]. **Source:** IEA (2006).

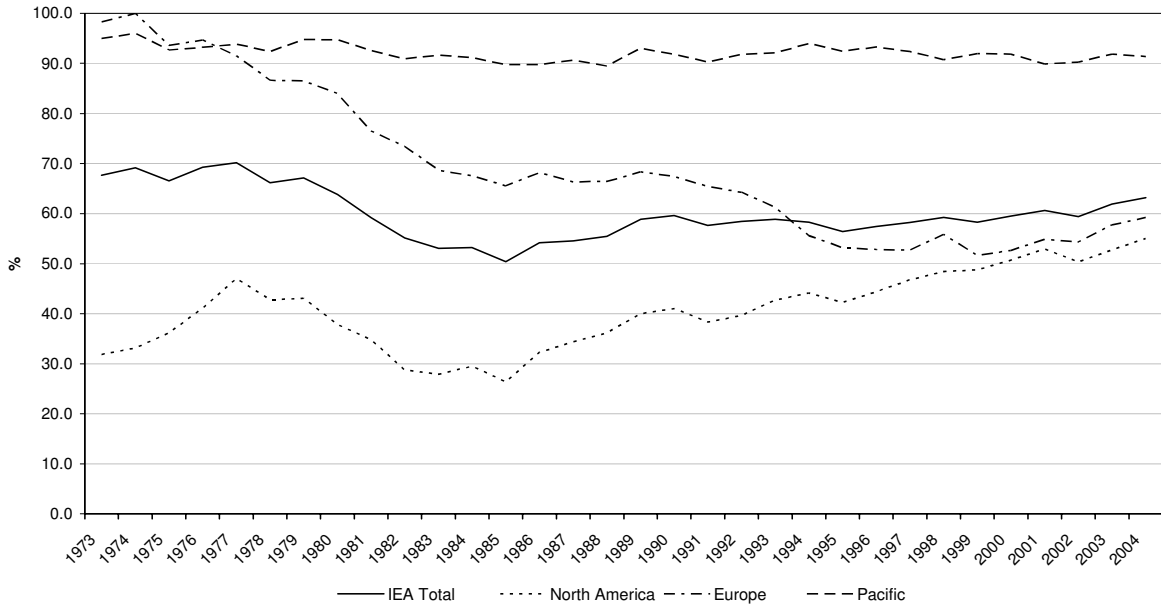
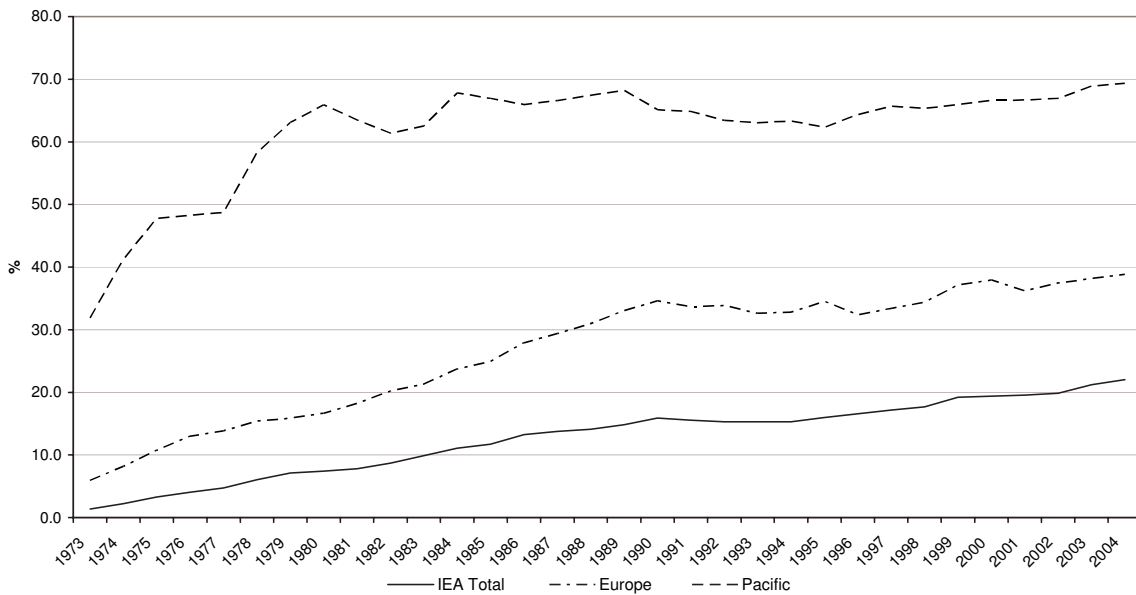


Figure 23.4: Natural gas import dependence in IEA [Import dependence has been calculated as (net imports)/(total primary energy supply + bunkers). For natural gas the import dependence for North America is zero]. **Source:** IEA (2006).



gas, electricity shortfalls have mostly national and regional impacts but no global ones. While there is no urgency to introduce global emergency response policies and measures, there is nevertheless the need to analyse the different types of emergencies and how best to avoid shortfalls or to remedy the situation. The IEA’s analysis of the conditions affecting trans-

missions system reliability points to the effects of market reform, which “has brought unbundling and independent, decentralized decision-making ... fundamentally changing utilization of transmission networks” (IEA 2005b: 38-39). The IEA suggests the following directions to assure security of electricity:

Table 23.2: World Primary Energy Demand in the Reference Scenario (Mtoe). **Source:** IEA (2005a: 82). Permission to reprint was granted by IEA.

	1971	2003	2010	2020	2030	2003–2030*
Coal	1.439	2.582	2.860	3.301	3.724	1,4%
Oil	2.446	3.785	4.431	5.036	5.546	1,4%
Gas	895	2.244	2.660	3.338	3.942	2,1%
Nuclear	29	687	779	778	767	0,4%
Hydro	104	227	278	323	368	1,8%
Biomass and waste	683	1.143	1.273	1.454	1.653	1,4%
Other renewables	4	54	107	172	272	6,2%
Total	5.600	10.723	12.389	14.402	16.271	1,6%

* Average annual growth rate

Management of system security needs to be transformed to maintain reliable electricity services in this changed environment. Clearly defined responsibilities and authority to act are required. Improved operating practice, with greater emphasis on system-wide preparation, and coordination to support flexible, integrated real-time system management are also needed. Effective real-time system operating requires accurate and timely information and state-of-the-art technology to facilitate effective contingency planning system monitoring, flow management and co-ordinated emergency response (IEA 2005b: 107).

Another IEA study (IEA 2005c) explains that reliability of electricity supply can be 'unbundled' into three parts of a chain: 1) secure fuel supply as input for power generation; 2) adequacy of generation capacity, transmission and distribution markets, and 3) system security in transmission system operation. In this context, the IEA has also published a study on *Saving Electricity in a Hurry* (IEA 2005d) which deals with temporary shortfalls in electricity supplies. Key messages are how to develop a strategy to save electricity quickly and what measures might be appropriate to use.

23.8 Challenges

As the oil market continues to evolve, the IEA and its members recognize the importance of keeping pace with market dynamics. One by-product of the increasingly sophisticated oil market is price volatility. This is an issue of common concern to producers and consumers. The IEA does not believe that strategic oil stocks can be effectively used to address price fluctuations. This would distort market mechanisms and signals, and invite unnecessary confrontation with

producers. The IEA believes emergency oil stocks should be reserved for emergency use. Issues of volatility and other market imperfections should be addressed, *inter alia*, through dialogue and data transparency.

The IEA's *World Energy Outlook 2005* (IEA 2005a) projects that by 2030 the world will be consuming two-thirds more energy than in 2007 (table 23.1). Almost three-quarters of the increase in demand is expected to come from the transport sector and oil is expected to still dominate this sector. Meanwhile, consumption in developing countries and the transition economies is expected to grow much faster than in the OECD. Under one scenario, almost two-thirds of incremental demand for oil between now and 2030 is projected to come from outside the OECD, particularly from Asian economies.

If policies do not change and this scenario becomes a reality, it would have significant implications for the security of supply which cannot be addressed adequately from an insular perspective. The success of the IEA's efforts today to reach out to these emerging consuming countries and to encourage the adoption by these countries of the principles embodied in the IEA's 'Shared Goals'³ can significantly improve global energy security in the coming decades.

The Agency is proactively involved in the wider producer/consumer dialogue at the Ministerial level in the International Energy Forum and at a technical level in the Energy Experts Meeting, as well as at regional and topical workshops and seminars. Also, the Agency has Memoranda of Understanding in place with Russia, China and India and extends its global

3 See <http://www.iea.org/Textbase/about/sharedgoals.htm>.

Table 23.3: World Oil Production in the Reference Scenario (million barrels per day). **Source:** IEA (2005a: 90).
Permission to reprint was granted by IEA.

	2004	2010	2020	2030	2004–2030*
Non-OPEC	46.7	51.4	49.4	46.1	0.0%
OECD	20.2	19.2	16.1	13.5	-1.5%
OECD North America	13.6	14.4	12.6	10.8	-0.9%
US and Canada	9.7	10.5	8.8	7.4	-1.1%
Mexico	3.8	3.9	3.7	3.4	-0.5%
OECD Europe	6.0	4.4	3.1	2.3	-3.7%
OECD Pacific	0.6	0.5	0.4	0.4	-1.4%
Transition economies	11.4	14.5	15.6	16.4	1.4%
Russia	9.2	10.7	10.9	11.1	0.7%
Developing countries	15.2	17.7	17.6	16.3	0.3%
China	3.5	3.5	3.0	2.4	-1.5%
India	0.8	0.9	0.8	0.6	-1.2%
Other Asia	1.9	2.1	1.7	1.3	-1.7%
Latin America	3.8	4.7	5.5	6.1	1.8%
Brazil	1.5	2.5	3.3	4.1	3.8%
Africa	3.3	4.9	5.2	4.7	1.4%
Middle East	1.9	1.7	1.5	1.4	-1.3%
OPEC	32.3	36.9	47.4	57.2	2.2%
OPEC Middle East	22.8	26.6	35.3	44.0	2.6%
Other OPEC	9.6	10.3	12.1	13.2	1.3%
Non-conventional oil	2.2	2.1	6.5	10.2	6.1%
of which GTLs	0.1	0.3	1.3	2.3	13.9%
Miscellaneous**	0.9	1.1	1.6	1.9	2.9%
World	82.1	92.5	104.9	115.4	1.3%
MENA	29.0	33.0	41.8	50.5	2.2%
Middle East	24.6	28.3	36.8	45.3	2.4%
North Africa	4.3	4.7	5.0	5.1	0.7%

* Average annual growth rate.

** Includes processing gains and stock changes.

Note: Includes NGLs and condensates.

reach further through collaboration with regional organizations. The IEA is committed to forging a dialogue and cooperation with regional bodies, thus avoiding duplication of effort and ensuring that topics of specific regional concern are addressed and evaluated from a global perspective.

The span and scope of the Agency's outreach programme reflects the IEA's commitment to improved global energy security and a clear recognition of the increasingly global nature of security of supply issues. As advocates for the collective benefits to be derived

from adherence to the IEA shared goals to which all EU countries subscribe, the IEA Secretariat is confident that with sustained and targeted effort, this wider collaborative effort will bear fruit and global energy security response policies will converge.

23.9 Toward a Sustainable Energy Future

Furthermore, it is now widely understood that the attainment of energy security embraces other policy objectives too (IEA 2001a). Indeed, as far back as 1993, IEA member governments stated their “Shared Goals,” which included a commitment to “seek to create the conditions in which the energy sectors of their economies can make the fullest possible contribution to sustainable economic development and the well-being of their people and of the environment” (see at: <<http://www.iea.org/Textbase/about/sharedgoals.htm>>). To this end, the IEA Energy Ministers adopted the following economic values:

... Undistorted energy prices enable markets to work efficiently. Energy prices should not be held artificially below the costs of supply to promote social or industrial goals. To the extent necessary and practicable, the environmental costs of energy production and use should be reflected in prices.

... Free and open trade and a secure framework for investment contribute to efficient energy markets and energy security. Distortions to energy trade and investment should be avoided.

... Co-operation among all energy market participants helps to improve information and understanding, and encourage the development of efficient, environmentally acceptable and flexible energy systems and markets worldwide. These are needed to help promote the investment, trade and confidence necessary to achieve global energy security and environmental objectives...” (excerpt from IEA Shared Goals)⁵

As we move into an era of “petropolitics”,⁴ energy security concerns have begun once again to take precedence in policy making, as awareness of the far-reaching consequences of energy supply and demand heightens.

4 This term was coined by Thomas L. Friedman: “Rise of the Petro-Authoritarians”, in: *The New York Times*, (Opinion & Commentary), Saturday, 13 May 2006,

24 Scenarios of Energy Demand and Supply until 2100: Implications for Energy Security

Leo Schrattenholzer

24.1 Introduction¹

This chapter combines two discussions in different disciplines: the work on environmentally compatible energy supply in the frame of sustainable development in the scenario community with the security discourse in the social sciences, and the policy debate on energy security. This linkage is not without problems because security as an individual or societal political value has no independent meaning, and is always related to specific individual or societal value systems and their realization (Brauch 2003).² As a social science concept, “security is ambiguous and elastic in its meaning” (Art 1993: 821). Arnold Wolfers (1952, 1962: 150, 1962a) pointed to two sides of the security concept: “Security, in an objective sense, measures the absence of threats to acquired values, in a subjective sense, the absence of fear that such values will be attacked.” From a constructivist perspective security is what ‘actors make of it’.

Since 1990, the erstwhile narrow national and primarily political and military external security concept has been widened to include also economic, social, and environmental dimensions (Buzan/Wæver/de Wilde 1998; Wæver 1995, 2008, 2008a) and deepened to include not only the nation state (‘national security’) but also other referent objects, such as human beings or humankind (‘human security’), the society (‘societal security’), the micro or macro region (‘regional security’), the international or global domain (‘international’ or ‘global security’).

Since the oil crisis of 1973, ‘energy security’, and especially the access to and supply of fossil fuels, has become a key concern of policies of governments and

international organizations (IEA, OECD, NATO, EU) alike. Not surprisingly, there is no consensus on an energy security concept, but in the opinion of this author, the aspect of risk should guide the analysis of energy security. Accordingly, ‘security’ is understood as the ‘absence of risk’ and risk as the ‘probability of an unwanted event’.³ Adopting this view, the seemingly different concepts of *energy supply security* and *energy demand security* are analytically identical. In both cases it is the minimization of risk, just the ‘unwanted events’ are – quite naturally – different, depending on the vantage point: *Energy supply security* focuses on the interest of states dependent on energy imports (chap. 23 by Jacoby), while *energy demand security* reflects the interests of energy exporting states in a stable oil or gas rent (chap. 29 by Selim/Sohar).

In 2005, during an IEA/NEA (OECD) workshop on “Security of energy supply for electricity generation”⁴, Bertel (2005: 4) saw the security of energy supply not as an academic issue but as a prerequisite:

from a decision-making viewpoint, for designing adequate policy measures to ensure security of supply and for monitoring their effectiveness. ... The notion of security of energy supply ... may be defined in a broad sense as the lack of vulnerability of national economies to volatility in volume and price of imported energy. ... Security of energy supply has economic, social, and political dimensions at the same time. Energy system analysts and economists can define the economic aspects, but the social and political dimensions are more difficult to capture. In addition, the analysis of energy system evolution shows that national policies aiming at security of energy supply have different objectives depending on the country context and global situation, and therefore follow different approaches. It is

1 The author gratefully acknowledges the contribution of Hans Günter Brauch to the conceptualization of energy security.

2 “Sicherheit”, in: *Brockhaus Enzyklopädie*, vol. 20 (Mannheim: F.A. Brockhaus, 1993): 227–229.

3 See the Oxford Dictionary at: <<http://physchem.ox.ac.uk/MSDS/glossary>>.

4 See for a documentation of this workshop at <<http://www.nea.fr/html/ndd/security/index.html>>.

generally agreed that insecurity of supply may result not only from physical disruptions, but also from increases in the prices of imported energy products. Physical disruptions may be caused by insufficient production or transport capabilities resulting from natural causes, socio-political conflicts or by abuse of market power on the part of monopolistic or oligopolistic producers. Similarly, a price increase might result from market mechanisms – demand exceeding supply – or from political decisions.

To illustrate how the concept of energy security can also be analysed from the level of the international system, of a political region (e.g. ‘European security’) of the nation state (‘national security’) but also from the perspective of the individual and social groups (‘human security’), US Senator Lugar on 13 March 2006 called for a “new realism” in US national ‘energy security’ pointing to six threats: a) vulnerability of oil supplies to natural disasters (Hurricane Katrina) and terrorist attacks, b) decline in oil and gas supplies, c) use of energy as a weapon by suppliers, d) oil as a means to prevent democratic reforms, e) the threat of climate change, and f) high costs of oil. Senator Lugar called for a shift from a narrow concept of US national energy security focused on oil at affordable prices, instead US “long-term security and prosperity require sufficient, affordable, clean, reliable, and sustainable energy”.⁵

As adopted here, these six threats describe unwanted events from the perspective of consumers. Addressing energy security from a balanced view, the perspective of demand security must be added that would include threats like a) abrupt reductions of oil and gas demand, b) use of ‘sunk costs’ as a weapon against the owners of transportation infrastructures to put pressure on energy prices, and c) energy prices too low to allow for returns on investments (in production and transportation infrastructure, for example). A global approach to increasing energy security would aim at minimizing the joint probabilities of all sides’ unwanted events.

In any case, the actors in such a global energy security management are likely to orient their assessment of the (subjective) probabilities involved in this exercise according to scenarios of future developments. Thus, energy projections have always played a major role in longer-term national security considerations (chap. 32 by Linkohr) but also in short- and me-

dium-term policy decisions of governments and international organizations (IEA, EU).

In the light of this observation, this chapter employs the concept of long-term energy security using quantitative indicators that are derived from existing long-term E3 (energy-economy-environment) scenarios. The aim is to reflect both the access to fossil fuels (‘economic security’) but also the impact of their use on the environment (‘environmental security’) and specifically on anthropogenic climate change. Using terms quoted above, these two criteria reflect ‘the availability of sufficient energy sources at affordable cost’, and we note that we explicitly include external (most importantly environmental and human health-related) cost into our consideration.

This overview will use long-term E3 scenarios from a perspective of energy security and draw conclusions for the strategic design of long-term energy supply strategies. By focusing on the long-term future excludes issues that are an issue for near-term political action, but this omission should not be seen as a failure as these issues are anyway covered elsewhere, as the issue of strategic energy reserves (chap. 23 by Jacoby) or the loss of economic output as a consequence of volatile prices (Awerbuch/Sauter 2006).

From a long-term global perspective, ‘conventional’ interruptions of energy security – such as natural catastrophes or anthropogenic interference – are only random oscillations. Thus, a long-term assessment of energy security does not focus on risks connected with random oscillations themselves but rather on the factors determining the vulnerability of energy systems to these oscillations. Linking this observation with scenarios of global energy demand and supply suggests thinking about the issue in terms of ‘potential security’⁶, of given long-term E3 scenarios rather than just ‘security’. This distinction properly accounts for the difference in temporal scope, and the notion of potential security is related to politically accepted risk connected with scenarios of global development.

One essential point of long-term scenarios – such as those prepared by IIASA and summarized in Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004) – is quantification. Accordingly, this chapter uses quantitative information (indicators) to dis-

5 See speech by Senator Lugar on 13 March 2006 at the Brookings Institution on: “U.S. Energy Security – A New Realism”, at: <<http://lugar.senate.gov/energy/press/speech/brookings.html>>.

6 To think of potential security instead of unqualified security does justice to the observation that more factors than those included here will influence the actual energy security in the course of the 21st century. At the same time it acknowledges that long-term security is more abstract than actual and near-term security.

cuss the implications of long-term E3 scenarios for energy security. For reasons of transparency, the process of selecting indicators is described by first giving a comprehensive list of indicators that were used by Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004) to characterize E3 scenarios. These indicators include

- Global and world-regional population
- Global and world-regional GDP growth
- Equity
- Primary-energy demand
- Resources-to-production ratios
- Cumulative CO₂ emissions
- Atmospheric CO₂ concentration
- SO₂ emissions
- Global temperature change 1990 to 2100

These items are all connected with IIASA's MESSAGE model⁷. Some of them are model inputs while others are model results. The causal relationships between assumptions and results are described in Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004), and in many primary publications. Here is no room for classifying these indicators as assumptions or results. Rather, the scenarios are presented as portraits of future developments without detailed explanations of the logic that led to their formulation, and only the context of those indicators is explained that were selected to best characterize energy security, that is *equity* and *resource-to-production ratios*.

In the author's judgment, these two capture important features of other important indicators included above. Definitions and a discussion of their significance for energy security follow in 24.2. Section 24.3 presents typical scenario results and discusses them from the perspective of energy security, and section 24.4 assesses the implications of energy scenarios on international, regional, national security.

24.2 Defining Two Indicators Properly

Above equity and resource-to-production ratios were presented as the preferred indicators of energy security in long-term E3 (energy-economy-environment) scenarios. It remains to motivate this choice and to give a proper definition of the indicators.

⁷ An overview description of MESSAGE is given in the appendix of Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004). A user's guide of an earlier version of MESSAGE is found in Messner/Strubegger (1995). A new user's guide is in preparation.

A *resource-to-production* (R/P) ratio is a hypothetical number measuring, for any given year and any given resource, the amount of the given resource left for consumption ('in the ground'), divided by the annual consumption in that given year.⁸ The R/P ratio is therefore expressed in years and signifies the time until the complete exhaustion of the resource. This time span is informative, but highly hypothetical because it would be quite unrealistic to assume constant future consumption and its sudden end at the same time. In general, low values of this indicator suggest a stress on resources and thus an increased risk of supply disruptions, but the indicative power of this number is also a function of the size of the denominator: A high R/P ratio can thus be the consequence of either large amounts of resources or low consumption in the year in question.

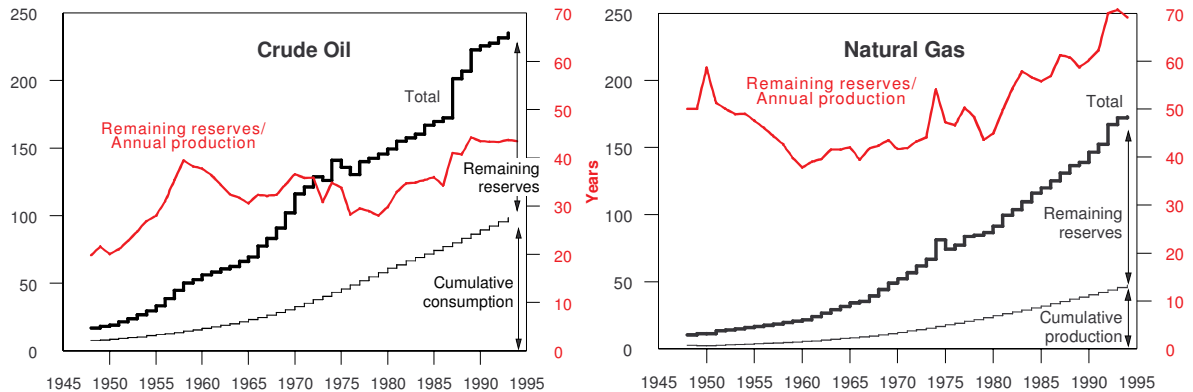
This chapter shall focus on the R/P ratios in the year 2100 for crude oil and natural gas.⁹ It is plausible to interpret higher R/P ratios as higher energy security, no matter whether the high value of this indicator is due to the large size of resources left for global consumption after the year 2100 or due to low levels of consumption in that year. If, for instance, the R/P ratio for crude oil is high due to low consumption in the year 2100, then even low amounts of remaining resources should not be considered as a major threat to energy security.

To illustrate the past behaviour of oil and gas resources, figure 24.1 depicts the development of oil and gas consumption, remaining reserves, and their

⁸ A more commonly used indicator is the reserves-to-production ratio. The difference between the two is based on the distinction between resources and reserves. According to this distinction, reserves are only that part of resources that are known to exist and that can be produced at competitive cost. When talking about a time span reaching almost a century into the future, it appears more appropriate to speak of resources instead of reserves and to think of something like 'ultimately recoverable reserves'.

⁹ We leave coal and uranium out of consideration here because coal resources are so redundant that their R/P is much less relevant than those for crude oil and natural gas. Uranium stands for resources of nuclear energy, but the size of this resource crucially depends on the technology used for its utilization. This touches on the issue of breeder reactors, which is considered outside the scope of this chapter. Let us just remark that in a scenario in which breeder reactors are considered an acceptable option for energy supply, energy security will be enhanced, although nuclear safety may become a bigger issue at the same time.

Figure 24.1: Annual Production and Known Reserves of Crude Oil and Natural Gas (1945-1995). **Source:** Nakicenovic/McDonald/Grübler (1998).



respective reserves-to-production ratios between the years 1945 and 1995. In both cases, the general trend of the reserves-to-production ratios is upwards – the consequence of rising prices and technological progress in exploration and production.

Equity was selected as the second indicator of energy security implied by long-term E3 scenarios on the basis that increased equity provides for a generally more peaceful global environment than an inequitable world. Obviously, the risk of harmful human intervention with energy supply is less of a risk in a more peaceful world. As an indicator of (intra-generational) equity we have chosen the ratio of average GDP per capita in today's developing regions and today's industrialized world regions. In 1990, this ratio was approximately six per cent. For the purposes of this chapter the *equity indicator* of a long-term E3 scenario is defined as the value of the corresponding GDP-per-capita ratio in the year 2100.

For both indicators higher values point to higher long-term potential energy security.

24.3 Typical Results of Long-Term Energy-Economy-Environment Scenarios

This section uses scenarios that were designed and published by the *Intergovernmental Panel on Climate Change* (IPCC). More precisely, all illustrative scenarios used here are included in the *Special Report on Emission Scenarios* (SRES; Nakicenovic/Swart 2000) or in the *Third Assessment Report* (TAR; Metz/Davidson/Swart/Pan 2001). The SRES scenarios were developed to represent the range of driving forces and emissions in the scenario literature so as to reflect cur-

rent understanding and knowledge about underlying uncertainties. The TAR scenarios included here were designed to analyse the consequences of imposing limits on the atmospheric concentration of greenhouse gases on selected SRES scenarios.

A detailed presentation of the IPCC scenarios is beyond the scope of this chapter, but explaining the naming convention used in the IPCC reports gives an important clue to their understanding. All scenario names include a combination of one of two letters ('A' and 'B') and one of two digits ('1' and '2'). These two pairs of identifiers characterize the scenarios along two independent dimensions. 'A' denotes a scenario world that emphasizes economic development more than the environment and 'B' the converse. The identifier '1' refers to a more globalized world whereas '2' refers to a more regionalized world. More will be said below about the characteristics of specific scenarios, but readers are referred to the original publications for more detailed descriptions.

For the assessment of the long-term *energy-economy-environment* (E3) scenarios with respect to their energy security implications, it appears useful to further distinguish the following three scenario groups: a) *sustainable-development scenarios* (24.3.1), b) *mitigation scenarios* (24.3.2); and c) *high-impact scenarios* (table 24.1).

Briefly speaking, *sustainable-development (SD) scenarios* meet a formalized set of criteria presented and discussed below; *mitigation scenarios* are the result of imposing greenhouse gas concentration limits on existing reference scenarios; and c) *high-impact scenarios* feature high environmental impact of energy conversion and use.

Table 24.1: Typology of Long-Term Energy-Economy-Environment Scenarios according to IPCC-SRES. **Source:** Nakicenovic/Swart (2000); Metz/Davidson/Swart/Pan (2001).

Types of scenarios ŷ »family of scenarios	Sustainable development scenarios	Mitigation scenarios	High-impact scenarios
SRES-B1	SRES-B1 SRES-B1G SRES-B1T	B2-550	
SRES-B2			SRES-B2
SRES-A1	SRES-A1T	A1B-500 A1C-550	SRES-A1B SRES-A1C SRES-A1G
SRES-A2		A2-550	SRES-A2

24.3.1 Sustainable Development Scenarios

24.3.1.1 Definitions

For the purpose of this chapter it suffices to use a definition of sustainable development only to the extent that it applies to long-term E3 scenarios.¹⁰ According to this definition (Klaassen/Miketa/Riahi/Schrattenholzer 2002: 553), sustainable development scenarios are defined by satisfying the following four criteria:

1. *Economic growth*, expressed in terms of GDP per capita, is sustained throughout the whole time horizon of the scenario.
2. *Socio-economic inequity* among world regions (that is, intra-generational equity), expressed as the world-regional differences of GDP (gross domestic product) per capita, is reduced significantly over the 21st century, in the sense that by 2100, the per capita income ratios between all world regions are reduced to ratios close to those prevailing between OECD countries today.
3. *Long-term environmental stress* is mitigated significantly. In particular, carbon emissions at the end of the century are approximately at or below the emissions in the year 2000. Other greenhouse gas emissions may increase, but total radiative forcing, which determines global warming, is on a path to long-term stabilization. Other long-term environmental stress to be mitigated includes impacts on land use, e. g., desertification. Short- to medium-term environmental stress (e. g., acidifica-

tion) may not exceed critical loads that threaten long-term habitat well-being.

4. The *reserves-to-production* (R/P) ratios of exhaustible primary energy carriers do not decrease substantially from today's levels. This criterion reflects the principle of inter-generational equity.

This definition is consistent with the 'Brundtland definition' according to which sustainable development means "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987: 54). At the same time it is also sufficiently quantitative to serve the purpose of classifying long-term energy-economy-environment scenarios. This means that the quantities used for the working definition are either parameters or outputs of the models used for the scenario formulation. The two indicators chosen which characterize long-term energy security in this chapter are also found among those defining sustainable development scenarios.

24.3.1.2 Characteristics of Sustainable Development Scenarios

All three scenarios¹¹ of the *SRES-B1* family (Nakicenovic/Swart 2000) belong to the group of sustainable development scenarios. In these scenarios, sustainability is achieved by assuming *service-oriented prosperity*, while taking into account *equity and environmental concerns* without policies directed at mitigating climate change. Telecommunications and

¹⁰ A precise and comprehensive general definition of sustainable development would not only be beyond the scope of this chapter but also be controversial, because several competing definitions have been proposed by different authors.

¹¹ As the focus of SRES was on greenhouse gas emissions by the energy sector, these three scenarios reflect three different energy systems (for details see: Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004) and for the IPCC-SRES see: Nakicenovic/Swart (2000)).

Table 24.2: Selected results and indicators of sustainable-development scenarios. Indicators of long-term energy security are emphasized. **Source:** Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004).

Scenario	Equity		Primary Energy Demand, EJ			Natural Gas				Crude Oil			
	1990	2100	1990	2050	2100	1990		2100		1990		2100	
						Cons	R/P	Cons	R/P	Cons	R/P	Cons	R/P
SRES-A1T	0.06	0.64	352	1213	2021	72	58	196	127	139	43	77	178
SRES-B1	0.06	0.59	352	837	755	72	58	215	49	139	43	45	55
SRES-B1G	0.06	0.60	352	911	1157	72	58	244	40	139	43	53	44
SRES-B1T	0.06	0.59	352	819	714	72	58	166	81	139	43	48	54

information technology expand rapidly, giving less developed world regions important opportunities to progress rapidly. Economic production is thus characterized by rapid ‘dematerialization’, and the introduction of clean technologies eventually leads to hydrogen-based economies in all world regions. The *B1 scenarios* describe a rapidly converging world, emphasizing *global solutions* for environmental and social sustainability, including concerted efforts aiming at rapid technology development, technology transfer, dematerialization of the economy, and improving equity (both worldwide and within regions). World population projections are low in all B1 cases. Global GDP is considerably higher than in ‘regionalized’ scenarios in the ‘SRES-2’ families (A2 and B2), the concepts of ‘green’ GDP gaining increasing importance.

The A1T scenario¹², also developed in the IPCC-SRES (Nakicenovic/Swart 2000), portrays a ‘*post-fossil*’ sustainable development future with rapid cost decreases of solar and advanced nuclear technologies¹³ on the supply side, and mini-gas turbines and fuel cells used in energy end-use applications. In contrast to the B1 scenarios, A1T is characterized by very rapid economic growth, and hence, also comparatively high energy demands. A1T assumes medium levels of availability of oil and gas. This, together with the relatively fast turnover of capital, leads to the rapid diffusion of carbon-free and advanced decentralized technologies (e.g., solar PV), particularly in the second half of the century. Selected indicators of these sustainable development scenarios are summarized in the following table 24.2.

¹² ‘T’ here stands for (advanced) technology.

¹³ Advanced nuclear power plants are defined as technologies that produce energy with higher efficiency and increased (‘inherent’) safety compared to today’s nuclear-technology standards. They are therefore assumed to be generally acceptable by the society.

Overall, the two indicators of energy security – *equity* and *resources-to-production ratios of oil and natural gas* at the end of the 21st century – show very favourable values for the sustainable development scenarios. In particular, the equity indicator expresses that the income ratio between the industrialized regions and today’s developing regions drops from a factor of 15 to less than 2, quite plausibly reducing the risk of major threats to security in general and energy security in particular.

As to the reserves-to-production ratios of oil and natural gas, the results summarized in table 24.2 illustrate that high values of this indicator can be achieved in two principal ways, that is, either by high availability or by low consumption. The high availability of natural gas reserves ensures high R/P ratios despite production that will have increased by factors between 3 and 4 in the period from 1990 to 2100. For oil, high R/P values are the result of the year 2100 production levels that have dropped significantly when compared with 1990.

The highest R/P values are found in the A1T scenario. They reflect the assessment, published by Rogner (1996), that resources of conventional and unconventional oil and gas are estimated sufficiently high so that technological progress made within the 21st century could turn these resources into reserves¹⁴.

24.3.2 CO₂ Mitigation Scenarios

24.3.2.1 Definitions

For the CO₂ mitigation scenarios included here, carbon emission constraints equivalent to climate policies that lead to a stabilization of atmospheric CO₂ concentrations at 550 ppmv were defined.¹⁵ Although

¹⁴ See Rogner (1996) for detailed characterizations of these resources.

Table 24.3: Selected results and indicators of CO₂ mitigation scenarios. Indicators of long-term energy security are emphasized. **Source:** Schrattenholzer/Miketa/Riahi/Roehrl/ Strubegger/Totschnig/Zhu (2004).

Scenario	Equity		Primary Energy Demand, EJ			Natural Gas				Crude Oil			
	1990	2100	1990	2050	2100	1990		2100		1990		2100	
						Cons	R/P	Cons	R/P	Cons	R/P	Cons	R/P
A2-550	0.06	0.23	352	959	1571	72	58	254	48	139	43	52	25
B2-550	0.06	0.33	352	881	1227	72	58	332	30	139	43	58	12
A1B-550	0.06	0.63	352	1339	2505	72	58	342	62	139	43	122	80
A1C-550	0.06	0.64	352	1269	2188	72	58	117	37	139	43	59	29

this level was chosen for illustration purposes, it should also be noted that it roughly corresponds to twice the pre-industrial concentration level of 380 ppmv. Therefore, the widely known ‘climate sensitivity’ parameter – quantifying the global temperature increase as a consequence of this doubling – directly corresponds to the value of 550 ppmv. It should also be noted that limiting CO₂ concentrations in this way gives the scenarios flexibility in space and in time, which means that, in principle, mitigation can occur at any time and in any world region depending on where and when it is the cheapest to mitigate.

Since greenhouse gas emission reductions will have significant consequences for sustainable development, the distinction between the scenarios of this group and sustainable-development scenarios may be considered fine, but it appears justified by the fact that the mitigation scenarios often include distinctly non-sustainable features. This observation suggests that sustainable development is a more general goal than climate mitigation.

24.3.2.2 Brief Characterization of CO₂ Mitigation Scenarios

For the purposes of the analysis, the quantification of CO₂ concentration constraints was the only difference between the mitigation scenario and the corresponding reference scenario.¹⁶ Although it would have been arguably plausible to also make different assumptions about technological development in a mitigation scenario, this option was not chosen so as to

study the effect of emission constraints under *ceteris paribus* conditions. Selected indicators of the CO₂ mitigation scenarios (with a constraint on atmospheric CO₂ concentrations at levels of 550 ppmv in 2100) are summarized in table 24.3.

With respect to the indicators of long-term energy security, we see here that the A2-550 and B2-550 scenarios show a comparatively poor performance with respect to equity. This, however, has nothing to do with the imposed concentration limits. Rather, it simply mirrors the indicators of the corresponding reference scenarios and the general design feature, mentioned above, that the ‘SRES-2’ family features less globalization and less economic growth than the scenarios in the ‘SRES-1’ family. The reserves-to-production ratios for natural gas could be considered satisfactory. For oil, the values of this indicator appear less comforting, particularly in the B2-550 scenario. However, as the A1B-550 scenario shows, long-term energy security can be high also in a scenario that does not belong to the group of sustainable development scenarios.¹⁷

24.3.3 High-Impact Scenarios

This group comprises all scenarios that cannot be categorized in the other two groups. It is also the biggest group of scenarios included here. In contrast to sustainable-development and CO₂ mitigation scenarios, which have distinctive normative elements, the high-impact scenarios are, in general, more descriptive than prescriptive (that is, normative). Many of them can be considered as ‘*dynamics as usual*’ scenarios. In other words, no new major global efforts to

15 The Third Assessment Report of the IPCC (Metz/Davidson/Swart/Pan, 2001) also reports scenarios with concentration limits of 450, 650, and 750 ppmv respectively.

16 Accordingly, the name of the mitigation scenario is the name of the corresponding reference scenario, extended by a suffix identifying the concentration limit included.

17 See Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004) for a more detailed discussion of the difference between greenhouse gas abatement and sustainable-development scenarios.

achieve climate stabilization or sustainable development are assumed. As a technical characterization, it can be said that scenarios in this group are often used to quantify baselines relative to which the difference – expressed in terms of cost and benefits – between increased efforts and reference policies is quantified. As a result of this categorization, scenarios in this group feature the highest greenhouse gas emissions.

24.3.3.1 Brief Characterization of High-impact Scenarios

The SRES-A1 family contributes three scenarios to this group. Like the sustainable development scenario of this family (A1T, see the characterization above), the high-impact scenarios are characterized by *very* rapid economic growth¹⁸, combined with low population growth (according to Lutz/Sanderson/Scherbov 1996: 361 and Lutz/Sanderson/Scherbov 1997: 803). World-regional average incomes per capita converge to the extent that ‘poor’ countries virtually disappear. The A1 world exhibits much higher energy demands, a consequence of assumed lower energy prices. Also, the higher incomes assumed for A1 encourage comfortable and convenient (often energy-intensive) lifestyles.

The SRES-A2 scenario foresees future developments toward a very heterogeneous (regionalized) world, characterized by high population growth in the developing regions, self-reliance of world regions in terms of resources, and less emphasis on economic, social, and cultural interactions between world regions. Eventually, the world ‘consolidates’ into a series of economic trade blocks. Compared to the other scenarios in this high-impact group, A2 is characterized by relatively slow capital stock turnover, slower technological change, and a more slowly narrowing income gap between today’s industrialized and developing countries. High-income but resource-poor regions shift toward advanced post-fossil technologies, while low-income resource-rich regions generally rely on traditional fossil technologies. This leads to steadily increasing levels of GHG emissions, with CO₂ emissions approaching 28 GtC in 2100. For comparison, global GHG emissions in the year 1990 were approximately 6 GtC.

The SRES-B2 scenario world is one of high concern for environmental and social sustainability. In contrast to the sustainable development in the B1 scenario family however, inter-national institutions decline in importance, with a shift toward local and regional decision-making structures and institutions, which favours local and regional pollution control. In the B2 world, most of the world’s economic growth takes place in today’s developing countries but leads only to a moderate convergence in productivity and income levels over world regions. In terms of population, technological change and energy use, B2 is clearly a *dynamics-as-usual* scenario. Population follows historical trends (including recent faster-than-expected-earlier fertility declines) toward a completion of the demographic transition within the next century (UN 1998). Between 1990 and 2100, global primary-energy demands increase by a factor of four, mainly due to demand increases in today’s developing regions. However, contributions to supply increase significantly for some energy carriers, in particular wind power generation and solar photovoltaic, but also for gas combined-cycle power plants, integrated gasification combined-cycle (IGCC), solar thermal power plants, and advanced nuclear power plants.¹⁹ Global GHG emissions in B2 increase approximately along a straight line with CO₂ emissions reaching 14 GtC by 2100. Selected indicators of these high-impact scenarios are summarized in table 24.4.

From the inclusive definition of high-impact scenarios one might expect that indicators might cover a wide range of values. As far as the unfavourable side (the low end) of the indicators is concerned, however, we do not find any values that are lower than those we have already seen in the other two groups of scenarios described above. On the favourable side (the high end), we find R/P ratios (for oil in SRES-A2 and for natural gas in SRES-A1G) that are higher than any of the according values above, but they appear in a range where their magnitude is anyway beyond critical values for energy security.

24.4 General Conclusions and Policy Implications

Looking at these results from the perspective of energy security it should be noted that typical long-term

18 In the A1 scenarios, the global economy is projected to grow at an average annual rate of 3 per cent to 2100, which corresponds to a replication, in today’s developing countries, of the post-World War II growth of Japan and South Korea.

19 The same safety features of nuclear technologies as in the sustainable development scenarios are assumed here.

Table 24.4: Selected results and indicators of high-impact scenarios. Indicators of long-term energy security are emphasized. **Source:** Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004).

Scenario	Equity		Primary Energy Demand, EJ			Natural Gas				Crude Oil			
	1990	2100	1990	2050	2100	1990		2100		1990		2100	
						Cons	R/P	Cons	R/P	Cons	R/P	Cons	R/P
SRES-A2	0.06	0.24	352	1014	1921	72	58	289	92	139	43	47	330
SRES-B2	0.06	0.33	352	869	1357	72	58	337	38	139	43	52	38
SRES-A1B	0.06	0.64	352	1422	2681	72	58	250	49	139	43	138	65
SRES-A1C	0.06	0.64	352	1377	2325	72	58	118	24	139	43	56	37
SRES-A1G	0.06	0.64	352	1495	2737	72	58	1241	629	139	43	391	59

E3 scenarios are built with a positive attitude in the sense that catastrophic scenarios are left out of consideration. This may lack the spirit of risk analysis, but we think that it is justified on several grounds. First, analytically, scenarios featuring catastrophes would be too trivial to produce interesting or non-expected results. Secondly, when looking at the future as an opportunity for constructive planning, it appears obvious to focus on catastrophe-free global developments.

Drawing policy conclusions based on long-term analyses must be different from those based on an analysis of immediate consequences of policy action aimed at immediate effects. The simple reason is that aiming at a situation occurring decades away in the future requires the following of a decision *style* rather than simply implementing decisions on one or the other project. Accordingly, we propose to think of ‘potential security’ of long-term E3 (*energy-economy-environment*) scenarios rather than of an actual degree of security in a given situation, which would anyway be difficult to predict for any given future point in time.

As indicators of such a potential energy security we have proposed (1) resource-to-production ratios, in the year 2100, of crude oil and natural gas, and (2) an indicator of equity. These indicators were chosen from a larger set of indicators that were, in many reports, designed to characterize driving forces and results of long-term E3 scenarios. It should not come as a surprise that the indicators chosen for the quantification of an energy security potential coincide with two of four criteria proposed in an IIASA paper (Klaassen/Miketa/Riahi/Schrattenholzer 2002: 553) to define sustainable-development E3 scenarios. We can therefore note immediately that, accordingly, pursuing long-term energy security pursues sustainable development at the same time. In other words, a truly sustainable energy supply system minimizes the risk of

a dangerous exhaustion of energy resources and thus contributes in a major way to energy security.

The general policy conclusion therefore is that a decision-making style that favours sustainable development overlaps considerably with one that aims at energy security in an isolated way. In more concrete terms, drawing conclusions from the importance of equity for long-term energy security suggests that policies aiming at a more equitable world will increase the energy security potential while contributing to sustainable development at the same time. The results of the long-term E3 scenarios summarized here suggest that the converse is not necessarily true, that is, equity – and, thereby, energy security – can thrive in a world that need not be on a sustainable development E3 path. The SRES-A1C scenario, which scores high on the ‘equity’ indicator but low on environmental sustainability, can serve as an example for this combination.

It must be noted that of course, equity is a normative input to the formulation of scenarios, and not a result. Its use as an indicator (of long-term energy security and sustainable development alike) could therefore be regarded to have some flavour of a truism. While this observation may limit the usefulness of this indicator as policy guidance, it was judged that nonetheless, it is useful also to policymakers to include equity as an important characterization of sustainable-development scenarios, which, as it is argued, suggests high long-term energy security.

The policy implications from analysing the second indicator of long-term energy security – resources-to-production (R/P) ratios of oil and natural gas – appear less trivial. The policy recommendations based on the analysis of scenarios with high R/P ratios (implying high potential long-term energy security) refers to the well-known dual character of technology as a problem and its solution at the same time. Taking the

SRES-A1T scenario - which was considered one of the most attractive sustainable development scenarios and therefore discussed in detail in Schrattenholzer/Miketa/Riahi/Roehrl/Strubegger/Totschnig/Zhu (2004) - as an illustration, we can see how technological progress, driven by a global dedication to environmentally compatible E3 systems, results in a sustainable-development E3 scenario that needs no further policy constraints for its realization. Using a well-known metaphor, A1T could be seen as a sustainable-development scenario that is mostly realized by the 'carrots' of successful technology policy without having to resort to the 'sticks' of stringent environmental legislation. The same general conclusion thus holds for pursuing long-term energy security.

25 Projections of Fossil Energy Reserves and Supply until 2050 (2100): Implications for Longer-term Energy Supply Security

Werner Zittel and Joerg Schindler

25.1 Introduction

Conditions of the world's oil supply have entered into a new phase: increasing demand pressure, worries about the security of supply in important oil producing countries, speculative factors, but particularly, clear indications that limitations on the supply side have caused unexpected and high price increases. This chapter argues that the world oil production is nearing its peak. Since crude oil is presently the most important primary energy source, this will have great implications on the availability of energy sources in the coming decades. The situation with natural gas is not much better and thus natural gas is no substitute for a declining oil supply. Based on these analyses (Schindler/Zittel 2000; Zittel/Schindler 2005) *fossil fuel supply scenarios* for the coming decades are sketched (Schindler/Zittel 2006). According to these scenarios the availability of fossil fuels is reaching its limit and an overall decline is highly probable.

Energy supply is not primarily a regional or political question which can be analysed as 'access to resources', rather the finiteness of fossil resources will unfold in the coming decades. A possible solution is an intensive use of renewable energy sources which could grow much faster than generally assumed. This will also be outlined in a rough scenario. But even in the best case this will not be sufficient to compensate for the fossil gap. This is true for the next few decades but potentially less problematic later on. The world is entering a transition phase from a fossil energy world to a post-fossil - renewable - future. But it is unlikely that this transition will be easy or smooth.

After peak oil and peak gas the supply of oil and gas will be physically constrained and will decrease over time. In a very basic sense the supply of vital energy sources is not secured anymore. As a consequence the competition for the remaining resources will intensify. Will this competition then follow other rules than is done today? Today the distribution and

use of oil and gas is determined by market forces, i.e. the ability and willingness to pay.

Will the distribution after peak be determined to a significant degree by military force and is it conceivable that this will 'work'? The 'success' of the military option is very doubtful for a number of reasons. One consequence would be the further growth of terrorism which would further decrease the supply (as can be seen in Iraq). Another consequence would be the repercussions on energy markets which are not predictable and might lead to severe economic disruptions endangering free trade. A final question may be appropriate: Would the supply and distribution of oil from the Middle East be different if the USA were not engaged militarily in the region?

The chapter analyses the empirical evidence of the imminent peak oil production and the subsequent declining supply (25.2), reviews the probable future natural gas supply (25.3), and discusses the future supply potential of coal, nuclear and renewable energy technologies (25.4). Then a scenario is offered for the future most probable energy supply (25.5) that is not intended to provide exact numbers, but to sketch the major trends and challenges arising over the next decades (25.6).

25.2 Oil Supply

25.2.1 General Pattern of Oil Production

The different phases of oil production can be described as follows: In the early phase of the search for oil, the easily accessible oil fields are found and developed. With increasing experience new oil fields are detected more systematically. This leads to a boom where ever more new fields are developed, initially in the primary regions, later on all over the world. Those regions which are more difficult to access are explored and developed only when sufficient new oil

cannot be found anymore in the easily accessible regions. As oil prospecting is linked to production, in general shortly after the discovery of new fields their development will begin. With increasing production the pressure of an oilfield diminishes and the water levels rise, and after some time the production rate begins declining. This trend can be controlled to a certain extent and the decline in production can be delayed or reduced: by injecting gas or water into the reservoir in order to increase the pressure, by heating the oil, or by injecting chemicals in order to reduce the viscosity of the oil.

In every oil province the big fields will be developed first and only afterwards the smaller ones. Once the first big fields of a region have passed their production peak, an increasing number of new and generally smaller fields must be developed to compensate the decline of the production base. Then it becomes increasingly difficult to sustain the rate of production growth. A race begins which can be described as follows: More and more large oilfields show declining production rates. The resulting gap must be filled by a larger number of smaller fields which reach their peak much faster and then contribute to the overall production decline. Thus, the region's production profile resulting from the aggregation of the production profiles of the individual fields becomes more and more 'skewed', the aggregate decline of the producing fields becomes steeper and steeper. This decline must be compensated for by a faster connection of more and more ever smaller fields.

The production pattern of an oil province over time can be characterized as follows: To increase the oil supply will become more and more difficult, the growth rate will decline and costs will rise until a point is reached where the industry is unable to bring into production a sufficient number of new fields fast enough. Then, production will stagnate temporarily and eventually start to decline. This pattern can be observed in many oil provinces. Sometimes this general pattern was not followed: either because the timely development of a 'favourable' region was not possible for political reasons, or because of huge surplus capacities so that production was held back for a longer time period. But the more existing spare capacities are reduced, the closer the production profile will follow the described pattern.

In the history of oil production, for more than 150 years, some fundamental trends can be identified (Campbell/Laherrere 1995; Deffeyes 2001; Campbell/Liesenborghs/Schindler/Zittel 2002):

- The world's largest oilfields were all discovered more than 50 years ago.
- Since the 1960's annual oil discoveries had a declining tendency.
- Since 1980 annual consumption has exceeded new annual discoveries.
- Until now more than 42,000 oilfields have been found, but the 400 largest (1 per cent) contain more than 75 per cent of all oil ever discovered.
- The historical maximum of oil discoveries reaches after some time a maximum of oil production ('peak').

How near is the peak? How steep is the decline after the peak? These are crucial remaining questions for the discussion of major oil producing regions of the world.

25.2.2 Countries outside OPEC and the Former Soviet Union (FSU)

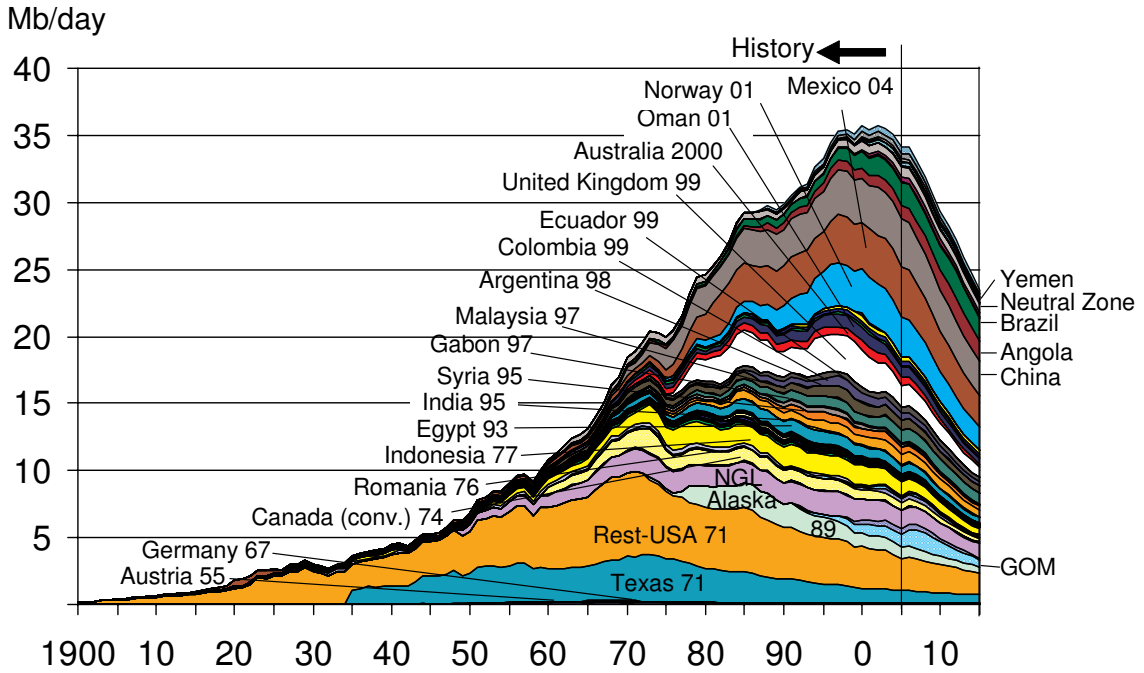
Globally the development of different oil regions occurred at different times and at varying speeds. Now, production regions in different development stages can be identified and the above patterns can be exemplified by empirically validating the concept. Nearly all major movements in the oil markets over the last eight years can be explained well with this pattern, while other attempts to explain the changing situation over the last years had to refer to 'unexpected market changes', 'speculation', 'unforeseen growth of consumption', etc.

Total production of the countries outside of the *Former Soviet Union (FSU)* and *Organization of Petroleum Exporting Countries (OPEC)* increased until the year 2000, but since then total production has been declining. A detailed analysis of the individual countries within this group shows that most of them have already reached their production peaks, and that only a very limited number of countries will still be able to expand production, particularly Brazil and Angola.

Responsible for the stagnation of oil production in this group of countries was the peaking of oil production in the North Sea, which occurred in 2000 (in 1999 in Great Britain, in 2001 in Norway).¹ Outside the OPEC and Former Soviet Union (FSU) countries, onshore oil production had reached a plateau much earlier, and has been declining since the mid-1990's.

1 Werner Zittel: "Analysis of UK Oil Production", February 2001, at: <www.peakoil.net> and <www.energiekrise.de>.

Figure 25.1: Oil production of countries/regions outside OPEC and FSU (Denmark, UK, Canada, Norway, Alaska, USA, Mexico, Brazil, Argentina). Estimates for 2005 based on government statistics for January–November, analysis and projection by LBST. **Source:** IHS (2003); BP St. Rev. (2005).



This decline could be balanced by the fast development of offshore fields which now account for almost 50 per cent of the production of all countries in this group. The North Sea alone has a share of almost 40 per cent of the total offshore production within this group. The peaking of the North Sea was decisive because the following production decline could not be overcompensated anymore by a timely connection of new fields in the remaining regions – it was only possible to hold the plateau for a few years.²

Crucial for the further development was the production peak of Cantarell in Mexico, the world’s biggest offshore field. This field, discovered in 1978, still contributes more than half of the Mexican oil production. It reached a plateau for some years and started to decline in 2005. Also the quality of the oil produced in Mexico has degraded steadily. Today, the share of light oil has halved since 1997.

The example of Indonesia is of particular interest, the only OPEC member which is included in this group of countries, because in March 2004 for the first time more oil was imported in this country. Oil production in regions having passed their peak can be forecasted with some certainty for the next 10 years.

If it is assumed that the remaining regions with growth potential (Angola, Brazil, Gulf of Mexico) will considerably expand their production by 2015 (based on optimistic forecasts of companies operating in these regions), but total oil production of these countries will decline by 10–15 Mb/day by 2015.

As the production of conventional oil is declining, these countries (figure 25.1) will supply additional amounts only from non-conventional sources. Non-conventional oil sands in Canada and heavy oil in Venezuela will contribute 3–4 Mb/day in 2015, provided that the already announced expansion plans will be realized without any further delay.

25.2.3 Former Soviet Union (FSU)

Oil production in the Former Soviet Union peaked at a production rate of more than 12 Mb/day at the end of the eighties. Soon afterwards production collapsed by almost 50 per cent within 5 years. The production peak at the end of the eighties had been forecasted by western geologists based on the depletion patterns of the largest oilfields (Masters/Root/Attanasi 1990). However, the following production collapse during the economic breakdown was much steeper than expected. After the liberalization of the oil market, Russian companies were able to stop this decline and to

2 This analysis is based on the database PEPS from IHS-Energy, edition 2003.

increase production levels again – at double-digit rates between 2000 and 2001 – with the help of international cooperation and investments. However, this fast recovery has now come to an end as the easily accessible fields have been developed and the financial and technological backlog is widely closed. The strong growth rates of Russian production in recent years have contributed by compensating for the inescapable production decline in other regions of the world. But the growth of Russian production is now coming to an end.

The two other important oil regions of the Former Soviet Union are Azerbaijan and Kazakhstan. Azerbaijan is the oldest industrial oil region of the world. Its highest production rates were reached in the 1960's. Now an expansion of production can only be expected offshore. Here the field complex Azeri-Chirag-Guneshli must be mentioned. Once fully developed, this field will probably reach its maximum by 2008 or 2009, with a production rate of 1 Mb/day. Soon thereafter the production rate will decline very fast to negligible amounts within 10 to 15 years. But the total production of this region will increase by a smaller amount as 150.000 bbl/day are already produced from Azeri-Chirag-Guneshli today, and as the production from other fields will drop noticeably in coming years.³ For several years Kazakhstan was considered as a potential counterbalance to Saudi Arabia. But these hopes were exaggerated. They were nurtured by speculations of the US Environment Information Agency (EIA) which expected oil and gas reserves around the Caspian Sea amounting up to 300 Gb of oil equivalent. But only about 45 Gb of oil are likely, about half of this amount is located in already developed fields. Azerbaijan and Kazakhstan will at best be able to increase their production rate by 2015 – from 1.6 to 3.0 Mb/day – but more seems unrealistic.

According to this assessment, the whole region may be able to increase its production in the coming years, but the very big expansion expected by some experts will not occur. A total production increase of 2–3 Mb/day is probably already on the high side.

25.2.4 OPEC Member Countries

The expected production decline in the above group of countries is partly offset by a possible expansion in Russia and in the Caspian Sea. But there still remains a gap of 5–10 Mb/day which must be closed to keep world oil production constant until 2015. Only the OPEC member countries may fill this gap. If the world oil consumption grows further, these additional amounts must also come from OPEC. According to conventional wisdom this will easily be possible for OPEC. But a production growth of 5–10 Mb/day within ten years constitutes a problem. Particularly as it is widely accepted that, apart from Iraq which cannot be considered to be a reliable oil producer for the time being, only Saudi Arabia will be able to increase its oil production significantly. This would require an expansion of at least 50 per cent of the Saudi Arabian oil production within very few years. This is a very ambitious goal, even for a country with an abundance of oil.

Moreover, in recent years the suspicion has grown that conditions for oil production in Saudi Arabia are not as favourable anymore and are getting more difficult. For the future production potential of Saudi Arabia, Ghawar, the world's biggest oilfield, plays a key role. This field was discovered in 1948 and has now been producing oil for more than 50 years. Meanwhile, more water is pumped into the field than oil is extracted, and it is possible that the production rate will decline in the near future. It is certain that Ghawar cannot contribute to an expansion of the Saudi Arabian production.⁴

Based on a comprehensive in-depth analysis of technical papers in the public domain addressing the problems of oil production in Saudi Arabia, and on a great number of interviews with engineers working on site, and also a visit of the oil fields in Saudi Arabia, Matthew Simmons (2004), an American investment banker (Simmons 2004), launched a debate whether Saudi Arabia will be able to increase its production significantly. If one applies the same criteria which are common practice in Western companies, then Saudi Aramco's allegation for proven reserves should be reduced by 50 per cent.⁵

3 AIOC (abbreviation) needs to increase investment in Azeri-Chirag-Guneshli oilfields. Alexander's Oil & Gas Connections, Company News: Central Asia, 28 August 2002.

4 For details see in: ASPO Newsletter, No. 40, April 2004; at: <www.peakoil.ie>.

5 Sadad al-Husseini, Saudi Aramco: "At the current depletion rate of 3 billion bbl/y, which represents 2.3 per cent of the remaining 130 billion bbl of proven developed reserves ..." quoted in: Aleklett (2004).

Table 25.1: Remaining proven oil reserves for 'ME Five', according to major estimates. **Sources:** [1] O&GJ, 19 December 2005 (for 1 January 2006); [2] BP, June 2005 (until end of 2004); [3] ASPO Newsletter, 62 (February 2006); [4] Bakhtiari (February 2006).

Country	Oil & Gas Journal [1]	BP Statistical Review [2]	Colin Campbell [3]	Bakhtiari [4]
Iran	132.5	132.5	69.0	35-45
Iraq	115.0	115.0	61.0	80 - 100
Kuwait	101.5	99.0	54.0	45 - 55
Saudi Arabia	264.3	262.7	159.0	120 - 140
UAE	97.7	97.8	44.0	40 - 50
TOTAL:	711.0	707.0	387.0	320 - 390

The problem of assessing the realistic reserves of the Middle Eastern (ME) oil producing countries is reflected in table 25.1. While O&GJ and BP mainly rely on published 'official' figures (which are often inflated), Campbell and Bakhtiari are based on detailed evidence (see: *ASPO Newsletter*, 63, March 2006). Bakhtiari is from Tehran and is one of the most reliable experts on ME oil reserves.

The analyses of Simmons and others argue that Saudi Arabia's potential to increase production will soon reach its limits. Also the potential of other ME countries is smaller than commonly assumed. The world is nearing the moment of truth.

25.2.5 World Oil Production Is Approaching Its Peak

The IEA (2005d) has published its latest scenario in '*World Energy Outlook 2005*'. In this scenario world oil production is projected to rise to 120 Mb/day by 2030. This is quite implausible as already today most world regions have either reached or passed their production peak. Once more and more regions shift from growing to declining production, it is getting increasingly difficult for the fewer remaining countries to compensate for this decline, let alone to add to total production. During the last 50 years the world has managed to increase global production per year from 5 Gb, by 25 Gb, to about 30 Gb. In half of this period it is assumed to be possible to increase yearly production by another 15 Gb! This is incredible due to the irreversible decline in major producing regions and a rate of new discoveries falling behind the production rate by a factor of about five. Given the remaining production potentials it is more likely that global oil production will never be able to exceed the 30 Gb level significantly, and only for a few years.

The German federal agency for earth sciences and raw materials (Bundesanstalt für Geowissenschaften

und Rohstoffe 2003; 104) has criticized the scenarios of the IEA and concluded: "The forecasts of EIA and IEA assume a continuous growth in oil consumption, without assessing sufficiently the real supply of oil and the production potential." In order to illustrate the possible availability of crude oil in coming decades two oil supply scenarios are defined:

- The 'high fossil' scenario is based on the ASPO production profile with a peak before 2010 and a moderate decline rate of 2–3 per cent per year.⁶
- The 'low fossil' scenario is based on the fears that future global decline rates will be higher than in the old mature oil regions (e.g. decline rates in Alaska and the UK are 5 to 10 per cent vs. 3 per cent in the 'lower 48' states of the USA). Accordingly, after peak in 2008 and plateau until 2010, a decline rate of 5 per cent per year is assumed between 2010–2020, of 3 per cent between 2020–2040, of 2 per cent until 2050, and of 1 per cent thereafter.

25.3 Natural Gas

Presently the world consumes two thirds as much gas as it does oil. But the substitution of declining oil supplies by natural gas would result in a drastic increase of gas consumption. Natural gas reserves and production rates can be analysed similar to oil. This leads to an estimate of possible future gas production rates and the probable timing of the peak gas supply. The main conclusion of this analysis is that the world's natural gas supply might peak about 20 years from now. If the production is increased at a faster rate, or future discoveries and stated 'proved' reserves are smaller than assumed in this analysis, the peak might

6 C. Campbell (2005) in: Association for the Study of Peak Oil, see at: <www.peakoil.ie>.

come earlier. If production is increased at a slower rate, then a few years would be saved until the inevitable start of decline.

This global 'top-down' analysis is somewhat theoretical because - unlike oil - natural gas is supplied and consumed in regional markets. Only 7 per cent of the total natural gas supply is globally traded in form of LNG. Production in these regional markets is determined by differing and specific supply conditions which are not correlated. Individual regional markets are better described with 'bottom-up' analyses of producing fields, ranking of fields by size, and their status of depletion. A full analysis must be included in the evaluation and interpretation of regional creaming curves of past discoveries (time series of the success ratio of exploration drillings). These analyses were published elsewhere (Schmidt/Weindorf/Wurster/Zereta/Zittel 2005).

At present, North America is the largest regional market with an annual volume of about 780 billion m³, amounting to almost one third of the world market. This market has already experienced its production maximum in the early 1970's, followed by a second smaller peak in 2001. But also in Europe, the second largest gas market, further expansion of consumption is getting more and more difficult as aggregate domestic supplies already have passed their peak. For example, UK gas production started to decline in 2001.

25.3.1 'Top-down' Scenario of the Global Availability of Natural Gas

Annual discoveries peaked around 1970 and are slightly declining since then (IHS 2005). In contrast, annual consumption is still rising and has already exceeded annual discoveries for several years (IHS 2005). Extrapolating the declining rate of new discoveries results in the assumption that a total of about 12,000 Tcf (~ 325,000 billion m³) might be discovered until 2100. Proven gas reserves are comparable in size to proven oil reserves (~ 160 Gtoe), but the already produced share is smaller (one third for gas against half for oil). Therefore the global production peak can be expected to happen later than for oil. A rough 'top-down' approach suggests that gas production will peak around 2025.

A bell-shaped production profile which fits the historical production pattern until 2004 and assumes the estimated total of 12,000 Tcf, results in a smoothly diminishing annual production growth rate which currently is at 2.5 per cent, and is projected to be at 1.9

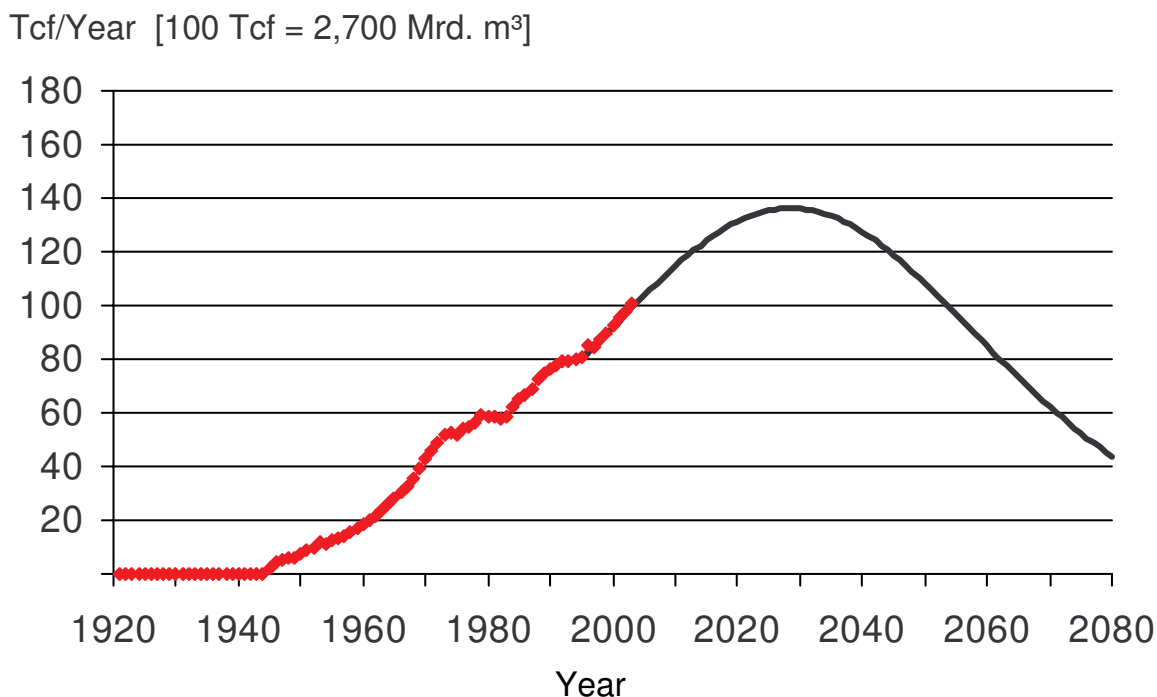
per cent in 2010. If future growth rates are larger, the expected production peak would happen sooner, and vice versa. This extrapolation assumes that about 75 per cent of world gas reserves have already been discovered (compared to 90 per cent for oil). Future reserve reassessments and upward revisions of (older) already producing gas fields will only marginally influence this pattern, as they usually do not result in changes of the production profile of these fields (Laherrere 2006).

This 'top-down' analysis does not take into account the different quality of the gas fields. Especially it does not reflect the 'stranded gas' situated far away of existing transport infrastructures, or for low quality gas with a high content of CO₂ or SO₂. Stranded gas is presently not used for economic reasons. However, this could change with increasing gas prices. But this would also imply much higher costs for the development of these fields and for the conditioning of the produced gas, especially in case of liquefaction or upgrading into other liquid hydrocarbon fuels. The conditioning, transport, and upgrading of this gas would consume between 20-50 per cent of its energy content, depending on whether the gas is liquefied or transformed into synthetic crude oil, ammonia, methanol or hydrogen. This conditioning would reduce available gas reserves accordingly.

These additional problems and the lead times for the construction of the necessary infrastructure make it probable that the calculated production rate in this scenario provides an upper (optimistic) limit for the gas extraction curve shown in figure 25.2. Probably the peak will be sooner followed by a plateau lasting several years.

Natural gas liquefies at temperatures of below -160° C. At ambient conditions it is gaseous and can be transported best in pipelines. Therefore pipelines are the backbone of the established gas markets which have developed over time, connecting the major consumers with their supply regions. This regionalization is the main difference to crude oil. Oil can be transported very easily, which helps to equalize regional imbalances. The importance of the pipeline infrastructure leading to separate regional markets makes it questionable whether the above sketched 'top-down' approach provides the basis for a meaningful interpretation. Probably this scenario will never be realized. Regional supply scenarios are more important as they reflect regional supply problems. Though liquefaction is possible and will be expanded in the future, a much higher effort is necessary regarding energy, materials, investments, and lead times.

Figure 25.2: Annual gas production 1920-2004 and extrapolation based on a bell-shaped profile and an estimated ultimate recovery of 12,000 Tcf. Currently 3,000 Tcf have been consumed and proven reserves are at 6,300 Tcf. **Source:** History: IHS Energy (2005); projection: LBST (Schindler/Zittel 2006).



Below, the most important regional markets are sketched. North America and Europe together produce about 45 per cent and consume about 55 per cent of the world's gas. In both markets the supply situation has dramatically deteriorated during the last few years, coming as a complete surprise for economically oriented gas market analysts. The analysis of these regional markets provides a better understanding of possible future supply restrictions than the optimistic 'top-down' approach sketched above.

25.3.2 'Bottom-up' Scenario of the Global Availability of Natural Gas

25.3.2.1 North America

In North America natural gas has been used almost as long as oil. The natural gas market grew in parallel with oil production. Production and consumer regions are distributed all over North America. Natural gas production peaked in the US in 1972, and rapidly declined thereafter. But more wells were drilled in mature and new areas, with a doubling of active wells from 200,000 in 1985 to more than 405,000 in 2005, thus reversing the decline after 1985. But, since the mid 1990's this second production increase came to a halt, only the imports from Canada still grew. In 2001

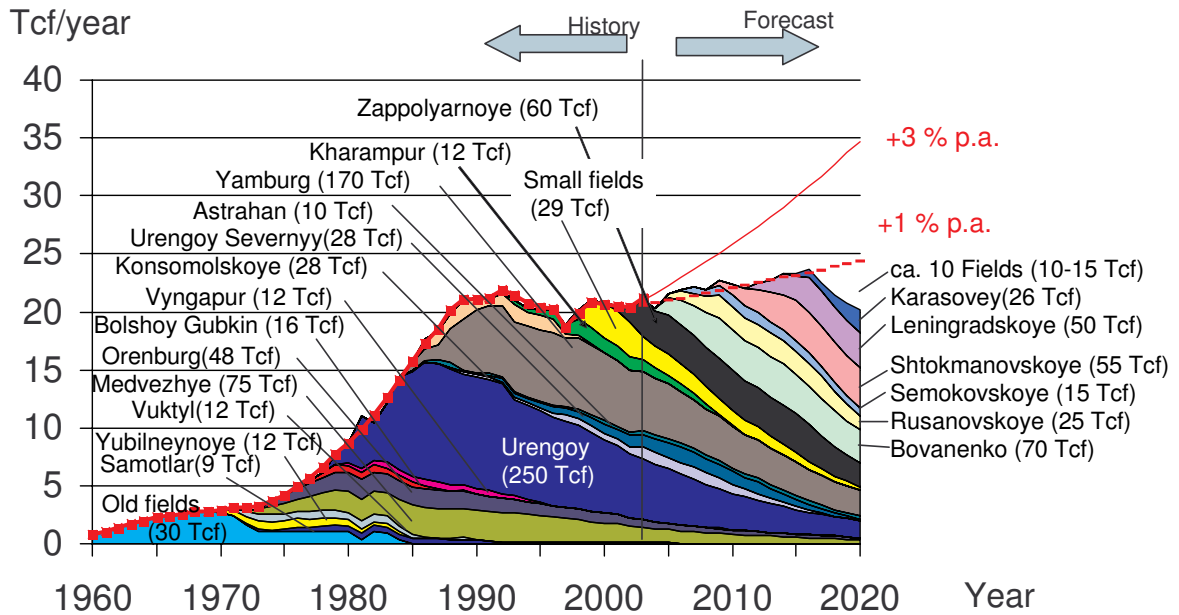
the production in North America passed its peak and entered the decline phase.⁷ The declining domestic oil and gas production in combination with limited import capacities (new LNG terminals are planned but have long lead times to construct) probably will increase future supply problems. For many market observers and politicians an energy crisis looms over the horizon, with grave consequences for North American energy markets, the whole economy, and for other regions as well.

25.3.2.2 The United Kingdom

As newly developed fields cannot compensate for the decline of the base production, the UK gas production is in decline since 2001, and has already dropped by 20 per cent. Since new field developments are rare, the future production profile can be estimated with a high level of confidence. Until 2010 the total production will be 50 per cent below the level of 2000, and until 2015 another 30–50 per cent below the level of 2010, depending on the success of finding new fields. Very soon the gas supply of the UK will depend on imported natural gas. A large expansion of import ca-

⁷ US Department of Energy, Energy Information Agency, see statistics; at: <www.eia.doe.gov>.

Figure 25.3: Gas production forecast for Russia. **Source:** Laherrere (2003); LBST estimate (2004).



capacities must be provided with new LNG terminals. The oil and gas supply of the UK should be seen as a warning which demonstrates how soon the days of surplus production of oil and gas with their corresponding high export revenues can be followed by steadily rising imports.

25.3.2.3 Europe

Europe has passed its gas production peak. Even a 50 per cent increase of the Norwegian gas production cannot stop the overall decline. Europe is in need of rapidly rising imports from Russia, North Africa, or other parts of the world. According to this analysis, gas imports must rise at an annual rate of 5 per cent until 2020, just to keep the supply base flat. Future demand growth would require even higher rates. Even this zero growth scenario requires the construction and operation of about 4–5 new pipelines with a net import capacity of about 30 billion m³/year until 2020.

25.3.2.4 Russia

The required additional amounts of gas cannot come from Russia as the three largest fields (Urengoy, Yamburg and Medvezhye) – containing about one third of the discovered gas – are already in decline.⁸ It is very

questionable whether Russian gas production can still be expanded for a longer time period, based on a field by field analysis of Russian gas production since 1960 and a forecast until 2020.⁹ This forecast is based on already known but not yet developed fields and supposes a hypothetical time schedule for their development (figure 25.3).

The analysis leads to the conclusion that probably an annual production increase of 1 per cent can still be realized in the next 10 to 15 years. However, this requires a timely development of new fields. These fields are situated further north (Barents Sea, Kara Sea) or further east; their development will be much more time consuming and much more expensive than the development of the already producing fields. It is uncertain how much of this gas will be available for export to Europe, as Russian domestic consumption is expected to rise and East Asian countries (China, Korea, Japan) as well as North America will compete for imports.

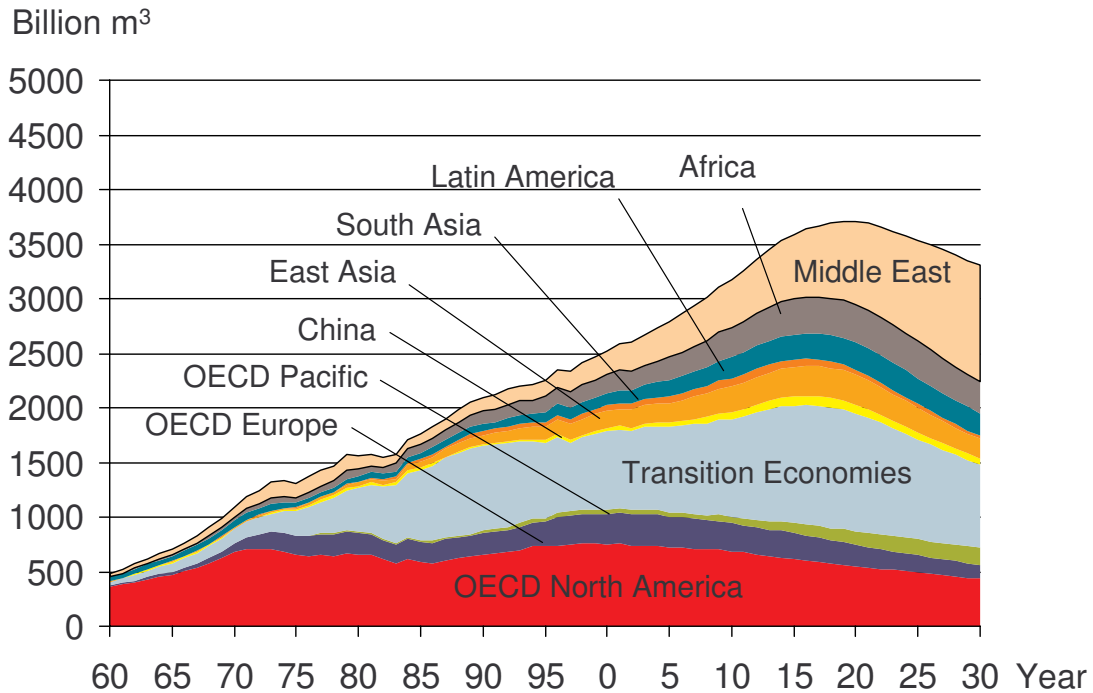
25.3.2.5 Global Analysis

Performing such an analysis for all gas producing countries leads to the conclusion that probably worldwide gas production will peak when Russian gas pro-

⁸ Analysis of field production profiles by Jean Laherrere. The data are taken from Petroleum Exploration and Production Statistics (PEPS) from IHS – Energy, 2004.

⁹ Own analysis extrapolating the historical production data from IHS-Energy and adapting total production volume to the field size as provided in: IHS-Energy: *The World's Gas Potential 1995* (Campbell/Laherrere 1995).

Figure 25.4: Worldwide Gas production According to LBST Scenario Calculations. **Source:** IHS Energy (2005); BP Statistical Review of Energy (2005); Projection: LBST (2005).



duction peaks. Though some world regions will still expand their production beyond 2020 (e.g. Qatar and possibly Iran), the decline in North America and Russia probably cannot be compensated. A probable scenario for the global gas production until 2030 is shown in the figure. The graph shows the production volume of each major region (figure 25.4).

For the formulation of global energy scenarios two alternative global gas production scenarios are used:

- The first is the future gas production according to the Association for the Study of Peak Oil. It exhibits a production plateau between 2015 and 2040 at 3,000 Mtoe ($\approx 3,400$ billion m^3 or 35 per cent above the 2004 level).
- A second 'low fossil' scenario assumes that this peak production plateau can only be sustained for ten years until 2025, and will then be followed by a decline of 3 per cent per year.

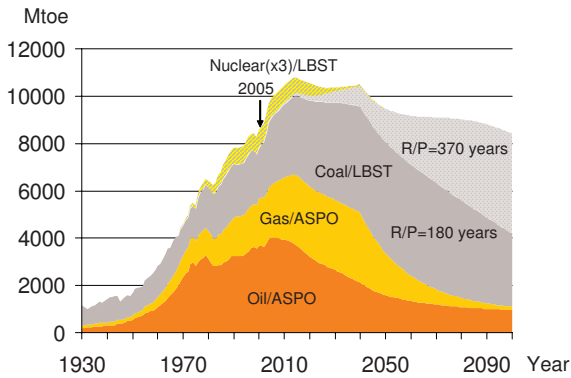
25.4 Fossil Scenarios

The aggregation of the production histories and scenario projections for the different fossil and nuclear energy sources is shown in Figure 25.5. This view of how the supply situation may probably develop in the

next decades is biased to the high side. Oil production is assumed according to ASPO projections, gas production is taken from ASPO with a production plateau between 2015 and 2040 exhibiting a 35 per cent higher production level than today. Coal projections assume a bell-shaped profile based on the more probable R/P-ratio of 180 years and on the 'upper limit' 370 years. Even within this 'upper limit' scenario, a further growth of world energy supply comes to a halt as soon as gas production cannot rise any more. A further decline is unavoidable in the following decades.

The production of nuclear energy cannot reverse this trend. Projections for nuclear energy show the energy production from existing reactors and their phasing out after 40 years on average. For this figure, the conversion from nuclear electricity to primary energy is based on 33 per cent efficiency. However, more appropriately, nuclear should be treated as primary electricity, then being directly comparable to renewably produced electricity later on. The low share of only a few per cent and the resource base makes nuclear energy already irrelevant for the global energy supply situation, irrespective of whether its share is kept or not. Yet from a financial view it is very relevant whether budgets are directed to the nuclear industry or to other energy sources.

Figure 25.5: ‘High fossil’ scenarios of future production of fossil and nuclear fuels based on peak oil before 2010 and a decline after peak of about 2-3 per cent per year and a gas peak around 2040. **Source:** for oil and gas: Campbell/ASPO (2005); coal and nuclear scenario: LBST (Schindler/Zittel 2006).



In order to better understand the upper and lower boundaries of the possible future development, a ‘low fossil’ scenario is also formulated. Such a scenario is presented in figure 25.6. Oil starts to decline with 5 per cent annually between 2010 and 2020 and by 3 per cent until 2040, then declines with 2 per cent until 2050, and with 1 per cent thereafter. The plateau of world gas production is expected to end in 2025 (and not by 2040 as in the ‘high fossil’ scenario) with an annual decline rate of 5 per cent in the following ten years, and with 3 per cent thereafter. The growth of coal production is assumed to be smaller than in the ‘high fossil’ scenario, with a plateau at 3,600 Mtoe (not 4,600 Mtoe as before) lasting from 2020 to 2050 and followed by an annual decline of 1 per cent. In this ‘low fossil’ scenario the paramount importance of peak oil is demonstrated. Once oil peaks and then declines with 5 per cent per year, no other energy source will be able to stop the aggregate decline of supplies, even for a few years. This scenario is not unlikely.

The ‘high fossil’ scenario is regarded as being positive from an economist’s point of view but is certainly regarded as negative from an ecologist’s point of view. Even with fossil fuel consumption peaking around 2010, these high emission levels might remain constant for thirty years before they begin to decline. And the worst scenario with respect to greenhouse gas emissions (with an assumed R/P-ratio for coal of 370 years) maintains this emission level until the end of this century.

But both scenarios are not as bad as the “business as usual” scenarios calculated by the Intergovernmental Panel on Climate Change (IPCC). The

IPCC scenarios are not based on a corresponding available resource base. In contrast, the above described ‘low fossil’ scenario (Figure 25.6) would even support a climate protection policy as total carbon dioxide emission could drop by about 30 per cent until 2050 and by about 55 per cent until 2100.

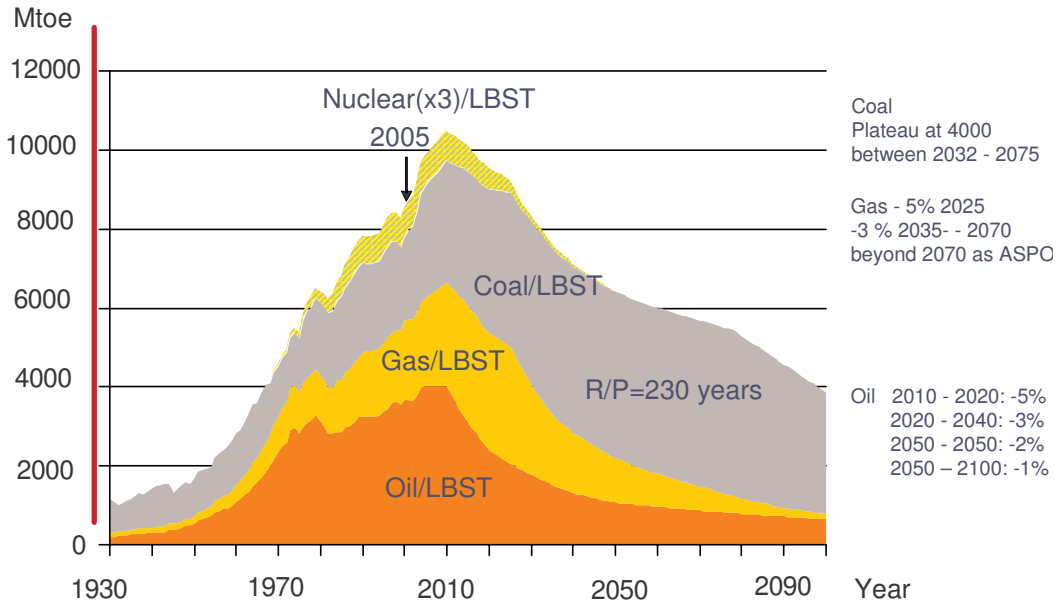
The scenarios sketched here contradict the IEA scenarios as published in the “world energy outlook” (IEA 2005d). The basic difference is that the IEA scenarios (and most other scenarios) are demand driven, while the present scenario attempts to describe the upper limit of the evolution of the supply in the best case. The demand then has to adapt to the possible supply, while the IEA scenarios balance the calculated demand by fossil fuels, not accounting for their limited reserve base. As a consequence, the future role of renewable energy is highly underestimated by the IEA, seeing no need for their enforced market penetration. Only the role foreseen for nuclear energy in this scenario – at least over the next 25 years – does not deviate much from the view of the International Energy Agency.

25.5 Renewable Energy Scenario

Renewable scenarios can be built in various ways by extrapolating past trends and incorporating expected future changes. The International Energy Agency builds its scenarios primarily by using economic considerations in which no drastic price changes for fossil and renewable fuels are assumed. Therefore it is no surprise that no incentives for a rising contribution from renewables are foreseen. The IEA does not narrowly interpret its scenarios as forecasts, but still they tend to interpret them as more or less likely, and in any case as an upper boundary, for possible future developments.

In contrast, the following scenarios are calculated by extrapolating observed past growth trends and then limiting the further growth by taking into account the estimated total supply potential for the different technologies. These are in effect market penetration scenarios, but they do not represent a forecast, rather they describe what would be possible under most favourable market conditions (while still starting from the empirical data describing the past development). No assumptions are made regarding actual future market conditions. The resulting scenarios therefore show the technical limitations of possible future developments not regarding economic limitations.

Figure 25.6: 'Low fossil' scenario of future production of fossil and nuclear fuels. Assuming oil peaking in 2010 and decline rates of 5 per cent per year. **Source:** for oil, gas, coal, and nuclear scenario: LBST (Schindler/Zittel 2006).



The main purpose of these scenarios is not so much to show how global energy demand might be supplied in 2100, but to sketch the major characteristics of the transition period between today's fossil fuel based energy economy and a possible future based on renewable energies. These scenarios are modelled with logistic functions which grow exponentially in the beginning, and then approach the ultimate potential attributed to these sources with continually decreasing growth rates. The assumptions for the calculation of these potentials are based on available literature sources (as specified below) and own calculations. For the scenario calculations a figure close to the minimum value of the respective potential was always used.

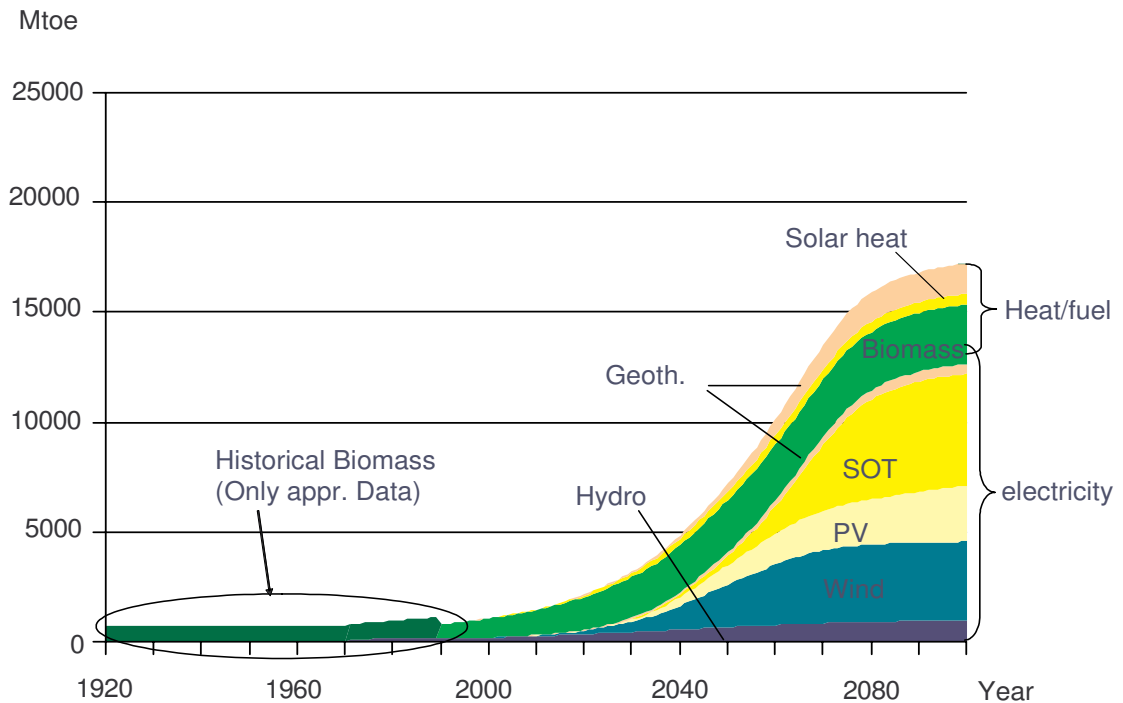
The calculation of this so called 'technical' potential was based on the following studies:

- **Geothermal Energy:** According to common practice the potential for electricity production was calculated by multiplying the number of the active volcanoes within the specified region with a scaling factor (Bjornsson/Fridleifsson/Helgason/Jonatansson/Mariusson/Palmason/Stefansson/Thorsteinsson 1998; Stefansson 2005).
- **Hydropower:** the results are based on a literature survey (Bjornsson/Fridleifsson/Helgason/Jona-

tansson/Mariusson/Palmason/Stefansson/Thorsteinsson 1998; WEC 2001).

- **Photovoltaics:** The Potential was calculated by multiplying the forecasted number of inhabitants and the gross domestic product with a specific factor which takes care of available roof areas and solar radiation. The link between population and gross domestic product was used to estimate the available roof area in the year 2100. This methodology is described in detail in reference (Schmidt/Weindorf/Wurster/Zerta/Zittel 2005) and Quaschnig (2000). Therefore, the basic assumption is that PV modules are only roof and façade mounted. Obviously, this underestimates the full PV-potential.
- **Biomass:** Biomass is the most discussed renewable resource as the potential varies by a factor of ten, depending on the assumptions regarding arable land area and fertilizer use. The results are based on a literature survey and on own calculations (Hoogwijk 2004; Kaltschmitt/Hartmann 2001).
- **Wind Energy:** The results are based on literature survey and own calculations (EWEA/ Greenpeace 2004; Elliot/Wendell/Gower 1991; Kruska/Ichiro/Ohbayashe/Takase/Tetsunari, Evans/Herbergs/Lehmann/Mallon/Peter/Sekine/Suzuki/Assmann 2003).
- **Solarthermal Power Plants:** For North Africa and Middle East countries the results of the Mediterra-

Figure 25.7: Possible market penetration of renewable energy sources. **Sources:** LBST (Schindler/Zittel 2006).



nean study (DLR) were used. These results were adapted to other regions (Klaiss/Staiss 1992; Trieb 2005; Leitner 2005; see chap. 28 by Trieb/Kre-witt/May).

It is impossible to accurately forecast how much of this potential will be used in the future. This depends on many aspects which are not of a technical nature. Most important will be their acceptance by the public, given increasing environmental and supply problems. Society must decide on the value of both environmental aspects, and of producing and using energy. To partly account for such decisions, the scenario calculations were based on the minimum values of the estimates of the technical potential, which by definition do include environmental restrictions as they are obvious today but do not include additional restrictions from lacking public acceptance.

The renewable energy scenario is shown in figure 25.7. It represents the aggregation of possible market share potentials for each technology in each world region. In general and in the long run plenty renewable energy will become available. The capacity increase of renewable energies might eventually reach its maximum around 2060. Primary renewable sources will supply most energy as electricity, and not as fuel or heat. This analysis focuses on the next 20 to 30 years which are the critical period. The accurate size of the

renewable potential does not influence the growth rates during the next 20 to 30 years; therefore it is of minor importance in the present context.

25.6 Transition towards Sustainability

The world is entering a crucial transition period: from nearly total reliance on fossil energies to a sustainable energy future based on renewable energy sources. The world will experience the peaking first of oil and later also of natural gas. The resulting energy supply gap cannot be filled by a rising share of nuclear energy, and can only partly be filled by an increased use of coal. But (without CO₂ sequestration) this would increase carbon dioxide emissions to unacceptable levels. The limits to growth will become apparent and this will probably happen rather soon. Renewable energies will have to fill the gap. They have a much bigger potential than the established institutions are willing to attribute to them. But even when renewables are fully used, the transition remains a difficult task. In the coming decades the build-up of renewable energy capacities will – even in the best case – be slower than the decline of fossil energy supply. Only in the later decades of this century will it be possible to reach again today's consumption levels.

The arrival of peak oil will lead to rising and eventually permanently higher energy prices. However, this is by no means a catastrophe. High energy prices will initially hurt an economy like ours which is presently not adapted to such an environment. Yet, higher energy prices must be seen as a necessary precondition for the transition to a sustainable energy future. In the longer run, high energy prices are not the problem but the first step towards a solution.

One important aspect is the efficient use of energy. In our present system with low energy prices, efficiency is not really attractive, and the economic rewards are weak. This will certainly change with higher prices, and also the social valuation of efficient energy use will increase. This is the case of private virtue versus public responsibility.

Declining oil and natural gas supplies for stationary applications (like electric power generation and the provision of heat) can relatively easily be substituted by energy efficiency measures and by strongly rising contributions from renewable energy sources. Probably there will be plenty of renewable electricity available but not enough fuels for transport. A serious deficit of fuels will develop over time, which can only partly be compensated by improved efficiency along the whole transport chain.

Various options for producing alternative fuels exist: Hydrogen produced from electricity, hydrogen or synthetic liquid fuels produced from biomass, hydrogen or synthetic liquid fuels produced from remaining coal instead of using it for power generation. But whatever option is chosen eventually, fundamental changes in lifestyles and in the whole economy will be caused by limited supplies and higher energy prices.

The transport intensity will have to be reduced without endangering mobility and also the energy intensity of the production and use of goods. Less available energy and higher fuel costs will increase transport resistance. There will be a stronger preference for activities in the neighbourhood, and there will be a penalty on longer distances as a consequence of higher relative prices caused by limited supplies. This will eventually change land use patterns, suburbia in many cases will not work anymore, and perhaps there will be a revival of the inner cities in the US. The dominance of the private car will recede, and the perception of what properties an attractive car should have will also change. Other modes of transport will gain importance and social acceptance. But until now all incentives are still pointing in the wrong direction.

Our industrialized economies rely on growth. Once growth rates are shrinking this is seen as a symp-

tom of crisis, no growth is a disaster. So nobody is prepared for a future with continually declining fossil energy supplies. This scenario is not on the radar of public awareness. Rising energy prices will change the perception and only then society will look for sustainable pathways into the future. The most important task will be to adapt our way of life, our economies, and our political and social systems to this situation. There are no ready solutions. A comprehensive public debate has not yet started. The outcome is open.

25.7 Conclusions

Peak oil is imminent and will cause an energy supply gap which cannot be filled by any other energy source. This is even more so since fuels for transport will have to be produced from other primary energy sources incurring high energy losses. Renewable energy sources will most likely not grow fast enough in the first two to three decades after peak oil to compensate the supply gap.

Putting all aspects together, one can expect that peak oil will be an inflection point leading to structural changes which will enforce changes in the lifestyle of industrialized countries – irrespective of the fact whether we like it or not. The quality of the life after peak oil will depend on the timely recognition of the challenges ahead, and on the appropriate actions taken by society.

In order to secure energy supply, it will be necessary to use energy in all sectors much more efficiently than today, and to promote the rapid transition towards renewable energies. The view of the authors is that the attempt to secure future energy supplies by military force will cause more problems than it solves.

26 Technical and Economic Potentials of Biomass until 2050: Regional Relevance for Energy Security

André P.C. Faaij

26.1 Introduction

Rapidly developing international bio energy trade may develop over time into a 'commodity market' which can secure supply and demand in a sustainable way; sustainability being a key factor for long-term security. It is clear that on a global scale and over the longer term, large potential biomass production capacity can be found in developing countries and regions such as Latin America, Sub-Saharan Africa, and Eastern Europe. If indeed the global bio-energy market is to develop to a size of 400 EJ over this century (which is well possible given the findings of recent global potential assessments), the value of that market at US \$ 4/GJ (considering pre-treated biomass such as pellets) amounts to some US \$ 1,600 billion per year.

This creates important future opportunities for such regions, given the expected increased role of bio energy within the world's energy supply. Consequently, this poses the fundamental question of how these potential major producers and exporters of bio energy can benefit from the growing global demand for bio energy in a sustainable way, i.e. that bio energy exports can contribute to rural development, benefit local communities, and can be an integral part of overall development schemes, including the existing agricultural and forestry sectors.

In this chapter bio-energy market developments, resource potentials, and links between developing bio-energy markets, trade and socio-economic development, and how sustainable bio-energy production could be realized are explored. Drivers, barriers, and future potentials for international bio-energy markets are discussed and socio-economic implications for possible exporting countries are identified. By doing so, several key opportunities and issues for the developing international bio-energy markets and their possible impacts are raised that should be taken into account by policymakers, market parties, international stakeholders, and other key stakeholders.

Summarizing; although international bio-energy trade and markets are developing very rapidly, and the future looks bright given market demand and potential supplies, also barriers occur that can disturb or at least slow down a sound development of such markets. Also, there are important concerns about competition for land that may conflict with food production, water resources, and biodiversity protection. Although biomass production may well provide a crucial strategy to enhance sustainable land-use management, negative developments should be avoided, e.g. by clear standards and best practice guidelines for (the design of) biomass production systems and their integration in agricultural areas.

Global energy demand is growing rapidly. The total current commercial energy use amounts to some 440 EJ (BP Statistical Review 2006). About 88 per cent of this demand is covered by fossil fuels. Energy demand is expected to at least double or perhaps triple during this century (Faaij/Wagener/Junginger/Best/Bradley/Fritsche/Grassi/Hektor/Heinimö/Klokk/Kwant/Ling/Ranta/Risnes/Peksa/Rosillo-Calle/Ryckmanns/Utria/Walter/Woods 2005).

At the same time, concentrations of greenhouse gases (GHG) in the atmosphere are rising rapidly, with fossil fuel bound CO₂ emissions being the most important contributor. In order to stabilize related global warming and climate change impacts, GHG emissions must be reduced drastically to less than half the global emission levels of 1990. In addition, security of energy supply is a global issue. Supplies of conventional oil and gas reserves are increasingly concentrated in politically unstable regions, and increasing the diversity in energy supplies is important for many nations to secure a reliable and constant supply of energy.

In this context, biomass use for energy can play a pivotal role. Biomass use for energy, when produced in a sustainable manner, can drastically reduce GHG emissions compared to fossil fuels. Most countries

have various biomass resources available or could develop a resource potential, making biomass a more evenly spread energy supply option across the globe. It is a versatile energy source, which can be used for producing power, heat, liquid and gaseous fuels, and also serves as carbon neutral feedstock for materials and chemicals.

International biomass markets have rapidly developed over the past years. International trade in biofuels (such as ethanol) as well as solids (e.g. pellets) and vegetal oils may develop over time into a new 'commodity market' which can secure energy supply and demand in a sustainable way; sustainability being a key factor for long-term security. Recent studies indicate that the technical and economic potentials of biomass resources and biomass production could be large, in the order or magnitude of 1/3 of the global future energy demand during this century.

If such potentials would indeed be developed it creates important future opportunities for producing regions. Consequently, this poses the fundamental question of how these potential major producers and exporters of bio energy can benefit from the growing global demand for bio energy in a sustainable way, i.e. that bio-energy exports can contribute to rural development, benefit local communities, and can be an integral part of overall development schemes, including the existing agricultural and forestry sectors. Although international bio-energy trade and markets are developing very rapidly, and the future looks bright given market demand and potential supplies, barriers occur that can disturb or at least slow down a sound development of such markets. Also, there are important concerns about competition for land that may conflict with food production, water resources, and biodiversity protection. Although biomass production may well provide a crucial strategy to enhance sustainable land-use management, negative developments should be avoided, e.g. by clear standards and best practice guidelines for (the design of) biomass production systems and their integration in agricultural areas. Those are important concerns.

Linking to the key theme of this book, large supplies of biomass and biofuels to the world's energy markets may have a profound effect on the diversity of energy supply in the world. This is in particular the case when biomass would be used for production of transport fuels (currently the key growth market for biomass use) because this provides an alternative for mineral oil.

In this chapter the bio-energy market developments, resource potentials and links between develop-

ing bio-energy markets, trade and socio-economic development, and how sustainable bio-energy production could be realized, are explored. Drivers, barriers, and future potentials for international bio-energy markets are discussed and implications for possible exporting countries are identified, including the impacts on energy supply, security, and stability. By doing so, several key opportunities and issues for the developing international bio-energy markets and their possible impacts are raised that should be taken into account by policymakers, market parties, international and other key stakeholders.

26.2 Developments in Global Bio-energy Use

Over the past decades, the modern use of biomass has increased rapidly in many parts of the world. In the light of the Kyoto greenhouse gas (GHG) reduction targets, many countries have ambitious targets for further biomass utilization. Also the recent increase of the oil price has strongly fuelled the interest in bio energy. For example, at an oil price of over sixty dollars per barrel, it is a very attractive option to drive on bioethanol derived from sugar cane instead of fossil fuel-based transportation fuels. At present, biofuels are seen as a key diversification strategy to reduce the dependency on mineral oil, thus as a way to improve energy supply security.

However, especially in developed countries domestic biomass potentials are often used to a high degree, though in some countries still untapped potentials remain. In the longer term, the pressure on available biomass resources will increase. Also, biomass produced in developed countries can generally be associated with higher production costs.

Ambitions and expectations for biomass use for energy are high in many countries, for the EU and also on a global basis, given a variety of policy objectives and long-term energy scenarios. A reliable supply and demand of bio energy is vital to develop stable market activities. Given the expectations for a high bio energy demand on a global scale and in many nations, the pressure on available biomass resources will increase. Without the development of biomass resources (e.g. through energy crops and better use of agro-forestry residues) and a well functioning biomass market to assure a reliable and lasting supply, those ambitions may not be met. The development of truly international markets for bio energy may become an essential driver to develop bio energy potentials,

which are currently underutilized in many regions of the world. This is true for both residues and for dedicated biomass production (through energy crops or multifunctional systems such as agro-forestry).

The fact that biomass potentials are underutilized is true both for available residues as well as possibilities for dedicated biomass energy plantations or multifunctional systems such as agro-forestry. On the other hand, many developing countries have a large technical potential for agricultural and forest residues and dedicated biomass production, e.g. ethanol from sugar cane, wood or other crops. Given the lower costs for land and labour in many developing countries, biomass production costs are much lower, and thus offer an opportunity to export bio energy.

The possibilities to export biomass derived commodities to the world's energy markets can provide a stable and reliable demand for rural communities in many (developing) countries, thus creating an important incentive and market access that is much needed in many areas in the world. For many rural communities in developing countries such a situation would offer good opportunities for socio-economic development.

Sustainable biomass production may also contribute to the sustainable management of natural resources. Importing countries on the other hand may be able to fulfil cost-effectively their GHG emission reduction targets and diversify their fuel mix. The future vision for global bio energy trade is that it develops over time into a real 'commodity market' which will secure supply and demand in a sustainable way; sustainability being a key factor for long-term security. It is clear that on a global scale and over the longer term, large potential biomass production capacity can be found in developing countries and regions such as Latin America, Sub-Saharan Africa, and Eastern Europe. This creates important future opportunities for such regions, given the expected increased role of bio energy within the world's energy supply. Such developments could give access to an open world energy market. Consequently, this poses the fundamental question of how these potential major producers and exporters of bio energy can benefit from the growing global demand for bio energy in a sustainable way, i.e. that bio-energy exports can contribute to rural development, benefit local communities, and can be an integral part of overall development schemes, including the existing agricultural and forestry sectors.

26.2.1 Current Use of Biomass

Over the past decades, the modern use of biomass has increased rapidly in many parts of the world. In the light of the Kyoto greenhouse gases (GHG) reduction targets, many countries have ambitious targets for further biomass utilization. Also the recent increase of the oil price has strongly fuelled the interest in bio energy. For example, at an oil price of over sixty dollars per barrel, it is a very attractive option to drive on bioethanol derived from sugar cane instead of fossil fuel-based transportation fuels. At present, biofuels are seen as a key diversification strategy to reduce the dependency on mineral oil, thus as a way to improve energy supply security.

Current energy supplies in the world are dominated by fossil fuels (some 80 per cent of the total use of over 400 EJ per year). Nevertheless, about 10–15 per cent (or 45 ± 10 EJ) of this demand is covered by biomass resources, making biomass by far the most important renewable energy source used to date. On average, in the industrialized countries biomass contributes some 9–13 per cent to the total energy supplies, but in developing countries the proportion is as high as a fifth to one third. In quite a number of countries biomass covers even over 50 to 90 per cent of the total energy demand. A considerable part of this biomass use is however non-commercial and used for cooking and space heating, generally by the poorer part of the population. This also explains why the contribution of biomass to the energy supply is not exactly known; non-commercial use is poorly mapped. In addition, some traditional use is not sustainable because it may deprive local soils of needed nutrients, cause indoor and outdoor pollution, and result in poor health. It may also contribute to GHG emissions and affect ecosystems if biomass is taken for energy without replanting and other conservation management. Part of this use is commercial though, i.e. the household wood in industrialized countries and charcoal and firewood in urban and industrial areas in developing countries, but there are almost no data on the size of those markets. An estimated 9 ± 6 EJ is covered by this category.

26.2.2 Growth of Modern Bio Energy

Modern bio energy (commercial energy production from biomass for industry, power generation or transport fuels) makes a lower, but still very significant contribution (some 7 EJ/yr in 2000), and this share is growing. Biomass combustion is responsible for over

90 per cent of the current production of secondary energy carriers from biomass. Combustion for domestic use (heating, cooking), waste incineration, use of process residues in industries and state-of-art furnace and boiler designs for efficient power generation all play their role in specific contexts and markets.

The liquid biofuels most widely used for transport today are ethanol and biodiesel. Ethanol is currently produced from sugar or starch crops, while biodiesel is produced from vegetable oils or animal fats. The growth in the use of biofuels has been facilitated by their ability to be used as blends with conventional fuels in existing vehicles, where ethanol is blended with gasoline and biodiesel is blended with conventional diesel fuel.

Ethanol currently accounts for more than 90 per cent of total bio-fuel production. About one-quarter of world ethanol production goes into alcoholic beverages or is used for industrial purposes (as a solvent, disinfectant, or chemical feedstock); the rest becomes fuel for motor vehicles. Most of the world's biodiesel is used for transportation fuel. Global ethanol production has more than doubled since 2000, while production of biodiesel, starting from a much smaller base, has expanded nearly threefold. In contrast, oil production has increased by only 7 per cent since 2000. (In absolute terms, however, world petroleum production increased by about 360 million litres per year from 2000-2005, compared to some 19 million litres for ethanol. In 2005, ethanol comprised about 1.2 per cent of the world's gasoline supply, by volume. The total production of biofuels currently (2006) equals about 1.5 EJ as transport fuel (Hunt/Easterly/Faaij/Flavin/Freimuth/Fritsche/Laser/Lynd/Moreira/Pacca/Sawin/Sorkin/Stair/Szwarc/ Trindade 2007).

26.2.3 Market Developments

Especially due to high prices for fossil fuels (especially oil, but also natural gas, and to a lesser extent coal) the competitiveness of biomass use has strongly increased. In addition, the development of CO₂ markets (emission trading), as well as ongoing learning and subsequent cost reductions for biomass and bio-energy systems, have strengthened the economic drivers for increasing biomass use, production, and trade. Biomass and bio energy are a key option in energy policies. Security of supply, an alternative for mineral oil, and reduced carbon emissions, are key reasons. Targets and expectations for bio energy in many national policies and long-term energy scenario's are am-

bitious, reaching 20-30 per cent of total energy demand in various countries, as well as worldwide.

However, without the development of sufficient biomass resources (e.g. through energy crops) and a well functioning biomass market that can assure a reliable and lasting supply, those ambitions may not be met. A lack of availability of good quality (and competitive) biomass resources has proven to be a show-stopper for many market initiatives in the past. On the other hand, various countries have considerable experience with building biomass markets and linking available resources with market demand. Examples are found in Brazil, Sweden, Finland, Canada, the Netherlands et al. International trade of biomass resources has become part of the portfolio of market parties, and volumes traded worldwide increase at a very rapid pace with an estimated doubling of volumes in several markets over the past few years. The fact that markets are growing means that more and more resources are becoming available from regions where biomass use was low or absent so far, and supply risks for biomass users have reduced due to more diverse and reliable supplies.

26.3 Biomass Resource Potentials: Long-term Outlook

Various biomass resource categories can be considered: residues from forestry and agriculture, various organic waste streams and, most important, the possibilities for active biomass production on various land categories (e.g. grass production on pasture land, wood plantations and sugar cane on arable land, and low productivity forestation schemes for marginal and degraded lands).

Active biomass production requires land. The potential for energy crops therefore largely depends on land availability, considering that worldwide a growing demand for food has to be met, combined with nature protection, sustainable management of soils and water reserves, and a variety of other sustainability criteria. Given that a major part of the future biomass resource availability for energy and

materials depend on these (intertwined, uncertain, and partially policy dependent) factors, it is not possible to present the future biomass potential in one simple figure. Table 26.1 provides a synthesis of a range of analyses that have assessed the longer term potential of biomass resource availability on a global scale. Also, a number of uncertainties are highlighted that can affect biomass resource availability.

Table 26.1: Overview of the global potential bio-energy supply in the long term for a number of categories, and the main pre-conditions and assumptions that determine these potentials. **Sources:** Compiled by the author based on: Hoogwijk/Faaij/van den Broek/Berndes/Gielen/ Turkenburg (2003); Berndes/Hoogwijk/van den Broek (2003); Smeets/Faaij/Lewandowski/ Turkenburg (2007); Hoogwijk/Faaij/Eick-hout/de Vries/Turkenburg (2005).

Biomass category	Main assumptions and remarks	Potential bio-energy supply up to 2050.
Energy farming on current agricultural land	Potential land surplus: 0-4 Gha (more average: 1-2 Gha). A large surplus requires structural adaptation of intensive agricultural production systems. When this is not feasible, the bio-energy potential could be reduced to zero as well. On average higher yields are likely because of better soil quality: 8-12 dry tonne/ha*yr is assumed. (*)	0 – 700 EJ (more average development: 100 – 300 EJ)
Biomass production on marginal lands	On a global scale a maximum land surface of 1.7 Gha could be involved. Low productivity of 2-5 dry tonne/ha*yr. (*) The supply could be low or zero due to poor economics or competition with food production.	(0) 60 – 150 EJ
Residues from agriculture	Estimates from various studies. Potential depends on yield/product ratios and the total agricultural land area as well as type of production system: Extensive production systems require re-use of residues for maintaining soil fertility. Intensive systems allow for higher utilization rates of residues.	Approx. 15 – 70 EJ
Forest residues	The (sustainable) energy potential of the world's forests is unclear. Part is natural forest (reserves). Range is based on literature data. Low value: figure for sustainable forest management. High value: technical potential. Figures include processing residues.	30 - 150 EJ
Dung	Use of dried dung. Low estimate based on global current use. High estimate: technical potential. Utilization (collection) for longer term is uncertain.	5 – 55 EJ
Organic wastes	Estimate on basis of literature values. Strongly dependent on economic development, consumption and the use of biomaterials. Figures include the organic fraction of MSW and waste wood. Higher values possible by more intensive use of biomaterials.	5 – 50 EJ
Total	Most pessimistic scenario: no land available for energy farming; only utilization of residues. Most optimistic scenario: intensive agriculture concentrated on the better quality soils. (between brackets: more average potential in a world aiming for large-scale utilization of bio energy)	40 – 1100 EJ (250 - 500 EJ)

(*) Heating value: 19 GJ/tonne dry matter.

Issues that require further research and especially more regional demonstrations and experience with biomass production are:

1. *Competition for Water Resources:* Although the analyses mentioned above generally exclude irrigation for biomass production, in some countries this could lead to further enhancement of an already stressed water situation. But there are also countries where such impacts are less likely to occur. More region specific knowledge is needed to what extent competing

demand for water resources is a constraint for biomass production (Berndes 2002).

2. *Availability of Fertilizers and Pest Control:* Better agricultural management and higher productivities imply availability of fertilizers and pest control methods. Its use needs to be within sound limits. Sound agricultural methods (agro-forestry, precision farming, biological pest control, etc.) exist that can achieve major increases in productivity with neutral or even positive environmental impacts. Such practices must how-

ever be secured by sufficient knowledge, funds, and human capacity and knowledge.

3. *Land-Use Planning Taking Biodiversity and Soil Quality into Account*: Further intensification of agriculture and large-scale production of biomass energy crops may affect biodiversity compared to current land-use. Biodiversity standards are to be interconnected with biomass production still when changes in land-use are considered. Perennial crops (which are the preferred category of crops for energy production) have a (much) better ecological profile than annual crops, and benefits with respect to biodiversity can be achieved when perennial crops are displaced. However, insights in how biodiversity effects can be optimized (and improved compared to current land-use) when sound landscape planning is introduced are limited. Also here, more regional efforts, experience, and specific solutions are needed.

4. *The Use and Conversion of Pasture Land Connected to More Intensive Methods of Cattle Raising*: A key land category in making more efficient use of land used for food production are the world's grasslands used now for grazing. The analyses that were discussed here show that much land can be released when production of meat and dairy products is done in more intensive (partly landless in closed stables) schemes. Grasslands could then be used for production of energy grasses or partly converted to woodlands. The impacts of such changes should be closely evaluated.

5. *Socio-Economic Impacts*: Large-scale production of modern biofuels, partly for the export market, could provide a major opportunity of many rural regions around the world to generate major economic activity, income, and employment. Given the size of the global market for transport fuels, the benefits that can be achieved by reducing oil imports and possibly net exports of bio energy are vast. Nevertheless, it is not a given that those benefits end up with the rural population and farmers that need those benefits most.

6. *Macro-economic Impacts of Changes in Land-use Patterns*: Although the analyses discussed indicate that both the world's food demand and additional biomass production *can* (under relevant preconditions) be achieved, more intensive land-use and additional land-use for biomass production may lead to macro-economic effects on land and food prices. Although this is not necessarily a bad mechanism (it could be vital for farmers to enable investment in current production methods), the possible implications on macro-economic level are poorly understood. More

analyses are needed that can highlight with what speed of implementation and change undesired economic effects can be avoided.

In theory, energy farming on current agricultural (arable and pasture) land could, with projected technological progress, contribute over 800 EJ, without jeopardizing the future world's food supply. Latin America, Sub-Saharan Africa, Eastern Europe, and Oceania clearly are promising regions. These analyses also show that a significant part of the technical potential (around 200 EJ in 2050) for biomass production may be developed at low production costs in the range of US\$ 2/GJ (Hoogwijk 2004; Rogner/Cabrera/Faaij/Giroux/Hall/Kagramanian/Lefevre/Moreira/Notstaller/Odell/Taylor 2000) assuming this land is used for perennial crops. Another 100 EJ of biomass could be produced with lower productivity and higher costs at marginal and degraded lands. Regenerating such lands requires more upfront investment, but competition with other land-use is less of an issue, and other benefits (such as soil restoration, improved retention functions) may be obtained, which could partly compensate biomass production costs (Smeets/Faaij/Lewandowski 2005).

Organic wastes and residues could possibly supply another 40–170 EJ, with uncertain contributions from forest residues and potentially a very significant role for organic waste, especially when biomaterials are used on a larger scale. This is a very important potential resource category once 2nd generation bio-fuel conversion technology becomes available. It should be noted though that parts of this potential are used for production of power and heat as well. In total, the bio-energy potential could be over 400 EJ (per year) during this century. This is comparable to the total *current* global energy use of about 430 EJ.

Key to the introduction of biomass production on the suggested orders of magnitude is the rationalization of agriculture, especially in developing countries. There is room for considerably higher land-use efficiencies that can more than compensate for the growing demand for food.

Major transitions are however required to exploit this bio-energy potential. Especially improving agricultural efficiency in developing countries (i.e. increasing crop yields per hectare) is a key factor. It is still uncertain to what extent and how fast such transitions can be realized in different regions. In developing countries (e.g. Sub-Saharan Africa) very large improvements can be made in agricultural productivity, given the current agricultural methods deployed (often subsistence farming), but better and more efficient agri-

cultural methods will not be implemented without investments and proper capacity building and infrastructure improvements. Such schemes, in which the introduction of bio energy can play a pivotal role, can create more income for rural regions by additional bio-energy production. Financial resources generated could then accelerate investments in conventional agriculture and infrastructure, and also lead to improved management of agricultural land. Finally, technological developments, market development, and high prices for fossil fuels can dramatically improve competitiveness and efficiency of bio energy. Increased competitiveness is logically a driver to develop the production potentials of bio energy. This will be discussed below.

26.4 Markets for Bio Energy

Absolutely crucial for the success of bio-energy systems is their economic performance. Biomass is a competitive alternative in many situations, but this is generally observed where cheap or even negative costs of biomass residues or wastes are available (Junginger/Faaij/Koopmans/van den Broek/Hulscher 2001). In order to make large-scale bio-energy use (especially from dedicated biomass crops) competitive with fossil fuels, the conversion technologies, biomass production, as well as the total bio-energy systems, require further development and optimization. Table 26.2 gives a global overview of the main short and longer term markets for biomass energy use.

26.4.1 Heat, Power, and Fuels from Biomass: Key Markets

With biomass prices of about 2 US\$/GJ, state of the art of combustion technology at a scale of 40 - 60 MWe can result in costs of electricity (COE) of around US\$ct 5-6/kWh produced. Co-combustion, particularly at efficient coal-fired power plants, can obtain similar or lower cost figures, largely depending on the feedstock costs. When BIG/CC technology becomes available commercially, COE could drop further to about 3-4 US\$ct/kWh, especially due to higher electrical efficiencies. For larger scales (i.e. over 100 MWe) cultivated biomass will be able to compete fully with fossil fuels in many situations. The benefits of lower specific capital costs and increased efficiency certainly outweigh the increase in costs and energy use for transport for considerable distances

once a reasonably well developed infrastructure is in place.

Decentralized power (and heat) production is generally more expensive, but better suited for off-grid applications. The costs that could ultimately be obtained with e.g. gasifier/diesel systems are still unclear, and depend strongly on what emissions and fuel quality are considered acceptable. Combined Heat and Power generation is generally attractive when heat is required with high load factors.

As discussed, production of heat and electricity dominate current bio-energy use. At present, the main growth markets for bio energy are the European Union, Central and Eastern Europe, and South East Asia (Thailand, Malaysia, Indonesia), especially with respect to efficient power generation from biomass wastes and residues. Two key industrial sectors for application of state-of-the-art biomass combustion (and potentially gasification) technology for power generation are the paper and pulp sector, and cane-based sugar industry worldwide.

Table 26.2 gives a broad overview of the perspectives for various markets combined with main biomass resources on short and longer term (Faaij 2006). Key points are:

- In traditional bio-energy use, heat for cooking and space heating are crucial. It is not expected that the traditional use of biomass will diminish in the coming decades, since traditional biomass use is often interlinked with poverty and underdevelopment, which prove difficult problems to solve. Nevertheless, modernizing bio-energy use for the poorer part of populations is an essential component of sustainable development schemes in many countries. This creates opportunities and major markets, for example for improved stoves, production of high quality fuels for cooking (e.g. bio-fuel based on such as ethanol and *fischer-tropsch* liquids) with considerable efficiency and health advantages. Furthermore, biogas, e.g. produced with digesters on the village level, prove very effective in various countries (such as China and India) in solving waste treatment problems and supplying high quality energy carriers (clean gas and power when used in gas engines) along with hygienic bio-fertilizers (Karthi and Larson, 2000).
- For commercial heat production reliable technology (e.g. gasification, advanced stoves, etc.) is commercially available for many applications (industrial, district, and domestic heating), but profitability of power generation (or CHP) seems better in most current markets. Especially for specific

Table 26.2: Generic overview of performance projections for different options and biomass markets on shorter (~5) and longer (>~20) years. **Source:** Based on data in Faaij (2006).

Biomass feedstock category	Heat		Electricity		Transport fuels	
	Short term: roughly stabilizing market	Longer term	Short term: strong growth market world-wide	Longer term: growth may stabilize due to competition of alternative options	Short term: growing market, but dependent on policies and financial support.	Longer term: potential key market for (cultivated) biomass.
Organic wastes (i.e. MSW etc.)	Undesirable for domestic purposes (emissions); industrial use attractive; in general competitive.	Especially attractive in industrial setting and CHP. (advanced combustion and gasification for fuel gas)	<3–5 US\$ct for state-of-the-art waste incineration and co-combustion. Economics strongly affected by tipping fees and emission standards.	Similar range; improvements in efficiency and environmental performance, in particular through IG/CC technology at large scale.	N.A.	In particular possible via gasification routes
Residues: • Forestry • Agriculture	Major market in developing countries (<1-5 US\$/kWhth); stabilizing market in industrialized countries.	Especially attractive in industrial setting and CHP. Advanced heating systems (domestic) possible but not on global scale	4-12 US\$ct kWh (see below; major variable is supply costs of biomass); lower costs also in CHP operation and industrial setting depending on heat demand.	2-8 US\$ct kWh (see below; major variable is supply costs of biomass)	N.A.; only for surpluses of food crops	See below (where?).
Energy crops: • oil seeds • sugar/starch • sugar cane • perennials	N.A.	Unlikely market due to high costs feedstock for lower value energy carrier; possible niches for pellet or charcoal production in specific contexts	6-15 US\$ct kWh High costs for small scale power generation with high quality feedstock (wood) lower costs for large scale (i.e. >100 MWth) state-of-the-art combustion (wood, grasses) and co-combustion.	3-9 US\$ct kWh Low costs especially possible with advanced co-firing schemes and BIG/CC technology over 100-200 MWe.	8-25 US\$/GJ; lower figures for ethanol from sugar cane; higher for biodiesel (RME) and sugar and starch crops in Europe and North America.	5-10 US\$/GJ; low costs obtainable with lignocellulosic biomass (<2 US\$/GJ) advanced hydrolysis techniques and large-scale gasification (i.e. <1000 MWth) for MeOH/H ₂ /FT, as well as improved sugar cane production and subsequent ethanol production in optimized distilleries.

industrial applications, heat production from biomass seems most attractive.

- Power generation from biomass by advanced combustion technology and co-firing schemes is a

growth market worldwide. Mature, efficient, and reliable technology is available to turn biomass into power. In various markets the average scale of biomass combustion schemes rapidly increases due to improved availability of biomass resources and the economic advantages of economies of scale of conversion technology. It is also in this field that competitive performance compared to fossil fuels is possible where lower cost residues are available. This is in particular true for co-firing schemes, where investment costs can be minimal. Specific (national) policies (such as carbon taxes, renewable energy support, e.g. by direct investment subsidies or feed-in tariffs) accelerate this development. Gasification technology (integrated with gas turbines/combined cycles) offers even better perspectives for power generation from biomass in the medium term and can make power generation from energy crops competitive in many areas in the world once this technology has been proven on the commercial scale. Gasification (in particular larger-scale Circulating fluidized bed (CFB) concepts) also offers excellent possibilities for co-firing schemes.

26.4.2 Production of Liquid and Gaseous Fuels from Biomass

For costs of various fuels that can be produced from biomass, a distinction is made between performance levels on the short and on the longer term. Generally speaking, the economy of 'traditional' fuels like Rapeseed MethylEster and ethanol from starch and sugar crops in moderate climate zones is poor and unlikely to reach competitive price levels even in the longer term. Also, the environmental impacts of growing annual crops are not as good as perennials because per unit of product considerable higher inputs of fertilizers and agrochemicals are needed. In addition, annual crops on average need better quality land than perennials to achieve good productivities. Perennial crops can also be grown on marginal lands, thereby achieving potential other key benefits such as soil quality improvement.

A key exception under 'conventional' biofuels is the production of ethanol from sugar cane in tropical regions where good soils are available, which proves currently a competitive system in the Brazilian context and some other countries. For countries where sugar cane production is feasible, commercially available technology allows for production of relatively low cost ethanol. The Brazilian experience shows that eth-

anol production competitive with gasoline is possible at current oil prices (Rosillo-Calle 1998; Goldemberg/Teixeira Coelho/Nastari/Lucon 2004). Ethanol production capacity based on sugar cane is increasing in some African, several Latin American, and Asian (most notably India and China) countries. Furthermore, better use of cane residues (e.g. for power generation or use via hydrolysis processes) can further improve the performance of cane-based ethanol production.

But it is production of methanol (and DiMethyl-Ester (DME)), hydrogen, Fischer-Tropsch liquids, and ethanol produced from ligno-cellulosic biomass that offer much better perspectives and competitive fuel prices in the longer term (e.g. between 2010-2020). Partly, this is because of the inherent lower feedstock prices and versatility of producing ligno-cellulose biomass under varying circumstances. Furthermore, the (advanced) gasification and hydrolysis technologies under development have the inherent improvement potential for efficient and competitive production of fuels (sometimes combined with co-production of electricity).

An important point is also that when the use of such 'advanced' biofuels (especially hydrogen and methanol) in advanced hybrid or Fuel Cell Vehicles (FCVs) is considered, the overall chain ('tree-to-tyre') efficiency can drastically improve compared to current biodiesel or maize or cereal derived ethanol powered internal combustion engine vehicles; the effective number of kilometres that can be driven per hectare of energy crops could go up with a factor of 5 (from a typical current 20,000 km/ha for a middle class vehicle run with RapeseedMethylEster (RME) up to over 100,000 km/ha for advanced ethanol in an advanced hybrid or FCV (Faaij/Hamelinck 2002). Note though, that the exception to this performance is sugar cane-based ethanol production; in Brazil the better plantations yield some 8,000 litre ethanol/ha*yr, or some 70,000 km/yr for a middle class vehicle. In the future, those figures can improve further due to better cane varieties, crop management, and efficiency improvement in the ethanol production facilities (Damen 2001).

Furthermore, FCVs (and to a somewhat lesser extent advanced hybrids) offer the additional and important benefits of zero or near zero emission of compounds like NO_x, CO, hydrocarbons, and small dust particulates, which are to a large extent responsible for poor air quality in most of the world's urban zones.

In Europe, policy targets create a major push for biofuels and large-scale demonstration, e.g. Fischer-Tropsch liquid production via gasification of biomass is likely in the foreseeable future (e.g. before 2010) (EC 2001). Various European countries have shown interest in moving in this direction, and serious demonstration activities are being undertaken in Germany and Sweden. Crucial for the economic feasibility of such schemes is their application on a large-scale (i.e. over 1000 MW_{th}). Related development and investment risks (also concerning a secure supply of biomass) are therefore considerable. Ethanol production from lignocellulose biomass offers similar perspectives, as well as technological and development challenges. RD&D efforts in developing advanced ethanol production technology (including hydrolysis techniques) are significant and various demonstration projects are being carried out (Sweden, USA) that may pave the way to large-scale commercial use of this technology before 2020 or so.

Inherent to the advanced conversion concepts, it is relatively easy to capture (and subsequently store) a significant part of the CO₂ produced during conversion at relatively low additional costs. This is possible for ethanol production (where partially pure CO₂ is produced), and in particular for gasification concepts. Production of syngas (both for power generation and for fuels) in general allows for CO₂ removal prior to further conversion. For Fischer-Tropsch (FT) production about half of the carbon in the original feedstock (coal, biomass) can be captured prior to the conversion of syngas to FT-fuels. This possibility allows for carbon neutral fuel production when mixtures of fossil fuels and biomass are used, and negative emissions when biomass is the dominant or sole feedstock. Flexible new conversion capacity will allow for multiple feedstock and multiple output facilities, which can simultaneously achieve low, zero or even negative carbon emissions. Such flexibility may prove to be essential in a complex transition phase of shifting from large-scale fossil fuel use to a major share of renewables and in particular biomass. The possibility of achieving negative carbon emissions may prove a crucial 'back-stop' technology when climate change develops at a more rapid pace than so far considered, and very rapid emission reductions are aimed at.

26.5 Biomass in the Total World Energy Supply

What contribution can biomass make to the future global energy (and material) demand? A wide diversity of projections of the potential future energy demand and supply exist. Typically, scenarios are used to depict uncertainties in future developments and possible development pathways. *Descriptive* scenarios, such as the *Special Report on Emission Scenarios* (SRES) developed in the context of the *Intergovernmental Panel on Climate Change* (IPPC), give insight in possible pathways to reach a certain future image. This set of 40 scenarios was developed to simulate long-term (up to 2100) GHG emissions. Typical dynamical driving forces are changes in population, economy, technology, and society. All these, in various forms, influence energy and materials demand and supply. The SRES scenarios are based on four storylines that describe how the world could develop over time. Differences between the scenarios concern the economic, demographic and technological development, and the orientation towards economic, social and ecological values. The storylines denoted with A1 and A2 are considered societies with a strong focus towards economic development. In contrast, the B1 and B2 storylines are more focused on welfare issues, and are ecologically orientated. While the A1 and B1 storylines are globally oriented, with a strong focus towards trade and global markets, the A2 and B2 storylines are more regionally oriented.

Figure 26.1 depicts the total energy demand for secondary energy carriers (such as transport fuels, electricity, gas, etc.) in four distinct years of the four scenarios. The various scenarios show large differences in demand and energy mix, as a result of variations in population dynamics, and economic and technological development. Total *primary* (so the presumed mix of fossil fuels, renewables, and nuclear) energy demand in 2050 varies from about 800 EJ up to 1400 EJ.

As discussed in 26.3, the total primary biomass supplies in 2050 could amount to 200–400 EJ. Increased availability of primary biomass is simulated in figure 26.2, showing a gradual development as well as possible ranges in future supplies. Assuming conversion to transport fuels with an expected average conversion efficiency of 65 per cent, this would result in 130–260 EJ fuel. This is more up to double the current demand and a similar range as the expected demand in the discussed SRES scenarios. Conversion to power with an assumed average efficiency of 50 per

Figure 26.1: Projections for global final energy demand for the four IPCC scenarios and energy models as used in Fig. 2.2. (A1, A2, B1, B2). **Source:** Based on IPCC (2000).

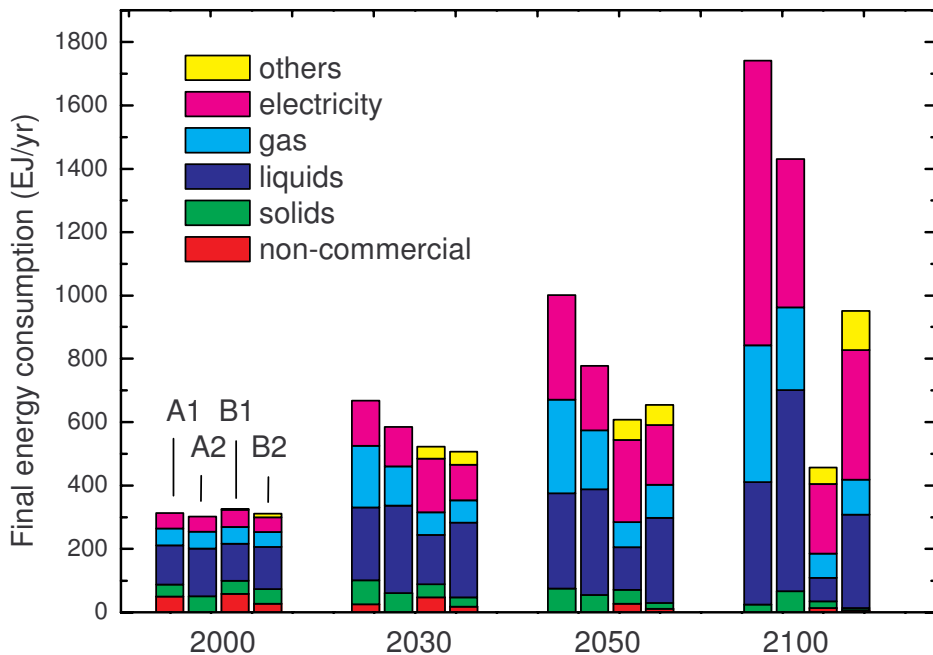
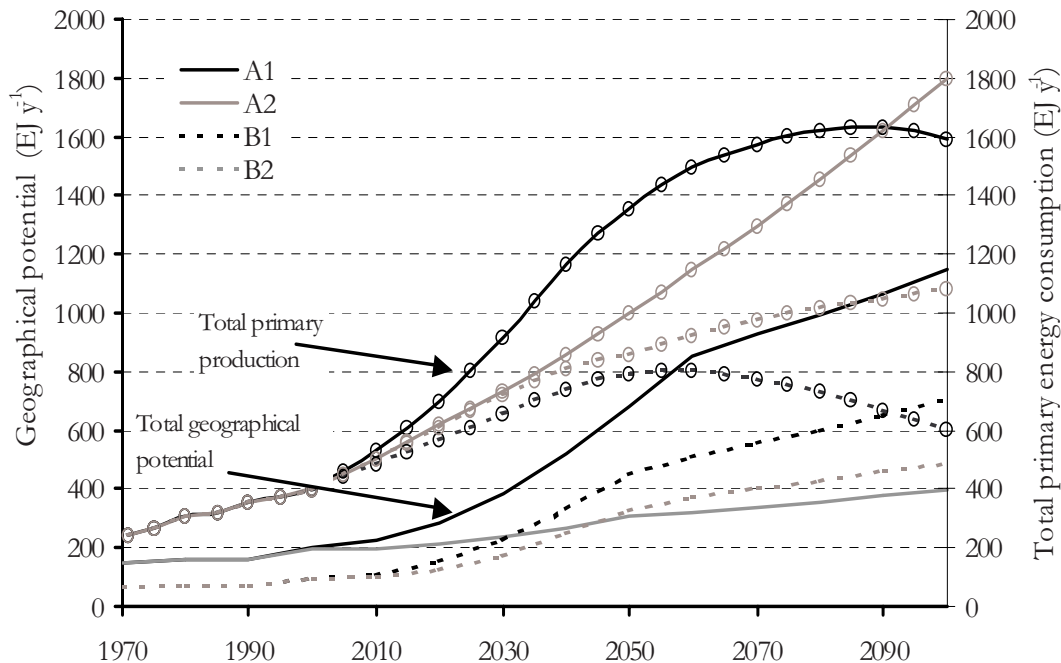


Figure 26.2: Geographical potential of woody biomass energy crops as assessed for the four SRES scenarios over time, as well as the simulated total primary energy consumption. **Source:** Based on Hoogwijk/Faaij/Eickhout/de Vries/Turkenburg (2005).



cent logically results in 100–200 EJ, also a similar range as the expected future demand. Additional future demand for (new) biomaterials such as bioplas-

tics could add up to 50 EJ (Sark/Patel/Faaij 2006) halfway this century.

26.6 Market Development and International Trade

Bio-fuel and biomass trade flows are modest compared to total bio-energy production but are growing rapidly. Trade takes place between neighbouring regions or countries, but increasingly trading is occurring over long distances. Examples are the export of ethanol from Brazil to Japan, the EU, and the USA, palm kernel shells from Malaysia to the Netherlands, wood pellets from Canada to Sweden, etc. This is happening despite the bulky and lower calorific value of most biomass raw material.

Biomass-derived transportation fuels currently represent a modest 1.5 EJ (about 1 per cent) of transport fuel use worldwide (largely covered by ethanol production from sugar and starch crops). But it is especially in this field that global interest is growing in Europe, Brazil, North America, and Asia (Japan, China and India). Four main drivers explain this growing interest:

1. The transport sector is particularly difficult to tackle in terms of GHG emission reductions; biomass is the only option for supplying (liquid) carbon neutral hydrocarbons.
2. The strategic importance of reducing the dependency on oil, imported from a declining number of exporting countries that experience political instability, is growing, as is concern that global conventional oil production may peak sooner than previously expected; transport fuels are by far the most important product produced from mineral oil (chap. 25 by Zittel/Schindler).
3. Technological developments offer clear perspectives of competitive and efficient production of biofuels from biomass, most notably ethanol via hydrolysis and fermentation techniques, and fuels such as Fischer-Tropsch, methanol, DME, and hydrogen via gasification. Sugar cane-based ethanol production in tropical regions already provides a competitive alternative, and ethanol production from this source is growing rapidly.
4. In addition, in the medium term (e.g. after 2015), biomass use for transport fuels may prove to become a more effective way to reduce GHG emissions using biomass rather than power generation. This can be explained by the partly observed and partly expected reduction in carbon intensity of power generation due to large-scale penetration of wind energy, increased use of highly efficient natural gas-fired combined cycles, and deployment of

CO₂ capture and storage (in particular at coal-fired power stations).

Biofuels from tropical regions (ethanol from sugar cane and palm oil) are considerably cheaper than biofuels from agricultural crops in temperate zones, providing strong incentives for trade. Trade barriers do not allow for large-scale supplies to e.g. Europe or the United States at present, and it is uncertain to what extent key demand centres will import biofuels in the future. This is a major variable in where and with what resources and technologies biofuels will be produced in the coming decades.

The possibilities to export biomass-derived commodities to the world's energy markets can provide a stable and reliable demand for rural regions in many (developing) countries, thus creating an important incentive and market access that is much needed in many areas in the world. For many rural communities in developing countries such a situation would offer good opportunities for socio-economic development. Sustainable biomass production may also contribute to the sustainable management of natural resources. Importing countries on the other hand may be able to fulfil cost-effectively their GHG emission reduction targets and diversify their fuel mix.

Given that several world regions have inherent advantages for producing biomass and biofuels (including lignocellulose resources) in terms of land availability and production costs, they may gradually develop into net and structural exporters of biomass and biofuels. International transport of biomass (or energy carriers from biomass) is feasible from both an energy and cost point of view. Especially for 2nd generation biofuels, where lignocellulose biomass is the feedstock and large-scale, capital intensive conversion capacity is required to obtain sound economics, import of densified or pre-treated lignocellulosic biomass from various world regions may be preferred. This is a comparable situation to current oil refineries in major ports which use oil supplies from around the globe. Such systems are in fact current practice: large paper and pulp complexes import wood from all over the world. Of course, when feedstock such as wood are considered, trade-offs should be weighed between producing the bio-fuel where the feedstock is harvested (and then exporting the liquid fuel), versus importing just the (processed) feedstock (and then converting it into biofuels in the country where the end products are to be consumed). Studies on intercontinental biofuels trade, and even of bulk transport of e.g. pellets, have found that maritime transport of these commodities could be economically feasible, as

it does not appear that dramatic energy losses would be incurred. For example, exporting forest residues some 1,500 kilometres from the Baltic region to the Netherlands – including inland transport and transfer, and using smaller-size vessels – results in an overall energy use of 5 per cent of the energy content of the biomass transported. And exporting (cultivated) wood some 10,000 kilometres from Latin America to Europe – accounting for inland transport and transfer, and using large-size vessels – uses about 10 per cent of the energy content of the biomass (Hamelinck/Suurs/Faaij 2005).

26.7 Closing Remarks

Biomass is one of the renewable energy sources capable of making a large contribution to the world's future energy supply. Biomass is a versatile energy source that can be used for production of heat, power, transport fuels, as well as biomaterials and, when used efficiently, make a large contribution to reducing net GHG emissions. Biomass is the most important renewable energy option at present and is expected to maintain that position during this century. At present, the state-of-the-art combined heat and power generation (CHP), co-firing and various combustion concepts provide reliable, efficient, and clean conversion routes for converting solid biomass to power and heat. Biofuel production is growing at a very rapid pace.

Although the future role of bio energy will depend on its competitiveness with fossil fuels and on agricultural policies worldwide, it seems realistic to expect that the current contribution of bio energy of 40–55 EJ per year will increase considerably. A range from 200 to 400 EJ may be observed looking well into this century, making biomass a more important energy supply option than mineral oil today; large enough to supply 1/3 of the world's total energy needs during this century.

Development of global bio-energy markets provides major opportunities, and links international bio-energy trade with rural development on a global scale. If indeed the global bio-energy market is to develop to a size of 300 EJ over this century (which is well possible given the findings of recent global potential assessments) the value of that market at 4–8 US\$/GJ (considering pre-treated biomass such as pellets up to liquid fuels as ethanol or synfuels) amounts some 1.2–2.4 trillion US\$ per year. Not all biomass will be traded on the international markets logically, but such

an indicative estimate makes clear what the economic importance of this market can become for rural regions worldwide, as are the employment implications.

On top of residues and use of marginal lands, the largest contribution of the biomass resources can be produced on good quality agricultural and pasture lands without jeopardizing the world's food supply, forests, and biodiversity. The key precondition is that agricultural land-use efficiency is increased, especially in developing regions. Improvement potentials of agriculture and livestock are substantial, but exploiting such potentials is a challenge.

Considering that about one third of the mentioned 300 EJ could be covered by residues and wastes, one quarter by regeneration of degraded and marginal lands, and the remaining from current agricultural and pasture lands, almost 1,000 million hectares worldwide may be involved in biomass production, divided over some 400 million hectares of arable and pasture land and a larger surface of marginal and degraded land. This is some 7 per cent of the global land surface and less than a fifth of the land currently in use for agricultural production.

There are rapid developments in bio-fuel markets; increasing production capacity, increasing international trade flows, increased competition with conventional agriculture (rising prices observed for e.g. sugar and maize), and strong international debate about the sustainability of biofuels production. Biomass and biofuels are developing into a globalized energy source with advantages (opportunities for exporters, more stability on the market; increased availability of biomass and more secure investments in conversion capacity and bio-fuel supplies) and concerns (competing land claims, involvement of farmers).

Biomass trading and the potential revenues for biomass produces could provide a key lever for rural development and enhanced agricultural production methods given the market size for biomass and biofuels. However, safeguards (for example well established certification schemes) need to be installed internationally to secure sustainable production of biomass and biofuels. In the period before 2020, substantial experience should be obtained with both sustainable biomass production under different conditions, as well as deploying effective and credible certification procedures.

Especially promising are the production of electricity via advanced conversion concepts (i.e. gasification and state-of-the-art combustion and co-firing) and modern biomass derived fuels like methanol, hydrogen, and ethanol from lignocellulosic biomass.

Sugar cane-based ethanol production already provides a competitive biofuel production system in tropical regions and further improvements are possible. Both hydrolysis based ethanol production and production of synfuels via advanced gasification from biomass of around 2 Euro/GJ can deliver high quality fuels in a competitive with oil prices down to 40 US\$/barrel. Net energy yields for unit of land surface are high and GHG emission reductions can be achieved over 90 per cent. Flexible energy systems, in which biomass and fossil fuels can be used in combination, could be the backbone for a low risk, low cost, and low carbon emission energy supply system for large-scale supply of fuels and power, and providing a framework for the evolution of large-scale biomass raw material supply systems. The gasification route offers special possibilities to combine this with low cost CO₂ capture (and storage), resulting in concepts that are both flexible with respect to primary fuel input as well as product mix, and with the possibility of achieving zero or even negative carbon emissions.

However, a number of questions are still open and should be elaborated in the future, while building experiences with the growing bio-energy markets over time. Below, several important issues are listed:

26.7.1 Domestic Production vs. Import/Export

Because biomass use is in particular favoured because of its desired impact on lowering GHG emissions, resources and chains should be favoured (and perhaps certified) that maximize GHG mitigation. This implies minimization of energy inputs, but also optimizing the use of biomass, e.g. including comparison between indigenous uses versus export.

While many developing countries have a low energy consumption compared to developed countries, their energy demand is increasing rapidly. Should biomass for energy be utilized locally or for export; should market forces have the last say? For example, Brazil is planning to increase ethanol production drastically over the next 8 years, and to start up biodiesel production from soybeans, palm oil, etc. Only a fraction will be exported, the rest will be used domestically. A similar situation can occur in developed countries, e.g. in Finland which currently exports large volumes of pellets to the EU, which could also be utilized domestically. The main driver being the different national incentives paid to pellets. In general, it would be more rationale to use the biomass primarily locally, and only the (certificated) excess should be exported. However, it should be borne in mind that interna-

tional competition will force domestic producers to be more competitive (Schlamadinger/Woess/Byrne/Green/Cowie/Faaij/Fijan/Gustavsson/Hatton/Hedding/Kwant/Pingoud/Ringer/Robertson/Solberg 2005).

In addition, biodiesel production in Western Europe, and ethanol in the EU-25, the USA and Canada has been increasing rapidly over the last few years. Even though these biofuels are often far more expensive (e.g. factor 2–3 compared to Brazilian ethanol), and the energy balance may be questionable. This is due to a combination of other factors e.g. fuel security, and employment in the agricultural sector. Therefore, these biofuels are currently subsidized or enjoy fiscal advantages (e.g. tax exemptions) in many countries.

26.7.2 Solving Sustainability Issues: International Classification and Certification of Biomass

Certification of biomass may be one way to prevent negative environmental and social side-effects. By setting up minimum social and ecological standards, and tracing biomass from production to end-use, the sustainability of biomass can be ensured. In an exploratory study it has been shown that such social and environmental standards do not necessarily result in high additional costs (Smeets/Faaij/Lewandowski 2005).

However, when implementing a certification scheme for sustainable bio energy, several other issues have to be dealt with. Firstly, criteria and indicators need to be designed/adopted according to the requirements of a region. Also, the compliance with the criteria has to be controllable in practice, without incurring high additional costs. Secondly, avoidance of leakage effects (leakage can be defined as activity-induced changes in land use that occur outside the area in which the activity takes place). The net effect is that carbon benefits gained in one place are partially lost in (leak away) in another location. Leakage in the context of biomass trade could stand for an unwanted shift of activities from the area of biomass production to another area where it leads to negative effects on the environment.

It should be investigated whether an independent international certification body for sustainable biomass is feasible. This should be done by a consortium of all stakeholders in the biomass for energy production chain. Probably a gradual development of such a certification scheme is most feasible with gradual learning and expansion over time. Any certification scheme should on the one hand be thorough,

comprehensive and reliable, but also not become a barrier to markets in itself.

26.7.3 Setting up Technical Biomass Standards

By setting up an internationally accepted quality standard for specific biomass streams (e.g. the biofuel standards of the *Comité Européen de Normalisation* (CEN)), biomass end users may have a higher confidence in using different biomass streams. Task 40 may possibly contribute on this, e.g. by collecting information on technical specifications required by consumers and conveying them to potential suppliers. Furthermore, classification of organic matter streams as specific biomass fuel may aid WTO classification as EGS (Environmental Goods and Services).

26.7.4 Lowering of Trade Barriers

Biofuels could help industrialized countries to promote reduction of carbon emissions but, in some cases – as is the case of ethanol exporting to the US and EU – exporting countries face trade barriers. Most of these barriers are established based on technical reasons, but the aim is pretty much to protect local producers that have production costs much higher than developing countries. The solution pointed by some analysts is to liberalize environmental goods and services (EGS), and to include biofuels as EGS. Building up structural international statistics (volumes and prices) on bio-energy trade are desired, this is not done so far.

26.7.5 Building up Long-term Sustainable International Bio-energy Trade

As described above, different issues can hamper the development and growth of international biomass trade flows. It has also been shown that further growth is needed to develop working markets and the related industries. To achieve both growing markets and long-term sustainable biomass trade, a pragmatic approach is needed. It is recommended to focus first on routes with low barriers. A compromise should be found between developing certification efforts, and ensuring sustainability of bio energy, and developing the market. While not all biomass types may fulfil the entire set of sustainability criteria initially, the emphasis should be on the continuous improvement of sustainability. For such an approach, public information dissemination and support is crucial.

The main targets and spin-offs of bio-trade should lead to a stable and reliable demand for rural communities, provide a source of additional income and an increase in employment for exporting countries, contribute to the sustainable management of natural resources, fulfil cost-effectively GHG emission reduction targets, and diversify their fuel mix. Sustainability may best be addressed by a sound certification framework. A gradual process in an international setting seems best to develop this, keeping in mind that a certification process should not become a barrier in itself.

For stakeholders involved, such as utilities, producers, and suppliers of biomass for energy, it is important to have a clear understanding of the pros and cons of biomass energy. For example, investment in infrastructure and conversion facilities requires risk minimization of supply disruptions, in terms of volume quality, as well as price. More important even, the long-term future of large-scale international bio-trade must rely on environmentally sustainable production of biomass for energy. This requires the development of criteria, project guidelines and a certification system, supported by international bodies. This is particularly relevant for markets that are highly dependent on consumer opinions, as is presently the case in Western Europe. It is even more important for developing countries and rural regions to be aware of the opportunities as well as limitations for modern bio energy in an international setting, and to get involved in debate and collaboration for achieving sustainable development where it is most needed.

26.7.6 Biomass, Biofuels, Biomass Markets, and Energy Security

Based on the insights in global biomass resource potentials, techno-economic perspectives for production of 2nd generation biofuels and the rapid market growth for bio energy, including international trading, it is evident that biomass may be able to play a crucial role in enhancing diversity of energy supplies and energy security, as well as reducing greenhouse gas emissions and supporting rural development.

In particular, developing regions in Sub-Saharan Africa, Latin America as a whole, and Eastern Europe are capable of producing large amounts of bio energy next to meeting (growing) food demand while protecting forests and biodiversity. Those regions are also able to supply biomass resources that, combined with advanced technologies in the supply chain and for final conversion to especially transport fuels, can com-

pete fully with main fossil fuel-based alternatives, most notably mineral oil. Assuming that biomass resource potentials are developed in a sustainable way, the right infrastructure is put in place, and that markets and international trading are well developed, biomass and biofuels can be produced in a large number of countries, including export capabilities. In terms of energy security, this promises an improvement compared to currently concentrated mineral oil supplies in the world. We may see a number of 10–20 countries in the world develop into major biomass and biofuel exporters. Brazil already has such a position in the world market, and is likely to stay a leader in this respect. However, Eastern Europe (Ukraine, Russia), the SDAC region (with countries like Mozambique, Zambia, Zimbabwe, and Malawi), Central Africa and other parts of Latin America (Argentina, Central America, Colombia, and Cuba) are potential large exporters. Also other countries and regions have very significant biomass potentials (including North America, the EU, and parts of Asia), but their internal energy markets are so large that it is unlikely that they will develop into bio-energy exporters. We may therefore see a completely new number of players in the global energy market, while at the same time dependency on especially oil imports can diminish.

The information discussed in this chapter also showed that a gradual and sustainable development is necessary to develop the biomass resource base and infrastructure over time. Securing sustainability, e.g. by means of well established and credible certification schemes, is essential to avoid conflicts with food production and sustainable development.

27 Solar Energy on a Global Scale: Its Impact on Security

David Faiman

27.1 Introduction¹

In developed societies, fossil fuel has become all but indispensable for electricity generation, for transportation, and for a variety of heating purposes (both industrial and domestic). However, with the dwindling world fuel supplies, the danger of an international race to gain control of what little remains serves to emphasize the close connection that exists between energy and security, and the precarious position in which any hope of world peace accordingly finds itself.

In order to try and probe a possible way out of this dangerous situation it is important to realize the increasing role that electricity has assumed starting from about the beginning of the 20th century and the way in which it tends to dominate our lives today. It is this dominance that leads one to realize that a solution to the problem of how to generate low-cost electricity from renewable energy could essentially decouple the security issue from that of energy.

The necessary ingredients for such a de-coupling, not necessarily in the order in which they will be developed, are:

- A world-wide, low-loss (possibly superconducting) electrical transmission grid;
- A network of renewable energy power plants to feed it (solar, wind, tidal, hydro, etc. according to geographic availability);
- Efficient storage methods to ensure the dispatchability of electricity from renewable energy plants,

particularly in the lead-up period to a world-wide grid;

- Hydrogen-‘burning’ engines for ground and air transportation (fuelled by hydrogen that is locally produced by the electrolysis of water, using electricity generated from renewable energies).

If every country in the world had access to sufficient grid power, both to serve its electricity needs and to generate its own hydrogen fuel, it would be freed from many of the political considerations that today constrain its economic development. There would also be a natural changeover from the use of primary fuel to lower-cost electricity for a great many industrial purposes.

Naturally the key factors for such a reorganization of the world’s energy sector must be the availability of renewable energy in sufficient quantities, and the possibility of using it to generate electric power at low cost – where ‘low’ essentially means, at lower cost than has hitherto been possible with fossil fuel.

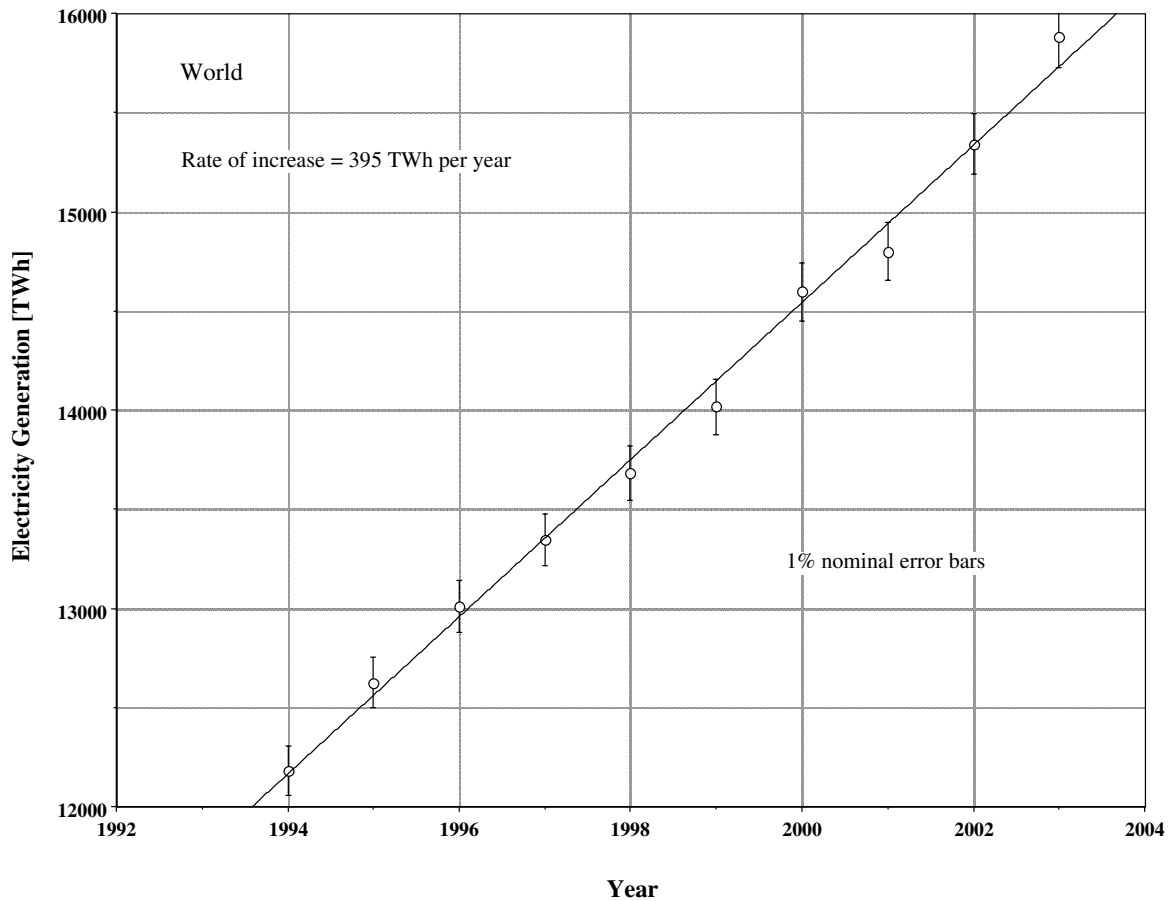
This chapter will discuss the potential for concentrator photovoltaic technology to play a major role in effecting such a solution to the energy problem. This is a technology that has recently been proposed for the large-scale generation of solar electricity at low cost (Raviv/Rosenstreich 2003, 2004, 2004a), if introduced into a number of key areas in the world.

27.2 The Magnitude of the Problem

In order to help us appreciate the magnitude of the problem, figure 27.1 shows the rate at which the world generation of electricity has been increasing in the past 10 years. The year 2003 is the latest for which data are presently available (IEA 2003). The increase is seen to be linear, with a slope of 395 TWh per year. To maintain this rate of increasing demand, the world will have to construct additional new power plants *each year*, with a combined power rating of approximately 80 GW, which will add to our fuel burden an

1 Research funded in part by the Israel Ministry of National Infrastructures. The author is indebted to his colleagues in the IEA Task 8 Photovoltaic Specialist Group *Very Large Scale Photovoltaic Solar Power Plants* for critical discussion of the assumptions made herein, and to Dov Raviv and Roy Rosenstreich for ‘lighting the fire’ and stimulating discussion. The author is indebted to Ms. Shoshana Dann for editorial assistance.

Figure 27.1: World electricity production during the years 1994-2003. Growth rate = 395 TWh per year. **Source:** IEA (2003).



extra 88 M tonnes (590 M barrels) of oil equivalent per year - each year.

Now figure 27.1 also indicates that the current annual world production of electricity is in excess of 15,000 TWh. Compared to this figure, an increase of 395 TWh per year may seem small. However, if the latter could be generated by renewable energies it could stabilize, at its present level, the annual demand for fossil fuel for electricity generation. Of course, ambitious as even this programme would be, it does not represent the world's *entire* energy needs: only the electrical part, which represents approximately one third of the total world fossil fuel consumption. But let us start by looking into what would be involved in trying to stabilize just the electrical part of the present world energy demand, by using solar energy to off-set the annual incremental requirements. This kind of approach has recently been applied in a study of the southwest states of the USA (Faiman/Raviv/Rosenstreich 2007), where high solar radiation levels, the availability of large areas of desert land, and relatively

high electricity tariffs combine to render such a goal feasible and highly cost-effective.

The biggest problem for solar is that, compared to fossil fuel, it is an *extremely dilute* form of energy. This can be appreciated by realizing that it requires *almost a year* for 1 m² of the (relatively sun-rich) deserts to intercept from the Sun the energy equivalent of 1 barrel of oil. And the world is currently consuming energy at a rate in excess of 200M barrels of oil equivalent *per day*. This means that we would need to collect solar energy over an area of 365 x 2,000M m² (assuming a nominal 10 per cent conversion efficiency) to generate this much usable solar energy. Are the world's deserts large enough to accommodate 730,000 km² of solar collectors? Since the Sahara alone is more than 10 times this area, and it is not the only desert, the answer is clearly in the affirmative. However, because an appropriate low-loss transmission method has not yet been developed for transporting electricity over global distances, it would be premature to think of the Sahara desert as an electric-

Table 27.1: World electricity generation statistics on a regional basis and linear projections to the year 2012. [*Generation for Eastern Europe and the Former Soviet Union fell steeply during the years 1990-1998. The linear fit for this region is therefore based on the past 5 years of data only]. **Source:** IEA (2003).

Region	Production in 2003 [TWh]	Percentage of World Production	Rate of Increase [TWh y ⁻¹]	Goodness of fit (R ²)	Projection to 2012 [TWh]
North America	4668.11	29.4	84.15	0.960	5425
Asia	4365.61	27.5	167.67	0.976	5875
Western Europe	2973.66	18.8	57.82	0.991	3494
Eastern Europe*	1668.18	10.5	36.67	0.992	1998
South America	723.74	4.6	20.97	0.944	912
Middle East	506.19	3.2	23.04	0.997	714
Africa	471.06	3.0	13.90	0.987	596
Oceania	370.95	2.3	13.59	0.999	493
Central America	104.92	0.7	4.02	0.992	141

ity source for the entire world. Instead, we have first to address smaller regions.

But what of the regional scale: Could solar energy reasonably be employed on a continental or even state-wide scale? Clearly the answer becomes more site-specific the smaller the scale that is considered, because it depends upon local population densities, land availability, and of course the quality of sunlight. Table 27.1 shows a break-down of figure 27.1 into its regional components. The regions are listed in descending order according to their present annual electricity production. The table gives for each geographic region of the world: the electricity generation figures for the year 2003 (IEA 2003); the rate of increase, based on a linear fit to the last 10 years of data; and the projected electricity requirements in the year 2012, based on a continuation of these linear fits. The projection for Eastern Europe, including the former Soviet Union, is based on the past 5 years of data only, due to the sharp fall in electricity production that occurred there during the years 1990-1998.

The reason that table 27.1 projects electricity generation to the year 2012 is that, as will be explained below, this is the *earliest* that a full-scale implementation of a solar alternative could realistically commence, and hence the last year that fossil fuel requirements for electricity production need continue to rise.

In a number of cases (North America, Asia, and South America) curvilinear least-squares-fits would match the data slightly better than the linear fits in table 27.1, but they are of no intrinsic significance as one can not predict the future. What is important is to realize that any such extrapolations, linear or otherwise, over such a lengthy period of time can not be

anything more than indicative as to *what we might expect* under a so-called 'business as usual' scenario. However, such extrapolations are useful for our present purpose, because they enable us to estimate the amount of land area that would be needed for a solar energy alternative, and the extent to which that land may or may not be available.

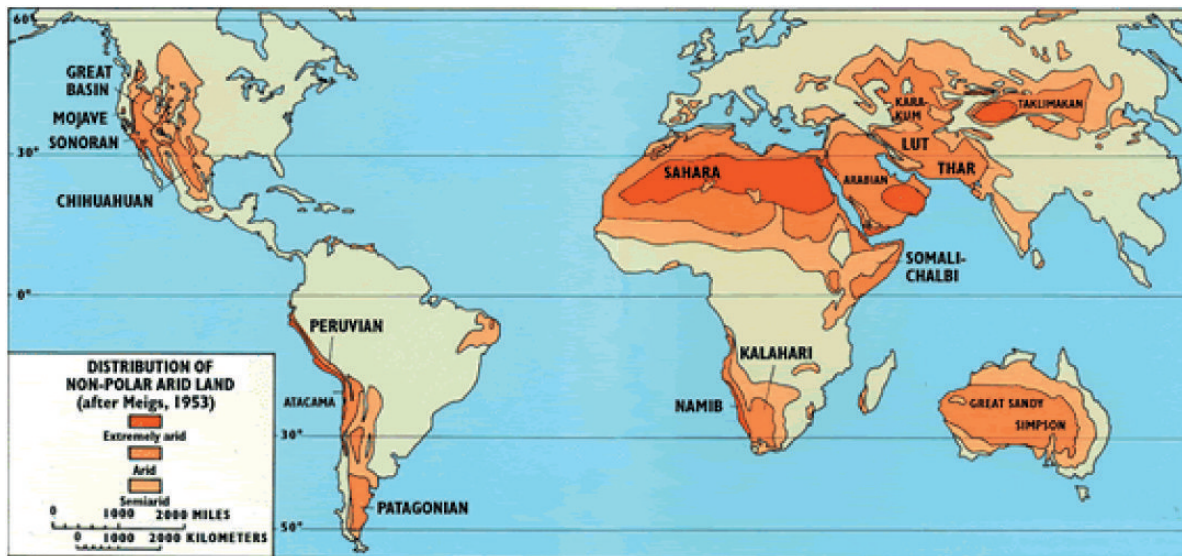
As regards the question of land availability, we see that the largest electricity requirements presently come from North America. Fortunately, the south-western part of this continent is amply endowed with desert areas in which large solar plants could be located. For example, the 300,000 km² Sonoran desert (Fig. 27.2) could, in principle, generate about 10 times the projected 2040 electricity requirements for this continent, as will be explained in the next section.

Similarly, the 1.3M km² Gobi desert and the 200,000 km² Thar deserts should be ample for providing Asia's future electricity needs. Western Europe could also be served by part of the Sahara desert. Eastern Europe could receive solar electricity from the 350,000 m² Kara-Kum desert and from the Gobi.

South America could employ the 670,000 km² Patagonian desert and the 140,000 km² Atacama desert. Of course the Middle East, being more or less entirely desert, has no lack of space for providing its future electricity needs. Africa has the Sahara in the North and the Kalahari and Namib deserts in the southwest, the latter two comprising more than 1 M km² of potential solar collection area.

Finally, although small on the world scale of consumption, the great Australian deserts could provide all of Australia's future electricity needs. As for the remainder of Oceania and also of Central America, al-

Figure 27.2: Distribution of the world's deserts. **Source:** U.S. Geological Survey; at: <<http://geology.com/records/sahara-desert-map.gif>>.



though deserts are not available, it is not impossible that cost-effective local solar energy solutions might be available on a country by country basis. However, because their energy needs are minuscule on a world scale, their fuel requirements are correspondingly modest. We shall therefore not deal with them further in this chapter. We turn now to the question of the type of solar technology that is appropriate for our task.

27.3 Photovoltaics – The Concentrator Variety

One might imagine spreading something like 730,000 km² of photovoltaic (PV) panels over the Sahara and feeding the resultant electric power into a future world electricity grid. In fact, the PV Task 8 Specialist Group, established by the International Energy Agency, recently performed a study of the feasibility of employing very large scale photovoltaic (VLS-PV) power generation systems in the deserts of the world (Kurokawa 2003). Such plants would typically be of the order of 1 GW in power production capability, and occupy some 10 km² of desert apiece. The study found that VLS-PV plants are already technically feasible, but that their cost is high compared to conventional power plants, mainly due to the need to use large amounts of PV material.

However, the IEA study also considered an approach known as *Concentrator Photovoltaics* (CPV). This method collects the solar energy over large, low-

cost, areas of glass mirrors, and concentrates it onto relatively small amounts of PV material for conversion to electricity. In this manner, a saving by typically a factor of 1000 can be effected in the amount of expensive PV material that is required. Thus, the world's present-day energy consumption rate of 200M barrels per day would still require 730,000 km² of mirrors in order to collect the sunshine, but only 730 km² of PV material for converting it to electricity.

Figure 27.3 shows a large parabolic dish reflector built for research purposes at Sede Boqer, Israel. Its capture area consists of more than 400 m² of silvered glass mirrors. In a European-funded project known as *HiConPV*, this dish was used to test a specially fabricated CPV cell module at a solar concentration 1000 times more intense than natural sunlight (1000X). A module of such solar cells, with dimension 65 cm x 65 cm, if illuminated by a 400 m² dish, could generate 120 kW of electric power under peak sunny conditions, or about 250,000 kWh of electrical energy per year.

An alternative CPV technology employs fresnel lenses, instead of mirrors, for concentrating sunlight. Figure 27.4 shows a prototype lens-based CPV collector under test in Phoenix, AZ, USA. This collector has a gross area of 225 m². Its 5760 plastic lenses concentrate sunlight by a factor 260X, focusing it onto an array of silicon CPV cells. This collector can produce about 25 kW under peak sunny conditions, or about 50,000 kWh of electrical energy per year.

Ten-thousand of the mirror dishes, or forty-thousand of the lens-type collectors could be packed into

Figure 27.3: CPV cell module exposed at 1000X at the 400 m² *PETAL* solar dish test facility in Sede Boqer, Israel. **Source:** Photo by David Faiman.



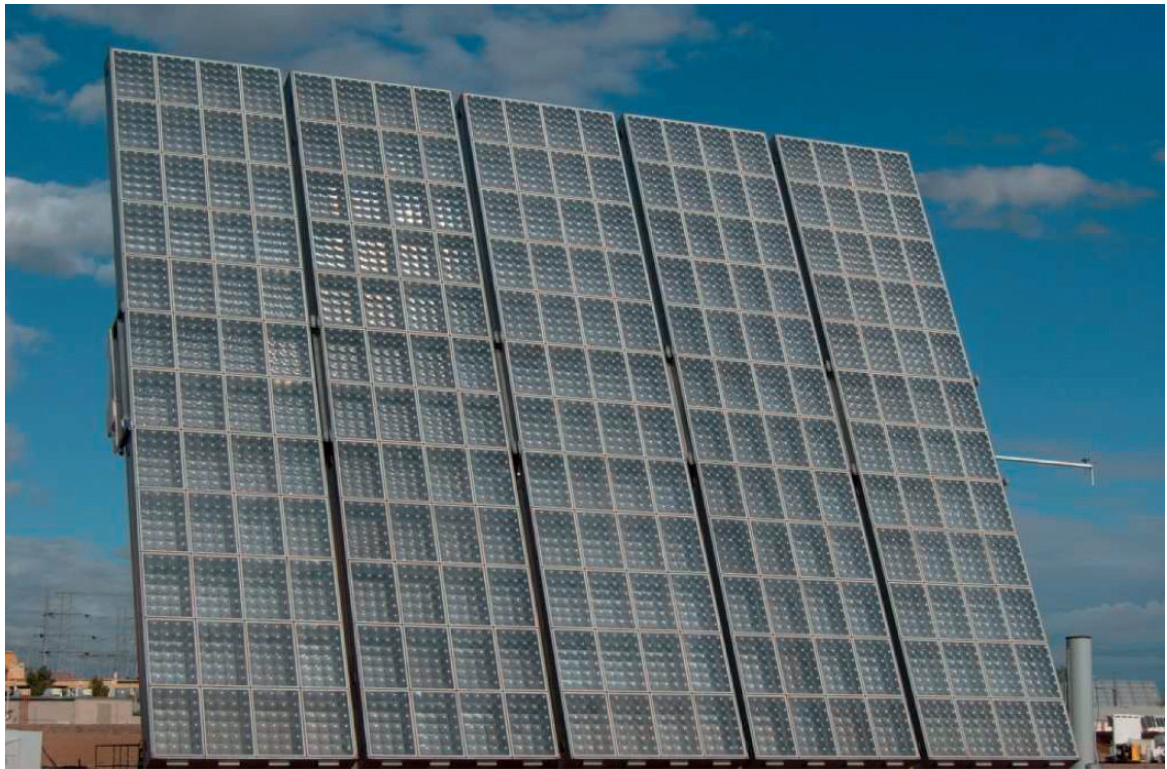
a 10 km² field and would generate an annual amount of electricity comparable to that of a conventional large modern power plant.

The two particularly promising characteristics of CPV compared to standard PV technology are its ability to reduce the amount of PV material per generated watt, as we have seen, by typically a factor of 1000; and the concomitant reduction in cost of the entire power-generating system - to levels that can compete with fossil-fuelled systems. In particular, it has been estimated that on the scale of GWs per year, large fields of CPV collectors could cost as little as \$850/kW installed (Raviv/Rosenstreich 2003, 2004, 2004a).

27.4 Storage Requirements for CPV

Storage is a problem for all power-generating systems *no matter what their energy source*. For example, coal-fired and oil-fired power plants can not be turned on and off at will, in order to provide energy only when needed. As a result, many utility companies resort to offering low-cost electricity at off-peak demand times in order to enable them to try and maximize the revenue from the fuel they are constantly forced to burn. However, provided that their peak generating capacity does not fall short of peak demands, such plants never have a problem of providing power when it is needed. Nevertheless, their fuel efficiency is low and in situations where storage can be provided (e.g. via water pumping), night-time electricity can be sold during the following day, and fuel efficiency increases accordingly.

Figure 27.4: A large pre-commercial CPV system under test in Phoenix, AZ, USA, consists of 5760 plastic fresnel lenses, which each focus sunlight onto one of a similar number of individual 1 cm x 1 cm silicon CPV cells. **Source:** Photo by David Faiman.



Now, renewable energy plants, particularly of the solar or wind variety, also have a storage problem, but one that is of a qualitatively different nature. Here, the variability of the energy source turns the plants on and off at random times of the day. This is an unacceptable situation for an economy that requires power to be available at all times. Therefore, in the case of solar, some form of storage is an absolute necessity. This problem can be approached in three stages.

At the first stage, solar generating capacity is so small that the electricity grid is capable of accepting all power if and when it is generated. Here, the word 'small' means that the peak solar output would never exceed the difference between demand and what the fossil-fuelled plants can generate. This would never be the situation if fossil plants were sized to exceed maximum demand levels. However, because of ever rising demands for electricity, utility companies constantly have to face situations in which additional power plants need to be constructed. In this connection, one of the great attractions of the 30 MW solar-thermal plants that were constructed in California during the 1980's, was their modularity and comparatively low cost compared to the giant 1000 MW plants that were

the available fossil alternatives. Thus, solar was able to fill the gap between rising electricity needs and available fossil-fuelled capacity, in a more cost-effective manner than would have been the case by adding an additional very large fossil plant. Of course, there was still the problem of what to do during cloudy periods (because the solar-thermal plants required direct sunlight). This problem was solved by employing gas-fired backup - i.e. small amounts of fossil fuel.

In the case of our proposed CPV plants, the first stage would employ battery storage, or perhaps small gas-burning generators. In the case of batteries, they would be charged at night (using fossil-generated power from the grid) and used during the day to fill in the cloud-cover gaps between successive sunny spells. The precise sizing of the batteries and the strategy for buying and selling fossil-generated energy for charging them would be a matter for optimization to specific local conditions. However, it has been suggested (Raviv/Rosenstreich 2003, 2004, 2004a) as a starting rule-of-thumb, that for each 3 GWp of solar generating capacity, batteries with 1 GW of 6 h storage capacity should be included.

Stage 2 of the storage problem is reached when the fraction of solar-generated electricity is no longer small compared to a given utility's overall mix of power inputs. This problem will require further research for the creation of optimal power usage strategies from the various types of grid input plants (fossil, solar, wind, etc. – and storage). It will also require new technological developments in various potential forms of storage.

Stage 3 is reached when there is a world-wide grid. At that stage, the global storage problem will be solved by the fact that the sun always shines somewhere. However, there may still remain some local storage requirements, and these will be handled by the various technologies that will have been developed at stage 2.

The bottom line of this storage discussion is that the world does not need to await the development of a complete solution to the storage and transmission problem before embarking upon the construction of very large solar power plants. Provided the latter can be built in a cost-effective manner and their use can lead to a significant reduction in the demand for fuel then such a programme should go ahead.

27.5 Land Requirements for CPV

There is one restrictive characteristic of CPV, compared to standard PV, and that is its need for direct sunshine. Conventional flat PV panels generate power in direct proportion to the amount of light they receive, irrespective of whether it is bright sunshine or the diffuse light from cloudy skies. This means that even on dull, cloudy days they produce some power. In contrast, CPV collectors, because they concentrate sunlight, need to be able to see the sun. This kind of technology is therefore mostly suitable for desert regions. But of course, since a solar solution, of any kind, will require large areas of available land, desert wastelands are in any case the most suitable locations. This is the reason why, in our search for a global solar solution, we have focused on countries that have substantial desert areas available for the CPV plants, and of their proximity to countries that do not. For example, Europe does not have deserts, but it is relatively close to the Sahara. Hence, via links between Morocco and Spain, or between Libya and Sicily, the European electricity grid could be fed from CPV stations located in the Sahara. On the other hand, much of Oceania is relatively far removed from the Australian deserts. Consequently, a CPV solution for those coun-

tries would need to await the further development of low-loss transmission cables.

Regarding the amount of land area that would actually be required for the erection of large CPV plants, a study of the seven southwest states of the USA concluded that, depending upon the intensity of sunlight available at the site, it would take from 4.85 km² (California) to 5.90 km² (Utah) of land to generate each 1 TWh of electricity per year (Faiman/Raviv/Rosenstreich 2007). Therefore, if we take 5 km² per TWh y⁻¹ as a rough guide, we see that in order to generate the 395 TWh per year at which world demand is increasing, we would need to cover approximately 1975 km² of additional desert each year. The operation of such an increasing quantity of CPV plants would enable the world's fossil fuel consumption for electricity-producing purposes to level off at its present value (or at whatever value it would have reached by the time the first set of CPV plants become operative).

Table 27.2 shows a region-by-region examination of the amount of land that will be required for enabling solar energy to halt the present annual growth in fossil fuel consumption. The table also identifies the name and the size of the closest desert terrain. The land requirement calculations are based upon a nominal 5 km² per 1 TWh y⁻¹.

27.6 Economic Assumptions for CPV Construction

In the following section we shall study the electricity needs of a number of single countries, from each of the regions in table 27.2. We shall then calculate the rate at which VLS-PV plants would need to be built in order to stop that country's annual fuel requirements from increasing. Equally important, we shall use the Raviv Model (Raviv/Rosenstreich 2003, 2004, 2004a) to calculate the expected costs and economic benefits associated with taking such a step. We therefore first review the economic assumptions of the Raviv Model that will be common to all of our examples. Since they have been discussed at length elsewhere (Faiman/Raviv/Rosenstreich 2007), there is no need to do more than to list them here.

- It is assumed that it would take 4 years to set up a collector manufacturing facility with an annual throughput of 1 GWp. The cost of this production line was calculated to be US\$630M. If a decision to implement such a programme were to be taken in 2007, then construction of the manufacturing facility would occupy the years 2008–2011.

Table 27.2: Estimated area of desert land required for enabling each geographical region to freeze its fossil fuel requirements at the anticipated 2012 level, by the annual construction of VLS-PV plants of the CPV type starting in the year 2012. [*Eastern Europe includes Russia and the former Soviet Union states, and is listed as being problematic owing to its comparative large distance from the nearest deserts.] **Source:** <www.geosource.ac.uk/worldguide/guide_deserts.html> after Chambers Book of Facts (2003).

Region	Annual increase in power generation [TWh y ⁻¹]	Solar land requirement [km ² y ⁻¹]	Nearest desert	Size of desert [km ²]
North America	84.15	421	Sonoran	311,000
Asia	167.7	838	Gobi Thar	1,295,000 453,000
Western Europe	57.82	289	Sahara	9,065,000
Eastern Europe*	36.67	183	problematic	
South America	20.97	105	Atacama	140,000
Middle East	23.04	115	Arabian	1,700,000
Africa	13.90	70	Sahara Kalahari	9,065,000 582,000
Oceania	13.59	68	Great Victoria	647,000
Central America	4.02	20	Chihuahuan	453,000

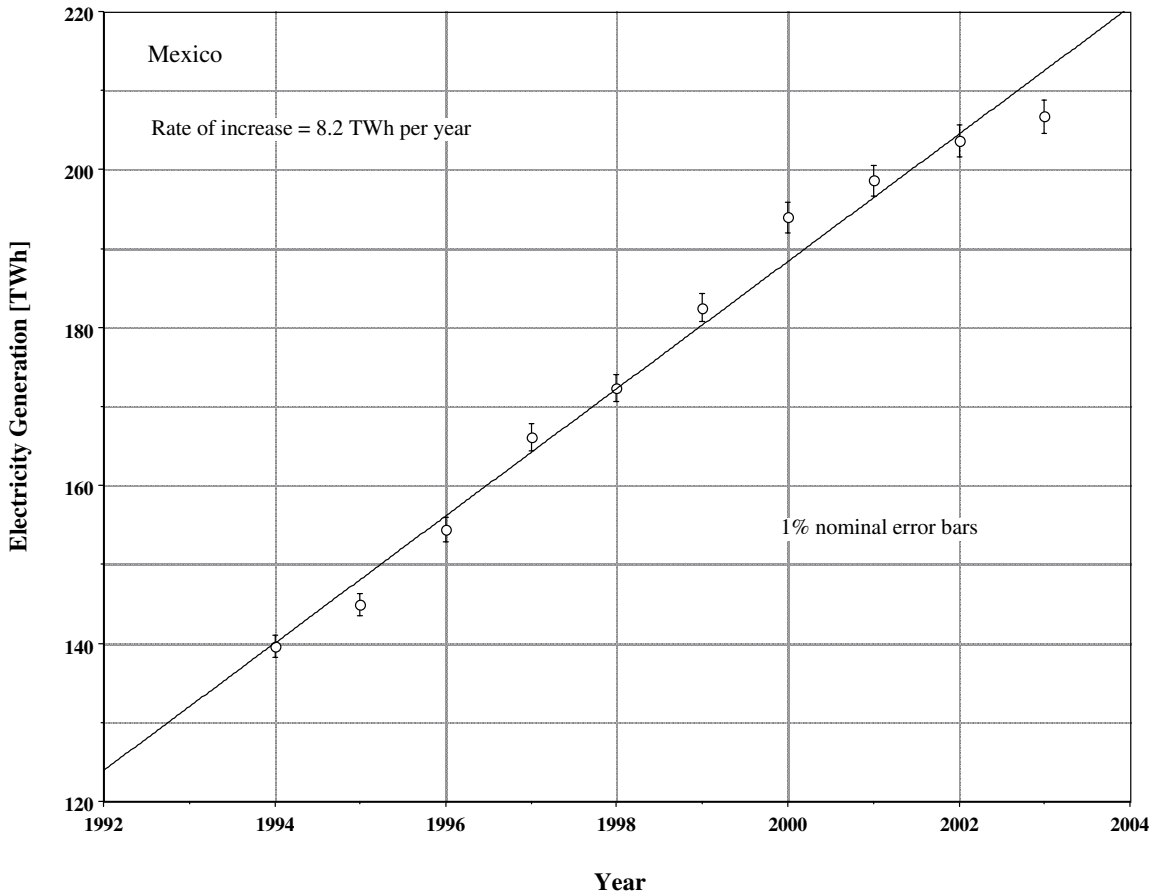
- Also to be established during the same 4 year period would be a storage battery manufacturing facility with an annual throughput of 333 kW. The batteries should have an effective storage capacity of 6 hours. The cost of the battery manufacturing facility was estimated to be US \$ 100M.
- It is assumed that the production cost of each 1 GWp VLS-PV plant (including 333 kW of battery storage) will be US \$ 1.133M. This cost includes components, manufacturing, delivery to site, plant construction and checkout. Manufacture and construction of the first plant would occur in the year 2012. This would accordingly be the last year that the state in question would have increased its fossil fuel consumption for electricity production: From 2013 onwards, all additional electricity needs would be provided by solar energy.
- A further US \$ 220M is included for research and development (R&D) costs. In principle, this is a one-time item that affects only the first manufacturing facility. However, since we do not know where that will be, we shall add this cost to the total cost required for setting up such a facility at each of the sites under discussion.
- In addition to the preceding large cost items, we also include general and administrative (G&A) costs of 5% of electricity sales up to a ceiling of US \$ 100 M per year.
- We assume that operation and maintenance (O&M) costs will amount to 0.5 US¢/kWh.
- We assume an annual interest rate of 5 per cent in constant dollars (i.e. above inflation).

27.6.1 Electricity Tariff

In our previous CPV studies, we made various assumptions about the tariff at which the electricity will be sold. In the case of our study for Israel (Faiman/Raviv/Rosenstreich 2007a) we assumed a tariff of 9 US¢/kWh, corresponding to the prevailing cost of electricity in that country. In our more general sensitivity study (Faiman/Raviv/Rosenstreich 2005) we assumed 10 US¢/kWh. In our study of the seven southwestern states of the USA (Faiman/Raviv/Rosenstreich 2007) we used the average tariffs prevailing in each of those states. In all of those cases (except for Utah) we found that VLS-PV systems in their CPV variety turned out to exhibit ‘sustainability’ in three distinct ways.

First, was the fact that mounting annual electricity revenues cause the initial capital investment plus interest to be paid back well within the lifetime of the first (and therefore oldest) VLS-PV plant. Second, after the initial investment is paid off, the electricity tariff can be lowered to a level that enables the continued annual plant construction, but without the need for any further external capital investment (so-called *Type-2 sustainability*). Third, assuming a 30-year effective lifetime for each VLS-PV plant, it becomes necessary to construct two plants per year from year 35 onwards. It

Figure 27.5: Electricity production in Mexico during the years 1994-2003. Growth rate = 8.2 TWh per year. Source: IEA (2003).



turns out, however, that this can also be done without the need for additional external capital investment, if only a slight adjustment is made to the type 2 sustainability tariff (except for the case of Utah). This ability of VLS-PV plants of the CPV variety to cover the costs of plant renewal was termed *Type-3 sustainability*.

For our present study, we shall turn the question around. Instead of assuming that the solar-generated electricity will be sold at some prevailing tariff we shall ask: What is the minimum price for which the electricity can be sold that will just permit Type-3 sustainability? That is to say, we shall calculate the minimum tariff, for each country considered below, that would enable the full investment plus interest to be paid off by the time VLS-PV plant No. 1 is 30 years old, and permit the subsequent construction of 2 new plants per year entirely from electricity revenues.

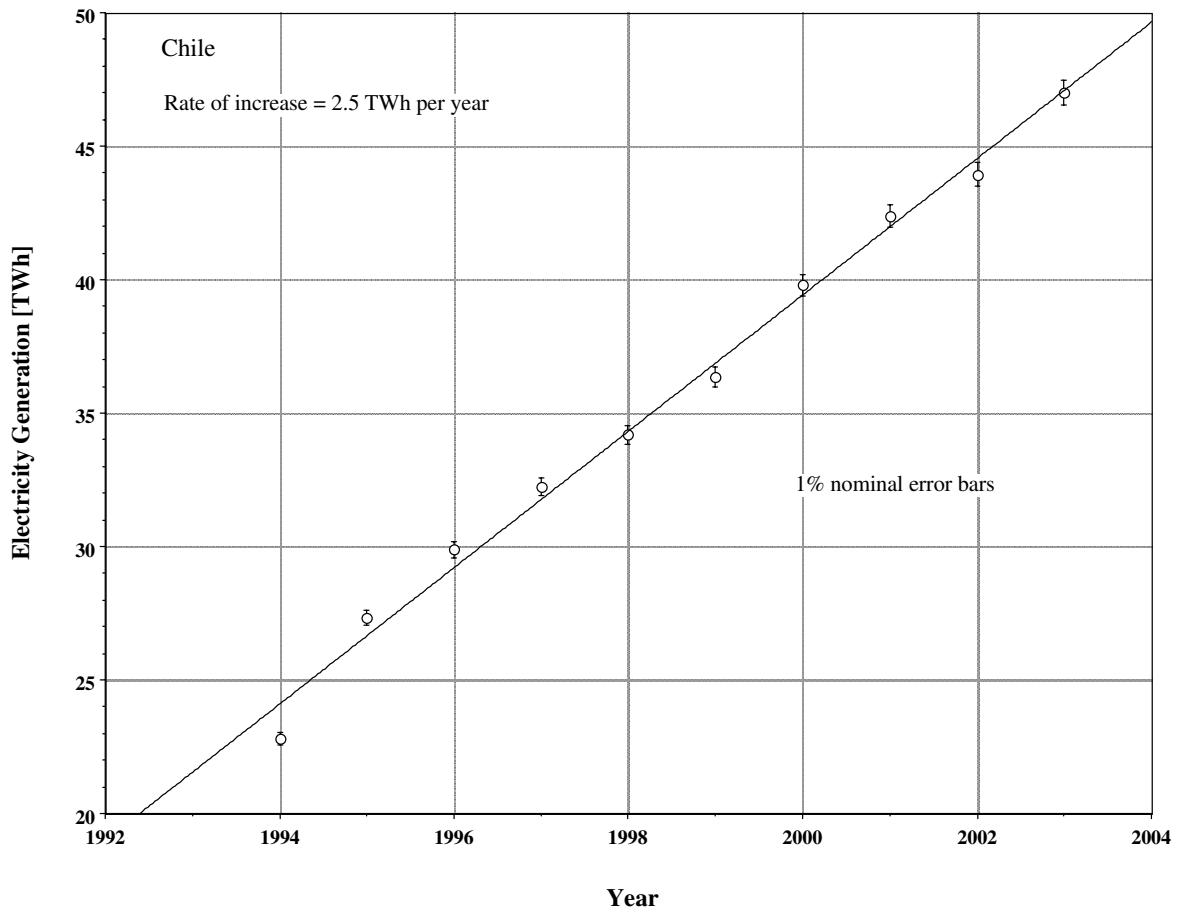
27.7 Some Specific Examples

27.7.1 Mexico

We have chosen Mexico as our example for North America because, on the one hand, the cases of seven of the states of the USA have been discussed in detail elsewhere. Secondly, unlike Canada, Mexico has its own desert, the Chihuahuan, in which the VLS-PV plants can be located. Let us first address the size of the VLS-PV plants needed for this country. Figure 27.5 shows the rate at which electricity production in Mexico has been rising during the past 10 years (IEA 2003).

One sees that Mexico's electricity needs are rising at a rate of 8.2 TWh per year. In order to generate this much electricity per year from solar energy, it would be necessary to construct VLS-PV plants at the rate of 4.1 GWp per year, each such plant requiring approximately 41 km² out of the 453,000 km² of the Chihuahuan desert.

Figure 27.6: Electricity production in Chile during the years 1994-2003. Growth rate = 2.5 TWh per year. **Source:** IEA (2003).



Regarding cost, a tariff of 6.13 US¢/kWh would be the minimum that would enable Type-3 sustainability for such plants. Such a starting tariff would permit the entire investment plus interest to be paid off in year 34 (i.e. the final year in the life of VLS-PV plant No. 1). From then onward, the electricity tariff could be lowered to 4.37 US¢/kWh for continued Type-3 sustainability.

With such a low starting tariff, the required credit line would reach a maximum value of US \$ 25.36B, in year 20. However, by employing a higher starting tariff, the credit line would be paid off sooner and it would not reach such a large maximum value. For example, for a starting tariff of 10 US¢/kWh, a credit line maximum of only US \$ 13.44B would be reached in year 12 and fully paid off by year 21. The tariff could then be lowered to 3.99 US¢/kWh for Type-2 sustainability and then raised in year 35 to 4.37 US¢/kWh for Type-3 sustainability.

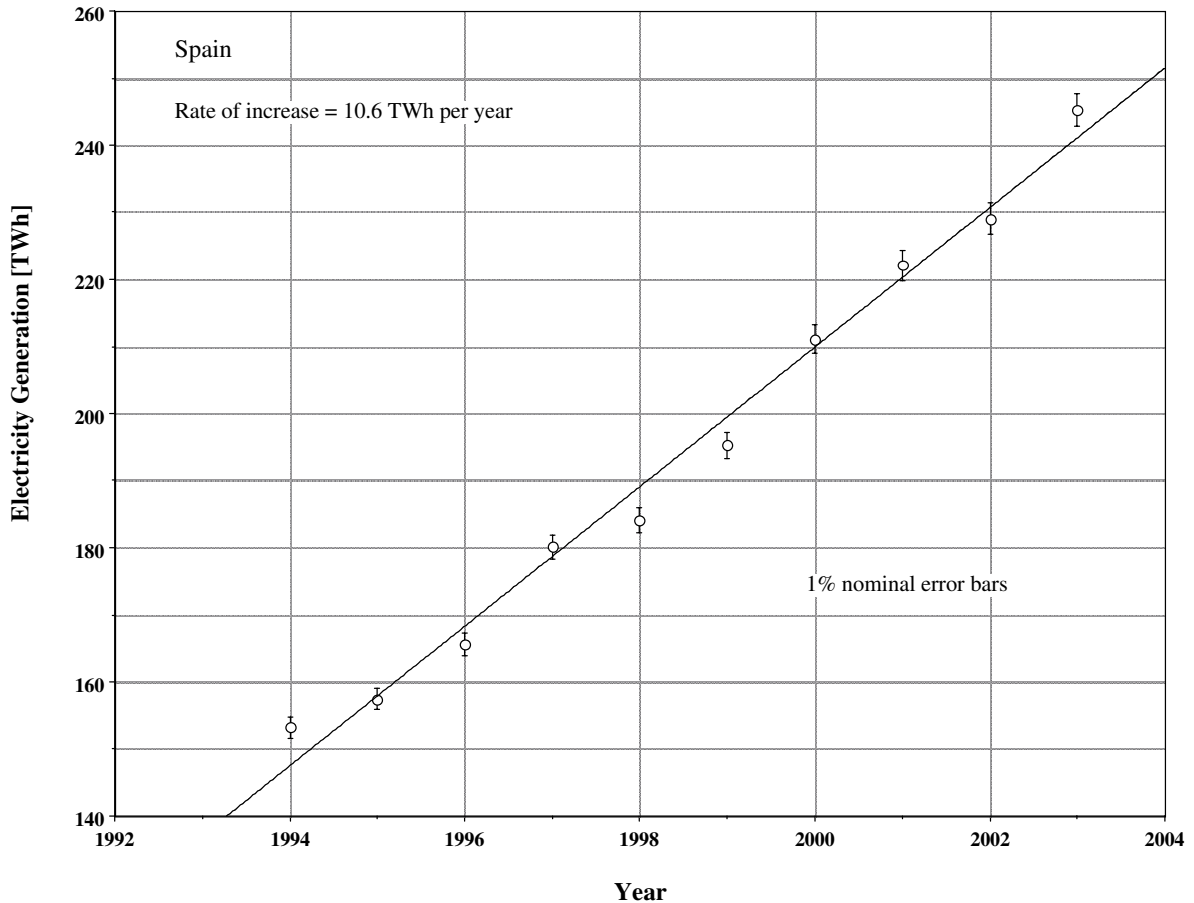
27.7.2 Chile

From North America we move south to Chile. Although this country is not the largest electricity producer in South America it has the advantage, for our purposes, of being located close to the Atacama desert. So let us again first address the size of the VLS-PV plants needed for this country. Figure 27.6 shows the rate at which electricity production in Chile has been rising during the past 10 years (IEA 2003).

One sees that Chile's electricity needs are rising at a rate of 2.5 TWh per year. In order to generate this much electricity per year from solar energy, it would be necessary to construct VLS-PV plants at the rate of 1.25 GWp per year, each such plant requiring approximately 12.5 km² out of the 140,000 km² of the Atacama desert.

Regarding cost, a tariff of 6.84 US¢/kWh would be the minimum that would enable type-3 sustainability for such plants. Such a starting tariff would permit the entire investment plus interest to be paid off in

Figure 27.7: Electricity production in Spain during the years 1994-2003. Growth rate = 10.6 TWh per year. **Source:** IEA (2003).



year 34 (i.e. the final year in the life of VLS-PV plant No.1). From then onward, the electricity tariff could be lowered to 4.42 US¢/kWh for continued Type-3 sustainability.

With such a low starting tariff, the required credit line would reach a maximum value of US \$ 13.75B, in year 18. However, by employing a higher starting tariff, the credit line would be paid off sooner and it would not reach such a large maximum value. For example, for a starting tariff of 10 US¢/kWh, a credit line maximum of only US \$ 8.59B would be reached in year 13 and fully paid off by year 21. The tariff could then be lowered to 4.07 US¢/kWh for Type-2 sustainability and then raised in year 35 to 4.42 US¢/kWh for Type-3 sustainability.

27.7.3 Spain

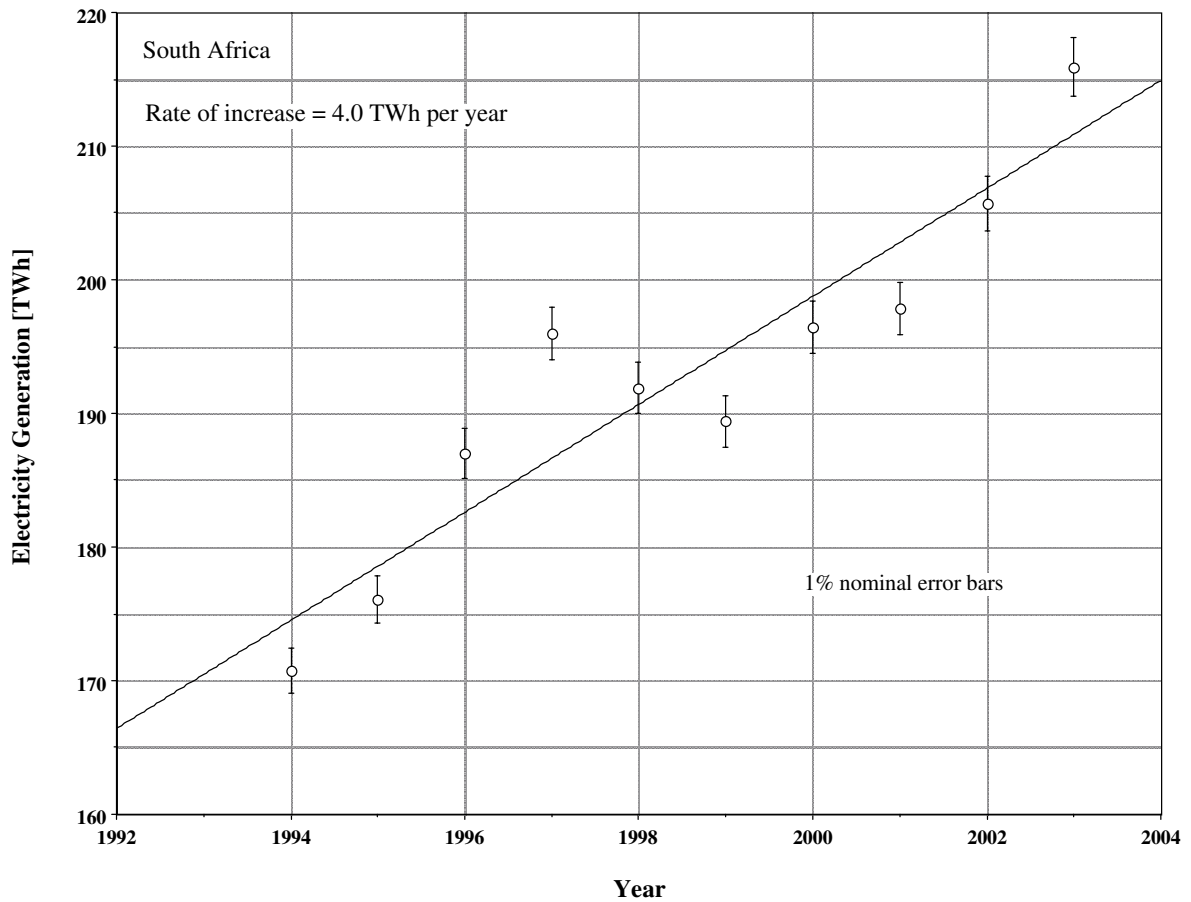
For our European example we have chosen Spain because of its close proximity, via the Strait of Gibraltar,

to the Sahara, where it is assumed European VLS-PV plants would be sited. It is also an example of a state with special feed-in tariffs to promote the use of alternative energies. Again, we first address the size of the VLS-PV plants needed for this country. Figure 27.7 shows the rate at which electricity production in Spain has been rising during the past 10 years (IEA 2003).

One sees that Spain's electricity needs are rising at a rate of 10.6 TWh per year. In order to generate this much electricity per year from solar energy, it would be necessary to construct VLS-PV plants at the rate of 5.3 GWp per year, each such plant requiring approximately 53 km² out of the 9.065M km² of the Sahara desert.

Regarding cost, a tariff of 6.01 US¢/kWh would be the minimum that would enable Type-3 sustainability for such plants. Such a starting tariff would permit the entire investment plus interest to be paid off in year 34 (i.e. the final year in the life of VLS-PV plant No.1). From then onward, the electricity tariff could

Figure 27.8: Electricity production in South Africa during the years 1994-2003. Growth rate = 4.0 TWh per year. **Source:** IEA (2003).



be lowered to 4.31 US¢/kWh for continued Type-3 sustainability.

With such a low starting tariff, the required credit line would reach a maximum value of US\$66.31B, in year 20. However, by employing a higher starting tariff, the credit line would be paid off sooner and it would not reach such a large maximum value. For example, for a starting tariff of 10 US¢/kWh, a credit line maximum of only US\$34.29B would be reached in year 12 and fully paid off by year 20. The tariff could then be lowered to 4.11 US¢/kWh for Type-2 sustainability and then raised in year 35 to 4.31 US¢/kWh for Type-3 sustainability.

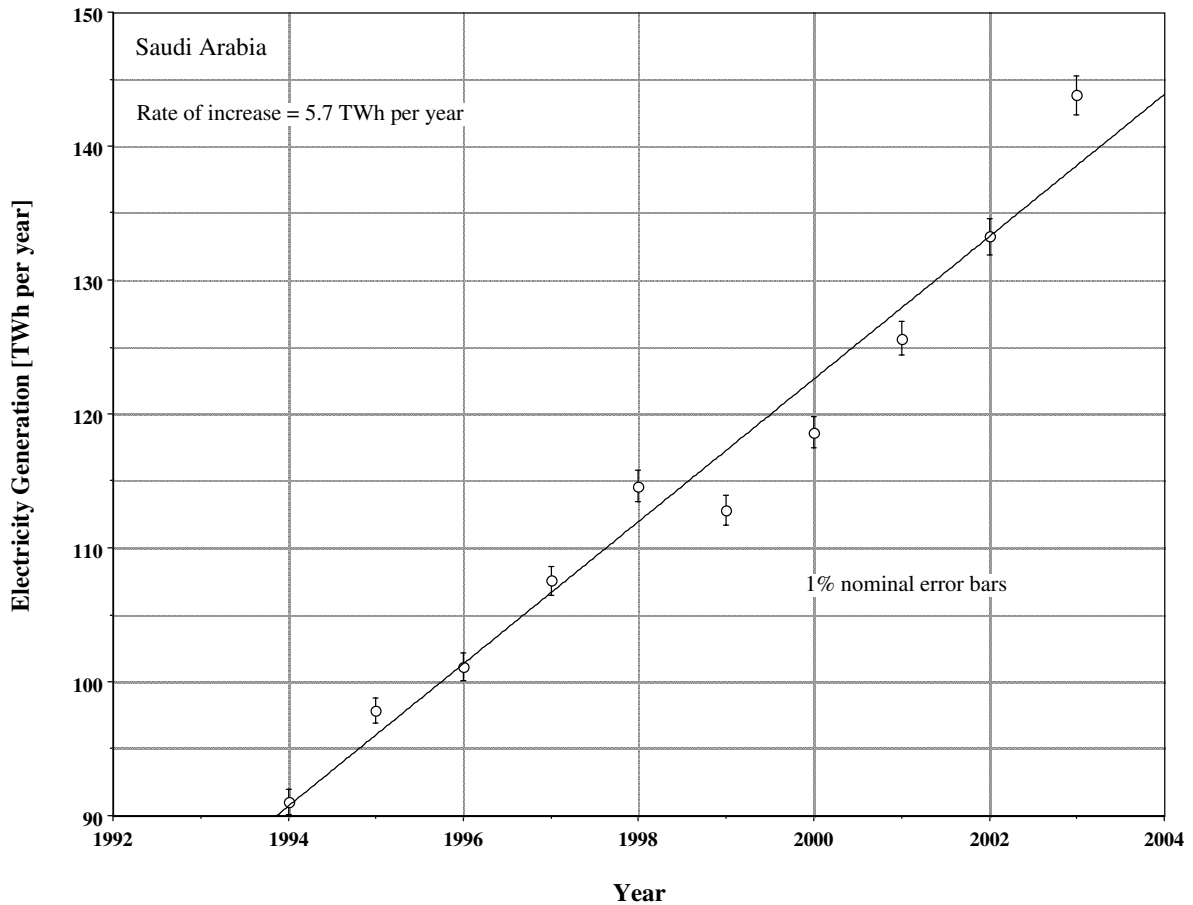
It should be mentioned that at the present time, solar entrepreneurs in Spain enjoy an artificially high feed-in tariff, equivalent to approximately 50 US¢/kWh, in order to promote the use of solar energy. If such high tariffs will still be available for the coming 30-40 years then VLS-PV plants of the kind discussed here will return their initial investment in record time. For example, with a starting tariff of 50 US¢/kWh, a

credit line maximum of only US\$11.98B would be reached in year 6, and fully paid off by year 8. The tariff could then be lowered to 14.92 US¢/kWh for Type-2 sustainability and then lowered yet again in year 35 to 4.31 US¢/kWh for Type-3 sustainability.

27.7.4 South Africa

From Spain we move south to the largest producer of electricity in the African continent, South Africa. Again, we first address the size of the VLS-PV plants needed for this country. Figure 27.8 shows the rate at which electricity production in South Africa has been rising during the past 10 years (IEA 2003). One sees that South Africa's electricity needs are rising at a rate of 4.0 TWh per year. In order to generate so much electricity per year from solar energy, it would be necessary to construct VLS-PV plants at the rate of 2.0 GWp per year, each such plant requiring approximately 20 km² out of the 582,000 km² of the Kalahari desert.

Figure 27.9: Electricity production in Saudi Arabia during the years 1994-2003. Growth rate = 5.7 TWh per year. **Source:** IEA (2003).



Regarding cost, a tariff of 6.13 US¢/kWh would be the minimum that would enable Type-3 sustainability for such plants. Such a starting tariff would permit the entire investment plus interest to be paid off in year 34 (i.e. the final year in the life of VLS-PV plant No. 1). From then onward, the electricity tariff could be lowered to 4.37 US¢/kWh for continued Type-3 sustainability.

With such a low starting tariff, the required credit line would reach a maximum value of US \$ 25.36B, in year 20. However, by employing a higher starting tariff, the credit line would be paid off sooner and it would not reach such a large maximum value. For example, for a starting tariff of 10 US¢/kWh, a credit line maximum of only US \$ 13.44B would be reached in year 12 and fully paid off by year 21. The tariff could then be lowered to 3.99 US¢/kWh for Type-2 sustainability and then, in year 35, raised to 4.37 US¢/kWh for Type-3 sustainability.

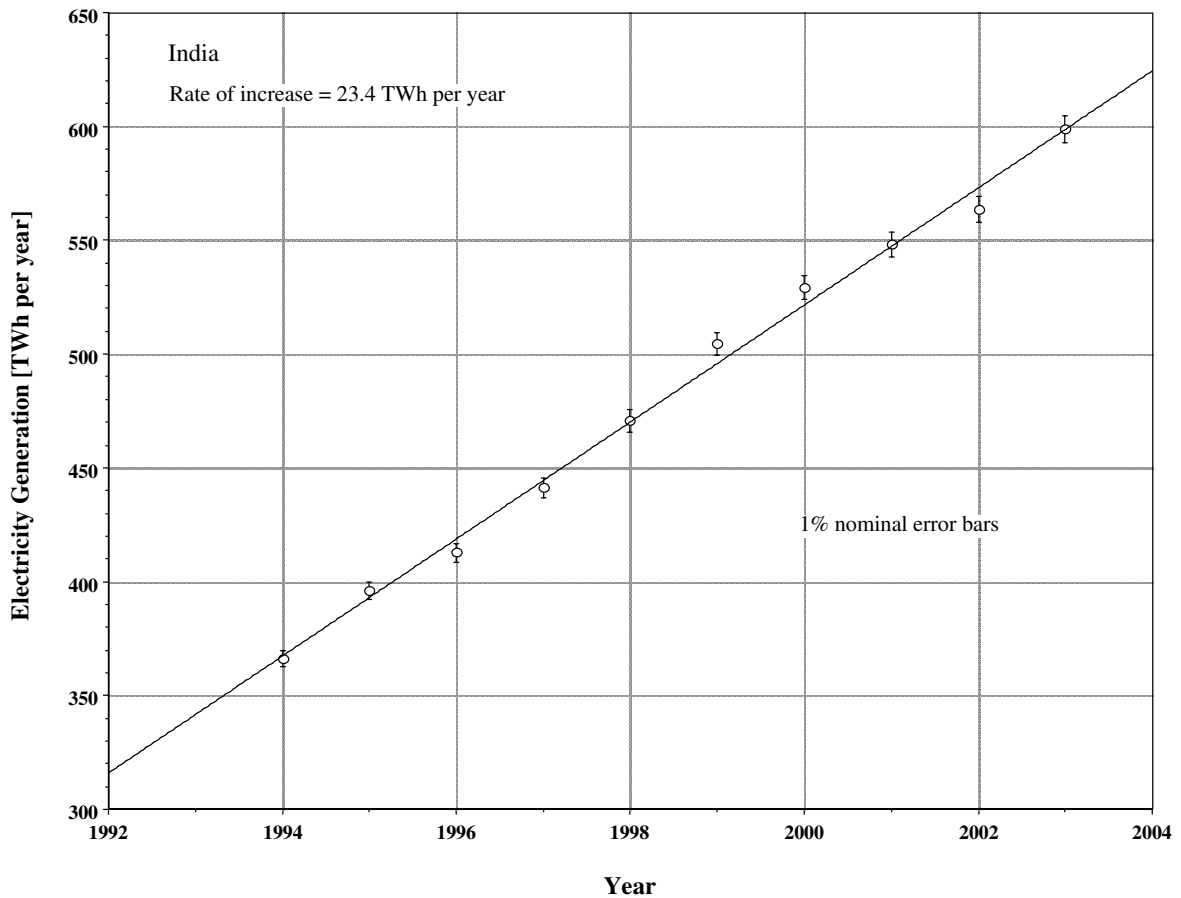
27.7.5 Saudi Arabia.

We now move north to the largest producer of electricity in the Middle East, Saudi Arabia. Again, we first address the size of the VLS-PV plants needed for this country. Figure 27.9 shows the rate at which electricity production in Saudi Arabia has been rising during the past 10 years (IEA 2003).

One sees that Saudi Arabia's electricity needs are rising at a rate of 5.7 TWh per year. In order to generate this much electricity per year from solar energy, it would be necessary to construct VLS-PV plants at the rate of 2.85 GWp per year, each such plant requiring approximately 28.5 km² out of the 1.700M km² of the Arabian desert.

Regarding cost, a tariff of 6.08 US¢/kWh would be the minimum that would enable Type-3 sustainability for such plants. Such a starting tariff would permit the entire investment plus interest to be paid off in year 34 (i.e. the final year in the life of VLS-PV plant

Figure 27.10: Electricity production in India during the years 1994-2003. Growth rate = 23.4 TWh per year. **Source:** IEA (2003).



No. 1). From then onward, the electricity tariff could be lowered to 4.34 US¢/kWh for continued Type-3 sustainability.

With such a low starting tariff, the required credit line would reach a maximum value of US \$ 35.93B, in year 20. However, by employing a higher starting tariff, the credit line would be paid off sooner and it would not reach such a large maximum value. For example, for a starting tariff of 10 US¢/kWh, a credit line maximum of only US \$ 18.85B would be reached in year 12 and fully paid off by year 21. The tariff could then be lowered to 3.94 US¢/kWh for Type-2 sustainability and then raised in year 35 to 4.34 US¢/kWh for Type-3 sustainability.

27.7.6 India

Of the countries exhibiting a linear rise in their electricity production, the slope of India's exceeds all others by far. It is therefore appropriate to consider this state as our example from the Asian continent. Again,

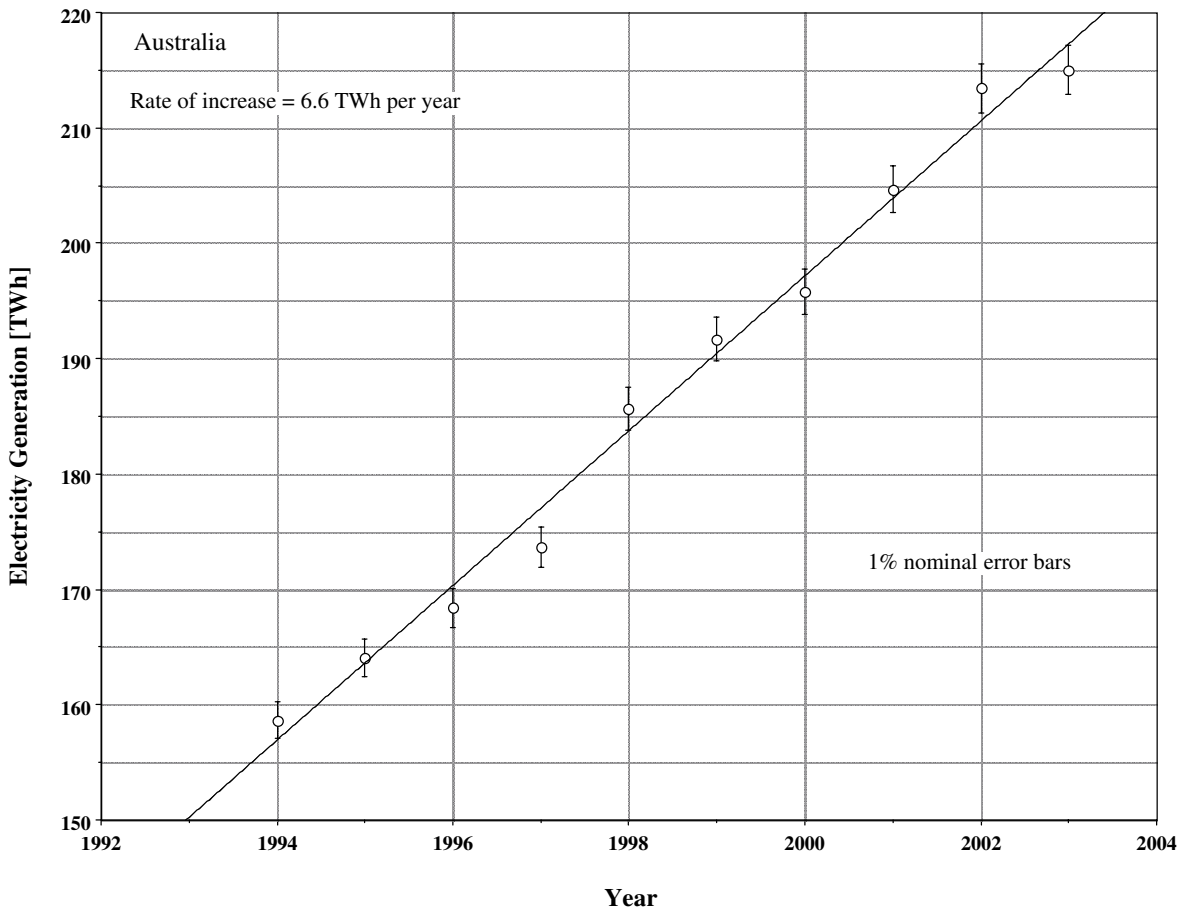
we first address the size of the VLS-PV plants needed for this country. Figure 27.10 shows the rate at which electricity production in India has been rising during the past 10 years (IEA 2003)

One sees that India's electricity needs are rising at a rate of 23.4 TWh per year. In order to generate this much electricity per year from solar energy, it would be necessary to construct VLS-PV plants at the rate of 11.7 GWp per year, each such plant requiring approximately 117 km² out of the 453,000 km² of the Thar desert.

Regarding cost, a tariff of 5.97 US¢/kWh would be the minimum that would enable Type-3 sustainability for such plants. Such a starting tariff would permit the entire investment plus interest to be paid off in year 34 (i.e. the final year in the life of VLS-PV plant No. 1). From then onward, the electricity tariff could be lowered to 4.30 US¢/kWh for continued Type-3 sustainability.

With such a low starting tariff, the required credit line would reach a maximum value of US \$ 144.98B, in

Figure 27.11: Electricity production in Australia during the years 1994-2003. Growth rate = 6.6 TWh per year. **Source:** IEA (2003).



year 20. However, by employing a higher starting tariff, the credit line would be paid off sooner and it would not reach such a large maximum value. For example, for a starting tariff of 10 US¢/kWh, a credit line maximum of only US \$ 74.37B would be reached in year 12 and fully paid off by year 20. The tariff could then be lowered to 4.07 US¢/kWh for Type-2 sustainability and then raised in year 35 to 4.30 US¢/kWh for Type-3 sustainability.

27.7.7 Australia

For our last example, we examine the case of Australia, by far the largest electricity producer in Oceania. Again, we first address the size of the VLS-PV plants needed for this country. Figure 27.11 shows the rate at which electricity production in Australia has been rising during the past 10 years (IEA 2003).

One sees that Australia's electricity needs are rising at a rate of 6.6 TWh per year. In order to generate this much electricity per year from solar energy, it

would be necessary to construct VLS-PV plants at the rate of 3.3 GWp per year, each such plant requiring approximately 33 km² out of the 647,000 km² of the Great Victoria desert.

Regarding cost, a tariff of 6.06 US¢/kWh would be the minimum that would enable Type-3 sustainability for such plants. Such a starting tariff would permit the entire investment plus interest to be paid off in year 34 (i.e. the final year in the life of VLS-PV plant No. 1). From then onward, the electricity tariff could be lowered to 4.33 US¢/kWh for continued Type-3 sustainability.

With such a low starting tariff, the required credit line would reach a maximum value of US \$ 41.53B, in year 20. However, by employing a higher starting tariff, the credit line would be paid off sooner and it would not reach such a large maximum value. For example, for a starting tariff of 10 US¢/kWh, a credit line maximum of only US \$ 21.70B would be reached in year 12 and fully paid off by year 20. The tariff could then be lowered to 4.14 US¢/kWh for Type-2

sustainability and then again in year 35 to 4.33 US¢/kWh for Type-3 sustainability.

27.8 Conclusions

In this chapter we have taken a sample of the world's larger electricity producers, one from each geographical region, and shown that it would be both technically and economically feasible for them to freeze their fossil fuel consumption at the 2012 level by embarking upon a massive construction programme of CPV solar power plants. Specifically, a decision would need to be taken in 2007 that would enable a plant manufacturing facility to be constructed during the 4-year period 2008–2011, and the first CPV plant to be constructed and connected to the grid in 2012. The level of investment needed is of the order of tens of billions of US\$, however, the capital investment is shown to be *fully recoverable* from electricity revenues within the expected lifetime of the power plants. Furthermore, because of the so-called 'triple sustainability' of CPV power plants, this kind of technical solution would stabilize the country's fuel requirements for an indefinitely long period of time. That is to say, a government which decides to adopt this kind of solution, solves the problem of power plant construction forever, and would use fossil fuel at a constant annual rate instead of an ever-increasing rate.

The example of Spain was particularly instructive because there we were able to see the striking effect of introducing high feed-in tariffs. In particular, the amount of capital investment needed is very much lower, and the infrastructure is paid off very much faster. This fact indicates that a relatively short-term public loan could enable CPV infrastructure to be installed relatively rapidly - i.e. in less than 10 years.

These single-state examples could be extended to most of the world. For this purpose, it would require approximately 1,000 km² of desert each year in order to enable CPV plants to generate the 395 TWh per year by which the world's present electricity production is rising. However, by stabilizing the electrical part of the world's fossil fuel requirements to a constant level, the amount of remaining fuel would last very much longer and the concomitant decrease in uncertainty would surely help promote security.

But there are several problems that must not be forgotten. First, a number of major electricity consumers are located relatively far from available deserts. Such is the case, for example, of the eastern European states. A CPV solution for them will require signifi-

cant technological advances in the development of low-loss transmission lines. At present the lowest loss method of transmitting power over distances of hundreds of kilometres is to employ high voltage DC cables. However, using solar to extend the length of time that fossil fuel will last will provide more time for developing alternative forms of low-loss transmission, such as high-temperature superconducting methods.

Storage is another technology area for which the additional time bought by the implementation of large-scale CPV plants will promote development. Storage is needed, not so much for night-time power generation (for which abundant fossil-fuelled capacity already exists) but rather for ensuring dispatchability during periods of cloud cover. For any given location, storage must be sized so that *available* night-time fossil-fuelled generating capacity can fully charge it in one night with sufficient energy to overcome a completely cloudy following day.

As for the non-electrical requirements of fossil fuel, we have seen that the estimated O&M cost of CPV electricity is of the order of 0.5 US¢/kWh. This is, effectively, the true generating cost of solar electricity after the CPV plants have paid themselves off. At such a low price, it would become cost-effective to generate hydrogen via the electrolysis of water and to use it as transportation fuel. Similarly, truly low-cost solar-generated electricity would enable this commodity to replace fossil fuel for a great many of today's processes for which the burning of fuel is more cost-effective than using electricity.

Naturally, this is a bootstrapping process. Using solar to freeze the fossil requirements for electricity production would already promote security by enabling the remaining fossil fuel reserves to last longer. However, using low-cost solar electricity to generate transportation fuel and also to replace other direct uses of fossil fuel would enable the latter to last even longer. This would obviously promote security still further. Furthermore, the development of low-loss transmission and efficient storage would enable other renewables, such as wind and wave power, to make their respective contributions, along side of solar, to a world electricity grid - and hence to greater security. But a start has to be made somewhere, *and very soon*. In this chapter we have argued that a suitable starting point could be concentrator photovoltaics in that the technology is ready and it would substantially reduce the dependence of electric power on fossil fuel.

28 Solar Energy as a Key for Power and Water in the Middle East and North Africa

Franz Trieb, Wolfram Krewitt and Nadine May

28.1 Introduction

This chapter argues that a strategy for energy and water security¹ in the Southern European Union, the Middle East, and North Africa (MENA) can be based on a combination of rational use of energy, renewable energy sources, and international cooperation. A well balanced mix of renewable and fossil energy sources is a prerequisite not only for environmental stability, but also for economic development, in fact being the least cost option for energy and water in the medium-term future. Renewables require no long-term subsidies like nuclear or fossil energies, but they need start-up investments that must be provided now by sound energy policies based on a Trans-Mediterranean partnership for energy, water, and development (Nitsch/Staiß 1997; Brauch 1997c, 1997d, 2000a, 2001a, 2006a).

The perspectives given here are the result of a study about the Mediterranean region that had the scope of evaluating the technical, economic, and environmental feasibility of a sustainable electricity supply system based on renewable sources, and give policy-makers a data basis for acting accordingly within their specific environment. As the MENA region is very heterogeneous, the scope was not to propose specific policies or strategies, but give local decision-makers a basis for acting according to their specific needs and frame conditions.

The authors are well aware of the present activities, policies, and problems in the MENA region. The perspective given here cannot be interpreted as prognostic. A scenario like the one presented here is a consistent pathway to the future leading to a certain goal,

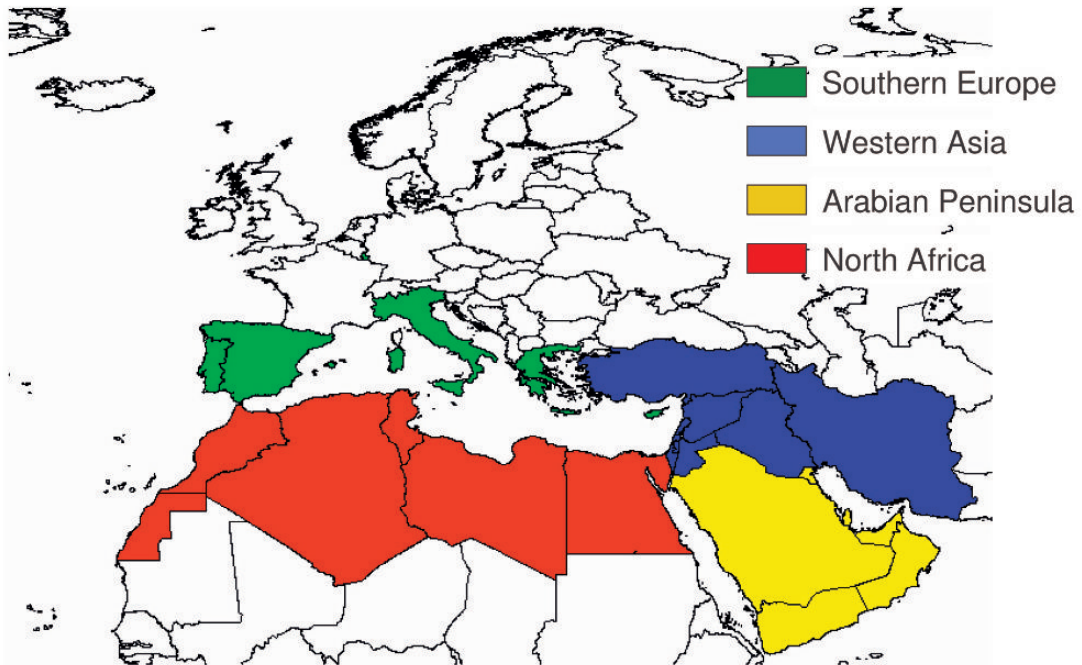
e.g. sustainability. There may be many variations of that scenario or different scenarios leading to the same or to other goals. Their achievement will in any case require effort, political will, and technical skills. The scenario presented here will not happen spontaneously, but it shows a viable path to the future for those who want to take that route.

The Middle East and North Africa (MENA) is a major focus of global interest, holding more than 60 per cent of the world's mineral oil reserves, showing high growth rates of population and economy, and at the same time facing serious hazards like the depletion of freshwater resources and desertification through climate change (IEA 2005). Countries like Morocco or Jordan that have no mineral resources are heavily burdened by any energy cost escalation, while others like Iran or the United Arab Emirates are feeling an increasing conflict between selling fuel to the world market and burning it for their domestic needs. The economic development of the North Western hemisphere – mainly Europe and USA – in the past centuries was flashed by the fossil energy resources of the MENA region, but now that this region also claims its share for economic development, the international pressure on those resources grows higher, and many MENA countries may be deprived of their means of economic development just when they are starting it. Separatism and fundamentalism are blooming, both in the Arab world and in the West, and terrorism is affecting both sides. Territorial conflicts on energy and water have been a regional reality, and they may soon break out on a large scale.

This situation is something of a paradox, because neither land, nor energy, nor water is scarce in this region. There is plenty of water in the Mediterranean Sea, the Red Sea and the Persian Gulf, plenty of unused desert land in most MENA countries, and – with a solar energy equivalent of 1 to 2 barrels of oil per year on every square metre – more solar energy than mankind will ever need. However, the knowledge is

1 Here, the term security refers primarily to security of supply. However, a sustainable form of supply is envisaged. This implies avoiding a number of environmental, economic, and societal risks, and leads to a more comprehensive effect on societal security in this region.

Figure 28.1: Countries of the EU-MENA region analysed within the MED-CSP Study **Source:** MED-CSP (2005) that is co-authored by these authors.



lacking on how to exploit these treasures. Civilizations have disappeared due to a lack of knowledge, while those having key information (and using it) have survived. Then there is a need for cooperation. Today, there is a strong trend for solving conflicts by force, driven by the illusion of military strength and national autonomy. However, in contrast to solving conflicts by cooperation, solving conflicts by force never creates added value but usually leads to the destruction of means, making everybody poorer and sharpening scarcity.

This chapter addresses the following questions:

1. Can renewable energy sources cope with the growing energy demand of the Middle East and North Africa?
2. Are renewable energy sources too expensive for this region?
3. Is there a solution for the problem of water scarcity in the MENA region?
4. Is a trans-national EUMENA partnership for renewable energy a viable option for development?

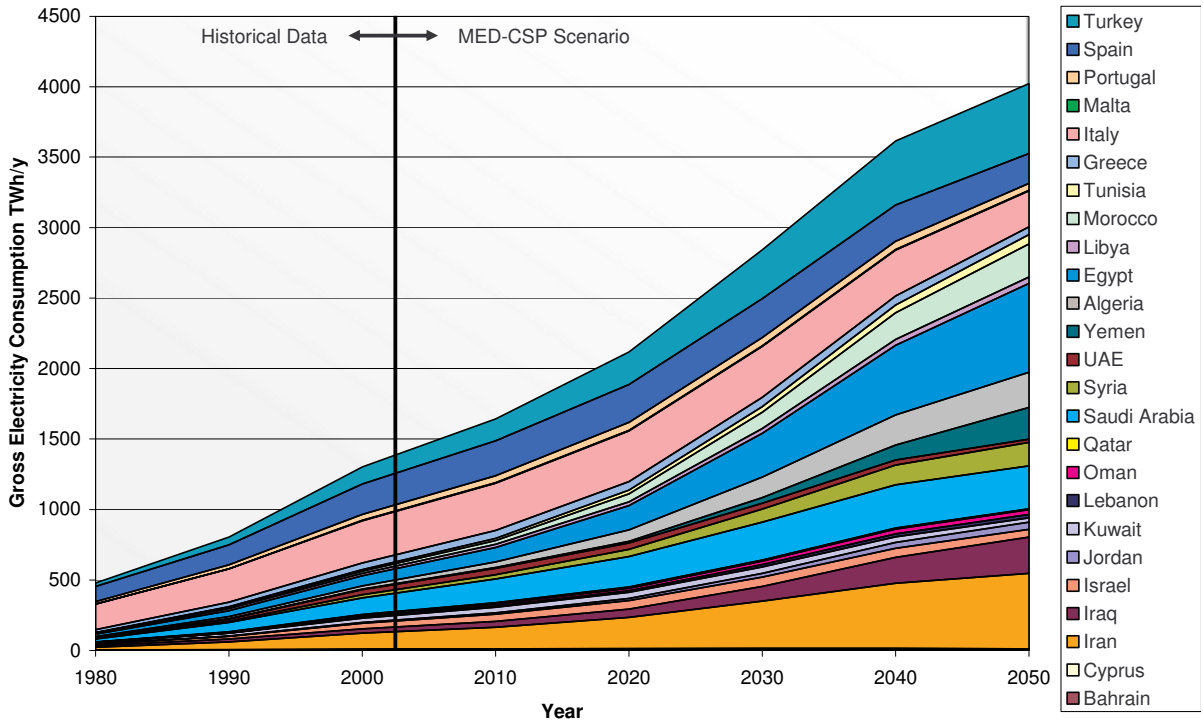
28.2 Perspectives of Energy and Water in the Euro-Mediterranean until 2050

This chapter focuses on the electricity and water supply of Southern Europe (Portugal, Spain, Italy, Greece, Cyprus, and Malta), North Africa (Morocco, Algeria, Tunisia, Libya, and Egypt), Western Asia (Turkey, Iran, Iraq, Jordan, Israel, Lebanon, Syria) and the Arabian Peninsula (Saudi Arabia, Yemen, Oman, United Arab Emirates, Kuwait, Qatar, Bahrain) (figure 28.1)

In these countries the growth of population (Brauch/Selim/Liotta 2003: 972) and of the economy will significantly increase the water and energy demand (MED-CSP 2005). By 2050, the MENA countries may reach a similar electricity demand as Europe (3500 TWh/y). Although this scenario assumes efficiency gains and moderate population growth or even population declining in some countries, electricity demand is projected to almost triple from 1500 TWh/y in 2005 to 4100 TWh/y in 2050 (figure 28.2). Electricity demand has already tripled during the past 20 years.

Water demand of the MENA countries will rise from 300 billion cubic metres per year in 2005 to over 500 billion m³/y by 2050 (figure 28.3). In most countries agriculture has stagnated or declined, while the

Figure 28.2: Gross electricity consumption of countries analysed. **Source:** MED-CSP 2005 that is co-authored by these authors.



domestic and industrial sector has strongly grown. In many MENA countries and in some Southern European regions, natural water resources have already been exploited beyond their sustainable yield by an overshoot of 40–50 billion m³/y, which is almost equivalent to the volume of the Nile River.

This excessive use of freshwater resources is only possible for a transient time. Overexploitation of groundwater resources must be reduced in the mid term and avoided afterwards, but additional demand must also be satisfied. This will require efficient water management and environmentally compatible technologies for seawater desalination based on a sustainable and affordable energy source.

Fossil or nuclear fuels cannot cope with any of these criteria due to being heavily subsidized, and suffering unsolved problems like nuclear waste disposal and proliferation of plutonium. Fossil fuels have caused international conflicts and contribute to climate change. Oil, gas, and uranium have multiplied in cost during the past few years, and a backward trend is not visible. In some oil exporting countries there is an increasing competition between exports and internal consumption. Building the future MENA water supply system on those resources by using those energy carriers for desalination would be highly risky.

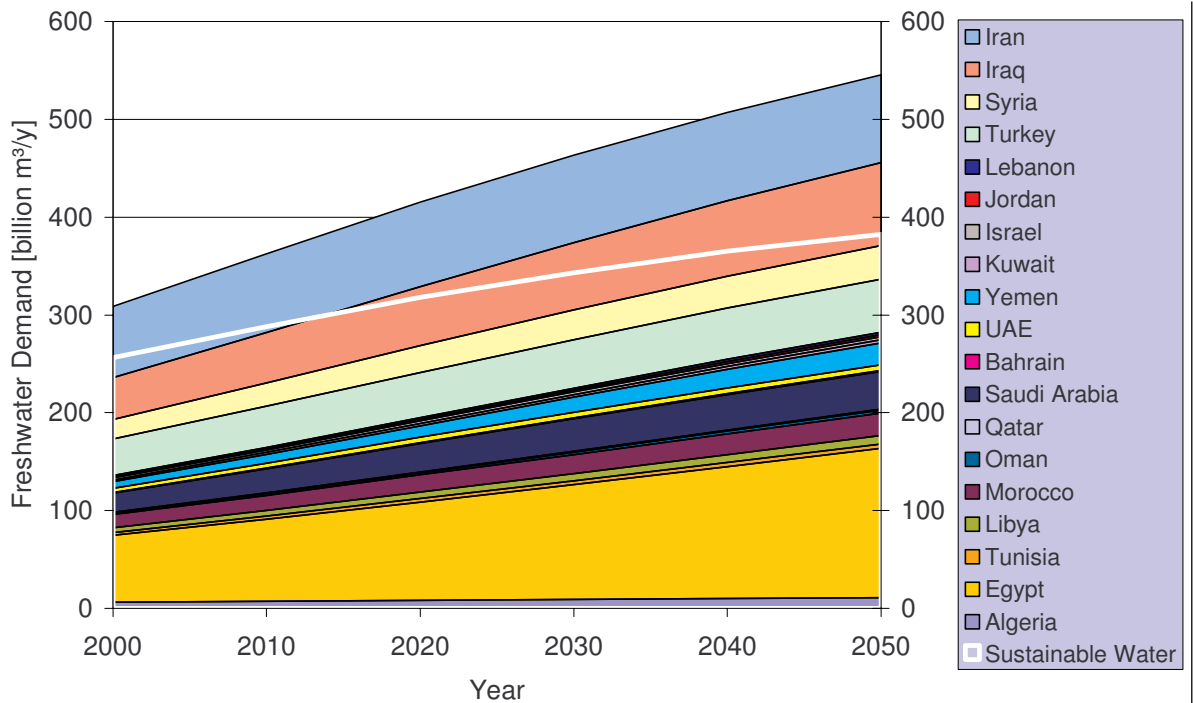
Energy and water supply can therefore not rely on fossil fuel resources alone.

28.3 Renewable Energy Sources are Plentiful

The central thesis of this chapter is that the renewable energy sources in the analysed region can cope with the growing demand of the developing economies. Wind, geothermal power from hot dry rocks, hydropower, and biomass electricity potentials are each in the order of about 400 TWh/y. Those resources are more or less locally concentrated and not available everywhere, but can be distributed through the electricity grid. The by far biggest resource in the MENA region is solar irradiance, with a potential that is several times larger than the total world electricity demand.

Wind power is a strongly fluctuating energy source that cannot be delivered on demand (table 28.1). However, distributed wind parks partially compensate each other's fluctuations and show a relatively smooth transition of their total output. Depending on the different situation in each country, up to 15 per cent of the installed wind capacity can be considered as se-

Figure 28.3: Water demand projection in the MENA countries in the MED-CSP scenario. Water demand already exceeds the sustainable resources of fresh water today, with an alarmingly increasing deficit. **Source:** MED-CSP (2005).



cured. Photovoltaic electricity is also strongly fluctuating and only available during daytime. There is no contribution to secured power, but a good correlation with the usual daytime power demand peak of most countries. PV is specially suited for distributed power supply, but also very large-scale PV systems are an option for the future. Geothermal power can be delivered on demand as base, intermediate or peaking power using the earth as a natural storage system. It can thus compensate the fluctuations from wind and PV.

Biomass can deliver power on demand as it is easily storable. However, biomass is scarce in the MENA region and subject to seasonal fluctuations. As a strategic guideline, biomass can be supplied in times when wind and PV power is low in order to compensate those sources, and shut down when wind and PV power is available to save the scarce biomass resources. The situation is similar for hydropower from dams, which can be delivered on demand but is scarce in the MENA and subject to strong seasonal fluctuations. If used only when PV and wind power are low, it acts like a complement and as a storage system for those resources.

Concentrating solar thermal power stations² can deliver power on demand, making use of their ther-

mal storage capability and hybrid operation with fuels. They are an ideal link between the fossil system and other renewables. As the largest natural resource, they will provide the core of electricity, taking over base and peaking load duties from fossil plants. Oil and gas fired power plants are most widely used. They will subsequently close the gap between the load and renewable power during peaking times. Thus, average fossil fuel consumption and carbon emissions will be reduced faster than their installed capacity. Only few MENA countries use coal fired power plants. Coal constitutes a feasible, problematic supplement to power generation in the MENA that is exclusively based on imports and contributes to global warming. Domestic sources like renewables, oil, and gas will be the preferable option in most MENA countries.

Power technologies based on hydrocarbons will increasingly be charged with extra costs of carbon sequestration, as their effect on climate change is very dangerous. If they decide for a power supply based mainly on fossil fuels, most MENA countries will

2 Steam or gas turbines operated with high temperature solar heat from concentrating solar thermal collectors and by fuel as backup. Thermal energy storage avoids the need for storing solar electricity during daytime.

Figure 28.4: Maps of renewable energy yields of different sources in the EU-MENA (darker colours indicate higher potentials per unit area; on the colour code see: MED-CSP (2005).

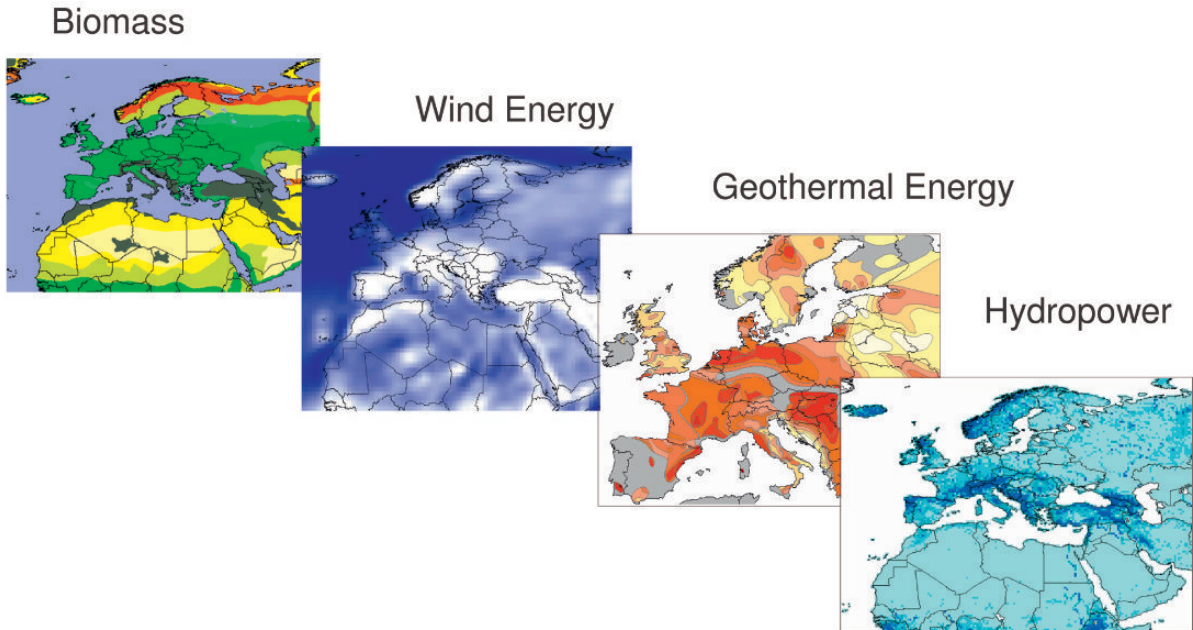
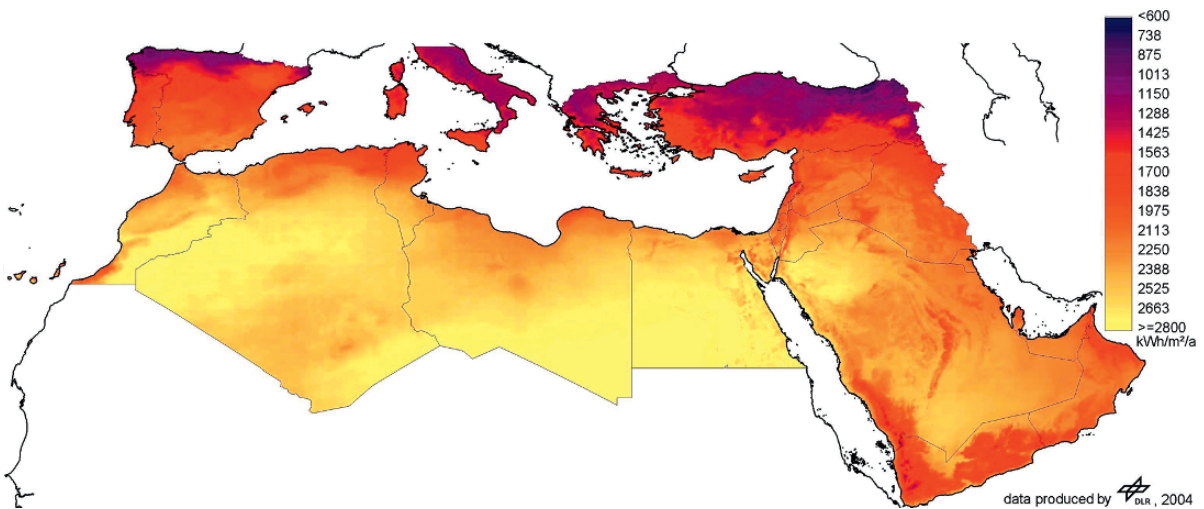


Figure 28.5: Annual Direct Solar Irradiance in the Southern EU-MENA Region. The primary energy received by each square meter of land equals 1–2 barrels of oil per year.



soon face a situation where they must decide either to overload their economy by subsidies to afford CO₂ sequestration or to overload the global environment and thus accelerate desertification.

Nuclear plants are a fading technology with unsolved problems of nuclear waste disposal and high environmental and political risks. In the early 21st century only 5 per cent of world energy demand is supplied by nuclear energy. The global uranium resources will not last longer than 50 years and are becoming more expensive. Breeder technology could expand

those resources but would lead to a dangerous proliferation of plutonium and increase nuclear waste by an order of magnitude. Despite massive subsidies of several billion US\$ per year, nuclear power had in 2005 a global share of the power plant market place of less than 1 per cent.

In spite of R&D expenditures of more than a billion US\$ per year spent by OECD countries for several decades and scheduled also for the future, electricity from nuclear fusion is not expected to be available before 2050, and the outcome of this costly

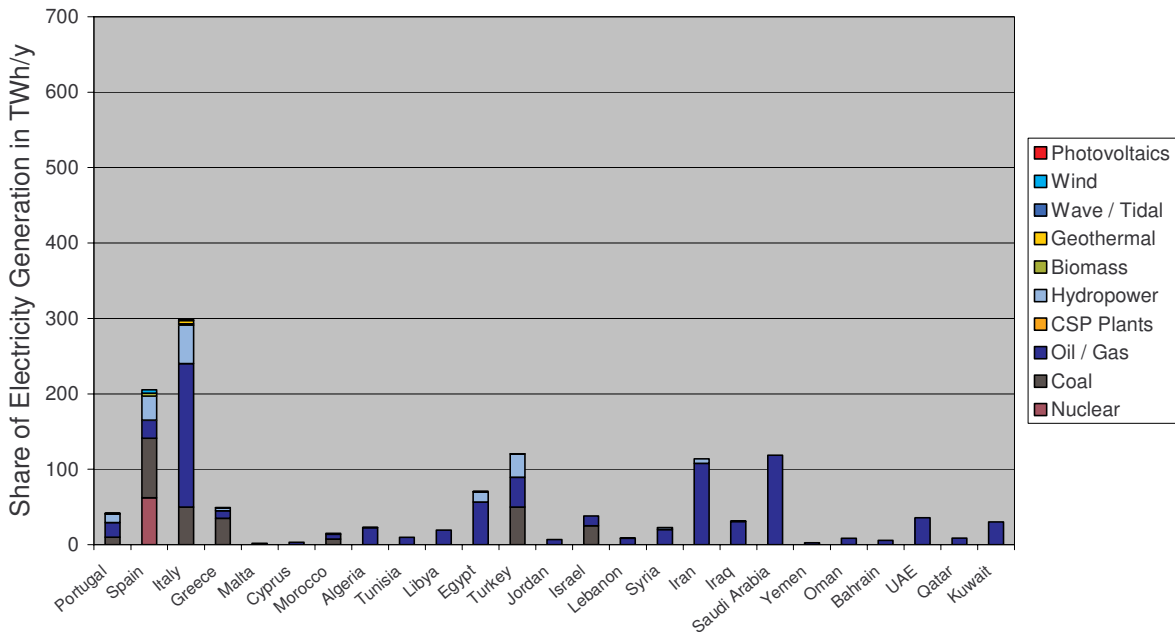
Table 28.1: Some characteristics of contemporary power technologies. **Source:** The authors.

Technology	Unit Capacity	Capacity Credit	Capacity Factor	Resource	Applications	Comment
Wind Power	1 kW – 5 MW	0 – 30 %	15 – 50 %	kinetic energy of the wind	electricity	fluctuating, supply defined by resource
Photovoltaic	1 W – 5 MW	0 %	15 – 25 %	direct and diffuse irradiance on a fixed surface tilted with latitude angle	electricity	fluctuating, supply defined by resource
Biomass	1 kW – 25 MW	50 - 90 %	40 – 60 %	biogas from the decomposition of organic residues, solid residues and wood	electricity and heat	seasonal fluctuations but good storability, power on demand
Geothermal (Hot Dry Rock)	25 – 50 MW	90 %	40 – 90 %	heat of hot dry rocks in several 1000 meters depth	electricity and heat	no fluctuations, power on demand
Hydropower	1 kW – 1000 MW	50 - 90 %	10 – 90 %	kinetic energy and pressure of water streams	electricity	seasonal fluctuation, good storability in dams, used also as pump storage for other sources
Solar Chimney	100 – 200 MW	10 to 70 % depending on storage	20 to 70 %	Direct and diffuse irradiance on a horizontal plane	electricity	seasonal fluctuations, good storability, base load power
Concentrating Solar Thermal Power	10 kW – 200 MW	0 to 90 % depending on storage and hybridization	20 to 90 %	Direct irradiance on a surface tracking the sun	electricity and heat	fluctuations are compensated by thermal storage and fuel, power on demand
Gas Turbine	0.5 – 100 MW	90 %	10 – 90 %	natural gas, fuel oil	electricity and heat	power on demand
Steam Cycle	5 – 500 MW	90 %	40 – 90 %	coal, lignite, fuel oil, natural gas	electricity and heat	power on demand
Nuclear Power	>500 MW	90 %	90 %	uranium / breeder	electricity and heat	base load power

effort is yet unknown. Obviously, neither of these nuclear power technologies can contribute to the reduction of greenhouse gas emissions or to sustainable development needed within the next 50 years.

28.4 A Scenario for Energy and Water Security

By the year 2050, wind, hydropower, biomass, geothermal energy, and photovoltaic systems could generate 200–300 TWh/y each and thus contribute considerably to meet the increasing electricity demand of the EU-MENA region. With the potentials of over

Figure 28.6: Share of different technologies for electricity generation in the year 2000. **Source:** MED-CSP (2005).**Electricity Mix 2000**

400 TWh/y for each technology, this permits future growth. Wave and tidal power will also have minor contributions. The largest renewable energy contribution will come from solar thermal power with over 2200 TWh/y. This represents less than 1 per cent of the concentrating solar power resource potential of this region, but over 50 per cent of the region's electricity demand expected for 2050.

Each EUMENA country has its own specific natural sources of energy and water, and different demand patterns with a different mix of renewable and fossil energies for a sustainable supply system. The MED-CSP scenario shows how resources and demand with regard to technical, economic, ecologic, and social constraints of each country can be matched in a sustainable way. Renewable energies will initially need public support but will steadily grow within niche markets and become cheaper due to learning and economies of scale. In the medium term, electricity from renewables will be cheaper than electricity from fossil fuels, even if the societal external costs of fossil fuel consumption are excluded. Therefore, renewable energies are the only way for a long-term stabilization of energy costs on a low price level.

At present, many MENA countries have high electricity growth rates that may lead to similar levels of consumption as in Europe by 2050. However, business-as-usual strategies for energy and water would

lead to a depletion of fossil fuel and natural water resources within a few years, to unaffordable costs of energy and water and to social conflicts. Economic development would be increasingly burdened by subsidies and conflicts. The possible impacts from climate change may make desertification irreversible and further increase the loss of arable land and floods. Due to progressing water shortage, self-sufficiency in cereals will decline and imports will increase significantly in the MENA region by 2030 (FAO 2003; Brauch 2003b). Only renewable energies can lead to affordable and secure energy and water. This will not require long-term subsidies but only initial investments as part of a concerted effort by all EUMENA countries to put the new renewable energy technologies in place.

Comparing figures 28.6 and 28.7 it becomes obvious that the growing electricity demand in the MENA region can only be satisfied in a sustainable way with renewables. By the year 2050, the electricity consumption of many MENA countries, like Egypt and Turkey, will by far exceed the consumption of present EU countries, like Italy. Many oil exporting countries, like Iran, Iraq and Saudi Arabia, will follow this trend that may result in an increasing competition between domestic consumption and the export of that precious commodity.

Figure 28.7: Total electricity consumption and share of different technologies for electricity generation in the analysed countries in the year 2050 according to the MED-CSP scenario. **Source:** MED-CSP (2005).

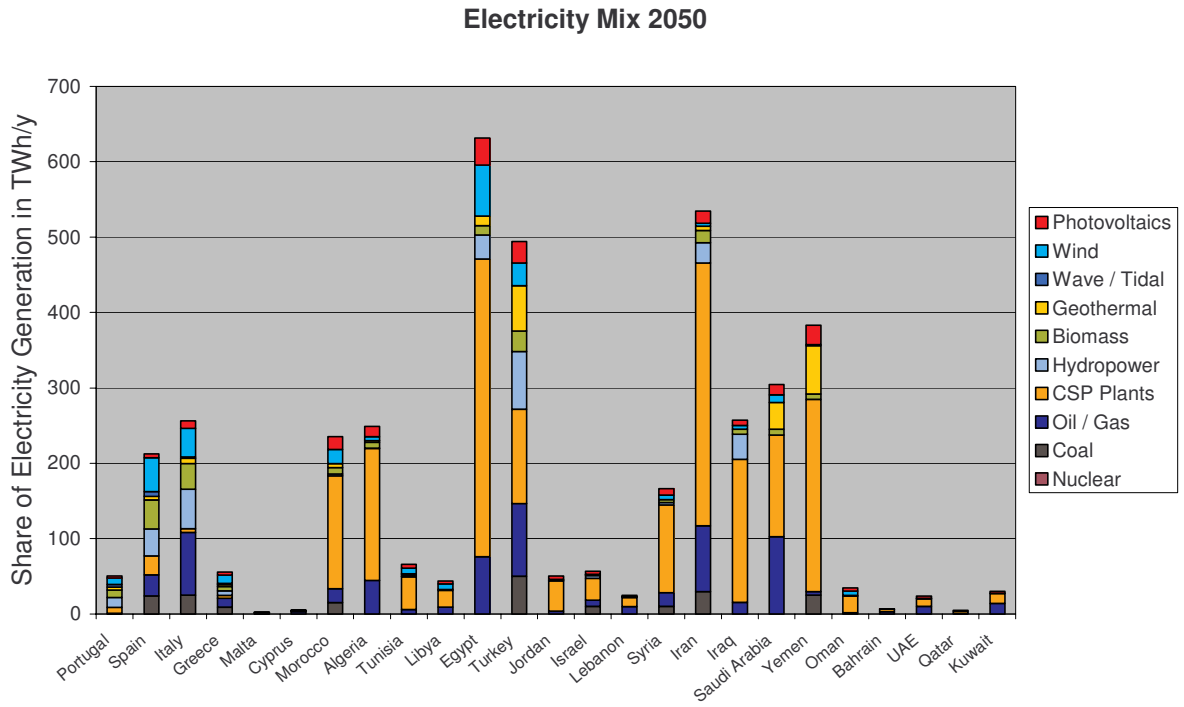
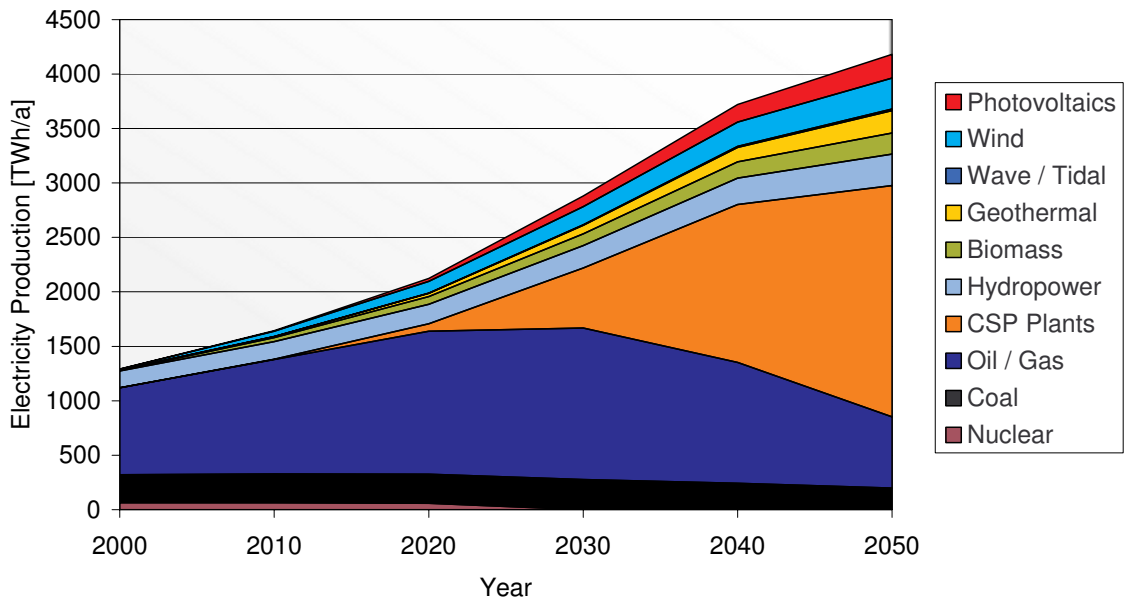


Figure 28.8: Annual electricity demand and generation within the countries analysed in the MED-CSP scenario. **Source:** MED-CSP (2005).

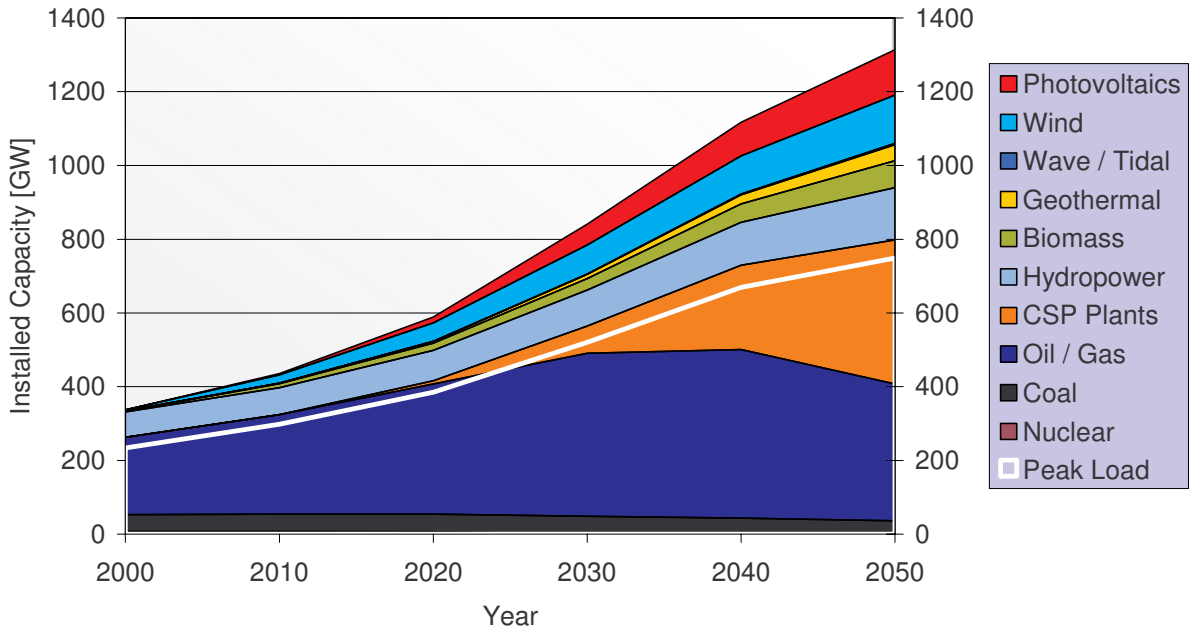


Comparing figure 28.8 (electricity generation) with figure 28.9 (installed capacity) reveals that the installed concentrating solar power capacity by 2050 may be as large as that of wind, PV, biomass and geothermal plants combined, but due to their built-in so-

lar thermal storage capability, CSP plants deliver twice as much electricity per year as the other resources.

For each country, the installed capacity of the power park was calculated in a way that the national peak load is always covered with an additional mini-

Figure 28.9: Installed power capacity and peak load within the analysed countries in the MED-CSP scenario. **Source:** MED-CSP (2005).



minimum reserve of 25 per cent of secured capacity. While PV and wind power are resource driven, the other renewable energy technologies can be applied in a demand driven manner, providing peak load, intermediate load and base load capacity on demand and serving as backup capacity for the fluctuating resources. As wind and PV electricity only contribute a minor share for the secured capacity, the total installed capacity increases subsequently in relation to the peak load.

Renewable energies will compete with fossil fuels. The cost of electricity from fossil fuel fired plants was calculated on the basis of the average annual full load hours of each country's power park, and according to the relation of oil/gas and coal plants installed. The electricity cost of new natural gas fired combined cycle power plants is displayed in those figures as well as the cost of steam-coal plants. The cost of fuel oil steam cycles is usually higher than the cost of gas fired combined cycles or coal plants, and is not displayed here (figure 28.9).

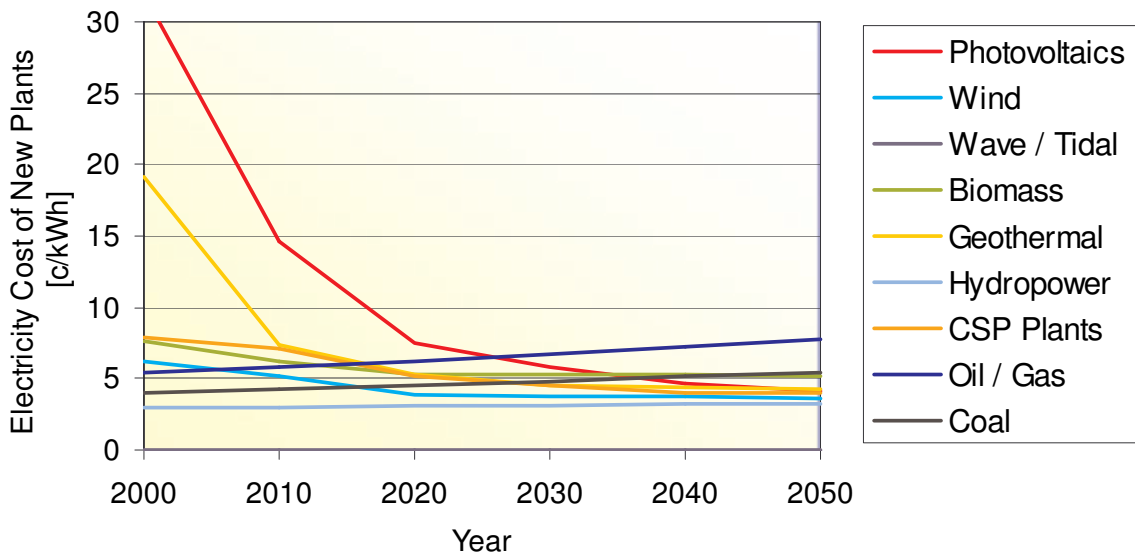
In Europe, the electricity cost of most renewable energies will decline below the cost of fuel driven plants between 2010 and 2020. Most renewable power plants will then produce electricity at a lower cost than new, fuel driven plants, especially after CO₂ sequestration is introduced in 2020. But even in the MENA countries, where CO₂ sequestration is not expected to become applicable within the analysed time

span, most renewable power plants will produce cheaper electricity than new fuel fired plants after 2020.

Once electricity costs between 3 and 6 cents/kWh will be achieved by renewable energy sources in the long term they will become a motor for economic development between 2025 and 2050. Thus, the relatively high initial costs of renewables may only be a temporary initial barrier that can be overcome by technology development, and by appropriate policies and financing schemes. Besides environmental concerns, the main reason to change to renewable energies is the high cost level expected for electricity generated from fossil fuels, which in the medium term will reach between 5 and 10 cent/kWh. This and the additional high volatility of fuel prices will be strong driving forces for the market expansion of renewables (figure 28.10).

Although climate change and environmental concerns are very good reasons for shifting to renewable energy sources, the main reason is the security of supply and future energy costs. Most economies in the MENA region will be unable to develop properly with the increasing costs of fossil fuels. These countries will also be severely affected by climate change and desertification (Kepner/Rubio/Mouat/Pedrazzini 2006; Brauch 2002, 2006). Thus, both economic and ecological considerations lead to a solar energy economy in the EUMENA region.

Figure 28.10: Example of electricity costs and learning in the MED-CSP scenario. **Source:** MED-CSP (2005).



The transient support for renewables must be considered as a public investment for a better and cheaper supply system, compared with the long term, steadily increasing subsidies that are required for fossil and nuclear power.

The specific carbon dioxide emissions of the national power park of each country were calculated on the basis of specific average values that have been obtained from life cycle analysis of each technology. For the future fuel-based power generation in Europe, an increasing share of CO₂ sequestration was considered. At present, the total carbon emissions of electricity generation of all countries analysed in the study amount to approximately 770 million tons per year. Instead of rising to 2,000 million tons of CO₂ emissions per year that would be expected for the year 2050 in a business as usual case, the scenario achieves a reduction of emissions of 40 per cent to 475 million tons within that time span. Thus, 28 billion tons of carbon dioxide are avoided until 2050, which is equal to the present total annual emissions worldwide (figure 28.11). Fossil power systems show emissions that are one or two orders of magnitude higher than those of renewables. CO₂ sequestration will require extra energy and thus will lead to higher emissions, which must additionally be disposed of, entering a kind of vicious circle. In contrast to that, renewable electricity will in the long term provide carbon avoidance without additional cost.

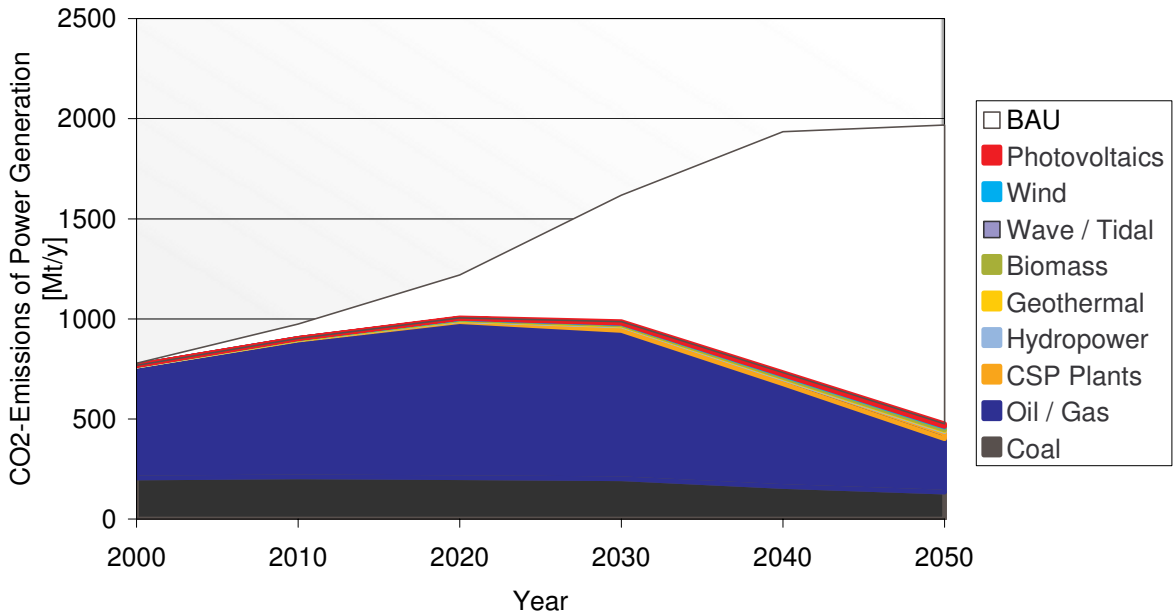
Contrary to prevailing views, the mitigation of greenhouse gases in the power sector based on renewable energies must not necessarily be financed with

subsidies. Rather, renewables constitute the most economic solution for future energy security. They require initial investments to launch and to continue the learning curves of renewable energy technologies and to become competitive with fossil fuels. The sooner this development starts; the sooner subsidies for the power sector may be cut. The fastest way is shifting present subsidies from the fossil and nuclear power sector to renewables. If this is not possible due to social constraints, renewable energy feed-in tariffs guaranteed by law are the best solution. As they reduce investment risks, they reduce the required equity interest rates and thus, the cost of market introduction. E.g. within the German Renewable Energy Act, a usual project rate of return of only 6–7 per cent is accepted, while conventional power investments require 9–15 per cent.

MENA countries will benefit from renewables by reducing their energy subsidies, especially those importing fuels, like Jordan and Morocco. They will be able to foster their national economies through a low cost, secure energy supply. Oil and gas exporting countries will be relieved from burning their major export product, and in the long run they may also export solar electricity. A strong renewable energy industry in the MENA region will lead to highly qualified jobs and reduce the present brain drain.

The water supply situation in the MENA region is very critical. In some places the groundwater level falls 6 metres per year. Large cities like the capital of Yemen Sana'a may come to a point where their water supply runs dry and their groundwater resources may

Figure 28.11: CO₂ emissions of electricity generation in million tons per year for all countries for the MED-CSP scenario and emissions that would occur in a business as usual case (BAU). **Source:** MED-CSP (2005) to which the authors contributed.



be exhausted within 10 years. A solution could be using large amounts of energy for seawater desalination. However, a strategy based on fossil or nuclear energy would not lead to an affordable and secure water supply system. Again, renewables and especially solar thermal power may become a key tool to reduce the conflict potential associated with energy and water scarcity.

The scenario offers a possible path towards a sustainable energy supply system in the EU-MENA region. This path is affordable, technically feasible, and desirable from the perspective of protecting the global environment. There are no serious counterarguments against such a development, except a widespread underestimation of the potentials of renewable energy sources and the interest of some lobbies to keep their subsidies in the future. However, the global environment and society cannot afford any longer obsolete, dangerous and costly energy supply schemes of the past. Fossil and nuclear power technologies were useful in pushing the technological and economic development in developed countries, but they - and the environment - would be overburdened to do the same for the rest of the world. Their increasing scarcity and cost will become an economic burden, and a cause for future resource conflicts (Klare 2001, 2001a), if no alternatives are built up in time. These alternatives are available and must be used now with appropriate political, technological, and financial efforts. Waiting for

the pressure to grow will deprive most national economies of their economic and political means to react properly to the global challenges this century will face.

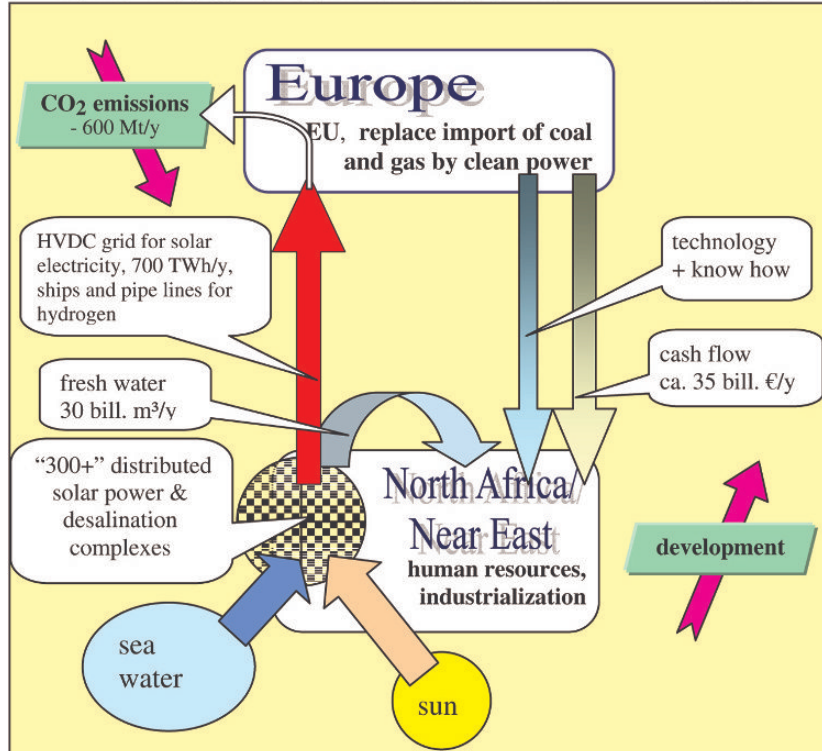
28.5 Trans-Mediterranean Renewable Energy Cooperation

Under the auspices of HRH Prince El Hassan bin Talal of Jordan and of the Club of Rome, and in the framework of the Arab Thought Forum in Amman, in 2003, a group of scientists, engineers, economists, and other professionals presented an initiative for a Trans-Mediterranean Renewable Energy Cooperation (TREC), with the goal to solve the scarcity of affordable and environmentally compatible energy and water resources of Europe, the Middle East, and North Africa (EUMENA) in a cooperative way (Kabariti/Moeller/Knies 2003).

It was suggested that the MENA countries could exploit their superior solar and wind energy potentials and generate clean electricity as a competitive industrial product for export to the European market. The developmental circuit, the flow of technology, know-how, and capital from the EU to the MENA countries, and the reverse flow of clean power and eventually hydrogen from the MENA region to Europe is illustrated in figure 28.12. Electricity generation from

Figure 28.12: A new circuit of development: CO₂ reduction in Europe fosters development for North Africa and the Middle East. **Source:** Earlier version (Kabariti/Moeller/Knies 2003); updated version with numbers for EU25 based on the CSP studies (2004-2006). TREC founding paper (2003), with updated numbers based on CSP studies (2006). Reprinted with permission of Gerhard Knies.

Trans- Mediterranean Renewable Energy Cooperation



Features of TREC

- hundreds of distributed solar power & desalination plants, with 10-400 MWel
- Wind & solar power, and hydrogen for export from MENA to Europe, and for local demand
- interconnecting HVDC grid
- water desalination for MENA in cogeneration
- component production in MENA
- industrial & socioeconomic development in MENA
- faster climate stabilisation
- create jobs in MENA instead of CO₂ in Europe

Power of 700 TWh/y is about 17 % of EU annual electricity consumption, and also about the power generated from imported coal in the EU. Such a capacity could be installed within about 30 years

solar radiation and wind energy requires larger manufacturing efforts and installations than the extracting of crude oil or natural gas requires. Thus, widespread technological development and industrial activities will create many jobs at different levels of skills and qualification.

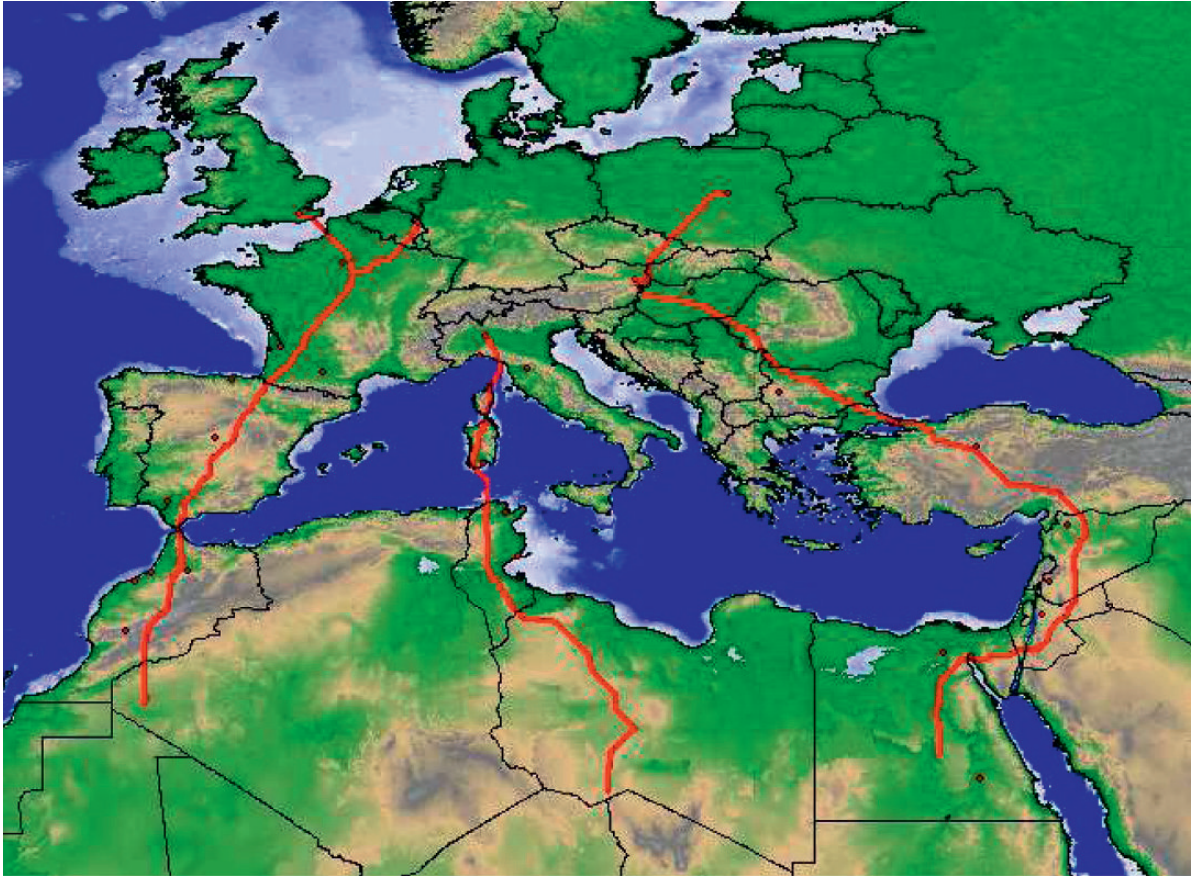
As a 'by-product' of solar power plant expansion in MENA and solar power export to Europe, large amounts of sea water could be desalinated by solar power and also by cogeneration of solar heat and power to overcome the expected shortages of fresh water in the MENA countries (Brauch 2006a, 2006b). Additional fresh water for drinking, industry, and eventually for irrigation purposes constitutes an indispensable precondition for further development. Thus, the proposed TREC project would expand the perspectives for human and socio-economic development in the MENA countries. According to a technology assessment (TA) the combination of concentrating solar thermal power stations (CSP) and high voltage direct current transmission lines (HVDC) is the most appropriate technical and economic solution for such a con-

cept. The environmental impacts of such a large-scale infrastructure would be acceptable, and large amounts of carbon emissions could be avoided at competitive costs (May 2005).

In January 2005, a study project called TRANS-CSP commissioned by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) was launched by the German Aerospace Centre (DLR) and several partners from the Mediterranean region to assess the feasibility of a high voltage interconnection of Northern Africa and Central Europe with the purpose of exporting solar electricity from the Sahara to Europe.

The reasons for choosing HVDC transmission instead of the usual AC (Alternate Current) transmission lines for such a long distance transmission scheme are lower losses of HVDC of less than 4 per cent per 1,000 km of distance, the compact installation of the power lines with only 120 m width for 10,000 MW of transfer capacity, and the capability of crossing the Mediterranean Sea. With over 70,000 MW of installed capacity, HVDC technology is well

Figure 28.13: Three samples of high voltage direct current (HVDC) interconnections between Europe, the Middle East, and North Africa (EUMENA) analysed for potential environmental impacts and costs. **Source:** TRANS-CSP (2006) to which the authors contributed.



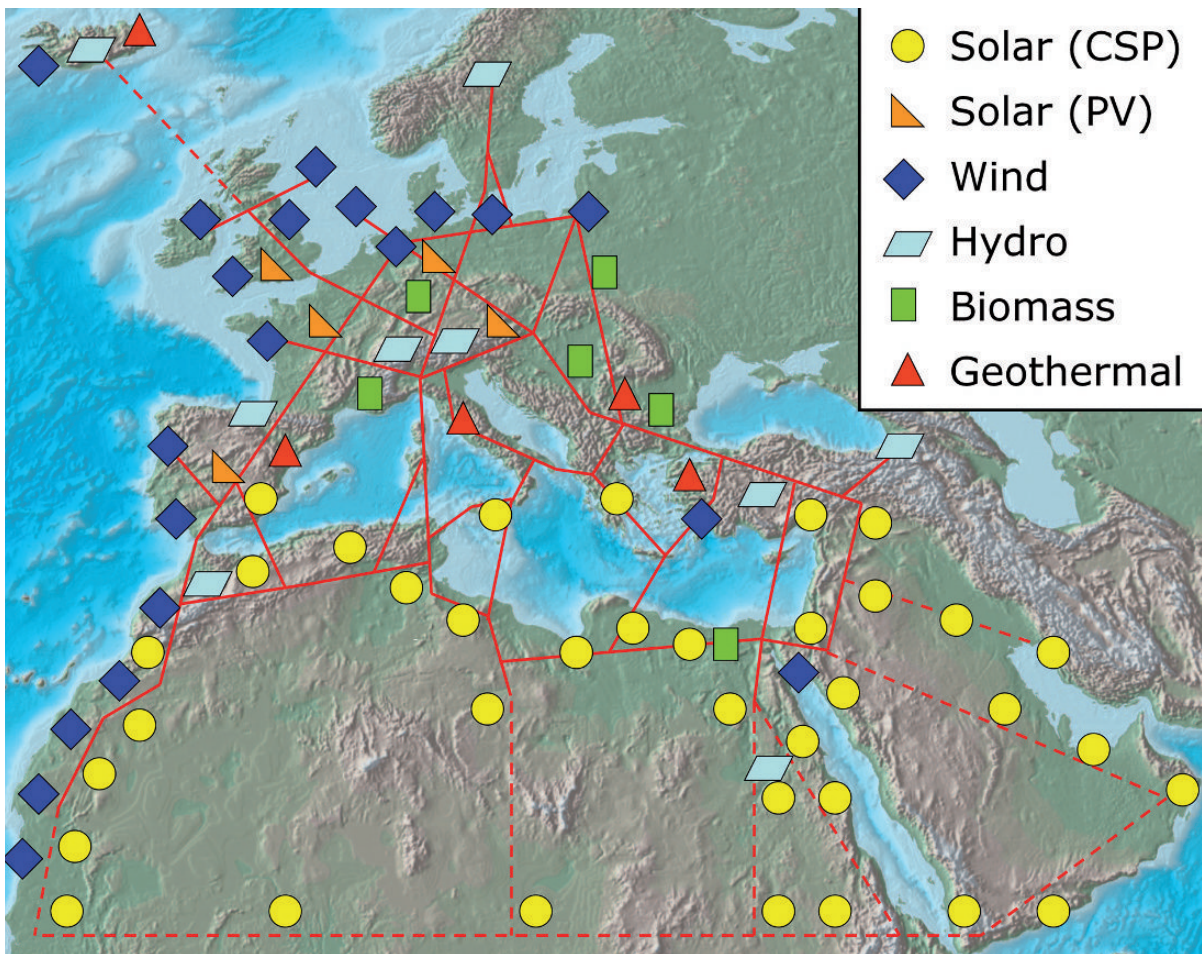
established in many projects globally. In the near future, many power lines will close the power grid around the Mediterranean Sea. The transfer capacity of the conventional electricity grid is limited to 1,000 MW. This would not allow considerable exports of solar power to Europe.

Three exemplary HVDC lines were assessed, interconnecting three sites of very high solar electricity yield in the Western, Central, and Eastern Sahara with three European centres of high electricity demand, each transferring 5 GW of power. In the final stage, a grid of 20 such power lines would allow the export of 700 TWh/y of solar electricity per year, which is equivalent to the present annual electricity consumption of Germany and Belgium or 15 per cent of the consumption of the 30 European countries analysed in the study (TRANS-CSP 2006).

There are three good reasons for choosing concentrating solar power technology for generating renewable export electricity. *First*, CSP plants are capa-

ble of delivering electricity steadily around the clock and around the year with firm capacity, which would enable them to deliver base load power like conventional nuclear or fossil fuel fired power stations. This is crucial to achieve a reasonable amortization of the HVDC infrastructure. *Secondly*, only solar energy resources are so vast that they will be able to cope both with the rapidly increasing regional electricity demand in the MENA region and at the same time with the European need for clean power, while the other renewable resources are more limited and will rather be used to supply a reasonable part of regional needs. *Thirdly*, CSP plants can be used for the co-generation of electricity and heat for the thermal distillation of brackish water and sea water, and thus help to solve the increasing scarcity of fresh water in the MENA region with a by-product from power generation or using directly solar electricity for desalination via membrane technologies.

Figure 28.14: Vision of a future Trans-Mediterranean HVDC electricity grid interconnecting sites of high renewable electricity potentials in Europe and beyond. **Source:** Trieb and Mueller-Steinhagen (2007).



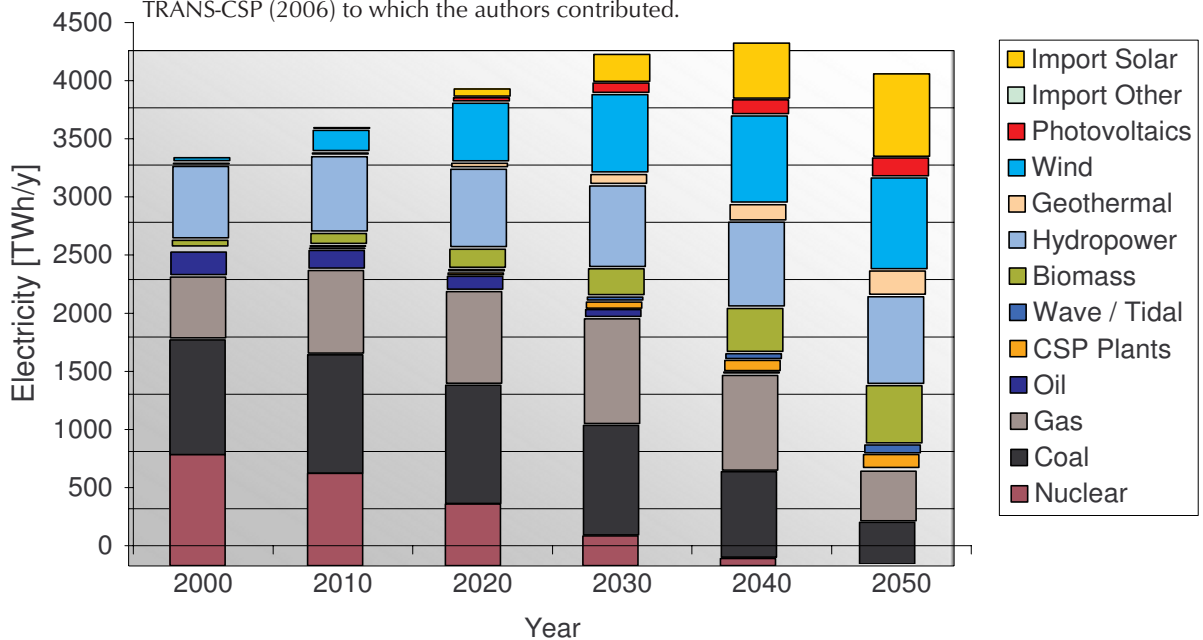
The scarcity of freshwater resources has made food self-sufficiency impossible. Water scarcity may lead to social instability of a growing population in the MENA region. Efficient power generation and fresh water is vital. The need for seawater desalination leads to higher energy demand and to an unavoidable additional burden for national economies. There is no sustainable solution for water security based on fossil or nuclear energy, and moreover, there is a growing conflict between domestic consumption and export of fossil fuels.

Cost traps in the energy sector originating from fluctuating fuel prices are serious enough, but the traps originating from a future fresh water deficit will be even worse, because water is indispensable even at the lowest economic level of development. With a water deficit equivalent to the Nile expected in the short term, the North African states face a challenge never experienced before in their history. To solve this se-

vere societal problem, they will require large amounts of low cost energy for desalination and, of course, an enhanced water infrastructure and optimal water management.

Solar power and desalination plants will not only tackle the problems related to a sustainable energy supply at a low cost, but also those related to clean water and to the conservation of productive soils. In the world's arid regions, such plants could become the nucleus of a totally new social paradigm: the conservation and recuperation of land endangered by desertification, comparable to the conservation and recuperation of flooded land in the Netherlands. Providing power, water, shadow and foreign exchange from the export of green power and revived agriculture, such plants can provide all that is needed to effectively combat desertification, and to regain land for human settlement and agriculture that otherwise would be lost to the desert.

Figure 28.15: A scenario^{a)} of the power sector in 30 European countries aiming at economic and ecological sustainability using a balanced mix of national and imported renewable electricity sources. **Source:** TRANS-CSP (2006) to which the authors contributed.



a) TRANS-CSP covers: Iceland, Norway, Sweden, Finland, Denmark, Ireland, United Kingdom, Portugal, Spain, France, Belgium, Netherlands, Luxembourg, Germany, Austria, Switzerland, Italy, Poland, Czech Republic, Hungary, Slovakia, Slovenia, Croatia, Bosnia-Herzegovina, Serbia-Montenegro, Macedonia, Greece, Romania, Bulgaria, Turkey.

Arable land resources in the MENA region and globally are disappearing at a speed of several hectares per minute. Concentrating solar multi-purpose plants in the margins of the desert could generate solar electricity for domestic use and export, fresh water from seawater desalination, and in addition provide shade for agriculture and other human activities. Such plants could turn waste land into arable land and create labour opportunities in the agriculture and food sector. Tourism and other industries could follow. Desertification could be stopped. Other decentralized renewable energy sources could also come into use in those newly developed regions, like e.g. photovoltaics, solar thermal collectors, wind energy, and biomass.

Solar energy and salt water are unlimited resources if used in a way compatible with environmental and socio-economic constraints. The economic figures of most renewable energies indicate clearly that within a manageable time span they will become much more cost effective than fossil fuels. Renewable energies are the least cost option for energy and water security in the MENA region. With increasing electricity intensity in a developing world, their importance will steadily

grow, being only limited by demand, and not by resources.

In the coming decades, the European electricity grid will subsequently be transformed, on one side by applying more decentralized supply structures in the medium- and low-voltage level, interconnected by information networks and operated like 'virtual' single power plants. These structures will include PV and wind power systems, micro-hydropower, fuel cells, and micro-gas turbines, but also consumers and storage facilities for load management. A grid of 'electricity highways' will be established on a high-voltage level, with a large long-distance transfer capacity and low transfer losses (figure 28.14). Both centralized and decentralized grid structures will provide high security, redundancy and diversity of power supply, and good economic performance through high competition. It will activate the best sites for renewable electricity generation, both in the centralized and decentralized level, and cope both with the energy demand of decentralized consumers as well as that of growing megacities in the MENA region while the urban centres in Southern Europe will shrink.

This option is more than a long-term vision. It should be given serious consideration in the present

planning of new power, because investment cycles in the power sector extend to 30–40 years. Present strategies and scenarios for the European electricity sector consider solar electricity imports as a major element of an environmentally and economically compatible, sustainable electricity supply in the medium- and long-term future (figure 28.15). A well balanced mix of national resources and import energies will provide energy security even for a region like Central Europe that has only scarce domestic fossil and nuclear energy resources.

28.6 Conclusions

Renewable energies can relieve Europe and the quickly growing economies of the Middle East and North Africa (MENA) from increasing subsidies for their energy and water sector, and from overloading their environment and natural resources. A strategy for energy sustainability must include three components: a) the rational use of energy, b) renewable energies, and c) a Trans-Mediterranean Partnership for Energy and Development. The challenges of the 21st century must be tackled in a joint EUMENA effort rather than lost through separatism and wishful thinking of national energy autonomy.

The studies presented here show that the EUMENA region has the technical means and the natural resources to achieve sustainable supply of power and water in the Mediterranean region and Europe. However, technology will not solve problems by itself. Political decisions and a cooperative policy framework are needed to implement this vision. The task of this chapter was to show that this option exists. Policies must be developed and implemented.

A good starting point can be the example of the renewable energy feed-in laws in Germany, Spain, and many other European countries. They provide the necessary revenues for renewable power in form of a long-term power purchase agreement guaranteed by law. This gives enough security to investors and helps to reduce equity interest rates, thus reducing the cost of market introduction. E.g. in Germany equity interest rates in the frame of the feed-in law are usually 6–7 per cent, while in the conventional power sector, due to the higher risk, 9–15 per cent are demanded by investors. Thus, a feed-in law is the most cost effective way to introduce renewables. As the tariffs are paid by all electricity consumers, the individual financial load is almost negligible, but future benefits by cost reduction are great.

Secondly, a EUMENA free trade area for renewables could be helpful to extend the achievements of the European renewable power sector also abroad, and could even help to initiate a more comprehensive free trade area in this region. At least in the renewable energy sector, it has become clear that the cooperation between European and MENA countries will be beneficial for both regions.

29 Energy Security in the Arab World

Mohammad Selim and Abdullah Sahar

29.1 Introduction: The Concept of Energy Security

Since the age of the Industrial Revolution, it has been widely acknowledged that energy is a major sector of modern economies. However, it took the world almost two and half centuries to acknowledge that the supply of energy is a major element in the conceptualization of national security, and to devise the concept of energy security. The concept was mainly developed in mid-1970 as the flow of cheap oil to the West from the Arab world was disrupted during and after the October War of 1973.

This concept came to refer to the quest of Western powers to secure the uninterrupted flow of oil from foreign suppliers, and the attempt to rationalize its use and diversify energy sources (Fried/Trezise 1993; Downs 2000). The literature on energy and energy security was characterized by the dominance of the oil dimension. Energy was viewed as equivalent to oil. This was mainly an outcome of the emphasis in the West on the question of the continued access to foreign oil. At a later stage, the concept of energy security was expanded into four directions, (i) to comprise all sources of energy, including oil, coal, nuclear, solar, and hydro energy so as to establish the 'optimum' mix of energy sources which best suits a nation's needs, and most importantly the continuous access to that mix; (ii) to refer to the threats to national security resulting from energy including supply shortages; (iii) to deal with the strategies needed to establish an energy regime which does not pose a threat to the quality of the environment, and reduces the negative environmental consequences of energy production and consumption; and (iv) to assess the impact of the quest to secure sources of energy on the flare-up of conflicts, and the impact of conflicts on securing sources of energy. The main questions to be asked in this domain are: to what degree are energy problems causes of certain conflicts, and what is the probability

of occurrence of energy problems as a result of conflicts?¹

This chapter deals with these issues in the context of the Arab world. The concept of the Arab world refers to the 22 members states of the *League of Arab States* (LAS). These are Mauritania, Morocco, Algeria, Tunisia, Libya, Sudan, Egypt, Lebanon, Syria, Jordan, Palestine, Iraq, Saudi Arabia, Oman, Kuwait, Bahrain, Qatar, Oman, Yemen, Somalia, Djibouti, and the Comoros Islands. The last three states will not be included as they are mostly at the periphery of the Arab regional system.

The main emphasis of this chapter will be the extent to which the concept of energy security has been integrated into the Arab conceptualization of security, the main substantive issues being debated in the Arab world on the question of energy security, the main energy-related threats to Arab security, the main strategies pursued by the Arab countries to achieve energy security, and the interlinkages between energy and conflicts in the Arab world. To what extent have energy issues led to conflicts in the Arab world, and have conflicts influenced energy questions? What are the implications of these linkages for the energy security in the Arab world?

1 The US *Nuclear Energy Institute* in Washington defined energy security as: "the ability to manage the economics, supply, and environmental consequences of energy sources or produce electricity. A diverse mixture of energy sources enables our nation to balance cost, availability, and environmental impacts to our best advantage." See at: <www.nei.org/doc.asp?catnum=4&catid=123>. Jabeen (2006) also established the Energy Security Index (ESI) which comprised three dimensions: dependency, certainty, and affordability.

29.2 Arab Conceptualizations of Energy Security

The Arab discourse on issues related to energy security has been traditionally restricted to the intellectual elites, and experts, governmental and non-governmental, perhaps with the exception of the question of nuclear energy which has been a subject of public debate in a number of Arab countries. Further, most conceptualizations of energy scrutiny have mainly dealt with the state level of analysis rather than the level of the pan-Arab regional system. It is only recently that the second level has been seriously considered in Arab conceptualizations of energy security.

Arab conceptualizations of energy security passed through two main stages. The first stage extended from the second half of the twentieth century. The question of energy was viewed from a dominantly technical perspective. The emphasis was on securing world markets for Arab oil exports, comparing the economics of various sources of energy, oil, natural gas, coal, solar, hydro, and nuclear energy. The literature was heavily dominated by references to oil as the main energy source. Other sources were viewed as residual. The main exception was Egypt's emphasis on hydroelectric power as a main source of energy, which led to the establishment of the 'High Dam' in Aswan in the 1960's. After the October War of 1973, Egypt moved in earnest in the direction of building an ambitious nuclear programme, with a view to generating electricity, and there was a genuine debate in Egypt over the merits and demerits of such a programme (Selim 1982; Mustafa 1985). However, the Egyptian programme was abruptly ended in 1986 and the debate subsided. Further, Arab states established a regional organization, the Organization for Arab Petroleum Exporting Countries (OAPEC) to coordinate their oil policies. However, it rarely exercised a significant success in achieving its objective.

By the beginning of this century, the discourse on energy was expanded to include other dimensions such as rationalizing the use of energy, diversifying global partners in marketing and producing oil and other energy sources, emphasizing upon pan-Arab regional cooperation in the area of energy security, the consideration of other sources of energy such as nuclear energy, and linking energy with environmental issues. The last two dimensions deserve special attention. In 2006, Egypt and the Gulf Cooperation Council States (GCC) began to advocate a nuclear option for generating electricity. This came in the context of the global debate on the Iranian nuclear pro-

gramme and the revelations that Iran has succeeded in building an elaborate programme for uranium enrichment. After twenty years of the abandonment of the nuclear energy option, Egypt reintroduced the question of nuclear energy, claiming that its traditional energy sources were fast declining. It began to reactivate the old plans to build a nuclear reactor on the northern coast near Al-Dab'a, to find out that the area had been sold to real estate developers and that another location must be found. Surprisingly, the Gulf Cooperation Council (GCC) states followed suite as the 27th summit of the GCC held in 2007 resolved to embark on a GCC nuclear programme, and these states approached the International Atomic Energy Agency (IAEA) to help in developing such programmes. Until that time, the GCC states used to criticize Iran for embarking on a nuclear programme as it has plenty of oil resources. As Arab countries joined the Kyoto Protocol, they became mindful of the environmental consequences of energy (especially of oil) production and consumption which led to an assessment of the impact of the Protocol on the continued access to global markets in the light of the necessity to reduce carbon dioxide emissions. This trend in the Arab discourse on security began in 2003 with the convening of a conference in Abu Dhabi on 'Energy and Environment'. The main themes discussed were: a) the impact of energy on the environment, b) the social and economic impacts of energy policies, and c) developing sustainable energy sources. The main issues for discussion were the implications of energy-related policies on the environment, fossil fuels for economic development and security, energy policies and their implications for sustainable development, socio-economic aspects of energy policies, promoting participation in developing sustainable energy policies in the Arab countries, environmental management systems as tools for energy management, and compliance with energy-related environmental standards in the Arab countries. The Conference also issued *the Abu Dhabi Declaration*, which recommended developing a new strategy which deals with the environmental consequences of energy production and consumption. Further, the *Council of Arab Ministers Responsible for the Environment* (CAMRE) issued an "Action Plan on Environment and Energy for Arab Countries" in 2004. For the first time, this Action Plan addressed the question of energy in the larger framework of the environment. The Abu Dhabi Declaration and the following Action Plan represent a noticeable shift in the Arab discourse on energy in the

direction of linking the issues of energy and the environment (Al-Lababidi 2003).

However, the question of energy security in the Arab world has not been integrated into the overall conceptualization of national security. The concept of 'energy security' (*Amn Al-Taka*) is not directly employed in the Arab discourse on energy and security. If one reviews the publications of Arab energy analysts, and the proceedings of Arab institutions majoring on energy questions, such as OAPEC, one hardly finds direct references to the concept with few exceptions.² There are no significant public debates on energy questions with the exception of the Egyptian debate in the 1950's on building the High Dam in Aswan to generate hydropower, and the debate in the 1980's on the use of nuclear power to generate electricity. This can be partially attributed to two factors, oil and electricity surpluses in Arab countries, and the dominance of the Arab security agenda by hard security issues. A brief review of these factors may be in order:

According to the 2002 statistics of OAPEC, Arab oil reserves were almost 650 billion barrels which represented 57 per cent of world oil reserves, and Arab oil production was 20.2 billion barrels a day which represented 28 per cent of world oil production. Arab

natural gas reserves are almost 40.7 billion cubic meters representing almost 26 per cent of global reserves. Electricity production was 492,538 gigawatt hours (GWh) and the consumption was 317,223 GWh. This means that the Arabs are producing oil and consuming electricity below their potential or actual capacity, which has provided the Arabs with a sense of energy security.³ Most Arab countries are either oil exporting or self-sufficient in oil production. Arab countries in the Gulf, Libya, and Algeria export huge quantities of oil. Other countries, such as Egypt, Syria, and Sudan either export small quantities or are self-sufficient. As a result, the sense of oil security is dominant in these countries, despite the long-term threats.

The Arab security agenda is also dominated by hard security issues related to territorial claims and foreign occupation, existential threats resulting from regional power disequilibrium and Israel's possession of nuclear weapons. The dominance of hard security issues has kept Arab strategic communities engaged in these issues to the detriment of the incorporation of soft security issues, such as energy, into the overall conceptualization of national security. However, that does not mean that the concept does not exist as the Arab literature just referred to is laden with references to the prospects of an energy crisis and the long-term threats to energy supplies in Arab countries.

2 In 2004 the *Organization for Petroleum Exporting Countries* (OPEC) held a seminar in Vienna on 'Petroleum in an Interdependent World' where the concept of energy security was clearly on the agenda of the conference. In 2004, the OAPEC held two conferences: "The 11th Co-ordination Meeting for Environmental Experts in OAPEC Member States," and "The 4th Meeting of Working Group on Possible Cooperation in Natural Gas Investment." Also in 2004, the *Emirates Center for Strategic Studies* in Dubai held its 10th Annual Energy Conference on the "Oil and gas sector in the Gulf." In these three conferences the concept of energy security was not discussed. For a review of the conferences see the: *OAPEC Monthly Bulletin*, 30, 10 (October 2004). In 2005, the *Bahrain Center for Studies and Research* issued a book entitled *International Energy Security and Cooperation* which contained the proceedings of a joint conference held in Shanghai in collaboration with the Shanghai Institute for International Studies. This is one of the few books in the Arab world which employed the concept of energy security. The main emphasis of the book was on Sino-Arab cooperation in the field of energy (Bahrain Center for Studies and Research 2005) Further, the April 2006 issue of *Al-Siyassa Al-Dawliya* [International Politics], a quarterly journal published by *al-Abram* (Cairo), was devoted to the theme of "energy security and the future of international relations". Thirteen papers were published in that issue, however, none of them provided a definition of energy security.

29.3 Energy-related Threats in the Arab World

The fact that there are oil and electricity surpluses in Arab countries should not conceal the reality that there are a number of short-term and long-term threats to energy security in the Arab world. Arab population growth rate is almost twice as high as the average world population growth, which resulted in an Arab energy consumption increase of about 1-1.5 per cent per year above the global average. The Arab energy demand is higher than the average global demand, which implies that these surpluses may be temporary and may not last for more than a quarter century. As almost one third of the Arabs have no access to electricity and as governments must supply them with electricity, the energy demand will grow even more. The quality of electricity supply to another one third of the population is below standards, with supply cuts, low and intermittent voltage, and other prob-

3 See: *OAPEC Monthly Bulletin*, 30, 10 (October 2004), and 30, 11 (November 2004).

lems that disrupt electricity services (Al-Khatib 2000). Further, the electricity sector in most Arab countries experiences major difficulties due to price subsidies and inadequate revenue collection, which reduces the efficiency of this sector.

In this respect, a number of security threats have been articulated by Arab intellectuals and energy experts. It is interesting to note that these threats have not been reflected in the Arab official discourse on energy which implies the existence of a gap between actual and perceived threats. Further, most of these threats have been articulated at the state and pan-Arab levels as awareness of the interconnectedness among Arab states in the area of energy security has been growing since the beginning of the 21st century.

The first main energy-related threat is the emergence of new oil producers in the global markets. The Caspian Sea and Central Asian oil suppliers have begun to extract and export huge quantities of oil directly to Western markets through Turkey.⁴ In 2006, Arab countries supplied almost 38 per cent of the world oil demand. But the Caucasian and Central Asian states have recently entered the market as serious contenders. There are two main views on the threat posed by these new producers.

The first argues that the new producers do not pose a real threat to Arab oil as the Arabs possess almost two thirds of proven world oil reserves and that “the Caspian current oil estimates cannot match the awesome size of proven reserves found in the Middle East” (Hussain 2002), and that “the vast oil space in the Arabian Gulf will become in the near future the only oil choice upon which the industrial world will depend.” It was also argued that Arab oil represented 42 per cent of global oil consumption, and this percentage will increase to 50 per cent in 2008, and that China is increasingly depending on the Arabian Gulf oil (Al-Gehany 2002). The maximum capacity of the Caspian Sea oil is 3–4 billion barrels a day, which is the production of one Arabian Gulf state (Al-Shalaby 1999). Sheikh Yamani, the former Saudi Minister of Oil, also subscribed to this estimation when he argued that “the future is bright for oil reserves in the Gulf area. Presently non-Arab oil producers are rapidly depleting their oil reserves by producing large volumes, while Arab oil producers are producing much less” (Yamani 1999).

Advocates of the contending viewpoint argue that “it will not be too long before these new Caspian pro-

ducers emerge as competitors of the OPEC countries in international oil markets” (Ehtishami 1999). It seems that the new competitors do not pose an immediate threat to Arab oil exporters. However, if this potential threat is assessed in conjunction with other threats, such as Western strategies to reduce the reliance on Arab oil, its impact will be felt.

The second main energy-related threat is Arab over-dependence on oil. Oil is a non-renewable source of energy and it is estimated that Arab oil reserves will be exhausted within eight or nine decades. Other sources of energy are either not available or not utilized. The Arab world is quite poor as far as coal and hydropower are concerned. With the exception of Egypt’s reliance on the Aswan High Dam to generate electricity, hydropower is hardly utilized in Arab countries. Solar energy, with which the Arab world is endowed, is also hardly exploited as its use has some technical and financial dimensions especially if used in household activities. Further, with the exception of Algeria, which has a small nuclear reactor to generate electricity, nuclear energy is hardly known in the Arab world. Egypt has two small nuclear reactors to generate radioisotopes with no capacity to generate electricity. During the 1970’s and 1980’s, Egypt developed an ambitious programme to build eight nuclear reactors with a capacity of 600 megawatt each. In 1986, the programme was disbanded as a result of American persuasion.

The third main energy-related security threat is the overdependence on foreign markets in the utilization of oil. Oil production policies are externally oriented and connected with the world oil market. This means that Arab oil revenues depend to a large extent on the oil prices which are determined in the global market rather than by the Arabs. The problem is further complicated by the overdependence of Arab economies on oil exports, especially in the Gulf countries oil revenues represent around 20 per cent of Arab gross domestic product (GDP). This percentage increases in the case of the Gulf Cooperation Council states to almost 30 per cent. Oil exports represent almost 75 per cent of the total exports of all Arab countries, and almost 92 per cent of total exports of the Arab countries in the Arabian Gulf. These high percentages imply a high dependence on a commodity whose price fluctuates quite often with wide implications for Arab economies. As oil prices fluctuate, Arab development policies suffer. The fall of oil prices in 1998 led to the decline of Arab income from oil exports in 1998 to almost one third of its level in 1980 in real terms. As a result, the Arab economies grew only 2.5 per cent per

4 In July 2006, the Baku-Ceyhan Pipeline was officially inaugurated and became operational.

year during the period 1980–1999 compared with a 5 per cent growth for other developing countries. This had drastically weakened Arab economies which depend on oil exports and the economies of other countries which also suffered as these countries felt the impact of that fall in the form of a corresponding fall in economic aid and remittances of expatriates (Al-Khatib 2000). This trend has been exacerbated by the decline of the demand of Western countries for oil during the 1990's. For the first time, there was a decoupling between economic growth and oil consumption and demand. The share of oil in the energy consumption of these countries declined from 54 to 45 per cent, and the share of natural gas increased from 17 to 37 per cent. The Asian financial crisis in 1997 has led to a decline in the Asian demand for Arab oil and resulted in a drastic decline of oil prices (Al-Shalaby 1999). Do increasing oil prices and a resulting surplus of 'petrodollars' boost Arab security? Not necessarily. Oil revenues were used to build modern infrastructures in Arab oil-exporting countries, and to provide social services to the population such as education, housing, and health. It has contributed to a significant rise in the standards of living in the Arab oil-exporting countries. The *Human Development Report* of 2006 by the United Nations Development Program (UNDP) classified Qatar, the Emirates, Bahrain, and Kuwait among the high human development category, while other Arab oil producing countries led the medium human development category. Oil revenues have also contributed to the establishment of Arab development agencies and funds, such as the Arab Fund, the Islamic Development Bank, and the development funds of Kuwait, Saudi Arabia, and the United Arab Emirates. These agencies have contributed significantly to the development not only of Arab countries but also of other developing countries.

But oil revenues have also reinforced the power of the state compared with the society as the former emerged as the only distributor of benefits and as a result the authoritarian grip of the state was solidified and state-society relations took the form of "no taxation and no representation", which means that the state, which relies on foreign sources for most of its income, will not impose local taxes, will provide services and finances in return for the absence of any representative bodies and the acceptance of the authoritarian state.⁵ In turn, this had led to extravagant and sometimes corrupt patterns of expenditures. These social expenditures have created a 'relaxed consumer society' in Arab oil-exporting countries, a society which despises manual labour, and overdependence

on foreign labour, and mostly oriented towards consumerism (Khatib 1999). A sizeable portion of the oil revenues was also used to purchase arms. In fact, since the 1973 oil boom, the military expenditures of the Arab oil-exporting countries, defined by the percentage of military expenditures from total GDP, remained the highest in the world for many years, reaching sometimes a threshold of 25 per cent. Weapons were bought on a turnkey basis and did not contribute to an indigenous military industrialization. The military industry in these countries remains weak and totally dependent on foreign sources. Thus, after three decades of the 1973 oil boom, the Arab oil-exporting countries are in a more vulnerable position than they were before. The regional balance of power has dramatically shifted in favour of non-Arab powers in the region, despite the surplus petrodollars.

The fourth main energy-related security threat is the decline of global demand for oil. Whereas oil represented 44.5 per cent of global energy supply in 1990, it represented 42.4 per cent of that supply in 2000. The global trend is towards increasing the use of renewable sources of energy such as wind, water, and solar energy (Abdullah 2002). This is because of the problems resulting from overdependence on oil, which results in carbon dioxide emissions leading to global warming. In fact, according to the Kyoto Protocol, developed member states are obliged to reduce these emissions until 2008–2012 compared to 1990 by five per cent. Flavin and Lensen (1990) expect that a shift to solar energy will be the cornerstone of a new global energy regime in the near future. Further, developed economies have achieved great progress in increasing energy efficiency, which has reduced the energy/economic growth coefficient, which means that economic growth is achieved with declining energy consumption. This threat is further complicated by (i) the rise of new oil producers in Central Asia and the Caucasus; (ii) Western strategies to diversify sources of oil importation and develop non-oil sources; and (iii) the Kyoto Protocol to which we will refer later.

The fifth main energy-related threat is the inefficiency in energy utilization in Arab countries. Such efficiency is measured by the GDP in \$ per kg of energy consumption. Whereas this measure has improved for industrial countries during the 1980–1996 period by

5 In fact, the concept of the 'rentier state' was developed to reflect this situation. The rentier state is the one which relies heavily on foreign sources of income to distribute to its society, which in turn makes the society dependent on the state (Luciani 1995).

22 per cent, and worsened for developing countries by 8 per cent, it has worsened more seriously in Arab countries by 23 per cent, reflecting the inefficiency of Arab policies on energy consumption. Energy is over-consumed for non-productive purposes, and energy supply is subsidized by the state, which results in extravagant patterns of energy consumption. There are also problems of inadequate revenue collection in most developing countries, which means that the revenues collected are usually less than the cost of energy production. Any policies to rectify this situation will most likely deprive more people from access to electricity, given the low per capita income in most Arab countries.

The sixth main threat to Arab energy security are the environmental consequences of energy production and consumption in the Arab world. Gas emissions have harmful environmental consequences. The Kyoto Protocol was devised to reduce global carbon dioxide emissions resulting from burning fossil fuels (oil, gas, and coal). It stipulates that by 2010, emissions from greenhouse gases should be reduced by five per cent below the level of 1990, which means reducing the use of oil (a major source of carbon dioxide emissions as a source of energy). Consequently, when fully implemented, the Kyoto Protocol will have a far-reaching long-term impact on the future of the Arab oil market. A major trend is towards natural gas, which is considered as the cleanest fossil fuel. Arabs are also increasingly converting to natural gas, but Arab reserves of natural gas are almost 53,123 billion cubic metres which is almost 28 per cent of the global reserves, which will put the Arabs in a disadvantageous situation in the future. Oil and natural gas represent the two main sources of Arab energy consumption (57 and 39 per cent respectively). Despite its major positive impacts, shifting from oil to natural gas will imply higher financial burdens for Arab economies (Al-Lababidi 1999). The Arabs must reduce carbon dioxide gas emissions for a healthier environment, but in doing so they incur a heavy financial burden by shifting to an energy source where they do not have an absolute relative advantage. Further, their key strategic commodity, oil, loses its attractiveness. The Kyoto Protocol also requires oil-producing member states to limit the pollution associated with the production of oil and oil products, which means that the oil producing countries will have to incur more costs and this increases the cost of production and subsequently of the commodity itself in the global markets.

Finally, one may refer to some other potential long-term threats to Arab energy security which could

emanate from inside and outside the region. The first is the threat of terrorist attacks on Arab oilfields. This is actually happening in Iraq after the Anglo-American invasion in 2003. On average, there are eight attacks a month, mostly pipeline bombings which kept Iraqi oil production 27 per cent below its pre-invasion level. There was also a failed attack on Saudi oilfields in February 2006. The last attack led to an increase of about 4 per cent of the price of the barrel of light crude. Osama bin Laden, the leader of Al-Qaeda, has persuaded his followers in December 2004 to attack oilfields in order to “stop the greatest theft of (Arab) oil in history” (Jenkins 2006). However, with the exception of the Iraqi case, such a threat to Arab oilfields is not eminent unless the region is engulfed in an all-out regional war which brings into the equation sectarian rifts.⁶ The second threat could result from a potential Sino-American rivalry over access to Arab oil. In 1993, China turned into a net oil importer, and as a result of the growing industrialization of the country, demand for oil has been galloping. China has been pursuing an active policy of securing oil from the Arabian Gulf states and Sudan through long-term partnerships. In pursuing that policy, China is keen to assure the US that this is not a zero-sum game and that it is not out to eliminate the American share. However, the US has expressed concern over the new Chinese policy for two reasons. The first is the US concern about the rise of China and the high military expenditure of that country. Repeatedly American policymakers have argued that China is ‘a strategic competitor’. The second source of American concern is that China is ready to provide its Arab oil exporting partners with arms, and some of them, such as Sudan, are considered as ‘rogue states’. If the Sino-American rivalry should escalate in the future, Arab oil may be

6 As the Iranian nuclear crisis mounts in the Arabian Gulf region, the possibility of such attacks also increased. During the World Energy Forum in Doha in April 2006, Hany Hussain, the Executive Director of the Kuwaiti National Oil Company, warned of the increased likelihood of terrorist attacks on the oilfields in the Gulf region. However, Abdel-Hussain Mirza, the President of the National Corporation for Oil and Gas of Bahrain, assured during the same conference that oilfields in the Gulf are secure and will not be influenced by any terrorist attacks. See: *Al-Qabas* (Kuwait), 26 April 2006. However, in February 2007, an attack on the world’s biggest oil-processing facility, located in Abqaiq, Saudi Arabia, was narrowly foiled. Although the attack was foiled, it sent global oil prices soaring. The USA has offered to help the Saudis in protecting their oilfields against future attacks (*Bahrain Tribune*, 23 December 2006).

one of the main targets of both sides. The US could cut off oil supplies to China, especially as it controls the supply routes to China. This explains the motives of China to diversify its partners and to import oil from Russia and Kazakhstan through routes uncontrolled by the US.

29.4 Arab Strategies to Deal with Energy-Related Threats

The Arab ability to deal with these threats was constrained by the dominant sense of energy security in the Arab world. No meaningful attempts were made to create less oil-dependent economies by diversifying the sources of energy. It is only in 2006 that the question of nuclear energy has been put on the Arab security agenda. However, this was mainly an attempt to match the Iranian nuclear success rather than a reflection of a genuine consideration of the nuclear option. Few believe that the Arab countries could actually embark on a nuclear programme to diversify the sources of energy.

The bulk of Arab strategies are mainly oriented towards diversifying global oil markets, and improving the efficiency of the oil sector and promoting the natural gas option. Most Arab investments in the oil sector are directed towards the exploration and field maintenance, and building refineries and petrochemical industries. Not only Western powers have been trying to reduce the dependence on Arab oil to avoid a replay of the 1973 oil embargo scenario, but the Arabs have also tried to reduce the overdependence on Western customers. There has been a noticeable shift in Arab oil strategy to diversity partners by building long-term relationships with Asian customers such as China, India, and South Korea. Today, the Arabs export 60 per cent of their total oil exports to Asian markets compared with 16 per cent to Western Europe, 15 per cent to North America, and 2 per cent to Africa (Al-Lababidi 1999). The Gulf Cooperation Council (GCC) states have been developing strategic partnerships in building oil refineries in East Asia and granting Asian companies oil concessions. It is expected that the Arabian Gulf oil-exporting countries will account for 11.7 million b/d, which will represent 66 per cent of total Asian oil demand by 2010 (Abdelwahab 2001).

Most Arab states have developed the refining industry to enable them to keep up with international requirements for clean fuel products and to improve the value added of refined oil. Conversion processes

top the technology options available because they can convert heavy residues left from direct refining into light, high-value products, give a refinery the flexibility to refine heavy crude, and allow producing countries to utilize poor quality oils which are difficult to export. Conversion processes for primary distillation residues also form an important part of Arab strategies to strengthen their ability to achieve oil price stability in world markets. Price instability stems from a shortage of refinery capacity, which has been exacerbated by the suspension of refinery building in some industrial countries. This has had a serious impact on the bottlenecks in world markets, as refineries in major consumption centres were unable to meet the growing demand for gasoline.⁷

Further, many Arab states have pursued a strategy to improve the quality of the environment resulting from oil by producing unleaded gasoline. Qatar began producing it in 1984, Tunisia in 1992, Egypt in 1996, Kuwait and Syria in 1997, Algeria in 1998, Bahrain in July 2000, and Saudi Arabia in January 2001. Moreover, most Arab states are cutting the sulphur in their diesel from 1 per cent in weight to 0.05 per cent in conformity with local laws and circumstances and oil refinery capacities. This requires installing new hydrocracking units in refineries. The target of 0.05 per cent sulphur content or less in diesel has already been achieved in Qatar and Oman, and most Arab countries are implementing projects to achieve that target.

At the regional level, the countries of the Arab Orient and the GCC states have devised strategies of integration in the energy sector. Egypt, Jordan, Lebanon, and Syria have already begun connecting their electricity grids and are building natural gas pipelines that connect these countries to supply them and Turkey with Egyptian surplus natural gas. The GCC states have also approved a plan in 1997 to connect their electricity grids. (Badawi 2002). In 2001 these states formed "The Electricity Grid Authority of the GCC states" based in El-Dammam, Saudi Arabia to supervise the linking of their electricity grids (*Al-Siyassa*, (Kuwait) 8 May 2007). The gas networks, through which Algerian gas is exported to Europe, also connects with Tunisia and Morocco.

At the international level, a main emphasis is to reduce reliance on Western markets and to diversify oil-importing partners by going east. This is mainly the strategy pursued by some GCC states. It evolves around creating partnerships with Japan, China, South Korea, and India through which Arab countries

7 See in: *OAPEC Monthly Bulletin*, April 2004.

would secure oil importers. Sometimes this takes the form of joint ventures, as with China, South Korea, and India. China seems to be the main long-term reliable partner upon whom most Arab countries are counting to secure oil partnership (Ahmed 2005; Guang 2005; Strecker 2000). But China as the main Asian customer is apprehensive about Arab oil because its maritime transport lines are controlled by other oil-hungry powers, and thus China is increasingly moving towards Russian and Central Asian oil-fields, oil from which is transported through more secure land routes.

Arab energy analysts have recommended certain strategies to boost energy security such as rationalizing energy consumption, developing new and renewable energy sources, improving the quality of local industries so as to reduce the 'domestic elasticity' of energy consumption, and building inter-Arab networks for the exchange of electricity in emergency cases (Abdullah 1992; Omar 2004). Arab governments are partially pursuing these strategies. The main trend is to reduce, if not eliminate, state subsidies for electricity consumption which mostly hurts the underprivileged classes in Arab countries and those who need access to electricity. Recently, the electricity grids of Egypt, Jordan, and Syria were connected so as to exchange energy in cases of emergency. Also Egypt has built a trans-Arab Mashreq pipeline to sell natural gas to Jordan, Lebanon, Syria, Israel, and possibly also Turkey. The natural gas pipeline became operational in 2003. The main objective is to secure continued access in this part of the world to energy supplies.

29.5 Energy and Conflicts in the Arab World

Energy issues were the source of many conflicts in the Arab world. Since the Anglo-German rivalry to control oil resources in Iraq in the late 19th century, great powers have been competing for dominance in the Arab Orient. During the Cold War, Western powers tried to prevent the Soviet Union from approaching the oil wells in the Arabian Gulf, and as a result they established a permanent military presence in the region. The dramatic increase in oil prices during the 1970's led to a military build-up in the Arabian Gulf states. These states possessed the capability to buy huge quantities of arms, which made the region an 'arms bazaar' (Sampson 1977). Some Western powers thus 'recycled' the surplus petrodollars into their economies. According to Lesser (2004) the name of

the game was 'Arms for Oil'. Control of Arab oil in the Gulf was also one of the main motives of the Iraqi invasion of Kuwait in 1990. The American campaign to end the Iraqi occupation of Kuwait as soon as possible was motivated by the quest to prevent a change-oriented power in the region from controlling a large percentage of oil production in the region. Likewise, the Anglo-American military invasion and occupation of Iraq in 2003 was motivated by the desire of the US to control Iraqi oil, the second largest reserve in the world, thus solidifying its single super power status and controlling the flow of oil to China, its future strategic competitor (Noshab 2003). However, it is also argued that oil was not the major motive of the invasion and that the USA could have controlled Iraqi oil by lifting the sanctions on Iraq without invading it (Al-Hajji 2004).

Conflicts have partially shaped the energy landscape in the Arab world. The Arabs have used oil supplies during the 20th century to achieve political gains. This was done during the Arab-Israeli war of 1973 when Arab oil producers stopped supplying pro-Israel countries with oil in order to persuade them to adopt a more balanced stance. This caused the US to threaten an occupation of Arab oil wells and to persuade the Arabs to lift the oil embargo as quickly as possible.

The Arab oil embargo policy triggered the establishment of the International Energy Agency (IEA), whose basic objective was to reduce dependence on Arab oil and finding alternative energy sources. The discovery of oilfields in other regions has also reduced Arab share of world oil production to almost 28 per cent. As a result, it became difficult for the Arabs to resort to the 1973 strategy of an oil embargo as Arab oil could be partially replaced by an increase in the production from other sources (Al-Shalaby 1999). When Mahathir bin Mohammad, the then Prime Minister of Malaysia, suggested during the summit of the Organization of the Islamic conference held in Kuala Lumpur in 2003 to use oil wells to curtail an eminent Anglo-American invasion of Iraq, the Arab member states ignored his suggestion. Most Arab analysts believe that the best strategy is to protect the Arab share in the global oil market and use the revenues to promote development and reinforce the Arab deterrent capability (Abdullah 2002).

During the final years of the first Iran-Iraq War (1980-1988) the two countries attacked the oil facilities of each other, including tankers exporting oil to world markets, which has led to the American intervention to protect tankers of third parties by re-flag-

ging them. These linkages between energy and conflicts in the Arab world call for a re-conceptualization of energy and security questions by integrating them into an overall energy security concept along with other dimensions such as the environment, climate change, and others.

The energy sector has also been one of the favourite targets of American sanctions against some Arab countries, such as Libya and Iraq. American companies were banned from investing in the oilfields of these countries, which led to a drastic deterioration of the quality of the oil extraction technology. Although the policy of sanctions has hurt the Libyan and Iraqi economies, it did not achieve its objectives as the change in the Iraqi and Libyan policies was an outcome of the invasion of Iraq in 2003 rather than the oil-related sanctions (Lesser 2004).

29.6 Conclusion: Towards a Securitization of Energy in the Arab World:

Problems emanating from energy-related questions pose threats to Arab security. An Arab energy analyst concluded that “the future of energy in the Arab world must be a source of anxiety to decision makers,” and went on to argue that “the present energy and electricity situation in the Arab world is not sustainable” (Al-Khatib 2000). However, because of present oil, natural gas, and electricity surpluses in the Arab world, which are not evenly distributed among the Arabs and among the population of the same Arab country, Arab strategists and consumers have not developed a sense of an imminent energy crisis which could pose an immediate security threat, except in countries with limited oil reserves.

Given the short-term and long-term threats, the Arabs need to develop an ‘Arab energy security’ concept which should be integrated into the overall conceptualization of security. Such a concept would include elements of the use the available energy and diversifying energy sources, and partners, and building new strategic relations with oil customers.

The first element in the Arab energy security concept is to increase the efficiency of oil and natural gas utilization. Other sources of energy should be seriously considered. For example, it was found that installing 2 million wind turbines along the west coast of the Arabian Gulf in 60 rows separated by 11 m, where each blade length is of 10 m and efficiency 35 per cent, would produce 556,660 MW, which is the

current total energy capacity of the GCC states (Al-nasser 2006). The same observation may be generalized to solar and nuclear energy in the Arab world.

More emphasis on local oil conversion and petrochemical industries to increase the added value of oil, and pan-Arab regional integration in the field of connecting the electricity grids and transporting natural gas have helped Arab countries during the last few years to boost energy security. Another major element of the suggested energy security concept is to find the optimal energy price subsidization policy which will increase the efficiency of the energy sector, and at the same time provide energy and electricity to those presently deprived of them.

A more refined strategy to secure international partnerships is also needed. This strategy should proceed in two directions. The first is to rectify the unbalanced trade relationships between Arab oil-exporting countries and their Western customers which are based on the formula of ‘Oil for Dollars’, and/or ‘Oil for Arms’, in the direction of a more equitable relationships based on partnerships in the extracting, processing, and trading oil, and more importantly, indigenizing technology in Arab countries. What is needed is a strategy through which the producers and the consumers benefit. The second direction is to cement East and South Asian partnerships, by establishing long-term relationships with them and making sure that China will be engaged in the long run in producing and commercializing Arab oil.

Finally, not all Arab countries are oil rich. Some of them, such as Morocco, Tunisia, and Jordan are net importers of oil and gas. The oil reserves of others, mainly Egypt, are about to run out in or two decades. These countries need to develop alternative energy sources, such as wind, solar, and nuclear energy. These countries need to explore the option of nuclear energy for industrial purposes. In fact, after the Egyptians disbanded their nuclear programme in 1986, they are now debating the wisdom of the decision in light of the increase of the oil prices and Egypt’s limited oil reserves (Ahmed 2006).

30 Turkey: Energy Security and Central Asia: The Politics and Economics of the So-called Great Game

Gareth M. Winrow

30.1 Introduction

Buzan (1991) and his colleagues (Buzan/Waever/de Wilde 1998) widened the concept of security to include political, economic, societal, and environmental dimensions as well as a military component. The term 'energy security' became increasingly employed after the oil price rises in the 1970's, the 1991 and 2003 Iraq wars, and the increase in oil prices in 2005. Energy security may be placed within the context of the economic dimension of security, but energy security may also accommodate other components of security. This is evident in the so-called 'Great Game' concerning Central Asia and the transportation of crude oil and natural gas to outside markets.¹

Turkey is a key player in this Great Game. Political and economic issues and energy security concerns are perceived to be closely intertwined. Because of an over-dependence on Russian natural gas, Turkish officials may look to Central Asia to diversify their natural gas suppliers. In the future, crude oil from Azerbaijan and Kazakhstan may also be imported. The authorities in Ankara are also stressing the strategic value of Turkey as part of a transportation corridor to deliver gas and oil from Central Asia and Russia, and possibly from the Middle East and North Africa, to markets in Europe.

30.2 What is Meant by 'Energy Security'?

According to Deese (1979–1980: 140), energy security is "a condition in which a nation perceives a high probability that it will have adequate energy supplies ... at affordable prices." Energy security interacts with three components of broader security concerns: so-

cial, cultural and political; economic; and military. Energy is essential to improve the quality of peoples' lives, boost industrial development, and fuel the military machine of a state. Influenced by the oil crises of the 1970's, Deese (1979–1980: 144–145) and others such as Maull (1989: 511–512) focused on how to reduce a state's vulnerability to the possible disruption of energy supply. Their proposals were in line with the recommendations of the International Energy Agency (IEA) (35.3). They also suggested diplomatic or military actions to ensure a guaranteed energy supply.

In his discussion of 'environmental scarcities', Homer-Dixon (1994: 8, 18–19) noted that there have been conflicts between states over limited non-renewable resources such as oil and minerals because these resources can power factories and maintain armies. Buzan, Waever, and de Wilde (1998: 74–75) observed that environmental scarcity involved energy problems such as the depletion of natural resources, shortages, and uneven distribution. While the issue of the scarcity of energy supplies has tended to be placed on the environmental agenda, questions pertaining to the access and security of energy supplies have largely remained on the economic agenda, although both issues have potential serious societal, political, and military consequences.

The wider concept of 'economic security' has been challenged. Cable (1995: 305–306) suggested that the concept had lost much of its relevance in the international economic system of the 1990's where uncertainty and risk were part and parcel of this system. Nonetheless, he also argued that threats to economic security from disrupted supplies could become a major public policy issue, especially where there was a high degree of dependence on a small number of suppliers, and when the impact of a disruption was 'strategic' – i.e. affected defence interests (Cable 1995: 313).

1 Azerbaijan is here included although geographically it is strictly speaking a Caucasian or Caspian state.

Buzan, Waever and de Wilde (1998: 22–25 and 95–106) argued that economic security should only apply in those cases where there was an “existential economic threat”, when the import of crucial resources from outside suppliers was threatened and this endangered the survival of the importing state. In these cases the issue was securitized by the government of the importing state, and emergency measures could be taken. In most cases in international economic relations, though, issues were politicized – i.e. became a part of public policy – rather than securitized by governments, and the survival of a state was not in question.

Buzan and his colleagues attempted to define economic security (and energy security) more narrowly by stressing the significance of state survival and existential threats. However, they also acknowledged that how an issue was presented by officials and perceived by the public was important. In practice, therefore, a supposed real existential threat depicted by the ruling authorities may not actually exist (Buzan/Waever/de Wilde 1998: 24–25). Hence, the boundaries between the so-called securitization and politicization of issues, and the level and nature of threats, are not clear.

This chapter will focus on the security of energy supply. The vulnerability of Turkey to the possible manipulation of supplies by Russia will be discussed. This vulnerability could have serious strategic, economic, societal, and political costs, although the survival of the Turkish state is not in question. Turkey could diversify its sources of energy supply and import oil and gas from Central Asia. This application of the term “energy security” is in line with IEA usage.

30.3 Energy Security and the IEA

The IEA was established in 1974 to ensure that the major industrialized countries would not be vulnerable to a future major disruption of oil supplies. The International Energy Programme (IEP) adopted by the IEA in 1974 set up emergency response mechanisms. Members were required to hold oil stocks, restrain demand, switch to other fuels, increase domestic production, and share available oil in the event of a major supply disruption. Coordinating energy policies and increasing efficiency in energy use were later agreed. These were outlined in the shared goals adopted by the IEA in June 1993. The IEA had broadened its agenda and no longer focused solely on oil. Emphasis was given to the need to develop open mar-

kets, and cooperation between energy producers and energy consumers was encouraged. More attention was given to environmental concerns. Closer coordination with non-members of the IEA was recommended – Turkey is a member of the IEA, but Russia and the Central Asian states are not members.²

According to the IEA, energy security includes not only the security of energy supplies, but also the rational management of the world’s energy resources and the protection of the environment. IEA officials are eager to promote an international cooperative approach to the issue of energy security. However, while adhering to these goals individual IEA members may still be vulnerable to energy supply difficulties. Moreover, the IEA itself is still sensitive to the concern for energy supplies, especially in the wake of developments in the Gulf since 1990. Significantly, in September 2005 IEA members released oil as an emergency response to Hurricane Katrina, which had devastated oil production in the United States (US).

Energy transit is an important issue for energy security. Piped crude oil or natural gas may not reach its intended destination because of sabotage or due to transit states illegally tapping into the pipelines to satisfy their own energy needs. Natural gas pipelines are fully dedicated transport infrastructures that are particularly vulnerable to transit risk (Luciani 2004: 13). In contrast to crude oil, natural gas may not be delivered by road or rail, and high costs until recently limited the amount of gas which could be liquefied and transported by tanker. Significantly, Russia has refused to ratify the Energy Charter Treaty which provides for legal safeguards for energy transit. This is mainly because of disagreements over transit tariffs and transit rights through third countries. Ratification by Moscow would open up access to the Gazprom-controlled Russian pipeline system for Central Asian natural gas producers hoping to export their energy to Europe (Roberts 2004: 12).

30.4 Turkey’s Energy Needs and Energy Policy

Officials in Ankara are aiming to reform Turkey’s energy sector through privatization, liberalization, and restructuring to create an effective regulatory framework for a favourable market environment. Eager to

2 See “International Energy Agency: An Overview”, at: <<http://www.iea.org/Textbase/about/index.htm>>, 4 March 2005, pp. 3–7 of 8.

join the EU, Turkish policy-makers are seeking to integrate Turkey with European energy markets and align with the EU's energy *acquis* (Isik 2004: 1). Hence, an Electricity Market Law and a Gas Market Law were enacted in Turkey in 2001, followed by a Petroleum Market Law in 2003. An Energy Market Regulatory Authority was established in 2001 to handle secondary legislation, and, in particular, licensing and tariff regulations. These reforms were in line with the IEA's recommendations concerning the rational management of energy resources and the creation of free and open markets.

Turkey's future energy needs are difficult to predict given uncertainties over future economic growth, internal political developments, and questions over EU membership. With stand-by assistance packages worth US\$ 26.6 billion offered by the International Monetary Fund (IMF), the Turkish economy recovered after financial crises in 2000 and 2001. Turkey's real gross domestic product (GDP) grew by 8.9 per cent in 2004. However, the substantial black economy remains to be tackled, agriculture must be modernized, much more foreign direct investment is required, and a sizable debt and a growing current account deficit still need to be properly addressed.

According to the State Institute of Statistics in 2004 electricity consumption in Turkey increased 6.6 per cent year-on-year to 149.6 billion kilowatt hours (kWh).³ In 2004 the Ministry of Energy and Natural Resources (MENR) and other public institutions completed a study which forecast future electricity consumption in Turkey. Figures were projected based on a low demand growth, a high demand growth, and a main scenario that assumed a 6.4 per cent average GDP growth rate (table 30.1).

Table 30.1: Electricity Demand Scenarios by MENR (kWh). **Source:** Isik (2004: 4).

	Main Scenario	Low demand growth scenario	High demand growth scenario
2005	163	159	168
2010	242	217	246
2020	499	407	571

3 See the figures produced by the State Institute of Statistics of Turkey at: <<http://www.die.gov.tr/english/SONIST/ENERJI/e230305.xls>> and at: <<http://www.die.gov.tr/english/SONIST/ENERJI/060404.htm>>, 21 September 2005.

Turkey's Energy Minister Hilmi Güler announced in February 2005 that substantial investment would be required to ensure a generating capacity of 54,000 megawatts (MW) by 2020 to enable Turkey to consume 499 billion kWh.⁴ Three years earlier Hilmi's predecessor, Zeki Cakan, had warned that there could be an energy shortage in Turkey in 2006 unless more funds were invested in the power sector.⁵ However, the figures used by Cakan were inaccurate, due to poor planning and problems with corruption. Fears of an energy shortage have been renewed. Without new investments the Electricity Transmission Company of Turkey (TEA) has warned that in 2010 it would only be able to supply 197 billion kWh (Isik 2004: 6). Güler has emphasized the need to use more local and renewable sources of energy and begin to use nuclear energy after 2012 to avoid a looming energy crunch.⁶

Natural gas is becoming more important as a source of electricity generation in Turkey. According to the State Institute of Statistics, in 2003 natural gas accounted for 44.8 per cent of electricity generation, ahead of hydropower with 21.5 per cent, lignite with 17.95 per cent, and fuel oil with 5.46 per cent.⁷ In 2002 about 67 per cent of natural gas utilized in Turkey was for power generation: a figure three times higher than the European average (Isik 2004: 7).

In the 1989–2002 period Turkey's demand for natural gas grew by 14 per cent per year on average (Isik 2004: 7). In 2004 Turkey imported 22.2 billion cubic metres (bcm) of gas, of which 14.3 bcm originated from Russia.⁸ More gas will be imported as a

4 "Enerjide disa bagimlilik azalacak" ["Dependence on the Outside for Energy to be reduced"], in: *Dünya* (4 February 2005). See at: <http://www.dunyagazetesi.com.tr/news_display.asp?upsale_id=206680&dept_id=645>, 4 February 2005.

5 "Turkish Energy Minister says no Energy Shortage until 2006", Ankara, in: *Anatolian News Agency* (27 April 2002), at: <<http://www.tnn.net>>, 27 April 2002.

6 "Bakan Güler - Yenilenebilir enerji kaynaklarının kullanimi artarsa nükleer enerjiyi erteleyebiliriz" ["Minister Güler: If the Use of Renewable Energy Sources is increased we can delay Nuclear Energy"], in: *Dünya* (22 November 2004). See at: <http://www.dunyagazetesi.com.tr/news_display.asp?upsale_id=197692&dept_id=645>, 22 November 2004.

7 See the figures produced by the State Institute of Statistics of Turkey at: <<http://www.die.gov.tr/english/SONIST/ENERJI/060404.htm>>, 21 September 2005.

8 Figures produced by the Petroleum Pipeline Corporation of Turkey (BOTAS) at: <http://www.botas.gov.tr/eng/naturalgas/ng_trade.asp>, 7 March 2005.

national gas grid takes shape. Domestic gas production is very limited and has been declining. According to the Petroleum Pipeline Corporation of Turkey (BOTAS), Turkey's demand for gas will increase to 38.5 bcm in 2010, 41.1 bcm in 2015, and 43.2 bcm in 2020, with much of this covered by Russian natural gas imports (table 30.2). These figures are open to dispute. BOTAS itself has regularly revised its estimates. However, BOTAS has clearly over-contracted and for the immediate future Turkey will import more gas than is necessary. For 2010 BOTAS has contracted to receive 51.1 bcm to meet an energy demand of just 38.5 bcm. Moreover, this gas is expensive and under take-or-pay obligations Turkey will have to make hefty compensation payments if it chooses not to import agreed upon amounts. The problem is compounded by the fact that Turkey does not have proper gas storage facilities. The influence of the so-called 'Russian lobby' in Turkey accounts for the size of the Russian natural gas imports. Large Turkish construction companies with extensive investments in Russia have been employed to build pipelines and power stations which will make use of natural gas from Russia. Nevertheless, it appears that Turkey will need to find new sources of gas after 2010. The 6 bcm/y with the Russian Federation (with Gazexport) ends in 2011 and may not be renewed. The liquefied natural gas (LNG) contract with Algeria expires in 2014.

Although not as important for electricity generation as natural gas, crude oil is also an invaluable source of energy for the Turkish economy. In 2003 Turkey consumed 29.5 million tonnes (mt) of oil. In the same year local production of crude only amounted to 2.4 mt.⁹ According to the US Energy Information Administration, if the economy grows on average by 3.4 per cent per year, Turkey will need to consume up to 45 mt by 2010 and 60 mt by 2020.¹⁰

Complaining about the high costs of natural gas imports from Russia and Iran, in addition to the over-reliance on natural gas for electricity generation, in April 2003 Güler called for a revision in Turkey's energy policy in order to exploit cheaper and local forms of energy such as lignite, geothermal, and

Table 30.2: Natural Gas Supply and Demand Scenarios (bcm). **Source:** BOTAS website. See at: <http://www.botas.gov.tr/eng/naturalgas/ng_sup_dem.asp> (21 September 2005).

Years	2005	2006	2008	2010	2015	2020
Demand volumes	25.0	32.3	36.4	38.5	41.1	43.2
Export Greece	0	0.2	0.7	0.7	0.7	0.7
Contracted volumes						
Russian Fed.	5.0	6.0	6.0	6.0	0	0
Russian Fed (Addition West)	8.0	8.0	8.0	8.0	8.0	8.0
Russian Fed (Black Sea)	6.0	8.0	12.0	16.0	16.0	16.0
Algeria (LNG)	4.4	4.4	4.4	4.4	0	0
Nigeria (LNG)	1.4	1.4	1.4	1.4	1.4	1.4
Iran	6.7	8.6	9.6	9.6	9.6	9.6
*Azerbaijan	0	0	3.0	6.6	6.6	6.6
**Turkmenistan	0	0	0	0	0	0
Total Supplies	31.0	35.8	43.6	51.1	40.8	40.8

* Annual contracted amounts may fluctuate due to changes in the initial date for gas deliveries.

** Purchasing of natural gas uncertain.

hydropower. The Energy Minister observed that importing substantial amounts of natural gas to avoid the penalties in take-or-pay obligations had resulted in geothermal and hydropower stations in Turkey lying idle.¹¹ In May 2005 a bill passed through parliament which called for the increased use of wind, and solar energy, and geothermal and hydropower.

In practice it would take several years for Turkey to develop other sources of energy. Much of Turkey's lignite is of quite poor quality. There are more possibilities with regard to hydropower. Turkey has significant reserves and is currently using only 35 per cent of its hydropower potential.¹² The MENR's interest in developing nuclear energy may also encounter future problems. In July 2000 the Turkish government was forced to abandon a US\$ 4 billion project to build a nuclear plant at Akkuyu on the Mediterranean

9 See the figures produced by the MENR at: <<http://www.enerji.gov.tr/petrolarztalep.htm>>, 7 February 2005.

10 See *International Energy Outlook 2004* (Washington, D.C.: US Energy Information Administration), Table B4. World Oil Consumption by Region, High Economic Growth Case, 1990–2025, at: <http://www.eia.doe.gov/oiaf/ieo/pdf/appb1_b8.pdf>, 7 February 2005.

11 "Türkiye'nin doğalgaz çıkması" ["Natural Gas cul-de-sac in Turkey"], in: *NTVMSNBC News* (28 April 2003). This article was accessed at: <<http://www.ntvmsnbc.com/news/212995.asp?m=19a>>, 29 April 2003.

12 "Draft Law for Renewable Energy sent to Grand National Assembly", in: *IBS Energy Line*, 7,4 (19 July 2004): 4. See at: <<http://www.ibsresearch.com>>, 26 July 2004.

coast because of financial difficulties and opposition from environmental protest groups. It seems likely, therefore, that Turkey will remain highly dependent on imports of crude oil and natural gas for the foreseeable future. This raises the question of the danger of an over-dependence on Russia, thereby threatening Turkey's energy security.

30.5 The 'Great Game'

Much attention has been given over whether the competition in post-Soviet Central Asia between governments and energy companies for political influence, prestige, and control of oil and gas transportation routes is a new 'Great Game'. The original Great Game involved rivalry between Russia and Britain in Central Asia at the end of the nineteenth century. Critiques of the new Great Game have questioned the scale of energy reserves in Central Asia, with the high costs and difficulties to extract and transport this crude oil and natural gas (Jaffe/Manning 1998–1999: 114–118). It has been argued that the so-called Great Game is not a game as it involves cooperation as well as competition between governments and companies over oil and gas concessions and this is a normal feature of the international economic system (Edwards 2003: 91–95). In non-zero sum games, though, there is cooperation between players in addition to competition. The interests of business lobbies, as seen in Turkey, may not always coincide with those of their home governments. Different games may thus be played at different levels within and between states. The stakes for Turkey with close economic and political interests in Central Asia may be quite considerable. Caspian energy reserves are potential useful alternative sources of energy for the Turkish economy. However, Ankara must also contend with the strategic concerns of Moscow in Central Asia.

The size of energy reserves in Central Asia has indeed been exaggerated. In December 1995 the American Petroleum Institute stated that the Caspian region contained two-thirds (659 billion barrels) of the world's known reserves of oil (Karasac 2002: 15). More recent assessments indicate that the region contains proven oil reserves of from 17 to 44 billion barrels (the higher figure comparable to US reserves) and additional potential reserves of 186 billion barrels. The proven oil reserves of Azerbaijan and Kazakhstan are 7 to 12.5 billion barrels and 9 to 29 billion barrels respectively. The region also has proven gas

reserves of 6,580 bcm (comparable to Saudi Arabia) and another possible 9,302 bcm. Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan have proven gas reserves of 851 bcm, 1,843 bcm, 2,014 bcm, and 1,877 bcm respectively (US Energy Information Administration 2005: 1). Moreover, much of the northern Caspian Sea appears to contain significant energy reserves and remains largely unexplored.

With the unravelling of the Soviet Union, and encouraged by the US administration and at first by the leaders of the newly independent Turkic states, officials in Ankara were eager to cultivate close political, military, and economic ties with Central Asia to boost Turkey's prestige and demonstrate that Turkey remained a strategically important state in the post-Cold War era. However, the Turkic states, seeking to diversify their relations, were not willing to bind themselves exclusively to a Turkish-led Commonwealth. Nevertheless, there are still close cultural, political, and economic links between Turkey and post-Soviet Central Asia. In this context, energy issues must also be considered. Recent governments in Ankara have underlined the importance of Turkey as a transit state on an east-west transportation corridor for the delivery of Central Asian crude oil and natural gas to Europe. Some of this energy may in future be consumed on the Turkish market to satisfy Turkey's growing energy needs and avoid an over-dependence on Russian energy imports.

The Baku-Tbilisi-Ceyhan main export pipeline, which will deliver crude oil from Azerbaijan and probably Kazakhstan to the Turkish Mediterranean coast, was initially principally a political project backed by US administrations to ensure that Turkey's influence in the Caspian region would be boosted at the expense of Russia and Iran. Rising oil prices made this project more economically feasible, although doubts remain over when and if the pipeline will operate at full capacity. Natural gas from the Azerbaijani Shah Deniz gas field in the Caspian Sea is planned to be delivered to Turkey along a Baku-Erzurum pipeline from 2007 onwards, although it will be much more difficult to transport natural gas from Kazakhstan, Turkmenistan, and Uzbekistan to Turkey, given the shortage of pipeline connections and Russia's interest in maintaining its substantial stake in the Turkish gas market.

The Great Game also involves legal and environmental issues. The failure to define the legal status of the Caspian Sea and apportion the sea among all the littoral states into national sectors had prevented the construction of an oil pipeline connecting the Kazakh

port of Aktau with Baku. This pipeline could have hooked up with the Baku-Tbilisi-Ceyhan link. The draft provisions of a possible Caspian Convention forbid the laying of subsea pipelines across the Caspian on environmental grounds. With the continued increase in the number of tankers navigating the hazardous Bosphorus Straits, the Turkish government has also cited environmental arguments to press the case for the Baku-Tbilisi-Ceyhan pipeline.

In January 2002 Russian President Vladimir Putin had announced plans for the formation of a Eurasian Alliance of Gas Producers with the governments of Kazakhstan, Turkmenistan, and Uzbekistan. This would have guaranteed the long-term Russian purchase of Central Asian natural gas for its domestic market and would thereby have enabled Moscow to continue to export significant amounts of Russian natural gas to hard currency markets in Europe (Hill/Fee 2002: 16). The EU opposed the establishment of this gas cartel, which ran contrary to the plans of Brussels to promote a liberalized gas market beyond the EU's borders, and which clashed with the provisions of the Energy Charter Treaty with regard to the freedom of transit. Moscow has more recently concluded separate long-term cooperation agreements with Kazakhstan, Turkmenistan, and Uzbekistan to ensure that Central Asian gas will be transported to the Russian market for the foreseeable future.

30.6 Turkey, the Great Game and Energy Security

The Turkish Petroleum Refineries Corporation (TÜPRAS) will import in 2005 4.5 to 5 mt of crude oil from Russia, 5.5 to 6 mt from Iran, 3.5 mt from Saudi Arabia, 4 to 4.5 mt from Libya, and, if security arrangements allow, 3 mt from Iraq.¹³ As previously noted, Turkey may consume up to 45 mt by 2010. Officials in Ankara plan to purchase 15 to 20 mt/y of crude from the Baku-Tbilisi-Ceyhan pipeline if and when the 50 mt/y pipeline operates at full capacity.¹⁴ First oil is expected to be transported along the pipeline in November 2005.

The oil fields in the Caspian Sea off the Azerbaijani coast, which will feed the pipeline, will not reach

peak production of 50–60 mt/y until 2010. But ExxonMobil and Devon Energy, with shares of 8 per cent and 6.5 per cent in the consortium developing the fields, have made alternative arrangements to transport their share of the oil production by rail to the Georgian port of Batumi until at least 2010. Probably up to 20 mt/y of crude from Kazakhstan's Kashagan oil field will eventually be carried to Ceyhan, but production at Kashagan is not expected to commence until 2008. Azerbaijan and Kazakhstan were expected to conclude an intergovernmental agreement in late 2005. A fleet of barges will require commissioning to transport Kashagan crude across the Caspian Sea. Talk of resurrecting plans to construct a subsea pipeline across the Caspian Sea would require the unlikely support of other littoral states. In the meantime, Russian officials have expressed an interest in supporting an alternative Bosphorus by-pass line connecting the Turkish Black Sea port of Samsun with Ceyhan, which could deliver 55 mt/y. Turkey could thus increase its imports of Russian crude in the longer term, although, presumably, officials in Ankara would ensure that Turkey does not become over-dependent on Russian oil.

Transit security problems for the Baku-Tbilisi-Ceyhan pipeline must be considered. Kurdish insurgents escalated their guerrilla campaign against the Turkish authorities in 2005 and may attempt to strike at aboveground oil pumping stations in Turkey. Pipeline routes connecting Azerbaijan and Turkey need to traverse the volatile Caucasus where conflicts over Abkhazia, South Ossetia, and Nagorno-Karabakh remain unresolved. In January 2003, US and Georgian officials created a special military unit to guard the Baku-Tbilisi-Ceyhan pipeline. An agreement has been signed with Northrop Grumman Corporation to provide aerial surveillance over the pipeline route (US Energy Information Administration 2004: 2). The pipe runs through the Akhaltsikhe-Vale sector of Javakhetia in southern Georgia where there is a mixed Armenian and Georgian population. It thus avoids the parts of Javakhetia that are predominantly populated by an impoverished Armenian minority, which is a group traditionally hostile to Turkey. The minority could target the pipeline, especially after the Russian military base at Akhalkalaki closes in 2007–2008. The base provides a major source of employment for the Armenians.

In February 2005, the Deputy Permanent Undersecretary in the MENR, Salih Pasoglu, remarked that if Moscow decided to sever its gas connections, Turkey "would be devastated".¹⁵ Until at least 2011 –

13 "TÜPRAS eyes Gains in Free Market", in: *Turkish Daily News* (14 December 2004): 6

14 See Baku-Tbilisi-Ceyhan COPL Project Directorate, at: <<http://www.btc.com.tr/eng/project.html>>, 21 September 2005.

when the contract with Gazexport expires – Turkey will remain highly dependent on Russian natural gas imports. This gas comes at a high cost and with onerous take-or-pay obligations. Energy officials in Ankara are seeking to reduce this dependence in the foreseeable future and handle the problem of over-contracting by re-selling and re-exporting some Russian natural gas to the European market. Gazprom may consider this if it is awarded contracts to distribute natural gas within Turkey. Re-sales and re-exports would need the construction of gas pipelines to connect Turkey and Europe as a part of an east-west energy transportation corridor.

After the contracts with Gazexport and Algeria expire, BOTAS could look for new suppliers in Central Asia to meet Turkey's gas requirements. Imports of natural gas from Iran and LNG from Nigeria are expensive. Turkey is contracted to receive 6.6 bcm from Azerbaijan's Shah Deniz gas field by 2010. From 2008 onwards up to 0.737 bcm of this natural gas may be re-exported to Greece. A 3 to 11 bcm/y gas pipeline connecting Turkey and Greece is planned to be completed by 2006, and this may be extended to Italy to carry initially 8 bcm by 2008. Negotiations are also under way for the construction of a 20 to 30 bcm/y gas pipeline to Austria via Turkey, Bulgaria, Romania, and Hungary. This network would lead to the realization of an east-west transportation corridor to carry Azerbaijani natural gas to Europe via Turkey. Turkish energy officials could perhaps import more Shah Deniz gas after 2011 when the second phase of production at the gas field would have commenced. The Baku-Erzurum pipeline will have a 16 bcm/y capacity.

In May 1999 Turkey and Turkmenistan concluded a 30-year agreement for the supply of 16 bcm/y to the Turkish market. Deliveries were supposed to begin in 2002. But the \$ 2.7 billion Trans-Caspian natural gas pipeline has not been built because of the legal disputes over the Caspian Sea and disagreements between energy companies and Turkmen President Saparmurad Niyazov over commercial terms. Presumably because the sale and purchase agreement has not been cancelled, Turkmenistan is still referred to in the natural gas supply and demand scenarios of BOTAS. However, it seems highly unlikely that Turkey will consume Turkmen natural gas in the foreseeable future, as Niyazov has turned his attention to

other markets. In April 2003 Turkmenistan and Russia concluded a 25-year gas agreement. If price disputes are resolved, from 70 to 80 bcm/y of Turkmen natural gas will be delivered to the Russian market from 2009. Turkmenistan also has gas supply deals with Ukraine and Iran, and is contemplating exporting natural gas to Pakistan and India. Instead of natural gas, Turkmenistan has instead delivered electricity to Turkey via Iran since December 2003. In 2004, 463 million kWh were exported to Turkey from Turkmenistan.¹⁶ However, this was only a small fraction of the electricity that Turkey consumed.

There are also no prospects in the immediate or medium-term for natural gas from Kazakhstan or Uzbekistan to reach Turkish consumers. Currently Kazakh gas is channelled to the Russian market and this will continue after agreements were signed in 2002 and 2003. Negotiations are ongoing over the possible construction of a pipeline that could result in 8 to 10 bcm of Kazakh gas being delivered to western China in 2008, with this amount rising to 30 bcm by 2020.¹⁷ Uzbekistan produces around 50 bcm/y, but most of this is either consumed locally or exported to Russia and Central Asian neighbours. Uzbekistan and Russia have agreed to strategic cooperation in the gas sector for the 2003–2012 period. Like Kazakhstan, Uzbekistan is hooked up to the Central Asia-Centre gas pipeline which connects to the Russian pipeline system. There is no proper network in place at present which would enable Kazakh and Uzbek gas to reach markets in Turkey and Europe, while avoiding the Russian pipeline system.

30.7 Conclusion

The term energy security is employed in this chapter to refer to issues related to energy supply – i.e. the security of energy transit and the problem of over-dependence on one supplier for a key form of energy. Officials in Ankara are seeking to extricate themselves from a situation where an over-dependence on Russian natural gas imports until at least 2011 has arisen. This over-dependence does not threaten the survival of the Turkish state. Nevertheless, in the near term Ankara has left itself exposed to possible economic or political blackmail. Because of this energy

15 “Rusya dogalgazi keserse mahvoluruz” [“If Russia cuts its Natural Gas we are devastated”], in: *Radikal* (27 February 2005): 15.

16 “Turkmenistan has increased the Export of Electricity to Iran and Turkey 2.2 times”, in: *TASS*, Ashgabat (19 January 2005).

17 “KazMunaiGaz mulls Gas Shipments to China”, in: *New Europe* (13-19 February 2005): 45.

dependence on Russia, Turkish governments in the foreseeable future may enjoy less freedom of manoeuvre in their conduct of foreign policy.

With the exception of hydropower, there is little immediate prospect for Turkey to exploit more local and renewable forms of energy. Ankara may thus import crude oil from Azerbaijan and Kazakhstan. However, natural gas is likely to remain an important resource for electricity generation. More natural gas from Azerbaijan, therefore, may be consumed. In the meantime, some Russian natural gas may be off-loaded in Europe through re-sales and re-exports to avoid immediate problems of over-contracting. Later possible re-sales and re-exports of Russian natural gas would encourage the diversification of Turkey's natural gas imports. In the longer term Turkish energy officials may hope to import natural gas from other Central Asian suppliers if pipeline networks are developed that avoid the Russian pipeline system. The

construction of pipeline connections westward to Europe would result in the realization of the east-west gas transportation corridor. This corridor could enhance the energy security of EU member states, especially if in the future natural gas from Iran and possibly Iraq, Syria and Egypt, as well as from Azerbaijan, could be conveyed along this corridor via Turkey.

The so-called new Great Game with reference to energy issues is not perceived by Turkish officials as a normal interaction within the global economic system, which may be amenable to an international cooperative approach. From Ankara's perspective - and also Moscow's - major economic, political, and strategic issues are closely interlinked. Turkey has been a key player in the Great Game since the 1990's and will remain so, given its sensitivities to developments in the neighbouring volatile Caucasus and the wider Caspian region, and its interests in importing energy from this area.

31 Towards a Sustainable Energy System for Africa: An African Perspective on Energy Security

Nogoye Thiam

31.1 Introduction

Energy is vital to economic, social and environmental development. Secure and affordable access to energy makes it possible to fulfil basic needs, i.e. access to drinking water, health care and to information and communication technologies, electricity for houses and schools, intensive agricultural production and conservation of agricultural products. A sustainable energy system is needed for speeding up the economic and social development process and to ensure food security.

Sub-Saharan African countries are mainly characterized by an extreme lack of energy, which is due to a very limited use of modern energy and a system based on unsustainable supply sources. In 2003, Africa only used 5.7 per cent of the world's energy, whereas its total population represents 14 per cent of the world population (figure 31.1). As a consequence, the level of energy consumption per inhabitant is very low. For instance, in 2003, Senegal and Cameroon have respective consumption levels of 287 and 429 kg of oil equivalent per capita. In developed countries, this consumption reaches, e.g. 7,843 kg of oil equivalent per capita in the US and 4,519 of oil equivalent in France.¹

In Africa, the energy system is characterized by a dual structure which highly depends on oil imports on the one hand and on biomass (figures 31.2, 31.3) products on the other. Those two characteristics clearly show that the energy system is highly vulnerable, which is also reflected by the rate of independence of the energy sector. This rate, which still remains very low in Africa, corresponds to the ratio between the energy produced at the national level and the total availability of primary energy per year. But there is some improvement if biomass energy² is included.

This dependence on oil imports and biomass availability involves several aspects of financial, economic, technical and environmental insecurity. Financial and economic insecurity results from the explosion of oil price and its impact on the trade balance. On the other hand, technical insecurity is related to the high dependence of several sectors of activity (industries, transport) on oil products.³

3 Energy security can have different definitions depending if a country produces or imports oil. For oil exporting countries, energy security means being able to maintain a position as an energy supplier for the long-term, working with stable and low-risk clients, and guaranteeing elevated petroleum prices. This chapter focuses on importing countries that are currently suffering from political, economic, technical, and environmental instability – all of which concern the supply and consumption of petroleum. Political insecurity is linked to physical location of petroleum reserves. According to Jean-Marie Chevalier (2006) “more than 80 per cent of petroleum and natural gas resources are located in politically turbulent or fragile countries: Latin America, West Africa, North Africa/Maghreb, the Middle East, Central Asia, and Russia.” Economic and financial insecurity arise following increased petroleum prices. Such increases hurt countries by disrupting commercial equilibrium and economic flow. Jamal Saghir (2006) notes that these increases will cause oil importing sub-Saharan countries to lose any modicum of economic stability they may enjoy. Following an oil price increase, countries' GDPs already fell more than 3 per cent; poverty rates have also increased 4–6 per cent. Technical insecurity is best defined in terms of insufficiently diversified technology. The vast majority of equipment/machinery in sub-Saharan Africa is dependent on petroleum products. This applies for both the electricity and transportation sectors. The potential outcome of accidents related to production, supplying, or spilling of petroleum has grave implications for such sectors. To mitigate these concerns, many countries have started to experiment with hybrid cars. Since 2003, nearly 35 per cent of cars sold in Brazil are *Fuel Flexible Vehicles* (FFV). The FFVs operate on a fuel mixture comprised of 85 per cent of ethanol. Environmental insecurity is linked to an increase of atmospheric greenhouse gases due to the production and consumption of petroleum products.

1 World Bank, 2003: *World Development Indicator database* (Washington, D.C.: World Bank); at: <<http://dev-data.worldbank.org/data-query/>>.

2 The energy independence of Senegal was 4.3 per cent in 2004, it reached 42.8 per cent if biomass is included.

Figure 31.1: 1973 and 2003 Regional Shares of Total Final Energy Consumption. **Source:** IEA (International Energy Agency); at: <<http://www.iea.org/statist/index.htm>>.

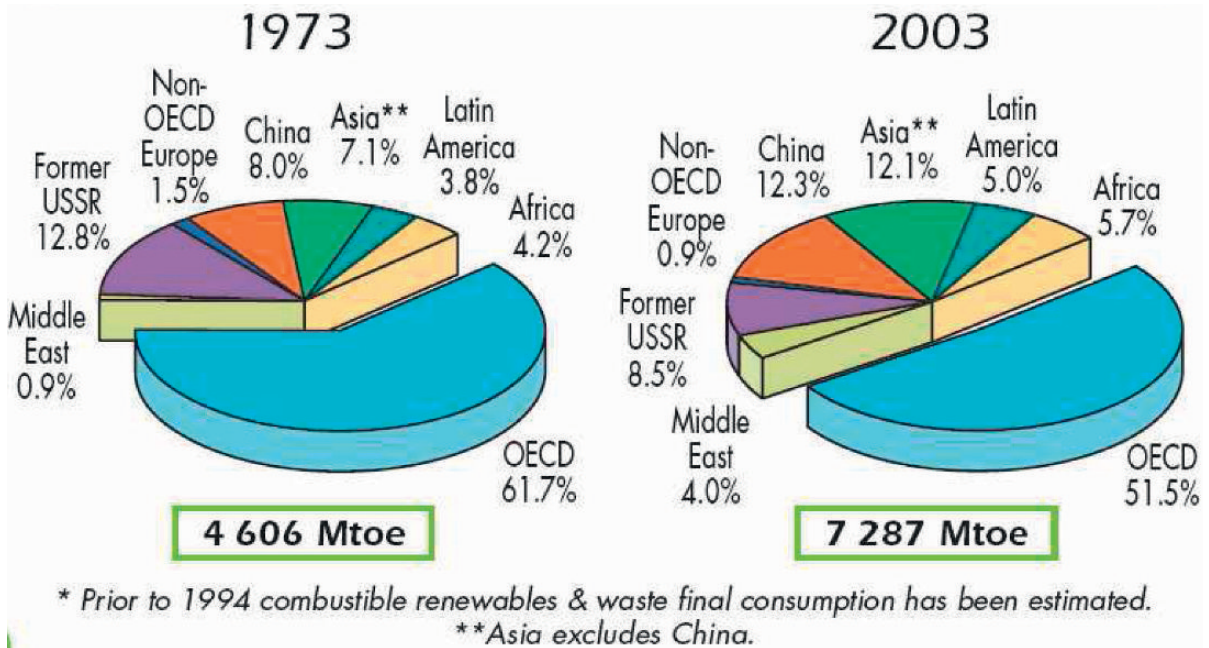
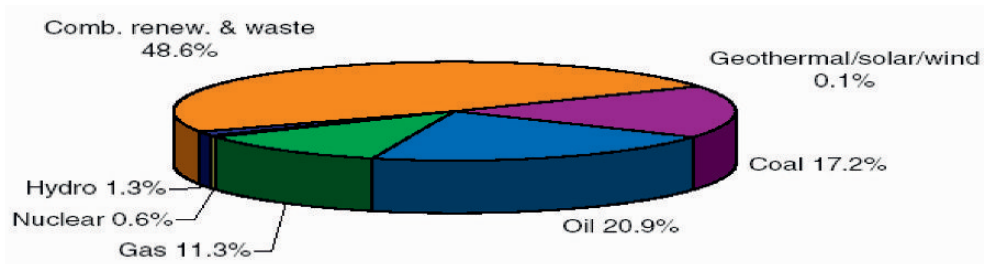


Figure 31.2: Africa's Share of Total Primary Energy Supply in 2003. **Source:** IEA (2006b); at: <<http://www.iea.org/statist/index.htm>>.



As for *environmental insecurity*, it results from the accumulation of *greenhouse gases* (GHG) in the atmosphere that are responsible for global warming. It is also related to the gap between the pressure on forests for energy purposes and the reforestation process, especially in the Sahel countries. It has become urgent for African governments to find alternative and sustainable energy supply and consumption strategies to deal with this insecure situation. According to several international experts, poverty reduction, food security and the realization of the *Millennium Development Goals* (MDGs) requires a safe supply of modern energy at affordable prices.

This chapter highlights the duality of the energy supply system, based on local biomass and oil product imports (31.2). The second part discusses the need for a more sustainable energy system in order to ensure

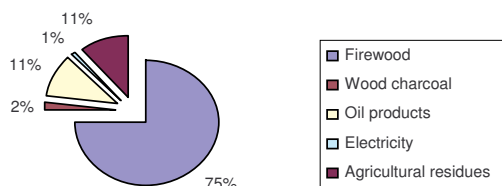
economic development and poverty reduction (31.3). This will require a certain willingness of national authorities to implement adequate energy policies based on the sustainable promotion of local renewable resources and consumers' practices change for more rational use of energy. Regional and international cooperation will also be needed in order to mobilize funds and relevant expertise for a large-scale exploitation of the continent's resources.

31.2 Dual and Vulnerable Energy System

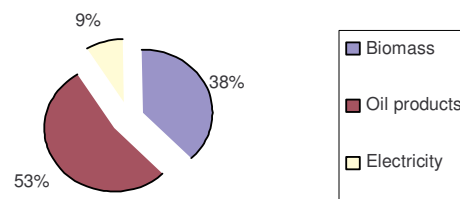
The energy system in Sub-Saharan African countries is characterized by two main energy sources: biomass and imported oil products. The biomass represents

Figure 31.3: Energy consumption profiles for Mali and Senegal in 2004. **Source:** Produced by this author based on annual reports by the National Ministries of Energy in Mali and Senegal.

Consumption levels per energy type in Mali



Consumption levels per energy type in Senegal



60 per cent of the total energy consumption, with average rates varying between 40 per cent in Senegal and 80 per cent in countries like Mali, Niger and Burkina Faso. The use of oil products depends on the country's economic structure (53.4 per cent in Senegal and 11 per cent in Mali; figure 31.3).

31.2.1 Oil Dependence

In some countries, available oil resources have led to conflict, corruption and social instability and therefore become a source of social and economic insecurity, but in some countries without any oil deposits the constant price increase for oil products on international markets it has become a real source of insecurity. The purchase of oil products for non-producing countries like Senegal involves major transfers of foreign currency, what negatively affects the trade balance. For landlocked countries, like Mali or Burkina Faso, the situation is even more complicated due to the additional costs for its transportation from sea-ports to the final destination. Thus in some countries, the energy cost often represents over 30 per cent of the total electricity costs. In Mali electricity is most expensive due to the cost of combustibles (33.6 per cent of total electricity cost); the delays in the operation of Manantali⁴ hydroelectric dam have further added the cost of electricity (Thiam 2003: 342, 2006; see chap. 51 by Kipping).

Senegal is facing similar economic problems. The rising oil prices caused a 12.7 per cent increase in oil

import costs, from 247 billion CFA (2003) to 278 billion CFA (2004).⁵ But the volume increased only 4 per cent, from 1693 tons (2003) to 1761 tons (2004). Oil imports represented 20 per cent of the country's total imports and absorbed 40 per cent of the income from exports. The imported oil is used for transportation (75 per cent) and electricity production. The electricity sector exclusively relied on thermal power until 2002 when the Manantali dam became operational that supplies 13 per cent of the electricity demand.

The recent crises in the international oil market had damaging impacts on the transport and electricity sectors. This has been exacerbated by the suppression of state subsidies for the oil sector.⁶ In Senegal, the fuel used by the *Senegal Electricity* (SENELEC) company rose from 75,536 F CFA per ton in January 2004 to 135,000 F CFA in 2005, or a 71 per cent increase⁷. This has resulted in severe supply problems for vehicle fuel and in power cuts. The state supported the most affected sectors to avoid a shortage of vehicle fuel and a collapse of the electricity production. The government established a stabilization fund to minimize fuel prices fluctuations and subsidized SENELEC to avoid bankruptcy, as the real fuel cost is not fully reflected in the electricity costs. The rise in electricity prices was limited to 10 per cent instead of 15 per cent as had been suggested by the National Commission regulating the electricity sector (*Commission de Régulation*

4 Senegal, Mali and Mauritania launched the Manantali hydroelectric project through the Senegal River Organization (*Organisation pour la Mise en Valeur du Fleuve Sénégal* or OMVS). It provides electricity for all three countries (52 per cent of its generation for Mali, 33 per cent for Senegal and 15 per cent for Mauritania). The building process was delayed and the power plant became operational in 2002.

5 This chapter uses an exchange rate of 500–520 CFA francs for 1.00 US\$. The Franc CFA is the currency of the *West African Economic and Monetary Union* (WAEMU) that comprises 8 West African countries: Benin, Burkina Faso, Guinea Bissau, Côte d'Ivoire, Mali, Niger, Senegal and Togo.

6 Subsidies only remain for LPG (liquefied petroleum gas) products due to limitations of forest resource exploitation.

7 From 157 US\$ in January 2004 to 270 US\$ in 2005 (exchange rate 1 US\$ = 500 F CFA).

du Secteur de l'Electricité).⁸ This decision resulted from a consultation and a review of the costs. The measures of the state have two weaknesses:

1. The increased support for the energy sector resulted in a reduction of public spending for health and education.
2. This can impede the evolution of alternative energy sources for electricity and transport.

The funds used to subsidize oil prices and to support this fragile system could have been used more efficiently for instance for technological research and for renewable energy. The dependence on oil had limited environmental impacts in Senegal due to the low levels of CO₂ emissions (3.73 Mt of CO₂ in 2003, or 0.36 t of CO₂ per capita).⁹

31.2.2 Dependence on Biomass

In Africa, 49 per cent of the consumed energy is traditional biomass (figure 31.2). This ratio can reach 60 per cent if the North African countries are excluded: This can pose a real threat for the environment. A reasonable use of biomass is safe, as it is a renewable energy, but the use in Sub-Saharan Africa leads to deforestation, soil salinization, erosion and desertification.

The increasing wood demand impedes the natural reconstruction process of forests, as the rapid population growth requires increasing amounts of combustibles. The improper use and overexploitation of forests contributes to rapid forest destruction. Apart from their environmental benefits, forests can be a highly useful and sustainable source of ligneous and non-ligneous resources and generate employment. Forests also play an important role in maintaining biological diversity, absorbing carbon dioxide and supplying wood for essential needs (fuel, clothing, cooking, buildings etc.).

Forests regenerate more slowly in the Sahel countries¹⁰ and thus overexploitation of natural resources

leads to a gradual disappearance of ligneous resources. In Mali where wood is the main source of energy, 4,800,000 ha of forests are lost, 6,000,000 tons are used every year and the annual CO₂ emissions amount to 8,304,000 tons (Mali 2005). In Senegal the situation is similar: 300,000 tons of wood are used every year what corresponds to a loss of 45,000 ha of forest (PERACOD 2005). But several programmes were developed to increase ligneous resources in those countries, including a Regional Programme funded by the World Bank that evaluated policies on 'traditional' energy (*Regional Programme for The Traditional Energy Sector - RPTES*) aiming at a rational use of the biomass. In several countries afforestation and reforestation campaigns were launched.

The dependence on wood has also caused health impacts, especially for children and women. The burning of biomass produces toxic gases (e.g. carbon monoxide), which causes serious respiratory problems that frequently lead to the death of babies. A study in Gambia on 5,000 children under 5 years showed that those children who are carried in their mother's back during cooking were 6 times more at risk to develop acute respiratory diseases (World Bank 1996).

31.3 Toward a Sustainable Energy System

The oil crises of the 1970's have triggered scientific and technical efforts for a more sustainable energy system. The recent oil price increases highlighted that oil resources are limited and can become a source of economic, social and political tension in many countries. For these reasons countries like France launched nuclear programmes, but uranium resources are also not inexhaustible. The issues of nuclear waste management and the accidents in Three Mile Island (USA, 1979) and in Chernobyl (Ukraine, 1986) led to a reduction of nuclear programmes in many countries and to a total rejection, e.g. in Germany.

In Brazil, the need to reduce the vulnerability due to fluctuating oil prices stimulated the development of biofuels, and already in the 1970's, many vehicles used ethanol (sugar cane alcohol). In other developing countries, especially in Sub-Sahara Africa, strategies were adopted to rationalize energy usage, accelerate oil prospecting and promote renewable energies. But all these initiatives produced limited results, due to a lack of dynamism in the elaboration and implementation process. However, the frequent oil crises

8 A review by the *Commission de Régulation du Secteur de l'Electricité* (CRSE) showed a 17.75 billion CFA deficit for the *Société Sénégalaise d'Electricité* (SENELEC) due to the increased cost of combustibles. This amounts to a 15 per cent increase in electricity costs.

9 In Africa the CO₂ emission rate is very low compared with other countries (global average was 3.99 for 2003), North America: 19.47, Europe: 8.61 and Africa: 0.9 (IEA 2005e).

10 In West Africa the biomass density in the southern coast countries varies between 3 and 5 m³/ha and it does not exceed 1 m³/ha in Sahel countries.

Figure 31.4: Map of oil and gas fields and pipelines in West Africa: **Source:** U.S. Department of Energy; at: <<http://www.eia.doe.gov/emeu/cabs/archives/africa/wafrica.pdf>>.



and the instability in the Middle East have shown that oil is not the most reliable energy source and that all countries should become less vulnerable to oil price fluctuations and diversify their energy sources or at least sources of supply. This requires to secure the supply and to improve the demand side management.

31.3.1 Supply Side Management

Strategies for increasing the energy supply should focus on diversifying energy sources and on facilitating a transition towards alternative energy sources.

31.3.1.1 Towards a Diversification of Sources of Energy Supply

The geopolitical uncertainties in the Arab-Persian Gulf have encouraged major oil importing nations, such as the U.S., to increasingly tap African oil resources. Despite huge oil potentials, Africa has been underexplored¹¹ compared with the rest of the world; Africa has now become a new area for big oil prospecting companies in search of new oil fields and reserves.

The Gulf of Guinea is being promoted as the most promising African region for offshore production.¹² Although this technique is more expensive compared with on-shore production, it is generally preferred because the oil is produced away from human settlements, and safe from social tensions what contributes to reducing hazards and making exploitation projects more promising.

But, making Africa an alternative source for oil supplies requires political and social stability, including an environment in these oil producing countries fostering good governance. Oil has often been a source of tensions, and the distribution of oil subsidies has caused conflicts among different stakeholders. In many cases, 'petrodollars' have not contributed to development programmes in the exporting nations or helped to effectively reduce poverty. They have contributed to maintaining a class of rich people in

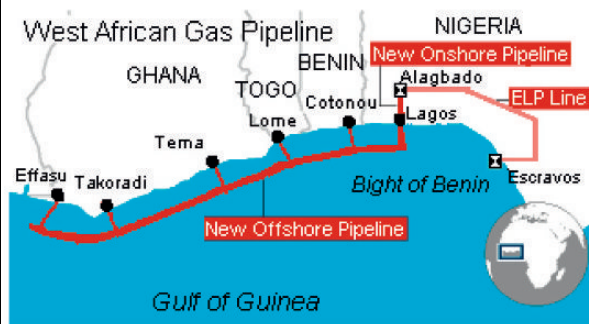
11 Senegal has 7 oil wells for 10,000 km² compared to the global average of 85 wells for 10,000 km².

12 Many conferences were held to demonstrate the oil production opportunities in this African region.

Box 31.1: West African Gas Pipeline (WAGP). **Source:** Based on this author's research.

The *West African Gas Pipeline* (WAGP) is an important cross-country project with an estimated cost of US\$ 600 million. It is 567 km long and starts in Alagbado (a suburb of Lagos), and connects the cities of Cotonou (Bénin), Lomé (Togo), Tema, Takoradi and Effasu (Ghana). The project will be developed on a BOO basis (built, own and operate) on behalf of the *West Africa Gas Pipeline Company*

Figure 31.5: West African Gas Pipeline (WAGP). **Source:** U.S. Department of Energy, Energy Information Administration; at: <<http://www.eia.doe.gov/emeu/cabs/wagp.html>>. This map is in the public domain.



(WAPCo), owned by an investment consortium including these six companies: (1) *Nigerian National Petroleum Corporation* (NNPC): 25 per cent; (2) Chevron Nigeria Ltd: 36.3 per cent; (3) Shell Nigeria: 18 per cent; (4) Volta River Authority of Ghana: 16 per cent; (5) *Société Béninoise de Gaz, S.A* (SBG): 2 per cent; and (6) *Société Togolaise de Gaz, S.A.* (STG): 2 per cent.

After an energy cooperation treaty for the exploitation of the gas pipeline was signed in January 2003 at the 26th ECOWAS Summit in Dakar, a joint authority was created to supervise the implementation of the project and to develop the fiscal framework of its management. It was agreed that 85 per cent of the gas production would be used by power plants and 15 per cent by local industries. WAPCO managers assume that gas supplies from different sites in Nigeria may last for 200 years. The project's expected benefits can be measured by the:

1. Shared valorization of energy resources to ensure sustainable energy supply and reduce exploitation costs;
2. Diversification of supply sources for Africa, which contributes to reducing dependence on importations from Middle East countries;
3. Availability of a less polluting and more affordable energy (i.e. less greenhouse gas emissions)
4. Speeding up of regional integration and promoting economic and social growth in different nations.

power, thus widening the gap between social classes and becoming a source of conflict. In other cases, oil producing nations have experienced the economic scheme, commonly referred to as the 'Dutch syndrome', marked by a lack of economic diversification and a total dependency on oil revenues.¹³ Eventually, in both cases, oil revenues are used to set up corrupt regimes, to impede the democratization process and to widen the gap between the rich and the poor. All these factors of social instability can deter attempts to seek alternative sources of energy supply in these countries.

However, with a significant progress towards good governance and accountability in the management of the oil revenues, African oil could contribute to strategies to diversify energy sources for both industrialized and Sub-Saharan African countries. This has

been re-enforced by the identification of oil reserves in Angola, Equatorial Guinea and Mauritania and the exploitation of new oil fields, what raised Africa's oil production by 40 per cent between 1990 and 2004, when the barrels produced increased from 7 to 10 million/day. A further increase of 50 per cent is expected by 2010 (Chevalier 2005). If soundly managed, these new reserves could become a real manna for African nations. For other sectors, such as electricity or other industries, a transition towards alternative energy sources – especially renewable ones – must be encouraged in order to reduce oil dependency.

31.3.1.2 Towards Diversification of Energy Sources

Moving towards a more sustainable energy system requires more energy diversification to reduce the dependency on a single non-renewable energy source. Natural gas is a good alternative for several uses, although it is also non-renewable. As a fossil fuel, gas is cleaner than oil, and produces less *greenhouse gas* (GHG) emissions. Large gas reserves are assumed for Sub-Saharan Africa. All African nations would benefit, what could help their successful energetic transition through effective cooperation in valorizing this re-

¹³ For Equatorial Guinea, the oil revenues account for around 90 per cent of national exports, for 86 per cent of national GDP, and 61 per cent of national income. For Nigeria the figures are: 95 per cent of exports, 40 per cent of GDP and 83 per cent of national income, and for Angola: 90 per cent of exports, 45 per cent of GDP and 90 per cent of national income (Gary/Kall 2003).

Box 31.2: Biofuel: Mali's experience with pourghere. **Source:** This author's research.

Mali, just like India and Madagascar, intends to turn pourghere oil into a real substitute energy source for gasoil and gasoline. The prices of these products are constantly increasing and promoting *pourghere* would enable communities to carry out income generating activities in a poverty reduction context. This was already tested by the colonial government in 1942. But the project was stopped due to the lack of positive results. Biofuel promotion activities were launched again in the 1980's. In 1989, a sugar cane plantation was valorized on 5,000 hectares in order to supply two industrial units in the *Complexe Sucrier du Kala Supérieur* (SUKALA.SA) for the production of 2,100,000 litres of alcohol. But gasoline prices dropped in the meantime, which made the sugar cane project not competitive. But over the last few years, Mali has been suffering from fluctuations in oil prices. Oil prices rose from 210 CFA in 1994 to 510 CFA in 2005, which means that they have more than doubled in ten years. The Malian Government's new energy policy highlighted the importance of developing the biofuel sub-sector, primarily pourghere production, for various uses (electric production, transportation, mechanization of farming equipment etc, in order to reduce the reliance on oil imports. A *National Programme for the Valorization of Pourghere* (PNVEP) was launched, with a total cost of CFA 708,000,000 (in US\$ 1.36 to 1.56 million) in order to:

1. supply rural areas with power using, 50 KWA power generators fuelled with pourghere oil;
2. process and use pourghere oil to fuel 20 4x4 vehicles of 10 to 20 HP CV for public transportation,
3. increase the nation's production of pourghere seeds, through the development of adequate lands in the rural areas.

The area covered by the programme include regions of Kayes, Koulikoro, Sikasso and Ségou in Mali. The *Pro-*

gramme National de Valorisation Énergétique de la Plante Pourghère (PNVEP) therefore helped to supply power to Keleya, a village of 3,000 inhabitants located 100 km from Bamako thanks to a pourghere oil generator. The oil consumption of the first generator of the power station was 3.7 litres/hour. The power supply project, which costs CFA 46,835,500 F has made it possible to run a public electricity network, supply electricity to community and administrative buildings as well as to about 20 subscribers.

The PNVEP Manager talked about the economic and environmental advantages his programme might yield in the long term. According to him, "as the production cost for 1 litre of pourghere oil will be between 170 and 250 CFA, compared to CFA 510 for diesel, which is twice less expensive, this is very competitive and, in the longer run, may yield interesting returns, more specifically for the nation's power electricity bill."

Now, pourghere, which was traditionally used as a medical plant, to make local soap and hedge, will soon supply Mali with energy and provide national income. This plant, which is very resilient to drought effects, can be grown almost anywhere across Mali, but more specifically in the Sikasso, Koulikoro, Ségou and Kayes regions.

However this sector is not sufficiently exploited despite the huge potentials it can represent for Malians. The current area of land developed for pourghere production is largely insignificant, with a production of about 50,000 tons, i.e. the equivalent of 12,500,000 litres of pourghere oil. In addition to the PNVEP Programme, several workshops and conferences were organized in Mali to sensitize, inform and encourage experience sharing among participants on the use of pourghere as an alternative source of energy to diesel and gasoline. The major objective is to promote that plant as a tool to challenge the energy poverty in Africa.

source. Therefore, several African countries launched the West Africa gas pipeline, which is at the centre of the NEPAD energy initiatives. In their action plans the exploitation of the large gas potentials has been included (see box 31.1, figure 31.5).¹⁴

Setting up a sustainable energy system also implies working towards energetic independence by increasingly using local and renewable energy resources. These must be at the core of most national strategies to develop the energy sector. Awareness-raising actions and campaigns to promote their larger scale use would be useful in the dissemination process. Simi-

larly, fiscal incentives and subsidies should be granted for renewable energy technologies in order to significantly increase their share in the energy supply. Several West African nations have established tax exemptions on solar energy equipments as a strategy to promote solar energy. Mali, for instance intends to promote a wider use of renewable energy technologies and equipments in order to increase their share in the nation's electric power production from less than 1 per cent in 2004 to 6 per cent in 2010 and 10 per cent by 2015 (Mali 2006). A huge campaign was launched in order to promote a plant called *pourghere* (scientific name: *Jatropha curcas*) to produce biofuel as a substitute for gas, oil and gasoline (see box 31.2).

14 Africa's share of global gas production increased from 0.8 per cent in 1973 to 5.5 per cent in 2004, while gas production increased globally respectively from 1,226 BCM (*Billion Cubic Metres*) to 2,794 BCM from 1973 to 2004. Africa hosts 7.3 per cent of the world's gas reserves (*La Tribune* (Paris), 6 April 2006)

Figure 31.6: Map of Mali. SOURCE: The University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/africa/mali_rel94.jpg>. The map is in the public domain.



Regional and international cooperation may also help boost the development of the renewable energy sector. This sector requires heavy investments and a lot of expertise and will surely benefit from harnessed regional efforts and human/financial resources when they are put together to exploit the existing large potentials. Above all, the estimated potential of hydro-power is 280 GW, and only 5 per cent of that potential is currently being exploited. However, the *West African Power Pool* (WAPP) project (see box 31.3 below), which intends to create a large regional power market with interconnections, represents a good initiative

for using a renewable local resource, as well as a good energy diversification strategy.

However, building regional infrastructure projects requires the adoption of relevant legal, institutional, and governing frameworks in order to attract private investments. This also implies the creation of new multi-state institutions in charge of organizing, operating and regulating such infrastructure. Finally, African nations may benefit from the advantages of the *Clean Development Mechanisms* (CDM) of the Kyoto Protocol as part of the *UN Convention on Climate Change* (UNFCCC). CDM projects, which allow in-

Box 31.3: The West African Power Pool (WAPP). **Source:** This author's research.

The *West African Power Pool* (WAPP) is a far looking project that was initiated by the ECOWAS Ministers of Energy. It fits into the NEPAD priorities in terms of regional infrastructure development. The WAPP's objective is to connect all power networks of ECOWAS countries to exploit the large hydroelectric potentials of this region and to create a real regional power market that would be attractive for investors to permit huge savings, in addition to encouraging cooperation permitting under-supplied and over-supplied countries to share their energy resources.

Regional cooperation in the electricity sector among West African nations started in the 1970's when the first interconnections were established between Togo and Ghana in 1972, and Togo and Benin in 1973, allowing Ghana to export electricity to its neighbours using the water resources of the Akosombo Lake. In 1983, the Ghana-Côte d'Ivoire connection was completed, then the Cote d'Ivoire-Burkina Faso links were established in 2000, before Benin was linked to Nigeria in 2003, what was the first achievement of the short term NEPAD energy plan. The Nigeria - Benin link is highly important for West Africa as it permits to interconnect the electricity networks of six countries: Nigeria, Benin, Togo, Ghana, Côte d'Ivoire and Burkina Faso, representing a crucial breakthrough of the ECOWAS WAPP project, with its two main branches A and B (see map below).

The A branch includes all these countries plus Niger, where many electricity networks are interconnected supplying energy across borders. With such interconnections, 2/3 of the electricity supplied by the *Communauté Electrique du Bénin* (CEB) - a two-states authority created to manage power supply between Benin and Togo - are imported from Ghana and Cote d'Ivoire (before this country experienced political turmoil). As the electricity companies of Benin (SBEE) and Togo (CEET) do not have enough power production capacity they highly depend on

electricity imports. This increases the advantages of interconnecting this region.

In the branch B area that includes other ECOWAS countries (Gambia, Guinea, Guinea Bissau, Liberia, Mali, Senegal and Sierra Leone), there are very few connections among electricity networks; thus it would be more cost-efficient to achieve a complete networking in this region. Once all national electricity networks are linked, an integrated electricity market and exchange within ECOWAS countries will be possible based on comparative advantages in terms of available energy resources. Such a market would help overcome existing constraints such as the size of the market or heavy fuel charges in some oil importing nations especially in Burkina Faso, Mali, and Niger. Such constraints make privatizations unattractive.

While WAPP's main motivation is to exploit the large hydro-electric potential of the continent. To supply their power station, all the interconnected countries may benefit from the wide range of energy supply sources, such as gas from Cote d'Ivoire and Nigeria, or Nigerian oil, in a context of energetic diversification as a way to secure their energy supply.

Similarly to the WAPP experience, other sub-regional groupings have organized themselves to set up energy pools across Africa. The *Pool d'Electricité de l'Afrique Centrale* (PEAC), an integrating project intended to interconnect all Central African member countries of the *Communauté Economique des Etats de l'Afrique Centrale* (CEEAC) is one of them. Among them are the *South African Power Pool* (SAPP) in Southern Africa, the *Comité Maghrébin d'Electricité* (COMELEC) in Northern Africa, and the *East African Power Pool* (EAPP) in Eastern Africa. The objective is to create a tool for sub-regional integration and solidarity that provides the possibility for countries to put their energy resources together in order to foster harmonious economic and social development in the region.

dustrial countries and their companies to fund development projects in developing countries thus reducing GHG emissions, provide funding opportunities for introducing clean and efficient technologies and contribute to popularizing renewable energy potentials.

31.3.2 Demand Side Management

Developing a successful alternative energy policy (through good diversification of resources) while securing continuous energy supplies would be a huge achievement, but it is not enough to set up a sustainable energy system. All energy sources are not inexhaustible. Even renewable energies, when used irrationally, may end up causing serious disruptions, for instance, vegetation losses as the result of heavy pressure on biomass resources.

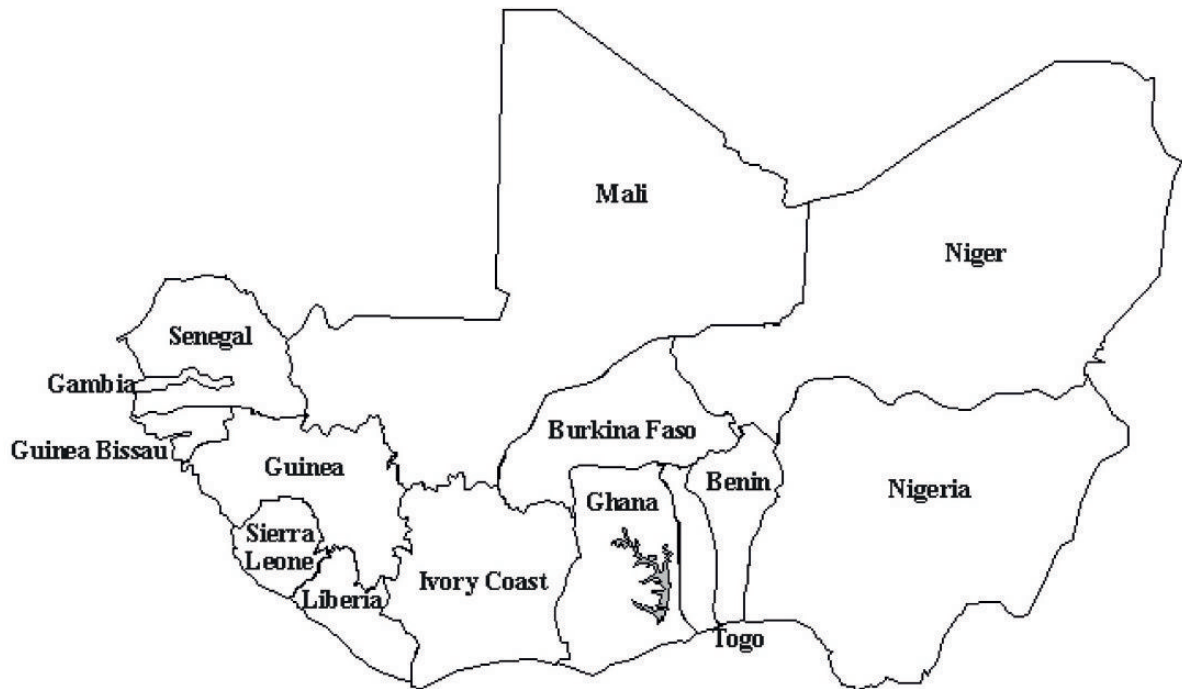
A demand management strategy could help setting up a sustainable energy system and anticipate insecurity risks. This strategy, together with an efficient energy system, would be sounder for the environment, as it helps to save more CO₂ emissions than the diversification strategy. Cutting down energy consumption will require to focus on the implications of the current technologies in this region using oil or biomass, the major energy sources in Sub-Saharan Africa.

31.3.2.1 Actions to Manage the Oil Demand

The fact that the transportation sector alone concentrates the largest quantity of oil used¹⁵ in the majority

¹⁵ For instance 80 per cent of the oil imported in Senegal goes to the transport sector (SIE 2005).

Figure 31.7: Map of ECOWAS countries. **Source:** University of Purdue, West Africa Power Pool Development Group, ECOWAS; at:<<http://www.purdue.edu/dp/energy/images/ECOWAS.gif>>. The map is in the public domain.



of *Sub-Saharan African* (SSA) countries suggests that there's need for an increased focus on that sector where the risks associated with the dependency on oil are the most serious. Optimizing transport systems through improved infrastructure combined with modernization of the vehicle fleet may help move towards more energetic efficiency and significant savings.

Most countries have old vehicle fleets with highly energy-consuming technologies, whereas the new generation of cars use less energy and are less polluting. Thus, any action on car import policies (car age requirement) and use considerations (collective vs. individual) would help to reduce energy costs. The Government of Senegal banned importing vehicles of over 5 years and trucks over 10 years of age. This initiative has contributed to reduce pollution, and should be repeated in other countries. Besides reducing the energy demand in the transportation sector, the efficiency of other industry sectors should be enhanced, as population growth and modern life styles (TVs, computers, large houses, electric appliances) will increase energy demand. This could be achieved by energy efficiency improvements.

Promoting new consumer practices to buy the most energy-efficient items will also help save energy. Therefore several branding/labelling¹⁶ programmes are developed in Europe and elsewhere to help con-

sumers identify the most energy-saving equipment. Some countries even prohibit importing bad quality equipments.

Technical losses during transmission or distribution due to the obsolete equipment in the electricity sector also are quite significant in a lot of countries in Africa. In Senegal, for example, they were estimated at 21.2 per cent from energy production in 2005. Unfortunately, the most electricity generation is done by thermal power plant. Thus, to achieve a substantial reduction of these losses and then saving energy, massive investment in the sector is required to renovate the equipment.

31.3.2.2 Actions to Manage Biomass Demand

Biomass is the most used energy source in sub-Saharan Africa (SSA). According to the Programme for the Promotion of Domestic and Alternative Energies in Sahel countries that belongs to the *Interstate Committee for Drought Management in Sahel countries* (CILSS¹⁷), the current levels of biomass dependency vary between 70 and 80 per cent, and this trend will

16 See: Energy Star, an U.S. energy label of the U.S. *Environment Protection Agency* (EPA), and similar energy labelling programmes in the European Community refer to energy-efficient office equipments.

remain for the next 20 years. Thus a focus on biomass demand and supply issues is needed and a development of best practices and consistent policies, to maintain the biomass chain in an economically viable and ecologically sustainable way.

On biomass supply a sustainable resource management through forest development plans is needed by setting up a system of firewood production quotas and by rotating exploitation areas. Based on experience of other Sahel countries, Senegal replicated this biomass resources management system. Since a new forestry code was established in 1998, biomass production has been regulated, and biomass resources are now exploited in two regions only (Kolda and Tambacounda).¹⁸ In order to secure a sustainable supply system, cost-effective charcoal production techniques require attention and a minimum investment. The Casamance mushroom variety with a higher yield¹⁹ has been very successful in most SSA countries, particularly in Senegal.²⁰ For reducing biomass demand, actions promoting improved stoves have relieved consumers by significantly reducing firewood and charcoal consumption with a specific cooking style. This has reduced the pressure on forestry resources (table 31.1).

Public authorities should launch campaigns to promote and support alternative products including butane, kerosene and other biomass by-products such as typha or rice husk that are crucial for local households' cooking styles. Senegal's policy to promote Liq-

Table 31.1: Stoves Efficiency. **Source:** Ministry of Energy and Mines and PERACOD (2005): "Estimates of domestic fuel consumption in Senegal from 1990 to 2004."

Firewood stoves		Charcoal stoves	
Traditional	Improved	Traditional	Improved
11%	35%	12%	45%

uified Petroleum Gas (LPG) as a replacement for charcoal, reducing the consumption of biomass from 60 per cent in 1994 to at least 40 per cent in 2004 (SIE 2005), has been successful and should be replicated to counter deforestation.

31.4 Conclusion

Modern energy is essential for human development, economic growth, health care, and education, and is crucial for poverty reduction and achieving food security. Thus, an energy system based on a sustainable, affordable and environmentally sound modern energy supply is a key requirement for most *Millennium Development Goals* (MDGs) and *Poverty Reduction Strategies* (PRSP).²¹ But most SSA countries lack enough modern energy capacity in their energy balance, where traditional energies (60 per cent on average) prevail. The small 'modern' energy component strongly relies on oil imports. Such dual energy systems involve economic, financial, and environmental insecurity as well as health issues.²² This trend must urgently be reversed in SSA countries and new conditions for a transition towards sustainable energy sources must be set up. Action plans and concrete measures for supply and demand must be set up to establish sustainable energy supply, production and consumption practices.

On the supply side this requires securing the supply system and diversifying supply sources. This will lead to several actions including the creation of national fossil energy²³ stocks for several months, the development of oil prospecting, and reducing the national expenditure for transport of hydrocarbon products to geographically landlocked importing coun-

17 CILSS (*Comité permanent Inter Etats de Lutte Contre la Sécheresse au SAHEL*) was set up on 12 September 1973 as an intergovernmental organization of 9 Sahel countries including Burkina Faso, Cape-Verde, Gambia, Guinea-Bissau, Mali, Mauritania, Niger, Senegal and Chad. The current CILSS mandate is to "ensure food security and the fight against drought and desertification, in order to achieve a new ecological balance" in the Sahel region.

18 Every year a by-law is issued to regulate forestry activity campaigns. Since the year 2000, Government allows charcoal production only in the regions of Kolda and Tambacounda (in Senegal).

19 This is confirmed by a comparative study conducted in Tanzania on two types of mushrooms used in 9 villages. The study considered 5 types of fireboxes including the Casamance type. The Casamance type proved more efficient, with outputs of 31 per cent (Source IDRC site: *International Development Research Center*; at: <http://www.idrc.ca/>).

20 In the latest issue of the guidelines for the energy sector development policy, the Government of Senegal (2003) decided to introduce and widespread the use of the Casamance mushroom.

21 *Highly Indebted Poor Countries* (HIPC) initiated a participatory process to develop *Poverty Reduction Strategy Papers* (PRSPs) based on a redistributive growth and meeting the basic needs of the poorest communities. The Paper provides a reference framework for country poverty reduction strategies.

tries. Achieving an enhanced energy security requires the implementation of policies to promote and disseminate the use of natural gas and renewable energies. So far, the development of renewables in Africa is constrained by the high costs for importing equipment and the lack of information on the latest technologies used to generate electricity. Thus, all countries should combine their efforts on research and training on setting up an industry to produce the needed equipments. Industrial units operating with solar energy would be a good alternative to using fossil energy, as Africa has a huge solar energy potential. The biofuel production experiences are already initiated in some countries in the region, both experimental or pilot projects, and at present several international seminars have been held to explore the possibilities for developing biofuels on a larger scale in Africa. The objectives of these seminars are mainly to explore the potential and challenges to the dissemination of priority biofuels technologies in Africa and also to promote sharing of experiences and lessons from countries in Africa, Brazil and other regions. Therefore, analyzing the balance between the need for new energy resources and the trade-offs and risks of biofuels requires a lot of attention. Thus, countries should more focus on domestic energy demands over exports; meeting needs in relation to both energy availability and rural development; creating inventories of biofuel technologies; considering the environmental impacts of such technologies; undertaking feasibility studies on potential competition between food and energy crops.

On wood fuel supply, countries should develop efficient decentralization policies to give rural commu-

nities a greater responsibility for the sustainable management of their biomass resources.

On the demand side relevant frameworks must be developed creating conditions for technology transfer and capacity building for an efficient use of various energy sources. Vast energy efficiency programmes in the building sector combined with audits of some industrial branches could help manage energy consumption. An energy policy based on market prices for energy consumption and relevant and targeted subsidies will save energy costs²⁴ Increased efficiency of electricity systems, through rehabilitation of electricity networks will induce savings on power distribution and transportation amounting to over 20 per cent of power production in the majority of SSA countries. Also much electricity is lost in the networks.

The pace of transition to more sustainable energy sources will largely depend on the willingness and capacity of national, regional and international authorities, private actors, NGOs and consumers. Consumers should therefore adopt new energy consumption behaviours that would guarantee more efficiency and reduce energy use. For that purpose, they must give priority to energy saving vehicles and equipment and use collective transportation systems.

National authorities should create attractive legal and governing frameworks to mobilize required funds in order to promote more energy-efficient technologies and renewables.²⁵ International institutions, NGOs and private actors should also provide the required technical and financial support for a better exploitation of the continent's energy potentials. Thus, the development of regional infrastructure – such as the WAPP project and the gas pipeline will prove profitable for all countries.

22 According to a recent publication on cooking with wood, dung, coal and other solid fuels on open fires or simple stoves is a daily reality for more than half of the world's population. This leads to high levels of indoor air pollution, a major risk factor for pneumonia among children and chronic respiratory disease among adults. Globally, pneumonia remains the single most important child killer and is responsible for two million deaths a year. Every year, the killer in the kitchen is responsible for 1.5 million deaths. Sub-Saharan Africa and South East Asia are particularly affected, with 396,000 and 483,000 annual deaths, respectively. Indoor air pollution also disproportionately affects women and children. In 2002, cooking with solid fuels was responsible for nearly 800,000 deaths among children and more than 500,000 deaths among women (WHO 2006).

23 In this respect, Mali (2006) intends to increase their storing capacity to 150,000 in 2015 and 231,000 in 2025.

24 According to J.P. Thomas and Sokona (1997), wealthier social classes benefit much more from global energy subsidies. Such funding can actually cause them to increase their energy consumption. As a result, this can and often does cause energy shortages. The poorest are forced to rely on traditional energy sources that are less expensive. All targeted subsidies (e.g., kerosene) generally require energy suppliers to ration a portion of the subsidized energy. Therefore, suppliers prefer to direct their stocks to those clients that offer the greatest profit potential (e.g., the transport sector for kerosene stocks).

25 For example, Mali introduced an action plan for renewable energy promotion in 2004 in order to reach the objective of 15 per cent renewable energy by 2020.

32 Energy Security: Economic, Environmental, and Societal Opportunity for the North – Potential of Renewables to Avoid Conflicts?

Rolf Linkohr

32.1 Introduction

Bluntly put, Europe's oil comes from the Gulf and gas comes from Russia. In order to secure its energy supply Europe maintains best relations with Moscow, irrespective of what the Russians do in Chechnya, and American soldiers look after the Gulf. The US has offered military protection to the Saudi royal family in return for the free flow of relatively cheap oil. In other words, our oil and gas is dirty if not bloody. This reflects public opinion in Europe.

If the Europeans could replace oil and gas with renewables, Europe would not only become independent from energy imports, but could also withdraw from possible conflicts. Bloody energy could be replaced with clean and environmentally friendly energy sources. By planting wind power and solar power stations in North Africa we would not only use the enormous potential of wind and sun in neighbouring countries, we would also strengthen the ties between them and us, and give these still poor countries a chance to develop their future on the basis of new technologies. Their revenue would be based on solar electricity or hydrogen. A new partnership would develop, and promote wealth and social security (Nitsch/Staiß 1997; Brauch 1990, 1997a, 1997c, 1997e, 2000, 2001a, 2006). Such scenarios are as old as European energy debates. They are simple and radical. This is a benign vision in a cruel world governed by money and greed, and should therefore mobilize the noblest persons on both sides of the Mediterranean.

How realistic is this vision? Is oil by definition bloody as gas is dirty? And if yes, are renewables an answer? And last but not least, are they a realistic concept? This chapter will discuss this vision and contrast it with alternatives. Europe and her neighbours are taken as an example for future North-South energy re-

lations, but these arguments can also be applied elsewhere.

32.2 Growing Energy Consumption

The strife on essential resources, from petroleum to water, will be a growing source of conflict among nations unless the world establishes a system of resource conservation and collaboration. The wars of the future may be fought over diminishing supplies of our most precious natural resources, particularly oil and gas, two needed and coveted commodities.

World energy consumption grew by 4.3% in 2004, the largest annual increase in global energy consumption and the highest percentage growth since 1984. Energy demand in China was up 15.1 per cent, and in India 7.2 per cent. Global oil demand grew by 3.4 per cent, gas demand by 3.3 per cent. Without the United States where gas demand grew slower due to a mild winter, gas was up 4.3 per cent.

Although the growth in the world's energy consumption in 2005 may be lower due to a decline in global economic growth, this trend is severe. Possibly previous assumptions on the growth of global energy consumption were too conservative. In its *World Energy Outlook 2004*, the International Energy Agency (IEA 2004a) assumed an annual growth rate of 1.7% between 2002 and 2030, a figure far surpassed by the statistical data of 2004. The powerhouse of the world seems to be the Asian countries, and probably their needs for energy will also determine Europe's future energy policy.

Certainly, the projections of energy demand and supply are subject to a wide range of uncertainties, including global economic growth, population growth, resource availability, technological developments, as well as government energy and environmental policies. But past experience suggests that energy de-

mand, particularly for oil and gas, will grow. The transport sector will be the main driver for increased oil consumption and we may expect an increase in daily oil demand from 80 million barrels (mb) in 2005 to about 120 mb in 2030. Oil demand will grow faster in developing countries, but Europe also needs more oil. EU-25 imports today nearly 60 per cent of its oil, and these imports are projected to rise until 2030 to nearly 90 per cent.

32.3 Dominant Role of the United States

In the US, oil imports rose to more than 50 % of total consumption in history. China and India are competing to secure access to oil resources for their huge economies. As with Japan, they must import their gas and oil from the same sources as the Americans and the Europeans. The problem of supply is further exacerbated by the fact that in Europe, as in the United States, domestic oil and gas production is declining.

In May 2001, US Vice-President Richard Cheney submitted a report on the *National Energy Policy* (NEP) to President George W. Bush. According to this report, domestic oil field production will decline from about 8.5 million barrels per day (mbd) in 2002 to 7.0 mbd in 2020, while consumption will jump from 19.5 mbd to 25.5 mbd. Imports or other sources of petroleum, such as natural gas liquids, will have to rise from 11 mbd to 18.5 mbd. Most recommendations are aimed at procuring this 9 (1.5 +7.5) mbd increment, or the equivalent of the total oil consumed by India and China.

One third of the recommendations in the Cheney report cover ways to get access to petroleum sources abroad, in Kazakhstan, Azerbaijan, and other Caspian Sea states. In May 2005, the oil pipeline linking Baku (Azerbaijan) with the Turkish port of Ceyhan was opened (Winrow, chap. 30). The US lobbied for this pipeline which prevents the Russians from using energy as a political weapon.

Of the world's major oil-producing areas, the Persian Gulf is most likely to experience conflict during this century. Possessing nearly two thirds of global petroleum supplies, the Gulf will remain the focus of intense worldwide competition as energy demand rises in the decades ahead. Many geologists assume that future discoveries will add to the region's net supply. The reserves are located close to the surface, thus they are easiest to find and to develop. Gulf oil is relatively cheap, and the profits are high. Although new

discoveries are expected in the North Atlantic or in Siberia, the Gulf area alone can provide the vast amount of hydrocarbons that will be needed to satisfy rising demand in the 21st century.

American leaders have persistently argued that the US must be able to employ military power if needed to ensure the continued flow of oil from the Persian Gulf to the markets in the West. "America's vital interests in [the Gulf] are long-standing," General Anthony C. Zinni, then commander in chief of the US Central Command (CENTCOM), told Congress in 1999. "With over 65 % of the world's oil reserves located within the Gulf states," the United States and its allies "must have free access to the region's resources."¹

US policy on the protection of Persian Gulf oil is unambiguous. When a threat arises the US will use whatever means necessary to ensure the continued flow of oil. This principle, known as the Carter Doctrine, was first articulated by Jimmy Carter in January 1980, after the Soviet invasion of Afghanistan and the fall of the Shah of Iran. It has remained part of US policy ever since. In accordance with this principle, the US used force in 1987 and 1988 to protect Kuwaiti oil tankers from Iranian missile and gunboat attacks, and in 1991 to drive Iraqi forces out of Kuwait.

Although the official US interpretation has been that oil had nothing to do with the March 2003 US-led invasion of Iraq: "The only interest the United States has in the region is furthering the cause of peace and stability, not in [Iraq's] ability to generate oil," White House spokesperson Ari Fleischer said in late 2002. But a closer look at the administration's war planning reveals a different picture. In a January 2003 briefing by an unnamed "senior Defense official", presumably Deputy Defense Secretary Paul Wolfowitz, on US plans for protecting Iraqi oil fields in the event of war, the Pentagon leadership revealed that Gen. Tommy Franks and his staff "have crafted strategies that will allow us to secure and protect those fields as rapidly as possible in order to preserve those prior to destruction" (Klare 2004).

Iraq is a major oil supplier with proven reserves of 112.5 billion (bn) barrels, more than any other country except Saudi Arabia, and it may possess another 200 bn barrels in undeveloped fields. Iraq could become a leading oil supplier in future decades if a stable government is in place. It could replace Saudi Arabia if

1 General Anthony C. Zinni, Prepared statement before the US Senate Committee on Armed Services, Washington, DC, 13 April 1999.

this country should turn against the US due to its close ties to Israel and Washington's anti-Islamic bias.

Probably the only way to guarantee the continued energy flow is to guard the oilfields and pipelines with soldiers. Given its strategic and economic importance, securing American dominance in the Gulf will continue to govern US strategy in the first decades of the 21st century. The outcome of such a policy is uncertain. Saudi Arabia is not only the land of oil but also of Osama Bin Laden. From its fundamentalist milieu, the world's most wanted terrorist recruited many followers in the late 1990's and obtained much financial support. A major challenge for US policy is to persuade Saudi Arabia to increase its oil deliveries and eradicate its fundamentalist opposition. Such a strategy requires a will to transform Saudi Arabia into a modern state, an objective that may be light years away from actual politics.

32.4 Is Diversification an Answer?

One answer to the great dependence on the Gulf area has been diversification. Central Asia offers new opportunities, as well as West Africa. According to available data, the Caspian Sea basin, consisting of Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Turkmenistan, Tajikistan, Uzbekistan, and the adjacent parts of Iran and Russia, have proven reserves of 17 to 33 bn barrels of oil, and possible reserves of 233 bn barrels. These amounts constitute the second largest untapped reserves after the Persian Gulf area.

But the Caspian Sea basin is landlocked. Oil and gas pipelines have to be built and secured. The authoritarian regimes that predominate in the former Soviet republics are riddled with corruption and reluctant to adopt the legal or tax reforms needed to attract Western investment. The Caspian Sea basin is an oil and gas rich area, driven by numerous disputes and internal divisions, surrounded by strong neighbours who are all waiting for their chance. Oil has only exacerbated existing problems. The most significant source of conflict is the territorial dispute over the ownership of development rights in the Caspian Sea (chap. 55 by Raketl). Therefore to ensure the safety of energy deliveries may require similar military commitments the US has long made to its principal energy supplier in the Gulf.

Another oil supplier is West Africa. These states' share of global oil production might rise from 10 to 25 per cent by 2020. But as in the Caspian Sea region, hopes to obtain additional oil from West Africa could

be hampered by ethnic violence and political unrest. The US might be tempted to respond to these challenges by deploying troops. But such behaviour could generate images of colonialism. At present, the US administration prefers financial and military assistance, mainly to Angola and Nigeria. Both countries stepped up their military expenditure as a percentage of their GNP to become respected regional powers.

Latin America is another important oil and gas producer. A large part of US oil and gas imports come from Mexico, Colombia, and Venezuela. Venezuela owns large amounts of conventional oil and immense reserves of so-called heavy oil or repulsion, a sludge-like material that can be converted to conventional oil through a costly refinery process. At prices above 25 \$ per barrel repulsion becomes competitive. According to the official estimates, the proven reserves of repulsion equal the oil reserves in the Persian Gulf. The American hemisphere will therefore play an important role in the US energy policy. In Mexico and Venezuela the constitutions ban foreign investments in the oil and gas sector. Venezuela's president Hugo Chávez is regarded as a new *enfant terrible* by the G.W. Bush administration.

These areas are not the only conflict-prone regions. Possible conflicts may arise in the South China Sea, where large oil and gas deposits are assumed. The possession of the Spratly Islands would guarantee access to underground resources within a 200 miles distance, but also control the movement of ships crossing the sea. This area may witness large-scale warfare, because all factors associated with resource conflict are concentrated here (quoted from Klare 2004).

It seems to be the curse of oil that it is mainly found in areas of political unrest. Particularly the Persian Gulf, the Caspian Sea, and the South China Sea harbour all ingredients of conflict. But so far the big powers, mainly the US, prevented internal or border conflicts from becoming open wars. But this requires enormous military and political efforts, and alliances with corrupt and undemocratic countries are another price to be paid. Oil is not an ally of democracy.

There are examples in history where oil triggered a war or where the pursuit of oil changed the course of a war. Mostly forgotten is the *Gran Chaco War*, South America's bloodiest twentieth century war. The *Gran Chaco* is a largely uninhabited region in Paraguay, Bolivia, and Argentina where oil was discovered in 1928. A war broke out between Bolivia and Paraguay in 1932 which ended with a victory for Paraguay. There were 100,000 dead and Paraguay held 300,000

prisoners. Bolivia lost a large part of the disputed area to Paraguay. The oil that had inflamed the imaginations of pre-war nationalist agitators never materialized. Bolivia's oil and gas resources are located far away from this disputed area. The oil speculators were mistaken, and both nations paid an enormous price for the mad ambitions of their leaders. The reason for this war was not oil but an old territorial conflict. The territory belonged *de jure* to Bolivia but *de facto* to Paraguay because the few settlers, mainly Mennonite communities from the US and Argentinean land developers and cattle companies, were brought in by the Paraguayan government, whereas Bolivia did not exploit the meagre resources. Oil speculation triggered the war but did not cause it.

A war nearly broke out when Mohammed Mossadeq, an enemy of the Anglo-Iranian Oil Company and a former president of the parliamentary oil committee, was elected Prime Minister of Iran in 1951. The nationalization of this oil company was signed by Reza Shah. But this caused a severe conflict with the British Prime Minister Winston Churchill who was ready to intervene with force. The Americans held him back, but after a political flirt with the Soviets the Americans were convinced that Mossadeq had to be removed, either legally or by force. In 1953 the Shah deposed him with full British and American support. A war broke out when British, French, and Israeli troops occupied the Suez Canal Zone and Sinai in 1956 after Gamal Abdel Nasr nationalized the Canal. Due to American pressure and after an oil boycott by Saudi Arabia, the three powers withdrew and the Suez Canal remained in Egyptian hands.

Oil was a strategic objective in both World Wars but was not a cause of conflicts. All post-World War II conflicts had other causes than oil. They were mainly ethnic conflicts, wars of liberation, or border conflicts. Oil or other resources had only a side-effect. But wars over oil or water resources may become distinctive features of the future global security environment.

So far, OPEC countries still managed to contribute to the security of supply by developing significant spare capacity. During the Gulf Crisis (1990–1991), 4.3 mb/day of crude oil exports were lost as a result of Iraq's invasion of Kuwait. OPEC producers were able to make up this loss within weeks through the use of available spare production capacity.

Therefore the conflict over oil need not necessarily lead to a military engagement. But it is part of that dangerous mixture of economy and armament. A study on: *Southern African Millennium Ecosystem*

Assessment (at: <<http://www.millenniumassessment.org/en/SGA.Safma.aspx>>) indicates that big environmental problems may result in large violent conflicts. A hundred years ago, Kenya was covered by big forests, but in 2005 only 1.7% of the country's surface is still covered by trees. Since the 1960's Kenya's population doubled, but still 75% live on agriculture. They clear the remaining forests in order to have enough wood for cooking and heating. Hence the countryside erodes, water becomes scarce, and dryness expands (see chap. 68 by Ejigu). If it rains, no forest and no brush retains the water, and the last fertile soil is washed away. Craving hunger is the result and many people starve to death. The few remaining fields are a cause of conflict; mostly tribal conflicts, e.g. in 2005 at Turbi in Northern Kenya where 77 people, among them 22 schoolchildren, were slaughtered with machetes by a rival tribe.²

So far major wars could be avoided. One reason is our growing interdependence. We do not only depend on resources, we depend on each other, on technology, or on a stable financial and political environment. The Gulf States are probably more dependent on us than we are on them. Harold Macmillan, a former British prime minister, once made a celebrated observation that the thing he feared most was events. Although it is impossible to predict what will happen in the future, something unforeseen may happen in the Near East, in the Gulf States, or in Saudi Arabia. The situation may be as critical as in Iran under the Shah's regime or under the present authoritarian government. Energy could be a major element in such a conflict, a weapon against the West or an opportune income to strengthen a fundamentalist Islamic state. How oil can become an instrument in foreign policy can be learned from Hugo Chávez who deliberately builds his initiatives in Latin America on a preferential rate for oil. Cheap oil for political concessions has become another shade of oil policy.

One may imagine an insurrection in Saudi Arabia and Pakistan leading to an alliance between two fundamentalist countries, one oil rich and the other in possession of nuclear weapons. Although this nightmare is not probable, it is not unrealistic either. Was Khomeini's revolution probable? The question remains whether a different energy policy could influence positively our politically unstable world. And if so, how this brave new energy era may look like.

2 See information reported in: *Africa Research Bulletin: Political, Social and Cultural Series* 42 (1–31 July 2005): 16271–16306.

32.5 Global Energy Outlook

Energy is the key to solving all problems, from water to population. Already billions of people live without reliable access to clean water for drinking and agriculture. As populations continue to grow and the depletion of existing aquifers worsens, vast new sources of clean water are needed. Our planet has huge water resources, but most are salty, and often thousands of kilometres away from demand. The problem can be solved with energy: desalinate the water and pump it over vast distances. But without cheap energy there is no answer.

Without fresh water, how are we going to provide the food for our burgeoning worldwide population? Without cheap energy, how are we going to produce the fertilizer, till the soil, harvest the crops, process them, package them, and deliver them to the markets? In short, energy is the single most important factor that impacts on the prosperity of any society.

The figures illustrate the magnitude of our problem. In 2004, we consumed on average 220 million barrels of oil per day and the world ran on about 14.5 terawatts. The vast majority was oil, gas, and coal. Nuclear fission and biomass were also significant players, as was hydropower, but we have already tapped most of the available rivers and lakes. An incredibly small amount was solar, wind and geothermal, with geothermal composing the largest part.

Assuming a world population of 9 billion people in 2050 – as has been projected in the medium scenario of the UN World Population Revision of 2004 (UN 2005) – and giving all the level of energy prosperity of the developed world with a several kilowatt-hours per person, we would need to generate 60 terawatts or the equivalent of 900 mb of oil per day. Getting there will be incredibly difficult. If you go out tomorrow and turn on the switch of a new power plant that would produce a thousand megawatts of power from a new, carbon free energy source, you would have to turn on a new plant every day for 27 years before you generate even 10 terawatts of new power. Ten plus 14 terawatts would not even supply half of the 60 terawatts eventually needed. If we fail to build such power plants over the next one or two decades, the 21st century may become very unpleasant.

The problem of energy is intimately linked to climate change. According to the overwhelming opinion of climatologists, we should not allow the average temperature to rise above 2 °C of the pre-industrial value, an objective that corresponds to more or less 30 billion tons of CO₂ equivalent per year. Actually we

are at 24 billion tons per year, and we will probably arrive at 30 billion tons per year in 15 or 20 years time. Assuming that by then we will be 7 to 8 billion people in the world, and that all people have the basic right to use energy in a decent way, we can divide the 30 billion tons of CO₂ by 8 billion people, and we get a figure of roughly 3.8 tons of CO₂ per year and per capita. In 2005, the average American produced nearly 20, the average European roughly 10, and the average Indian one ton of CO₂ per year.

Therefore any future energy system must solve two equations: to supply enough cheap energy to everybody and to limit our CO₂ emissions, a condition that can only be fulfilled if everybody has an equal right to pollute the air with CO₂. Both equations are coupled. The future energy systems must be as carbon free as possible, but they must also be as cheap as possible. Both equations are linked to democracy and equality before nature. As we are confronted with a global problem we need to act with global consensus, in other words the final solution must solve the social problems, mainly poverty. Energy policy is not only applied physics, chemistry, and biology; it is also politics in the pure sense of the word.

32.6 Solutions?

What are the solutions? How can we find alternatives to oil? And how are these solutions compatible with our commitment to reduce the emissions of greenhouse gases? We could achieve some progress with conservation and efficiency. The potential to save energy is estimated to be 30 or 40 per cent in Europe. In other industrialized countries it is certainly of the same order of magnitude, in the US even more.

Let us take lighting as an example of energy saving. Pure white light-emitting diodes (LEDs) on the basis of gallium nitride (GaN) are no longer a dream and could replace our conventional lamps in five or ten years. They represent a tremendous saving of global energy-requirements, thanks to compound semiconductor material science. The success of LEDs lies in their longevity, energy efficiency, durability, low maintenance cost, and compact size. Replacing conventional lamps with LEDs in the US alone will bring energy benefits of up to \$100 billion by 2025, saving up to 120 gigawatts (GW) of electricity annually. If this figure is compared with the overall nuclear capacity of 100 GW in the US then the importance of these environmentally attractive new devices is easily understood. In the underdeveloped world, however, conser-

vation is meaningless, because so little energy is used. However, the industrialized world could help them to shorten the way from underdevelopment to a highly efficient modern society.

Some argue rightly that we could live in the future with not more than 2,000 watts (W) per person without giving up our standard of living, if we only used the most modern and sophisticated technology. If that were true then 10 billion people could live with 20 terawatt (TW), a third of our former figure. This is still a lot, and much more than our actual energy consumption, but much less than in a “business as usual” scenario. In the end the reality may be between both figures, depending on technology and economic growth.

Energy crops could be grown every year at a high rate to produce just one TW. This would require a revolution in agriculture at a time when we are struggling just to sustain our current production levels for food. But it could be made. We could also build a fleet of nuclear fission reactors, or even breeder reactors, we could develop accelerator driven systems working with thorium, but as the amount of capital is limited and the investment costs are high, even the nuclear option cannot solve all problems.

Another solution could be clean coal. According to an International Energy Agency study (IEA 2004) CO₂ capture and sequestration could drastically reduce emissions. Coal and lignite could last for another 200 years if production is expanded. With capture and sequestration coal could become compatible with our climate strategy. However, the IEA study highlights the fact that large-scale uptake of capture and sequestration technologies is probably 10 years off and that, without a major increase in R&D efforts, the technology will not be in place to realize its full potential as an emissions mitigation tool from 2030 onwards. The share of renewables including geothermal energy could be increased. There is a consensus among energy specialists that renewables deserve more development. But if their costs remain high these technologies have a very limited scope in developing countries, even in the highly industrialized countries where other alternatives exist. More energy could be provided for the world, more efficiently, and the outcome be that we would not need the 60 GW, but much less.

In a nutshell this is our actual energy vision. We use the appropriate energy technology, develop new ones, we count on future and still unknown devices, we develop worldwide systems of CO₂-emissions trading, bringing the developed and underdeveloped

world together, and thus we become more interdependent. Interdependency increases stability although everybody tries to be as independent as possible. Energy is traded like other goods and services. And the ecological costs are taken into account by the price we give to CO₂. Waste gets a price and can also be traded worldwide because CO₂ is a global problem. Some want to do it with nuclear energy, others without, but nearly everybody agrees that a mixture of different energy technologies is the best and cheapest way to provide the world with enough energy.

But what comes after oil and gas? Will coal replace the two other fossil fuels? Or will we rely on oil sands or methane hydrates? Will nuclear fission – and in 50 years nuclear fusion – provide us with sufficient energy? Or will we invent something completely new that allows us to increase our efficiency tenfold? We will find new technologies and devices if we invest enough in fundamental research. There is no limit to knowledge. Why should it not be possible to provide the world with a high standard of living with lower consumption of energy and raw materials? This is the vision of a sustainable growth.

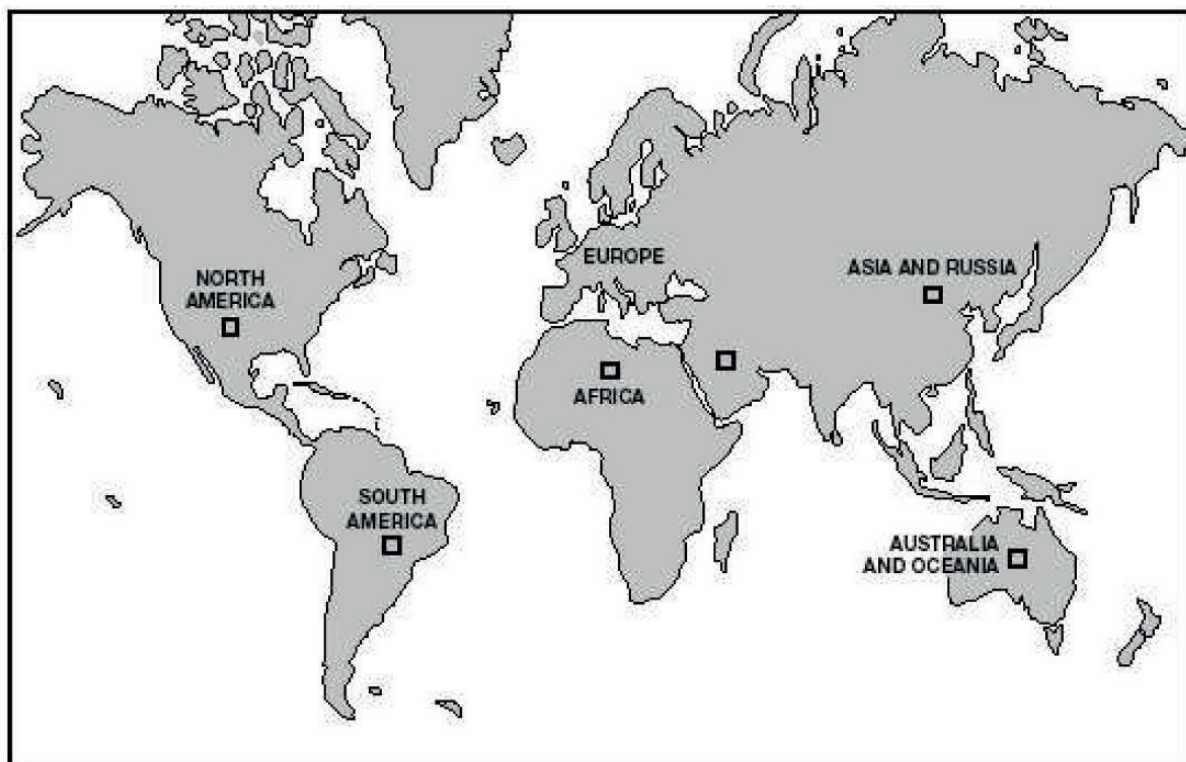
32.7 Solar Visions

Apart from nuclear fission or nuclear fusion reactors there is a hydrogen fusion reactor, the sun. Daily 165,000 TW of power has hit the earth for already over 4 billion years, and this will probably continue providing energy for several billion years.

A square of 100 km each, in areas of high solar radiation, covered with photovoltaic panels with an efficiency of 10 per cent, could provide 3.3 TW of electricity. Six such sites, in different parts of the world, could produce roughly 20 TW, the equivalent of 60 TW total energy power with a 33 per cent energy conversion. Our energy problems would be solved for ever, and we could concentrate on other problems for the rest of this and the next centuries.

We need new energy technologies at a competitive price. Presently solar electricity, produced by photovoltaics, is ten times more expensive than electricity produced by conventional power systems. Solar thermal power may be a promising technology and also be cheaper, but we do not have enough experience yet. The oil price will probably go up and gas will become more expensive. Even coal prices rise and with clean coal technology, with capture and sequestration of CO₂ the price of electricity would also go up. New technologies and an economy of scale will bring the

Figure 32.1: Solar cell land requirements where six boxes (100 km on a side), in areas of high solar radiation, can each provide 3.3 TW of electrical power. **Source:** Smalley (2005).



price of solar electricity down. When the costs of both options are comparable the solar vision becomes a reality.

A recent study of the Scientific Council of the German Government for Global Environmental Change (WBGU 2004) recommends a strategic partnership between the European Union (EU), the Middle East, and North Africa. The basic idea is to create an economic area between Europe and the Middle East including North Africa, combining the different geographical advantages and renewable energy sources. The potential of wind, geothermal and biomass is estimated at about 0.25 TW. The potential of solar power is much larger than the total world electricity demand (figure 28.4).

The energy output of renewables is fluctuating; some more like wind, some less like hydroelectricity. Only geothermal energy can provide a steady flow of electricity. Thus, a combination of different renewable energy sources, supported by fossil power stations, mainly gas, can overcome this shortcoming. A close-meshed electricity grid, linking all countries and energy sources with the consumers, may overcome this deficiency. New technologies and concepts of solar power may store heat overnight, and nanotechnol-

ogies, new materials, and possibly new physics might help us to develop even local energy storage in the future (figure 28.5).

Such a local energy storage has been proposed by Richard E. Smalley (2005), a Nobel laureate in chemistry (1996) without giving technical details. As a vision it is useful. If we had an economic solution for local energy storage it would enable an extremely robust delocalized energy system. But so far, nobody knows whether we can develop local energy storage. But had anybody anticipated very efficient and fast computers in nearly every household at low cost some 50 years ago? Richard Smalley discovered the fullerenes, an infinite new class of carbon molecules - who could have foreseen it before? The laws of physics do not prevent local energy storage from becoming a reality in the future.

Although we cannot exclude an energy system relying solely on renewables, combining the geographical advantages of different parts of the world and using still unknown, but possible technologies, nevertheless it is still far from being a reality. But it seems to be possible. An energy partnership between Europe, the Middle East, and North Africa has another advantage. It makes us more interdependent,

thus stabilizing peace, and it brings investment and development into a region where stagnation and underdevelopment seems to be the rule. The vision of an energy partnership goes much beyond the supply of electricity. It is a political vision. But why does it not work yet? Where are the drawbacks? What are the major obstacles?

32.8 Reality Does Not Necessarily Follow Our Scenarios

The model to avoid conflicts with renewables seems to be simple. It consists of the following observations, assumptions, and hypotheses.

1. Solar energy has the potential to make the world independent from other energy sources like uranium, coal, oil or gas.
2. The more we rely on renewable energy sources the lesser we risk resource wars.
3. Energy interdependence guarantees peace and development.

From a purely physical point of view the first hypothesis is true. Solar insolation provides us with abundant energy that needs simply to be tapped. This observation is scientifically true.

So where is the problem? The technology of this new energy world is not yet available at a reasonable cost, otherwise every hedge fund would invest in photovoltaic or in an electricity grid in the Sahara. Even mass production will not bring down the costs to a level comparable to the costs of conventional energy, and storage is still lacking a practical solution. Another objection refers to the choice of technology. Why are exclusively renewable energy sources needed? If CO₂ abatement is the objective, why are nuclear or clean coal, or CO₂ capture and sequestration excluded? As long as we have cheap fossil fuels and can produce electricity without CO₂ emissions, why are these energy technologies excluded? The sole choice of renewables may be interesting and should be tested, but it has no scientific base. People make political choices. An energy vision based solely on renewables may be in line with public opinion in some countries that is changing, and power stations must last for 30 to 60 years.

Third, it is dangerous to put all your eggs in one basket, particularly if you do not even know whether the basket is strong enough. We do not yet know all the drawbacks of renewables and there might still be a lot of unpleasant surprises. For instance, how effi-

cient is an energy system based solely on renewables? How reliable is it? What about the inevitable losses due to reserve capacity, regulation, additional grids, transport, etc.?

The hydrogen story is an example of how visions are taken as reality without taking science into account. Justi (1965), Bockris (1980), and Dahlberg (1982) proposed a hydrogen economy, based solely on renewable sources. Justi proposed an energy bridge between the Sahara and Europe. The basic idea was to produce solar electricity, transform it into hydrogen, pump the hydrogen to Europe, and transfer it again into electricity. Had we followed his recommendation we would have had losses of 75 per cent or more by transferring electricity into hydrogen, liquefy it, pump it, store it, and transform it again into electricity (Bossel 2004). The losses in an energy chain are often overlooked. People are fascinated with a technology whose advantages seem obvious and forget the drawbacks. One reason for the comeback of nuclear power might be the disillusionment with the so-called benign and miraculous energy systems which are by definition sustainable, solar, peaceful, democratic, and cheap. In the future they may be superior to our conventional systems, but more time is needed to be on the safe side.

Another problem refers to statistics. If equal distribution of available goods would solve the problems, we would have neither poverty nor hunger in the world. By dividing existing resources among all people one may easily solve every distribution problem, e.g. dividing the global GNP of 34,491.5 billion US \$ in 2003 by a world population of 6.3 billion people. Thus, one gets 5,474.8 US \$ per year and per person, which is much less than we earn in industrialized countries but enough to live modestly above the poverty line. By the same calculation you can feed all hungry people in the world. You sum up all crops and all available food, you distribute it equally among the people, and everybody can eat and drink.

Unfortunately, such a utopia does not exist. Rather, we are far from being equal. I still remember the debates in the European Parliament when we discussed the future of our water supply. The Austrians and the Swedes categorically refused to pump water from their mountains to Spain or Greece in pipelines yet to be built. Water, they argued, is not a commodity as cars or textiles, and therefore does not fall under the freedom of the Common Market. Thus, we will not share our water resources with our neighbours. If even in Europe we do not want to share our water resources, how can we expect others to behave differ-

ently? Nor do we want to share our wealth. The rich are getting richer while the poor get poorer. Although we know that a democratic society cannot live for ever with inequality, redistribution of wealth is unpopular. We prefer to rely on growth, on equal chances, but only on a limited distribution of this growth.

The real world does not allow us to divide simply the resources by the number of people who need them. The oil rich do not want to share their oil with us. Nor do we want to share our production of cars with others. Who wants to have something has to pay the market or the seller's price. A modern society cannot be built on charity. Hence, statistics may be physically true, but they don't necessarily help us. They are often politically incorrect. Nevertheless, there might be a solution. The problem can be solved by common interest. You trade resources and technologies like other commodities. Trade is not restricted to renewables. It must be open to all technologies as long as they reduce the emission of greenhouse gases.

On the second problem, is the relationship between resource scarcity and wars really true? Does underdevelopment and scarcity of resources result in conflicts and war? Hunger is not necessarily caused by environmental disasters. According to Armatya Sen (1981), famines can be avoided. In 1974 Bangladesh produced sufficient food but nevertheless many people suffered malnutrition and died. They were too poor to buy the available food. In 2005, the Republic of Congo suffered from famine although the country could produce more than to feed its people. Zimbabwe, once the granary of Southern Africa, suffers hunger because of dryness whereas neighbouring South Africa – suffering under similar environmental problems – harvests record crops. And why is it that India, although confronted with a growing population and sometimes great ecological catastrophes, never suffered famines since independence? Famines can be avoided even after natural hazards. The states suffering hunger do not have a free press. Their governments are not committed to the well-being of their people. Thus, the main reason for the existence of famine is bad government.

Without good government, without the commitment to serve the people and not the ruling class or family clan, even the best technology is ineffective. Technology as such does not make a society better or worse. Its usefulness depends on the safety rules, the efficiency, the quality, the maintenance, in other words on human behaviour. Therefore, it is more than doubtful to tag a technology with a label democratic or undemocratic as some try to do with nuclear en-

ergy. Is a nuclear Finland a less democratic society than a non-nuclear Austria?

But lack of good governance can be an obstacle to development. In 1995, at the Euro-Mediterranean summit in Barcelona the Foreign Ministers of 15 EU and 12 MENA countries agreed on a new cooperation in the Mediterranean basin aiming at a security partnership, a free trade area until 2010, and deeper social, cultural, and humanitarian relations to bring the Mediterranean countries closer to each other and to foster links between countries and people. Energy, telecommunications, and transportation issues were chosen. It was believed the integration into a common economic area would make room for a new and prosperous neighbourhood (Brauch/Marquina/Biad 2000). The Barcelona process was more onerous than pessimists thought, but it could neither solve the Palestinian problem nor the quarrels between Turkey, Greece and Cyprus, nor could it foster cooperation among the Maghreb countries. The MENA countries were not ready for political reasons to share their future with their neighbours.

From the European experience underdevelopment has been less a state of technical under equipment than a mental problem. It took Europe two world wars to overcome its deeply rooted nationalism, but we cannot exclude a return of an atavistic behaviour. It will take time to convince countries that it is wiser to share sovereignty with neighbours than to defend against them.

On the third hypothesis, does energy interdependence really generate peace and development? If this were true we would already live in a better world. Our interdependency is growing due to progress in transport and telecommunication technology, a worldwide system of trade and finance, or in a nutshell, due to globalization. Europe imports today 50 per cent of its energy needs; in 2030 it will probably be 70 per cent or more. Particularly oil and gas, but also coal and uranium must be imported. By 2030 we will experience the same energy dependence as in 1973 when a painful price was paid for our energy vulnerability during the oil crisis.

Or is that danger only due to our oil and gas import dependence? Would it be different with electricity imported from the Sahara? Is it really unthinkable that the countries hosting the new solar power plants will not cut the electricity lines as today they may stop selling us oil at a decent price? There is no scientific reason to believe in such a hypothesis. Without changing the societal conditions and the political relations, without good governance and common val-

ues, we would simply replace oil and gas with electricity. Europe would continue to depend on energy imports. Hydrocarbons would be replaced by electrons. Such a replacement does not per se provide us with a peaceful future.

So is it hopeless? Is energy cooperation really useless in solving problems? Is autonomy or self-reliance the answer? Certainly not! But we can definitely exclude the hypothesis of an automatically safer world by energy interdependence. You need more than technology.

32.9 What Will or Might be a Realistic Perspective?

The Barcelona process did not bear the fruits many people expected. Hence, the European Union has started its European Neighbourhood Policy (ENP). One major element of ENP is a strategic energy partnership. This includes security of supply and energy safety as well as security. As the world's largest oil and gas importer and the second largest consumer, the European Union is surrounded by the world's most important reserves of oil and natural gas. As Europe will increasingly depend on imports, neighbouring countries play a vital role in the security of energy supply. On the other hand many countries seek improved access to the EU energy market, either as current or future suppliers (Russia, Egypt, Libya, and Algeria) or as transit countries (Ukraine, Belarus, Morocco, Tunisia). Improving energy network connections between them and the EU, as well as the legal and regulatory convergence, are of strong mutual interest. Moreover, increased energy cooperation provides mutual business opportunities and can contribute to socio-economic development and improvement to the environment.

Europe has an excellent record in market-driven energy policy. Electricity and gas networks bring the producers and the consumers together, regulated access to the unbundled electricity and gas grid improve competition, and the preferential access of green electricity to the grid enhances the chances of renewable energy sources. Since the Treaty of Maastricht there is an article on the Trans European Networks (TENs).

To increase the energy dialogue and cooperation, Action Plans are developed to foster gradual convergence of energy policies and of legal and environmental provisions. These Action Plans include energy efficiency and energy savings, as well as renewable energy and cooperation on energy technologies, including

clean coal. There are possibilities to participate in the Intelligent Energy Programme and in the research programmes, as well as in the European Gas and Electricity Regulatory fora. These Action Plans build on existing bilateral or regional initiatives, such as

- the EU-Russia Energy Dialogue;
- the Tacis-funded Inogate programme dealing with the Caspian basin;
- the energy cooperation in the context of the Euro-Mediterranean partnership, in particular the creation of a Euro-Maghreb electricity market and the already agreed Euro-Mediterranean energy networks;
- enhanced energy co-cooperation between Israel and the Palestinian Authority;
- increased gas cooperation in the Mashriq region (in the Euro-Mediterranean context); and
- the South Eastern Europe Regional Energy Community which involves Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Kosovo (UNMIK), Macedonia (FYROM), Romania, Serbia and Montenegro, Turkey, and with the added involvement of Austria, Hungary, Italy and Slovenia, and Moldova as an observer.

The South Eastern Europe Regional Energy Community is the first example of where the EU extends in a legally binding manner its legislation to other non-member states. The countries concerned must implement the EU directives on the internal market for electricity and gas, as well as relevant environmental laws such as the Directive on Large Combustion Plants reducing thereby emissions and improving efficiency standards.

The European Neighbourhood Policy in general and the Action Plans in particular are assisted by financial instruments. Until 2007, Tacis and MEDA will remain the main financial instruments for assisting partner countries. Lending has also been reinforced. In November 2003, in the context of the mid-term review of the EIB external lending mandate, the Council agreed to the Commission proposal to increase the lending ceiling for the Mediterranean countries by € 2,180 million. A similar extension has been agreed to cover Russia and the western New Independent States (NIS).

In the period 2000–2003 the financial assistance to ENP partners under Tacis totalled € 1,332.2 million, whereas countries covered by MEDA received altogether € 3,716.1 million. This can only be explained by the vital interest of the European Union to develop a good neighbourhood policy with adjacent states.

Some of them may join the European Union in the years to come, like the Balkan states or possibly Turkey, others like the Mashriq and Maghreb states might become part of an economic space, comparable to the European Economic Space whose members are Norway, Liechtenstein, and Iceland. In this case they would fully participate in the functioning of the internal market, would respect the common values, and participate in an always deeper cultural and human relationship. We are still years away from this objective. Some progress was made but national interests and the lack of democracy in many countries slowed down this promising process.

If in ten, twenty, or thirty years the EU and her neighbours should succeed in creating an integrated energy space, with common competition rules and a common environmental policy, then all partners would be linked by big electricity grids and gas pipelines and a solid financial and business framework fostering trade. If they also had a common vision on their future they could start thinking about a new energy era.

But we could even start to think beyond. Our actual energy relationship is mainly based on oil and gas. Europe is increasingly the buyer; our neighbours sell or transfer oil and gas by pipelines or LNG-tankers. But oil and gas will not last for ever. Particularly cheap oil will soon reach its production peak and gas will follow soon afterwards. We do not yet know the exact time but both resources are limited. Then the question is what comes after oil and gas, what comes in the second half of the 21st century?

According to what we know today we will probably run out of cheap oil and gas, coal will still be available at decent prices, and CO₂-free clean coal technologies will be available at reasonable costs, new and intrinsically safe nuclear power stations will be operable and nuclear fission may become a reality, renewable energy sources including storage technologies may be available at affordable costs – and last but not least, we will all participate in a greenhouse gas emissions trading system. Greenhouse gases, mainly CO₂, will have a price, and this price will have a major impact on our energy policy. Most probably there will remain three competitive energy sources: nuclear, clean coal, and renewables. They will compete with each other to provide the necessary energy, water, and other commodities. If nuclear were to be rejected by one or the other reason we will have two remaining energy sources, or if in a further future even coal would become scarce, renewables might be the last hope. But it could also be the other way round. If oil and gas

would run out and renewables would still be too expensive, then the whole area would have to rely much more on clean coal and nuclear, a nightmare for those who believe in renewables only, but not far from reality and certainly achievable. In this case Europe would provide a bigger share of common energy needs. Europe would again become an energy exporter. But how can the African countries pay their energy bill? It therefore makes sense to help them develop new indigenous energy sources.

But why do they have to develop only renewable energy sources? Why can they not import cheap coal from opencast mines and build clean coal power stations on their coasts? And why should they not build high temperature nuclear reactors, like the one South Africa is developing? Countries like our immediate neighbours who have very limited resources will look for the cheapest and most economic solution. If the renewables are to win the energy race they must become competitive. It is not excluded that this may happen if the alternative becomes too expensive and if new discoveries are made.

Whatever happens, it makes sense to develop the renewable energy technologies, and perhaps they may play in the future a major role in our energy security policy. It is in the interest of the Europeans as of their neighbours to knit the network ever closer, to develop technologies jointly, to create confidence by cooperation and success. We Europeans should include the neighbouring countries into our energy strategy. As the solar irradiation is three times bigger in the Sahara than in Central Europe, it makes sense to build a solar power plant there and not here. Particularly thermal solar power stations must be built in these hot spots of our globe.

Better sooner than later these countries should be included in the European Emissions Trading System, because it promotes investment in technologies that reduce the emissions of greenhouse gases. Already today, in the first phase of Europe's National Allocation Plans, more than 300 million tons of CO₂ have to be acquired by CO₂ credits in Third World countries. Let us assume an average CO₂ price of € 10 per ton then the EU-member states have to buy CO₂ credits at a cost of 3 billion per year. This sum will go up in the future and will soon reach the amount of several tens of billion euros in the forthcoming decades. CO₂ credits might soon become the currency of our sunny neighbours, and it will help them to finance investment in renewables or other CO₂-free technologies (Brauch 2000a).

32.10 Summary and Conclusions

Let me summarize the answers to the initial questions: Will a North-South energy partnership contribute to energy security? Yes, if we extend the partnership to all categories of life - environment, human rights, democracy, and good governance. Can we avoid conflicts by exploiting exclusively renewable energy sources? The answer is no. There is no historical or scientific proof for such a hypothesis, but it is also impossible to falsify this hypothesis. The best approximation is probably a market-driven approach including all technologies and greenhouse gas abatement costs. The European Neighbourhood Policy has all the merits to develop into such a new relationship between North and South and deserves sympathy and political backing.

33 Food as a New Human and Livelihood Security Challenge

Úrsula Oswald Spring

33.1 Introduction¹

As a result of a process of “regressive globalization”² (Kaldor/Anheier/Glasius 2003; Oswald 2008b) and of an increasing concentration of wealth in few hands, the economic gap has widened between North and South and within the countries between rich and poor, which has often affected the survival of social groups. This inequality is one of the core elements of failure in the eradication of hunger and poverty. Therefore, many multilateral organizations, such as the *World Bank* (WB), the *International Monetary Fund* (IMF), and regional associations like the *Economic Commission for Latin America and the Caribbean* (CEPAL), the *Inter-American Development Bank* (IDB), the *Asian Development Bank* (ADB), and the *African Development Bank* (AfDB) and the *East African Development Bank* (EADB), have recommended to the governments to reduce the internal gap and to dedicate more resources for human development. They should address basic food production systems with job creation, increase low salaries and

subsidies for the marginalized and promote cheap prices of basic food for the urban poor.

These recommendations have directly linked ‘food security’³ to the wider concept of ‘human security’⁴ (Brauch 2008; Oswald 2008b, 2008d; Brauch/Oswald/Mesjasz/Grin/Dunay/Behera/Chourou/Kameri-Mbote/Liotta 2008). ‘Freedom from want’ requires sufficient food (‘food security’) and water (‘water security’), and both are key demands of any human security concept as a necessity for survival, and thus it has become a basic human right. Human security requires not only a quality of life and a decent livelihood, but also health and stable productive conditions for almost half of the world population living in marginal rural and urban areas (see part IX and chap. 74 to 96).

In the early 21st century, more than 2 billion persons depend on food self-sufficiency and another billion peasants suffer from eroded and polluted land, are unable to satisfy basic human needs, and are often forced to migrate to shanty towns or to cross illegally the borders to industrialized countries in search of jobs and quality of life (Schteingart 2006; Oswald 2006a). Thus, in this author’s understanding ‘food sovereignty’ goes beyond the physical conditions of production and market, and involves *social* (Campos 1995; Strahm/Oswald 1990), *cultural* (Arizpe 2004), *economic* (Calva 2008/a; Martínez 2003; Cadena

1 This article has been substantially improved as a result of an international cooperation. I want to thank two anonymous reviewers for helpful comments and Hans Günter Brauch for his critical input to the first draft. He also compiled box 33.1 and systematized important parts of box 33.3. I am immensely grateful for his careful editing and style correction and to Ronnie Lappin for his language editing.

2 Regressive globalization is understood in this context as a doctrine, rooted in the confidence of the efficacy, institutional building and moral authority of US power, allied with transnational capital in the sphere of communication, military, commerce, finance, and productive system. Using the term democracy and progress it is promoting a liberal global world order, favouring international capital and transnational productive systems. In the poor countries this process creates greater poverty, technological dependency, debts, massive rural migration and often loss of food sovereignty, while a small elite benefits from this alliance.

3 For the definition of and the scientific debate on the term ‘security’ in English and Spanish see Albrecht/Brauch (2008, 2008a); Brauch (2002a, 2003, 2008, 2008a, 2008b, 2008c, 2008e, 2008f); and Oswald/Brauch (2008, 2008c). The author will not use the term ‘food security’ developed during the past four decades (see part 34.2, where the debate in the FAO and World Bank has been briefly documented and criticized as a too technological and top-down approach), but will develop a wider concept of ‘food sovereignty’.

4 The author has developed in chap. 90 her proposal for a new and wider policy-relevant security concept that combines *human*, gender and *environmental* security (HUGE) dangers and concerns.

2003, 2005), *political* (Kaplan 2003), and *identity* factors (Serrano 2004; and chap. 89).

On this dual political and conceptual background, this chapter addresses the following research problem: food represents not only a security issue of intake of nutrients, but it forms part of a holistic understanding of life and a constituting element of any civilization. Thus it includes networks of connectedness (vertical: patron-client, and horizontal: social groups), belonging, relationship of trust, reciprocity, cooperation and exchange. It creates social benefits and risk reduction, but also innovative activities through a wider access to information and learning. It is a process of anchoring of personal and group identity (see chap. 90 by Oswald on HUGE), where social relations reaffirm the integration of a person inside a community with clear rights and obligations, such as access to land, credit, technology, training, market, life quality and rituals. Besides guaranteeing the physical and cultural survival, food also creates new opportunities for people-centred poverty alleviation and new understanding of 'rurality'. It represents a critical response to the past development and modernization paradigms and opens ways for diverse rural life processes, where agricultural activities and environmental services coexist with services, technology, and industries.

In addressing this research question, this chapter links the concept of food security with food sovereignty, a term developed by peasant movements, especially *Via Campesina*⁵ that was later also taken up by FAO. It first reviews basic concepts such as food security, food sovereignty, survival strategies, self-sufficiency, and livelihood (33.2). Then it scrutinizes the contradiction that in a world with increasing production and a diverse offer of food, hunger is still one of the most important causes of illness and death, because an important part of food is used for livestock and for industrial purposes. Recently, biofuels have aggravated the scarcity of food worldwide and regionally, affecting above all vulnerable groups such as poor peasants and marginalized urban people in the South

and North. This part reviews the internal food intake not only globally, but also for Latin America and in a case study of Mexico that focuses on the remote indigenous regions of Chiapas, Oaxaca, and Guerrero where undernourishment is still high and one of the causes of child mortality (33.3).

Part 4 explores three global models of food production: a) the productive paradigm, represented by the 'green revolution' that emerged in Mexico; b) the new paradigm of the 'life sciences', where *transnational enterprises* (TNE) have converted food not only into a commodity, but also into health and medical items; c) the third paradigm refers to 'organic agriculture' that cannot be globalized. It uses traditional agricultural methods developed in each region; recycles organic waste, produces soil enrichment with compost and uses biopesticides and natural seeds. The transformation of food uses long-established techniques and avoids the use of chemicals for conservation. This production system not only conserves the natural nutritional values of food and soils, but it is also an alternative for the self-sufficiency of poor peasants worldwide (33.4).

In the concluding part these three models are compared and related to its repercussion on environmental, gender, and human security (Oswald 2001, 2006a and chap. 90 below on HUGE). It links 'food security' with some traditional models of self-sufficiency that were proposed by Julius Nyerere in his 'ujamaa' philosophy and by ecofeminists (Mies 1998; Shiva/Mies 1997; D'Eaubonne 1974). It was taken up by *Via Campesina*, the most important world peasant movement and developed into a 'food sovereignty' paradigm. This approach is able to link up small producers from South and North, East and West, and to produce enough food for a livelihood with dignity. This approach integrates democratic land reforms, local market structures, green agriculture, and natural seeds as the patrimony of peasants and communities, with a culturally diverse livelihood (Shiva 2008, see preface essay in this vol.).

5 *Via Campesina* is a world organization of peasants and small producers and fishermen from the South and North with sub regional association such as *Latin American Peasant Organizations* (CLOC in Spanish), in Latin America, North America, Europe, Asia and Africa. Their goal is to defend an integral process of rural livelihood including agriculture, livestock, orchards, fishing, hunting and recollection, including direct producers, rural workers, women, elders and the young. Their executive committee is democratically elected and regionally representative, caring about gender and youth equity.

33.2 Conceptual Considerations and Clarifications

Why is food important for humans? Food, water, and air are the crucial elements of survival for humans. Food creates energy required for growth, sustenance, and biological and physical activities; it acts within the cells and it purveys the structural and catalytic components to build anabolism.⁶ Whenever one of these

functions fails, organisms substitute it with another process (Oswald 2006: 663–664).

Food is the generic term used for vegetal and animal nourishment as a whole, in parts or its different versions (flowers, fruits, leaves, roots, milk, eggs, muscles, kidney, blood, etc.). It can be distinguished from nutrition, which is the process through which food is absorbed and transformed. Food intake is a biological necessity, determining the quality of life and health of a human being, and its nutritional requirements vary according to age, sex, physical activities, climatic factors, and health conditions.

Nutrition refers to the process of absorption of food by living organisms.⁷ It starts with ingestion, continues with digestion, where the proteins are transformed into amino acids and keeps on with the absorption of nutrients in the intestine. Once integrated into the blood, they are assimilated by the body and transformed metabolically in each cell. The last phase is the excreta of faecal material and urine, where also toxins are eliminated from the body.

Nevertheless, food cannot be reduced only to this physiological process. It is a holistic experience where different senses intervene (smell, flavour, touch, view). Each civilization has developed a culture of tra-

ditional, ritual and food specialties linked to religious and civil events. Different diets and food preparation, but also taboos, ceremonies and rituals, are able to reinforce the cultural and territorial identity of people.

33.2.1 Food Security

Maxwell and Smith (1992) had counted more than 200 definitions of ‘food security’ (FAO 2003a, 2005c). Within the Food and Agricultural Organization (FAO) the food security concept has gradually been developed as a guiding concept for FAO’s evolving food policy (box 33.1).

The general definition of ‘food security’ that was inspired by FAO is related to the personal right to sufficient food for a person and a nation, discounting no-food uses.⁸ The US Department of Agriculture (USDA) evaluates national food security by measuring the gaps between actual food consumption, domestic production, plus commercial imports, minus unused food and consumption targets. Sometimes, nutrition gaps are also measured by the minimal daily nutritional requirements in relation to age, sex, and activities. Thus, food security is assuring the physical availability and the economic accessibility to enough food in an environmentally and socially sustainable manner, where adequate quantity and quality, but also culturally acceptable food for everybody at any time is able to guarantee a healthy and active life. Quantity refers to amount, distribution, calories and proteins, and quality to safe, innocuous, nutritious balanced, good and culturally accepted food. Among the many

6 Anabolism is the process which builds up complex molecules from smaller units, able to give the body the required energy that is coming from glucose and fatty acids. Therefore, it refers to chemical reactions that produce a combination of different molecules. The result of anabolism is the creation of new cellular material (enzymes, proteins, cells and its membrane, organs and tissues). Thus, anabolism is crucial for growth, maintenance, and reparation of tissue.

7 An optimal functioning of an organism or of its cells requires about a hundred different substances located in the environment. Their function is to maintain the structure and to control the metabolism. Metabolism means the sum of chemical changes taking place inside an organism by which food is transformed and utilized by the organisms, and water products are eliminated. Generally, there are chemical components with high molecular weight (proteins, sugar, fibres, salts, starch), which are transformed into nutrients in the intestines. Once liberated, they are absorbed by cells into the blood circulation. Essential chemical elements for the human body are – depending of the weight of the body – 65 per cent oxygen, 18 per cent carbon, 10 per cent hydrogen, 3 per cent nitrogen, 2 per cent calcium, 1.1 per cent phosphorus, 0.25 per cent sulphur, 0.20 per cent potassium, 0.15 per cent sodium and chlorine, 0.05 per cent magnesium, 0.004 per cent lead and traces of copper, manganese, zinc, cobalt, silicon, molybdenum and others (Oswald 2006: 664).

8 Today, less than a third of the grain produced worldwide is directly used in human consumption. The rest is transformed into animal food and industrial inputs. With biofuel the situation will worsen. In Mexico the price of corn per ton rose from 1,400 Mexican pesos in September 2006 to 3,500 pesos in December 2006. The International Monetary Fund indicated that the price of white corn was US\$ 102.7 per ton in the USA. As a quarter of the corn was used for biofuel, the price increased to US\$ 144, but in October 2007 the price rose by 18.2 per cent compared with September, and in November it rose again by 15.4 per cent compared with October, achieving US\$ 164. Peasant organizations explain that the corn is bought from the peasants for 1,400 Mexican pesos and sold in the towns to the tortilla factories for 3,400 pesos, due to speculative practices of monopolies of the TNE Cargill and the Mexican enterprise Maseca, together with other smaller speculators involved in corn importation and tortilla transformation (see at: <<http://www.jorgezepeda.net/13-01-2007/la-tortilla-para-entender-el-aumento-del-precio/>>).

Box 33.1: The evolution of the concept of food security within the FAO. Text is in the public domain.

According to FAO (2003a) the food security concept gradually emerged in the mid-1970's when the initial focus was on:

food supply problems – of assuring the availability and to some degree the price stability of basic foodstuffs at the international and national level. That supply-side, international and institutional set of concerns reflected the changing organization of the global food economy that had precipitated the crisis. A process of international negotiation followed, leading to the World Food Conference of 1974, and a new set of institutional arrangements covering information, resources for promoting food security and forums for dialogue on policy issues (ODI 1997).

Focus was put on productivity, within a frame of Green Revolution, independent of social, environmental, and political costs. The problems of famine, hunger, and food crises were analysed in detail, resulting in a “redefinition of food security, which recognized that the behaviour of potentially vulnerable and affected people was a critical aspect” (FAO 2003a). The insight that the green revolution “did not automatically and rapidly lead to dramatic reductions in poverty and levels of malnutrition ... were recognized as the result of lack of effective demand” (FAO 2003a). Food security was defined in 1974 as:

‘availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices’ (UN 1975). In 1983, FAO expanded its concept to include securing access by vulnerable people to available supplies, implying that attention should be balanced between the demand and supply side of the food security equation: ‘ensuring that all people at all times have both physical and economic access to the basic food that they need’ (FAO 1983a).

The commoditization of inputs and food markets widened the existing social gap, giving support to large-scale industrial agriculture and expelling millions of peasants from their land. An influential World Bank (1986) report on *Poverty and Hunger* addressed the temporal dynamics of food insecurity and introduced the “distinction between chronic food insecurity, associated with problems of continuing or structural poverty and low incomes, and transitory food insecurity, which involved periods of intensified pressure caused by natural disasters, economic collapse or conflict” (FAO 2003a). The food security concept evolved to: “access of all people at all times to *enough food* for an *active, healthy life*” (World Bank 1986: chap. 2). In the mid-1990's, this definition was widened:

to incorporate food safety and also nutritional balance, reflecting concerns about food composition and minor nutrient requirements for an active and healthy life. Food preferences, socially or culturally determined, now became a consideration. The poten-

tially high degree of context specificity implies that the concept had both lost its simplicity and was not itself a goal, but an intermediating set of actions that contribute to an active and healthy life.

In UNDP's (1994) human security concept, food security was one of its seven aspects. In 1996, the World Food Summit adopted an even more complex definition:

Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, *safe and nutritious* food to meet their dietary needs and *food preferences* for an active and healthy life (FAO 1996b).

In 2001, the FAO again refined this concept in: *The State of Food Insecurity 2001*:

Food security [is] a situation that exists when all people, at all times, have physical, *social* and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO 2002).

This new emphasis on consumption was influenced by Amartya Sen (1981) who stressed entitlements of individuals and households. A study of FAO (2003a) described:

food security ... as a phenomenon relating to individuals. It is the nutritional status of the individual household member that is the ultimate focus, and the risk of that adequate status not being achieved or becoming undermined. The latter risk describes the vulnerability of individuals in this context. ... Useful working definitions are described below.

Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. Household food security is the application of this concept to the family level, with individuals within households as the focus of concern.

Confronted with new models of fast food, people began to suffer more from obesity, cardio-vascular accidents, diabetes and cancer. Thus the concept of food security shifted again, now to healthy and innocuous food, able to maintain a person vigorous and active by reducing the intake of animal fat, sweet beverages, and junk food. But when confronted still with 825 million hungry people, food insecurity was addressed, together with the fact that 80 per cent of the poor live in rural areas and agriculture employs almost 50 per cent of them:

Rural development is critical for improving food security. The traditional agriculture sector has low productivity due to the lack of investment, inadequate water supply and scarce arable land. Rapid depletion of groundwater resources may be the most serious problem facing the countries (FAO 2006: 20).

definitions of 'food security' used in the scientific and policy oriented food discourse those selected here indicate its scope:

- "when people do not need to live with hunger or fear starvation"⁹;
- "physical and economic access, at all times, to sufficient, safe and nutritious food to meet dietary needs and food preferences for an active and healthy life"¹⁰;
- "the ability of individuals to obtain sufficient food on a day-to-day basis"¹¹;
- "the notion that all people, especially the most vulnerable, have dignified and unthreatened access to the quality and quantity of culturally appropriate food" that will fully support their physical, emotional, and spiritual health (Wolfe/Frongillo/Valois 2003);
- "state in which all persons obtain a nutritionally adequate, culturally acceptable diet at all times through local non-emergency sources" (Riely/Mock/Cogill/Bailey/Kenefick 1999);
- "condition of having enough food to provide adequate nutrition for a healthy and productive life" (USAID, Bureau for Africa 1986a).

USAID defined 'food security' as:

all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life. Achieving food security requires that the aggregate availability of physical supplies of food is sufficient, that households have adequate access to those food supplies through their own production, through the market or through other sources, and that the utilization of those food supplies is appropriate to meet the specific dietary needs of individuals.

Achieving food security requires that the aggregate availability of physical supplies of food is sufficient, that household have adequate access to those food supplies through their own production, through the market or through other sources, and that the utilization of those food supplies is appropriate to meet the specific dietary needs of individuals (Riely/Mock/Cogill/Bailey/Kenefick 1999: 2-3).

The *US Food and Drug Administration* (FDA 2003) defined 'food security' as the daily balanced intake of proteins, carbohydrates, vitamins and minerals re-

quired for a healthy life. The disequilibrium in quantity and polluted food, or with toxins, could generate illnesses and limit the physical and mental development of children. Finally, food security is also related to food safety such as hygiene and prevention of illnesses caused by food in bad conditions or food-borne sicknesses.¹² According to WHO, bacteria are the main threat for innocuous food that are present in the domestic and professional food chain.

33.2.2 Food Sovereignty

Food security, as defined by FAO, does not include social and cultural factors of food and nutrition, nor land rights, seeds, credits, family ties, social relations of productive and consumption pattern together with communitarian cohesion. Therefore, *Via Campesina* understood 'food sovereignty' as "the right of peoples, communities, and countries to define their own agricultural, labour, fishing, food and land policies, which are ecologically, socially, economically and culturally appropriate to their unique circumstances. It includes the true right to food and to produce food, which means that all people have the right to safe, nutritious and culturally appropriate food and to food producing resources and the ability to sustain themselves and their societies" (*Food Sovereignty: A Right For All*, Political Statement of the NGO/CSO Forum for Food Sovereignty, Rome, June 2002).

Thus important elements of food as a cultural and not only as a technical process are lacking in the FAO definitions. The concept of "food sovereignty represents both a social and a personal right of individuals and communities to healthy, culturally appropriate and permanent food" (Oswald 2006: 664), but includes also the process of production, land tenure, local native seeds, access to water and to other natural resources, storage processes, transformation of food, eating, fiestas and rituals in which women play a key role.

Social movements such as *Via Campesina* have used in their daily struggle the concept of food sovereignty, including geopolitical, socio-economic, identity and cultural aspects (box 33.2).

This new concept of 'food sovereignty' that differs significantly from the concept of 'food security' (box 33.1) that is being used by FAO and the food aid community has been taken up by the *UN Forum for Indigenous Peoples* during its sixth session, 14-25 May 2007 that defined food sovereignty as:

12 See; US FDA (2003); at: <<http://www.fda.gov/OHRMS/DOCKETS/98fr/01d-0583-nad00002.pdf>>.

9 See: Medicine.Net.com; at: <<http://www.medterms.com/script/main/art.asp?articlekey=32945>>.

10 See: FAO/Netherlands; at: <www.fao.org/ag/wfe2005/glossary_en.htm>.

11 See: MCGraw Hill Online Learning Center; at: <http://highered.mcgraw-hill.com/sites/0070294267/student_view0/glossary_e-l.html>.

Box 33.2: Concept of food sovereignty as developed by social movements. Text is in the public domain.

Via Campesina, social movements, ecofeminists and indigenous organizations define food sovereignty as an integral process of production, commercialization, transformation and intake related to the family and community culture of food, proper of any region, social class and nations. Their understanding of food sovereignty includes:

- a.) local production and trade of agricultural products with access to land, water, native seeds, credits, technical support and financial facilities for all participants;
- b.) women are the main food producers worldwide¹⁾ and they are often in charge of transformation and local trade;
- c.) therefore, access to land, credit and basic production means for women and girls at home and in the community is a guarantee of food security, but it is also able to overcome the violent and unjust patriarchal structures within families, communities, social organizations, countries, and global economic systems;
- d.) inclusion of the indigenous, women, and peasants in regional and national rural policy and decision-making processes related to agriculture and food sovereignty;
- e.) the basic right to consume safe, sufficient, and culturally accepted non-toxic food, locally produced, transformed and sold, since food is more than intake of proteins and calories: it is a cultural act of life;
- f.) the rights of regions and nations to establish compensations and subsidies to get protection from dumping and artificial low prices as a result of subsidies in industrialized countries;
- g.) the obligation of national and local governments to improve the food disposal of its citizens through stimulus of production and transformation of food, subsidies, and economic programmes to achieve food sovereignty in basic crops; discounts in urban poor regions, able to guarantee the basic food basket; popular kitchens; breakfast in schools, and special food for undernourished babies and pregnant mothers;
- h.) governments should guarantee an adequate nutrition above all for babies, infants, and pregnant women, offering food supply for poor people;
- i.) during bad harvests the importation of basic crops from the world market, and when countries are threatened by famine, with the advice and support from the World Food Programme;
- j.) clean water and sewage facilities to eliminate parasites, viruses, helminth and protozoa²⁾;
- k.) links among environmental services, agriculture, territorial planning and democratic participation in the decision-making process to guarantee the livelihood and dignity of the most vulnerable in rural areas. They create opportunities for rural population to stay on their field without pressure for migration. The sum of these processes reinforce for each citizen the basic rights of life, but also the right of non-migration, thanks to sustainable life with dignity in its own communities and countries.

-
- 1) In most countries of Sub-Saharan Africa (SSA), women represent: 33 per cent of the rural labour force; 70 per cent of paid rural daily work; 60–80 per cent of self-subsistence crops and local sale; 100 per cent of food transformation; 80 per cent of harvest, transportation from the fields to the community and food storing; 90 per cent of weaving and hooking; 60 per cent of market activities (FAO/SDWW 1999: 2)
 - 2) Helminths are worms and their eggs living inside of a human organism or animals. Protozoa are single cell organism able to divide within a host organism. Malaria is caused by protozoa called *Plasmodium*. Other frequent protozoa parasites are *Giardia* and *Toxoplasma*.

the right of Peoples to define their own policies and strategies for the sustainable production, distribution, and consumption of food, with respect for their own cultures and their own systems of managing natural resources and rural areas, and is considered to be a precondition for Food Security.¹³

This concept has also been discussed by several NGOs, such as the *Africa Europe Faith and Justice Network* (AEFJN) that adopted a food sovereignty

document in September 2005 that points to many shortcomings of the food security concept (box 33.3).

These definitions on food sovereignty by social movements representing the interest of farmers in the South (*Via Campesina*, box 33.2) and of an African-European Catholic group (box 33.3) are just two exemplary snapshots that point to major shortcomings of the debate on food security during the past three decades. They are also responsible for the lack of progress against hunger since until today 25,000 people, above all small children, die daily of hunger. The next two concepts of 'survival strategies' and 'livelihood' that have been developed in the South address different means for the marginalized poor to achieve 'food security' with 'food sovereignty'.

13 See; [at<http://209.85.135.104/search?q=cache:ysjC3kV2zJ8J:docip.org/Permanent%2520Forum/pfo7/PFO7jointstatement100.pdf+FAO,+food+sovereignty,+definition&hl=de&ct=clnk&cd=1&gl=de >](http://209.85.135.104/search?q=cache:ysjC3kV2zJ8J:docip.org/Permanent%2520Forum/pfo7/PFO7jointstatement100.pdf+FAO,+food+sovereignty,+definition&hl=de&ct=clnk&cd=1&gl=de).

Box 33.3: Food Sovereignty Document, September 2005. **Source:** <http://www.aefjn.be/index.php?option=com_content&task=view&id=31&Itemid=37>. Text is in the public domain.

On 7 July 2005 some representatives of AEFJN met ... to discuss the principles of food sovereignty as a possible framework for the work of AEFJN.

Food Sovereignty:

The discussion stimulated interesting reflections about the definition of the term, the difference with other mainstream concepts such as the right to food and food security, weaknesses and strengths of this paradigm, and the specific aspects that can relate food sovereignty to Catholic Social Teaching, Human Rights and policymaking. We would like to summarize here some of our findings. Life is the most precious gift. The right to life is therefore the most fundamental right for any human being. An essential condition to sustain life is food. Access to food is recognized as a basic human right.

Right to Food:

The right to food was recognized in the Universal Declaration of Human Rights in 1948. It is also included in the International Covenant on Economic, Social and Cultural Rights of 1976:

"Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food..." (Universal Declaration of Human Rights, Art. 25.1)

Therefore the right to food is an integral component of human rights, based on existing international law and protected by a legally binding framework in international law. Also important are the FAO "Voluntary Guidelines" (November 2004) formally accepted by FAO members states as a useful tool to challenge unwilling governments to take their internal and external responsibilities serious.

Food Security:

The concept of food security has long dominated the discussion about the question how to diminish and eliminate poverty and hunger. Coined in the context of the UN specialized agencies, such as FAO, the term has been used since the 1970's. Although there is a definition agreed by all, the 1996 World Food Summit defined Food Security as 'the situation in which all people, at all times, have physical and economic access to safe and nutritious food that meets their dietary needs and food preferences for a healthy life'. Though it refers to having enough food to eat, it doesn't talk about where the food comes from, who produces it, how and under which conditions it has been grown.

Food sovereignty is a global or national vision oriented towards production, rather than access to food by deprived persons and groups. The way to have access to food can be different: to grow food, to have

paid work to buy food, or to receive welfare in case of inability. This allows the big food producers both in the North and South to argue that the best way for poor countries to achieve food security for their people is to import cheap food from abroad rather than trying to produce it themselves. It does not question the existing relations of inequality and processes that increase these social gaps, within a country by landlords and outside by TNE.

In spite of the green revolution, improved productivity and tremendous efforts to provide food security, the number of hungry people in the world has been growing. Surprisingly, the very people who grow food, the small peasant farmers, particularly women, are afflicted by hunger and can no longer make a living on their land. To speak only of food security is no longer enough. We have to look at the question of what kind of food is produced, how it is produced, for whom it is produced. Food security is a definition of a goal rather than a programme with specific policies that aim at the eradication of the causes of hunger and malnutrition. Therefore a more comprehensive notion is under discussion today to ensure the daily food for all through food sovereignty.

Food Sovereignty:

There are several definitions of 'food sovereignty':

Food sovereignty is the right of people, communities, and countries to define their own agricultural, pastoral, labour, fishing, food and land policies which are ecologically, socially, economically, and culturally appropriate to their unique circumstances. It includes the right to food and to produce food, which means that all people have the right to safe, nutritious, and culturally appropriate food, and to food-producing resources and the ability to sustain themselves and their societies.

Food sovereignty also refers to the right of states to protect their population by restricting the dumping of products in their markets and through the control of the domestic market.

The notion of food sovereignty has not been invented by intellectuals. It comes from the grassroots, from peasant farmers and indigenous people in Latin America who started to reflect on the root causes of their misery and to look for a way to live a dignified life. Farmers associations in Asia took up the concept. Today farmers in Europe are threatened as well in their existence by the effects of globalization. They, too, begin to accept food sovereignty as a revolutionary alternative to the dominant neo-liberal model, which tends to look at reality exclusively from an economic and a commercial angle.

More important, the concept of 'food sovereignty' wants to integrate the welfare of people/human beings as well as/and to integrate the notions of the common good of society and ecological sustainability into concepts of the market economy.

The concept of food sovereignty is not necessarily opposed to that of food security, but it goes beyond it. Food sovereignty actually expands the focus by looking at the causes of hunger rather than concentrating only on the effects. Food sovereignty can be an alternative to the current mainstream thinking on food production. It is people-centred as it looks at people not only as consumers of food, but at active agents in the production of food.

Elements of Food Sovereignty:

There are various definitions of food sovereignty. We want to look at the definition accepted by the Forum for Food Sovereignty in Rome in 2002.

Food sovereignty is the right of people, communities, and countries to define their own agricultural, pastoral, labour, fishing, food and land policies which are ecologically, socially, economically, and culturally appropriate to their unique circumstances. It includes the right to food and to produce food, which means that all people have the right to safe, nutritious and culturally appropriate food and to food-producing resources and the ability to sustain themselves and their societies."

Let us analyse the most important elements:

The *democratic principle* (who decides what we grow and eat?):

At present the decision concerning what is grown on farms and sold in supermarkets is taken by a few powerful transnational companies, which control much of the food production and distribution. Their principle aim is to produce and sell as cheaply and as profitably as possible. The concept of food sovereignty wants to give back to states or groups of states and agricultural communities and farmers the possibility to decide what kinds of food they want to grow and how to grow it. States are to remain "sovereign" and need to have a political space in order to implement their own agricultural policies.

The *question of ownership* (who controls the means of production?):

With the advance of industrialized farming the means of production (land, water, and seed) are taken over by companies, turning farmers into underpaid slave labour or slum dwellers. In an economy of food sovereignty the state will provide small farmers with the resources needed to grow their own food. Agrarian reform and redistribution of land is the most appropriate means to achieve that. In contrast to the social-

ist model (state ownership of the means of production) and the capitalist model (the capital is owner) food sovereignty demands that it is the producers who remain in control of their resources. Food is a social and personal right.

The *right to protection*:

Today the political choices made by the multilateral institutions, like IMF and WTO tend to protect the agribusiness industry both in the North and the South, and to destroy the livelihood of millions of subsistence and family farmers by controlling the food cycle all the way from agricultural inputs and the growing of the crops to the distribution, processing, and selling of food. The dumping of heavily subsidized agricultural products onto the world market thus drives local farmers into bankruptcy. This is the very vision of agriculture that the concept of food sovereignty challenges. Not only does this practice constitute a grave injustice, it contributes to the decline in food production and to the increase of hunger, and at the same time creates mass unemployment for millions of people. Food sovereignty stipulates the right of peoples to protect themselves against dumping through protective tariffs, to retain the capacity of receiving remunerative prices for their products and so remain masters of their own way of life.

The *principle of ecological sustainability* (who can best produce healthy food without destroying the environment?):

The present system of industrial monocultures is economically efficient and profitable. Yet, for the environment it is a disaster. Biodiversity and the nutritional value of the food are reduced. The destruction of the environment for the sake of profits destroys the irreplaceable richness of animal and plant life for future generations, and is thus a crime against them. Food sovereignty favours food production through family units who produce healthy food in respect of natural processes.

Another Vision of Life, Society, and The World:

Economic models are based on ideas and a vision of human nature, of the role of society, and of the purpose of creation. The present economic philosophy sees human beings mainly as producers and consumers. The social dimension which used to be part of the 'social market-economy' is gradually eliminated. The long-term ecological cost of our way of producing, transporting, and selling our goods is completely neglected. Food sovereignty wants to come back to a holistic view of the world and integrate the different dimensions that make up our reality. Economic activities have consequences for social relations and the environment that have to be considered.

33.2.3 Survival Strategies and Livelihood

The scientific modernization theories¹⁴, the economic recipes of the neoliberal ‘Chicago School’¹⁵, and the ‘Washington Consensus’¹⁶ offered by Northern theoreticians that have been implemented by many development agencies and *international financial institutions* (IFIs), especially by the Bretton Woods organizations (WB, IMF, IFC), have failed to achieve their goals in many parts of Africa, Asia, and Latin America. The implementation of these theories by governments in Latin America is reflected in three lost decades of development, while the policies have failed to eradicate poverty and to overcome hunger. In many cases these neoliberal concepts have worsened the situation of the rural and urban poor who still experience undernourishment with all the negative human, social, economic, and cultural effects.

Due to the low income of the marginalized poor as a result of underdevelopment, economic crises, the increase of productive costs and chemical inputs, the rise of prices for basic products when crop prices collapsed, erosion of soils and scarcity as well as pollution of water, the peasants started in Latin America in the 1950’s to migrate massively to big towns. In marginal slums, they have lived with *survival strategies* (box 33.4) that are defined by Diego Palma as “a sum of initiatives able to complement the salary in terms of the reproduction of their labour force” (Palma 1986: 28). Nevertheless, the origin of the concept started with Duque and Pastrana (1973) when they described the situation of rural migrants invading urban marginal land in Chile, and started to create their new livelihood. Susana Torado included in the concept “the procreation of family life cycle and labour migrations” and named them “strategies of family life” (nd: 2), a term that was amplified by the group of Quito as “strategies of existence” (PISPAL 1978).

Thus, ‘survival strategies’ were consolidated in the socio-economic crises of Latin America, when in the

1970’s the models of capital accumulation and of import substitution as post-war strategies were exhausted and the neoliberal globalization process was reinforced. On 11 September 1973, Chile experienced first with the military coup the neoliberal imposition of the Chicago school. Argentina followed with a military coup in 1975, and many other countries in South and Central America experienced this regressive globalization combined with repression and impoverishment of large social groups.

Mexico (like Venezuela and Ecuador) seemed to be exempted from these repressive coups due to its richness in hydrocarbons, however, with the fall in oil prices, and a corrupt financial management of the governments (oil rent), elites were unable to consolidate and distribute profits, and thus crashed the ‘Mexican wonder’. Confronted with the incapacity to pay the debt service, the IMF imposed its structural adjustment policies (SAP, see figure 33. 1).

From Mexico the crisis spread all over LA, Africa, and to several Asian countries. The affected nations were obliged though draconic policies to pay back at any cost their debts, and as a consequence public support and subsidies were drastically reduced. The adjustment costs of this failed policy were transferred to the workers and peasants, and later to the middle classes, which resulted in massive unemployment, loss of *purchase power*, increasing prices of the basic food basket, the elimination of controlled prices in basic products, a growing monopoly in the trade system, and a reduced purchase power parity (PPP) (Castillo 1991; Oswald 1991; Calva 2003, 2008a; Strahm/Oswald 1990). Keynes’ limited ‘welfare state’ collapsed. Without governmental support and high inflation, only complex survival strategies integrating the whole family were able to compensate for the loss of PPP. Poverty doubled in LA¹⁷ and the structural inequality avoided an improvement for poor people (CEPAL 2005)..

Without governmental support, during this crisis situation traditional networks broke apart and women above all organized themselves to survive. After an illegal occupation of risky land in urban marginal areas, they built shelters from precarious materials (waste), picked up from landfills (Schteingart 2006; Cantú 2003; De Mattos 2003). Chronic unemployment and missing opportunities for cash obliged them to get temporary precarious jobs. Simultaneously, they sold any unnecessary goods and borrowed from family

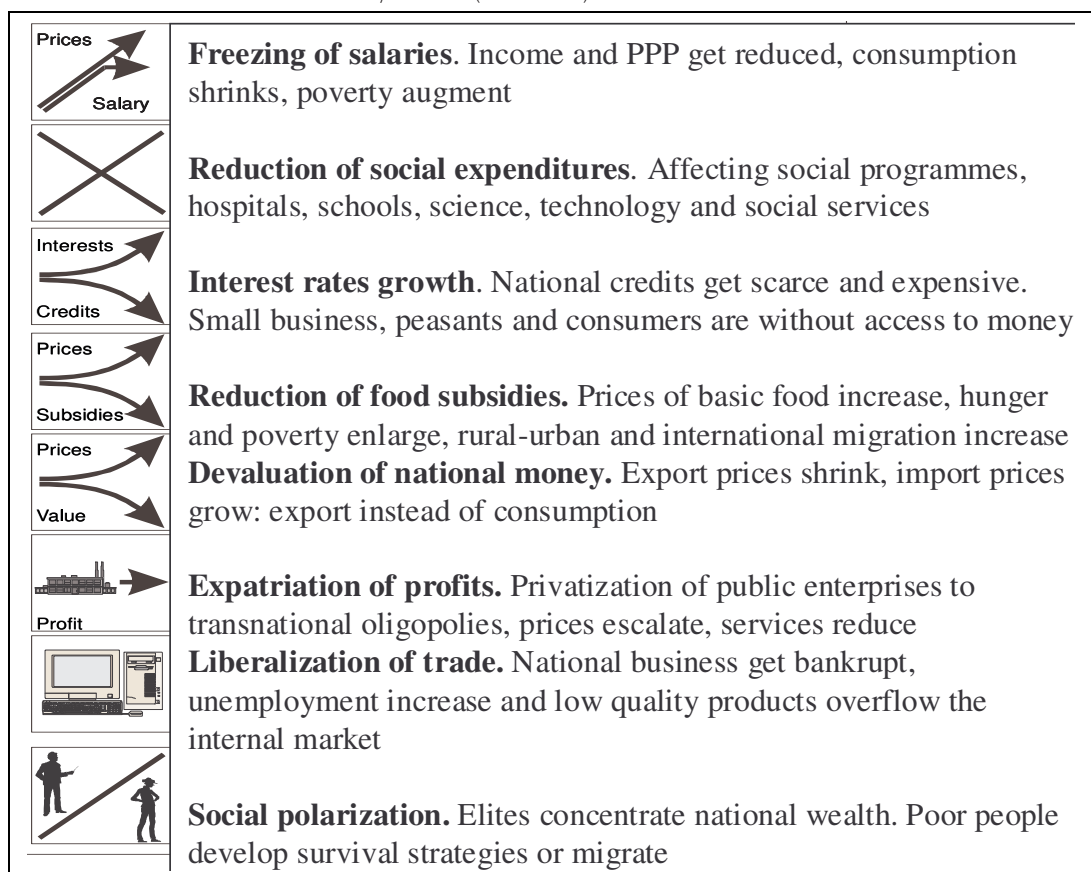
14 See references to the modernization theories and its critics in South (*dependencia*: Dos Santos 1978) and North (Sader 2005; Oswald 2008b; Shiva 2008; Saxe 2008; Dos Santos 1995; Mies 1998; Senghaas 1973).

15 See reference to Milton Friedman and the ‘Chicago school’ and its major critics (Calva 2008; Dabat 1994; Dos Santos 1993; Saxe 1999; Strahm/Oswald 1990; Omán 1994)

16 See references to the major intellectual representatives and their major critics (Calva 2003, 2008a; Dos Santos 1995; Sen 1995; Held/McGrew/Goldblatt/Parraton 1999).

17 See: Silvia Van Dijk, 2007: *Proposal for PhD Thesis*, Mexico, D.F.: University of Mexico City.

Figure 33.1: Conditions of the Structural Adjustment Policy (SAP) of the IMF for Debt Repayment in Developing Countries. **Source:** Strahm/Oswald (1990: 130).



members, neighbours, and from the corner shop. Soon, these possibilities disappeared due to the persistence of economic crisis, and food became scarce. Then, e.g. in Mexico City (Oswald 1991), women organized themselves, picking up half-perished products from the garbage of the central market and transformed these products into food in collective popular kitchens

Collective community work (kitchen, child rearing, pressure on public functionaries) was organized through a system of rotation. United, they fought for basic services (electricity, water, roads, security, health and community centres; Rosiques 2003) and the legalization of land and services. Due to lacking cash and jobs, they struggled also for public subsidies and poverty alleviation programmes (Ramírez 1991). Besides all these activities, women still found time for some temporary paid work as domestics, washing or ironing; others generated services, handicrafts, food selling, etc. to be able to maintain their families. Children, grandparents, and sometimes husbands supported these complex strategies, where poverty of

time was the highest cost paid by women (Damian 2002).

Furthermore, these popular colonies have not only been hazard-prone but also exposed to organized crime and gangs. Thus, only a strong social organization permitted them to fight against public insecurity, where often the police was involved in illegal activities. The sum of these complex actions empowered women, and therefore they were also able to fight against interfamilial violence. As a result these women were often abandoned by their partner, and as heads of household they had to struggle for the future of their children (INEGI 2005).

After a decade of intensive mobilization and organization, most of these quarters achieved some social and economic consolidation (Oswald 1991, 2007b), and their living conditions and livelihood improved. When they have been confronted with chronic unemployment, they integrated their micro-businesses vertically and horizontally (Cadena 2005) with popular savings banks, collective childhood, pre-

Box 33.4: Major survival strategies. **Source:** Oswald (1991, 2007b, 2008a).

These manifold survival strategies may be synthesized in the following scheme:

1. Massive rural migration to urban slums
2. Illegal occupation of marginal and risky land
3. Construction of shelter with precarious materials from waste
4. Chronic unemployment of men and lack of cash
5. Selling unnecessary goods
6. Credits from family members, neighbours, and local shops
7. Economic crises deepened and food became scarce
8. Collection of perished fruit and vegetables
9. Collective popular kitchen
10. Rotation of women in collective community work (kitchen, child rearing, paid jobs)
11. Common struggle for basic services (electricity, water, access, community centre)
12. Communal organization for the legalization of land and services
13. Struggle for public subsidies and poverty alleviation programmes
14. Temporary paid work
15. Multiple informal activities: services, handicraft, food, washing, ironing, services, prostitution
16. Social organization against organized crime and gangs
17. Empowerment and fight against interfamilial violence
18. Social and economic consolidation of the neighbourhood and the families
19. Horizontal and vertical integration of micro-business chains with micro-credit and technical improvements, enclosed under the term 'economy of solidarity' or 'social economy'.

school attention, and collective sale of handicrafts.¹⁸ These are some of the alternatives to avoid perverse poverty and to improve their quality of life. .

In India, Bangladesh and Africa similar processes of survival strategies took place, all of them replete with criticism of the imposed liberal modernization and globalization process. "Over the past two decades every issue ... what the industrial economy calls 'growth' is really a form of theft from nature and people" (Shiva 2000: 1). After the slogan in Seattle "No new round, turnaround", she added that the real challenge is to "turn the rules of globalization and free trade around, and make trade subservient to higher values of the protection of the earth and people's livelihood" (Shiva 2000: 127). The future of the three billion impoverished people in the world lies on small farms, peasant and marginal urban livelihood, able to produce safe and culturally accepted food. This productive process is neither marginalized nor criminalized, and food sovereignty is a secure basis for regional sovereignty.

18 After five decades of development and the creation of multilateral organizations of the UN such as the FAO (Food and Agriculture Organization), WHO (World Health Organization), UNDP (UN Program of Development), UNICEF (UN Fund for Children) and UNIFEM (UN Fund for Women) among others, the achieved results are limited. Goals proposed were several times reduced, despite enormous advances in Science and Technology (S&T). During the 1980's, 35,000 died daily, a decade earlier the number was 41,000, and today the estimate is about 24,000 persons, above all children.

33.3 The State of Art of Food Security

There exists a vicious circle linking hunger and undernourishment with poverty and ignorance (figure 33.2).

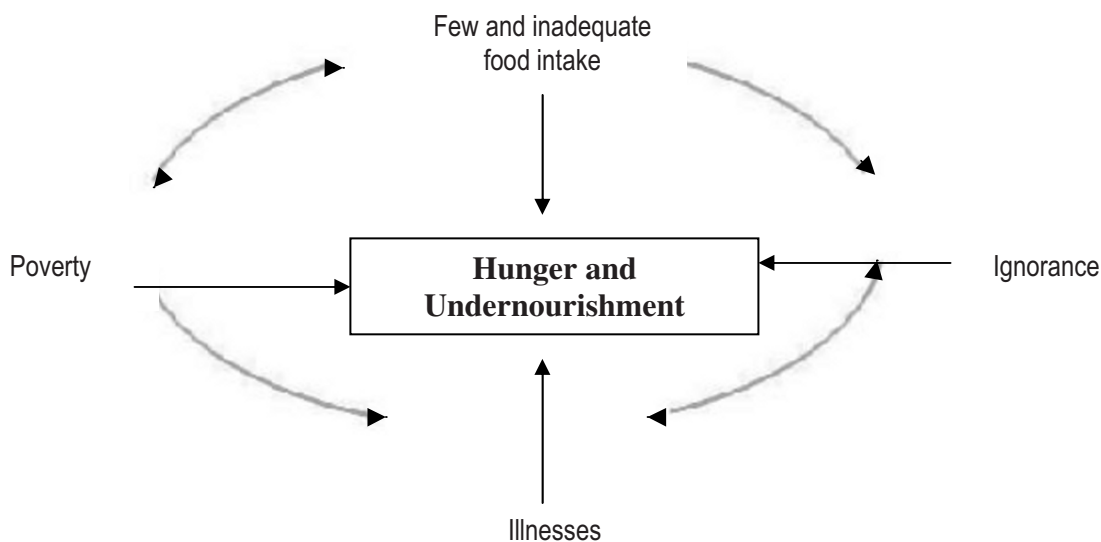
These authors analysed the food transition in the Mexican diet from traditional corn and bean intake to a modern food pattern that is rich in carbohydrates, fat and sugar, thus inducing illnesses, excess of weight, and hypertension which starts in the womb of mothers, creating chronic malnutrition and later obesity and associated epidemics. This phenomenon exists worldwide and has contributed to a deterioration of food, livelihood, and health security.

Thus, hunger is a complex interrelation where poverty is reinforced by ignorance and propaganda in the mass media, inducing people to buy junk food with their scarce money. Unhealthy food creates further health problems above all for children, limiting their brain and bone development and adversely creating modern illnesses and degenerative processes from childhood on.

33.3.1 The World

One billion persons suffer from hunger and undernourishment. Daily 24,000 persons die as a consequence of hunger; three quarters of them are children below five years. Furthermore, in half of the deaths among the 150 million undernourished children, malnutrition is the main cause. Between 1990 and 2003 undernourishment in children increased from 29 to 37 million, and only in East Asia hunger was reduced from 24 to 10 million (UN 2005a)¹⁹.

Figure 33.2: Vicious circle of hunger, undernourishment, poverty, and ignorance. **Source:** Chávez/Ávila/Shamah (2007: 208).



The FAO (2005a) estimated that there are still 468 million people suffering from hunger in poor countries, implying a loss of GDP of 30 billion dollars/year. Chronic infant undernourishment linked to a lack of iron and iodine reduces the intellectual capacity of infants by 10 to 15 per cent. Combining protein-calorie insufficiency with missing micro elements, the economic loss in poor countries affects 5 to 10 per cent of their GDP, equivalent to 500 bd/year. Regions threatened by war and internal conflicts are responsible for 10 per cent of deaths limited by famine. Nevertheless, malnutrition is basically concentrated in rural areas of poor countries and increasingly chronic undernourishment is present in urban slums, affecting also industrialized countries²⁰.

The global demand of food is estimated to increase between 70 to 85 per cent between 2000 and

2050, and simultaneously an increase of irrigation water of 15 to 35 per cent is estimated, due to an unsustainable management of aquifers. Water withdrawal is regionally limited and it will affect regions that have already today overexploited its reserves. This refers also to areas with high population growth and countries such as India, the south of the USA, and northern Mexico, Peru, to the south-east of Australia, to North Africa, Spain, the Sahel region, the Nile basin, East Africa, South Africa, Central Asia, the south of China, Pakistan and Mongolia (Millennium Ecosystem Assessment 2005). Thus, the future of food production increase is limited due to the availability of water, desertification processes, and loss of soil fertility, but also due to growing food prices since 2006 because of the promotion of biofuels. The trend towards an increasing undernourishment may grow when natural, population, and economic factors together become more urgent (figure 33.3).

In 1996, in countries with a high *human development index* (HDI) the intake was 3,347 calories (11.6 per cent more than in 1976) and 102.7 g of proteins (a 13 per cent increase); in countries with a medium HDI the intake was 2,696 calories (26.9 per cent increase) and 69.6 g of proteins (33.7 per cent increase) and in countries with low HDI the intake was 2,145 calories (1 per cent less) and 51.0 g of proteins (4.4 per cent less). Another indicator of life quality is the birth weight. In industrialized countries in 1997 seven per cent of babies had low weight, 17 per cent in countries with medium development and 20 per cent with low HDI (UNDP 1999: 172–175). According to UNDP

19 During three decades of crises, the popular sector of Mexico lost 80 per cent of its PPP and the relation of wealth between capital/work of GDP increase from 50 per cent to 85 per cent in favour of capital (Bank of Mexico 2006). This process reduced the workers' capacity to negotiate labour conditions and salaries, and the survival problems pulverized the labour struggles of a whole favor of capital.

20 In 1999, when on 1 June the rally against hunger started in the US, 31 million US citizens (12 million children) were exposed to food insecurity, meaning, they suffered from hunger or did not know how to get their next food. Hunger increased in African countries affected by war, but also in East and South Asia, and an increase of 23 million in Latin America.

Figure 33.3: Food Production, Prices, and Undernourishment. Globally an estimated 852 million people were undernourished in 2000-2002, up 37 million from the period 1997-1999. Only undernourishment in poor countries is plotted here. **Source:** FAOSTATS Millenium Ecosystem Assessment. This map is in the public domain.

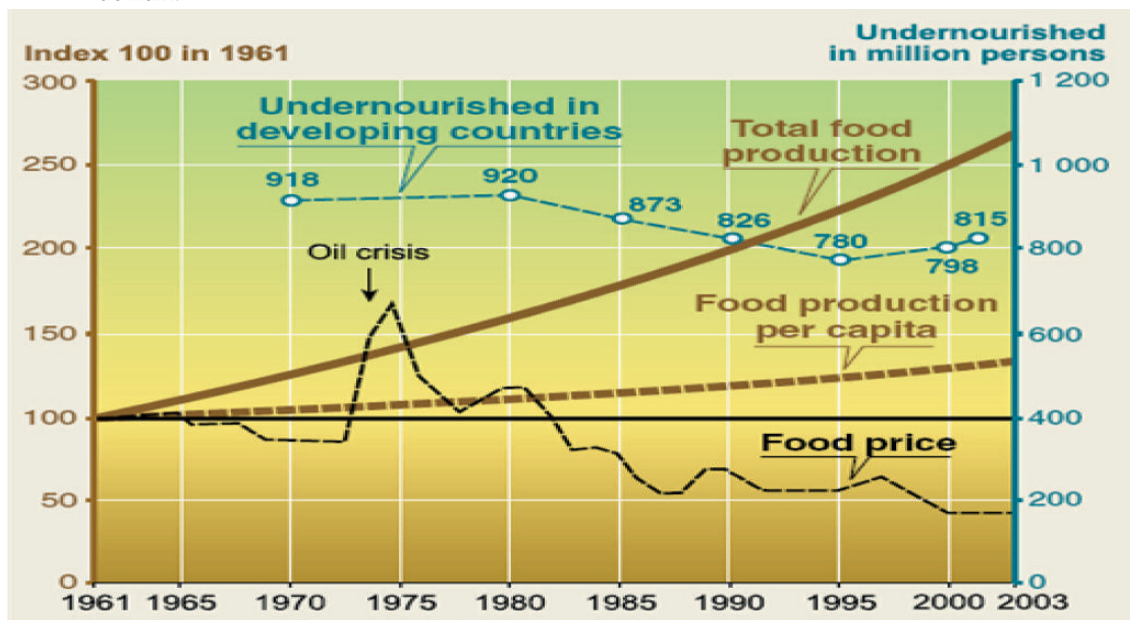
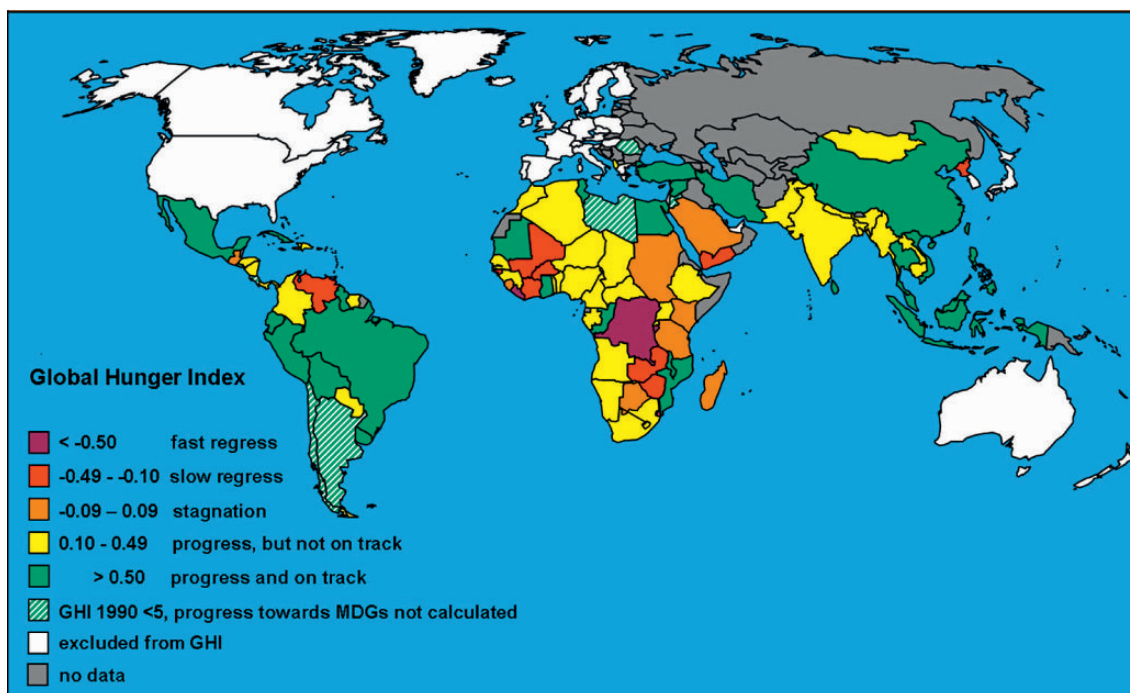


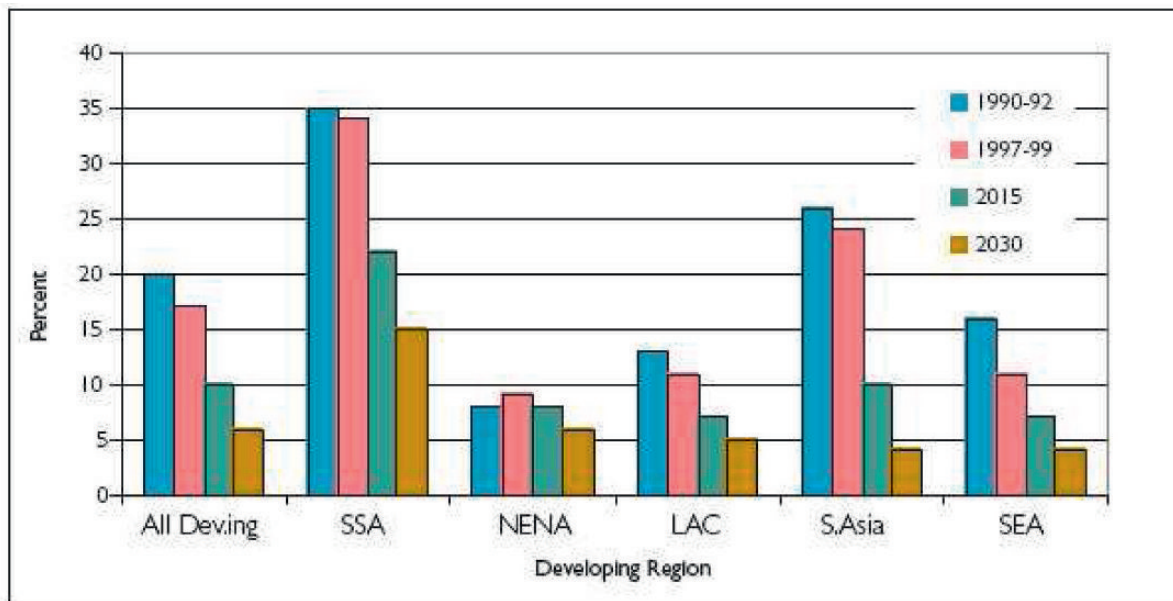
Figure 33.4: The Global Hunger Index Progress towards the MDGs. **Source:** IFPRI (2007). The map is in the public domain; at: <<http://www.ifpri.org/media/20071012GHI/GHIMap07hr.jpg>>.



(2006), still 46.8 per cent of children below 5 years were undernourished in poor countries and 14.7 per cent in medium HDI countries. These processes are

expressed in the Hunger Index summarized referred to in figure 34.4

Figure 33.5: Proportion of Undernourished in Developing Regions. Actual and FAO Baseline Projections. **Source:** FAO/IFAD/WFP (2002: 9).



¹ Legend: SSA: Sub-Saharan Africa; NENA: Near east and North Africa; LAC: Latin America and the Caribbean; S.Asia: South Asia; SEA: East and Southeast Asia.

Furthermore, regional and social differences exist (figure 33.4). Food production has augmented, but at the same time poverty, hunger, and preventive illnesses (HIV/AIDS) increased in several countries, above all in *Sub-Saharan Africa* (SSA). This region has at its disposal today 20 per cent less food than 25 years ago, despite the population increase (UNDP 1998, 1999, 2000, 2001). The SSA countries produced between 2002 and 2003 about 22.89 million tons of cereals; a small increase compared with the 21.55 mt of the previous year. This production is insufficient to feed the population and 15.2 million people are threatened by famine or require international food support (figure 33.5). Causes are complex: in the former grain reserve of the region in Zimbabwe a corrupt government rules; in Congo a civil war is ongoing; and Namibia is confronted with a severe desertification process. In general, severe droughts and disasters have affected food production in many countries, but also the international trade rules are unequal for Africa (Turner 2003).

In SSA the fifth poorest segment of the population obtained only 72 per cent of nutritional requirements, in Latin America 78 per cent, and in the recent independent countries of the former USSR, 80 per cent. The gap among and within countries in Africa and Asia is increasing, and only the fifth wealthiest

will get their nutritional requirements in the near future. These negative results are reinforced by the present policy of cash crops, the food production, and the policy of biofuel controlled by multinational enterprises (MNE).

Tajikistan and probably Azerbaijan will lose their food security without armed conflicts, but the food situation can get worse in the event of political destabilization (chap. 34 by Salih). In sum, with the estimated population growth in poor countries and the present policy of food as a commodity, poor countries will be highly affected by the change of food patterns, and therefore more exposed to hunger and famine. These processes are reinforced by propaganda, where occidental introduced values of food patterns are taking away the few resources able to offer healthy food to poor people.

With a global population of more than 6.5 billion inhabitants, more than one sixth in 70 countries are suffering from hunger (USDA 2005). Natural factors such as loss of fertile soils, salinization of coastal areas and deltas, intrusion of salty water into coastal aquifers, and greater droughts will increase food vulnerability in countries that are today food insecure. These processes will be aggravated by climate change and more frequent hazards.

Table 33.1: Models of World Global Food Consumption by Social Classes. **Source:** Lang/Heaseman (2004 or 2005: 195), modified by Oswald.

Category of consumption	High	Medium	Poor
Diet of social class	1.5 billion people: meat, packed food, bottled drinks	3 billion: grain, clean water	1.8 billion: insufficient grain, polluted water
Transportation	Private cars, planes	Bicycles, buses, cars	Walking, public transportation
Origin of food	Food from far away, supermarkets, shops of specialties, delicatessen	Some food from outside, local shops and markets	Local food, local shops and markets
Materials	Throw away	Durable	Local biomass
Goals	Wide with global horizons	Sufficient, regional horizons	Limited or missing local horizons
Fuels	Gas, gasoline, kerosene	Gasoline, gas	Wood, excrement, organic waste
Environmental Impact	High	Considerable	Low

33.3.1.1 Food Prices and Trade

The export of primary commodities from the poor countries to the world market equals that of 1980, representing 26 per cent of the global trade. Nevertheless, the imports grew from 28 per cent in 1970 to 37 per cent in 1997. The net food imports in the poorest countries have increased by about 50 per cent between 1980 and 1997 (a rise from US\$ 3.9 to US\$ 6 billion). The increase in 19 medium income countries was 40 per cent (from US\$ 9.3 to US\$ 13; see: Kwa 2003: 24). Food distribution is another unequal issue (Sen 1995). Globally, one fifth of the world population has access to 86 per cent of world consumption, compared with the poorest 20 per cent that obtain 1.3 per cent, and consumption in rich countries is still rising.

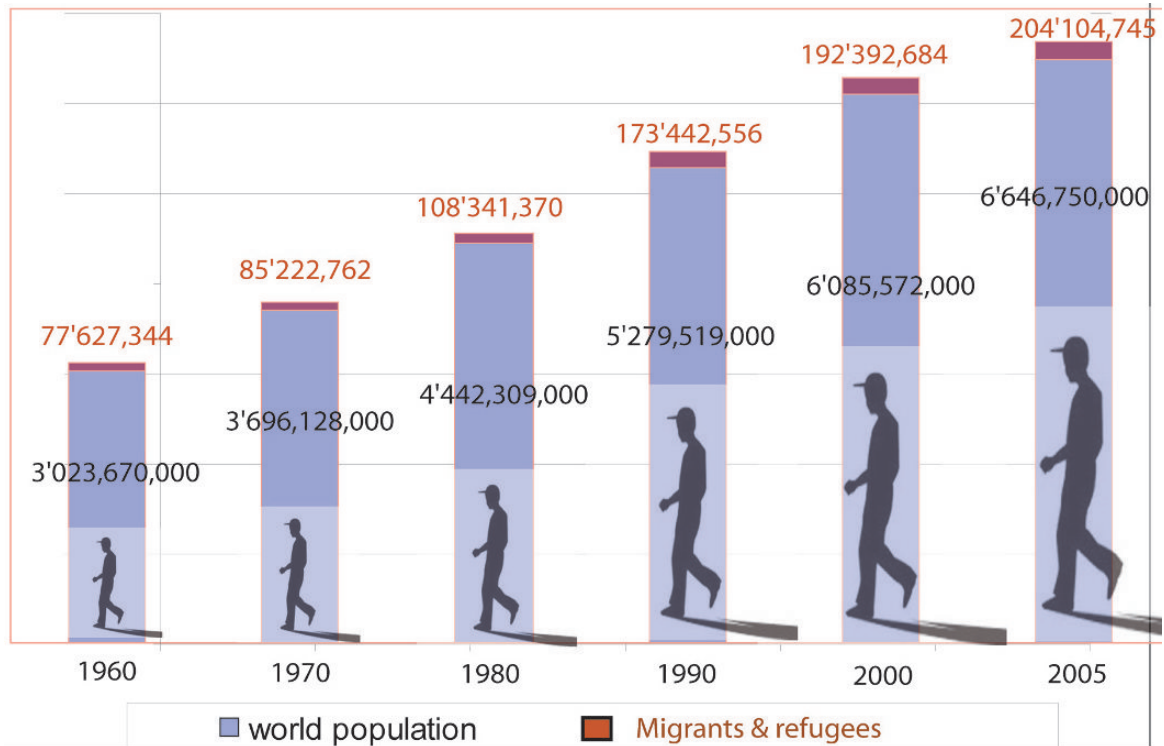
These data show the concentration of food in industrialized countries and a situation of increasing hunger in the poorest nations as a result of missing money, unemployment, low prices for prime material, unjust terms of trade and trade system, low salaries, population growth and corrupt governments, but also missing land and production means for the poorest. Especially women and girls belong to the group of highly vulnerable persons, and are affected by this perverse poverty.²¹ The sum of these factors prevents rural people from getting sufficient food to overcome hunger, and thus many are forced to migrate to slums in cities where environmental, social, and economic deterioration affects again the most vulnerable (Villarreal 2003; Scheitingart 2006).

33.3.1.2 Food Aid and Internal Gaps

During 1996/97, 66 low income countries required 8.5 million tons (mt) of grain from food aid, and in 1998 it increased to 11 mt. The USDA estimated that this aid covered 85 per cent of the projected needs, and the minimal nutritional requirements are 17.6 mt. The FAO (2005b) calculated that the food deficit will grow in 2008, and with the same minimal ingestions, per capita insufficiency will increase by 80 per cent to 19.8 mt, while nutritional deficiency will rise by 65 per cent to 28.4 mt. As a result, 35 poor countries will experience food shortage and 47 countries more must reduce food intake. This implies new subsidies for food surpluses and a greater food power for exporting countries (USA, Canada, EU, Australia). This power is based on highly subsidized prices affecting poor countries and their rural people. TNE obtain a

21 Extreme poverty is better characterized as 'perverse poverty' (Oswald 1990). The perversity lies in the fact that a child before being born, is condemned already to becoming a second class citizen due to brain damage, caused by chronic undernourishment and having an anaemic mother. Later, the child enters into the 'Valley of Death' between 1 and 2½ years of age, because of its fragile immune system. If they survive despite chronic hunger, often the growth, intellectual improvement, and motricity of the child is seriously damaged. During the first year of life a child requires 80 per cent of the nutrients for brain development and growth. Malnutrition causes irreversible intellectual and physical damage. Besides the small size, there are problems for logical learning, altered micro-motricity, and slow reactions.

Figure 33.6: International migrants and refugees (1960-2005). **Source:** UN (2006); at: <<http://esa.un.org/migration/>> (15 October 2006).



major part of these subsidies, and Gorelick (2000) estimated that profits obtained by big companies in the USA in form of subsidies and external support amount to US\$ 2.4 billion dollars, without including environmental costs or health damages. Vandana Shiva (2003) calculated that each kilogramme of food consumed in the USA travels 1,500 miles, generating 10 kg of CO₂, thus contributing to global warming.

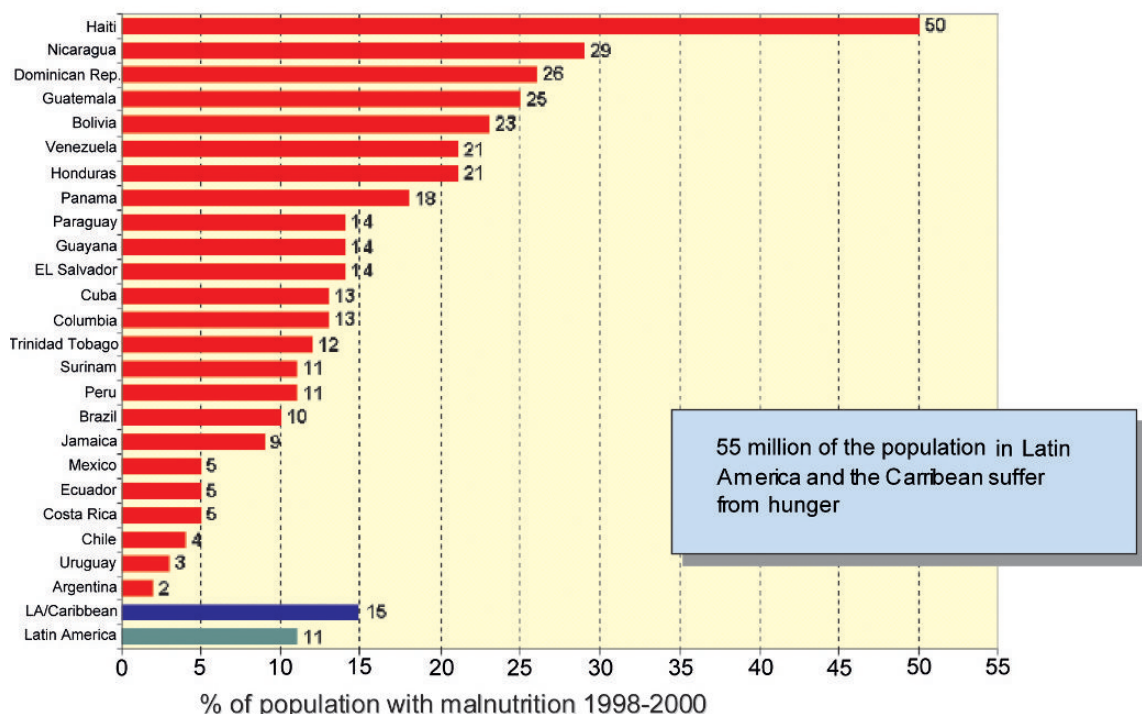
These structural inequalities create worldwide prototypes of food consumption, depending on economic possibilities (see table 33.1). It represents a kind of schizophrenic behaviour of upper classes that are damaging to the global environment (see chap. 59 by Dalby/Brauch/Oswald) and their personal health, with their inadequate food intake (Murray/López 1996).²² Middle classes are becoming aware of their health and consume more locally produced organic food, but they also buy fruit and vegetables from outside. The lower classes struggle not only for their food survival, but also for drinking water and other basic services. These social groups create the lowest environmental impact.

This global food pattern is the result of complex and multicausal processes, where local and global activities get negatively reinforced, and where *Free Trade Agreements* (FTA), indiscriminate openness of

agricultural markets in the South, SAP imposed by IMF (Strahm/Oswald 1990; Stiglitz 2002), failed policies by the World Bank (mega-projects of dams and irrigations districts, and modernization of agriculture in hands of agribusiness) have created hunger. This critical situation worsened due to subsidies for agricultural products by industrialized countries, corrupt national governments, and local elites²³, financial monopolies, exports of prime materials at international prices below production costs, debt payments, bank rescues, patriarchal structure inside families and society, lack of peasant support also for organic agriculture, and low agricultural wages. With deteriorated and marginal land, polluted resources and high prices

22 In 2003 more than 40 billion dollars were spent for food advertisements, what is equivalent to 70 per cent of the GDP of poor nations. For each dollar spent by WHO to heal damages caused by inadequate food intake, more than \$500 were spent to support these diets. Three quarter are oriented to promote junk food, empty calories, and a high level of sugar and low nutrients. In Eastern Europe 60 per cent of investment in foreign food are oriented to sweets, jam, and bubble water, and only 10 per cent of food expenses were used for fruit and vegetables (Dalmenry/Hanna/Lobstein 2003).

Figure 33.7: Undernourished Population in Latin America and in the Caribbean. Percentage of Population with Malnutrition (1998-2000). **Source:** The estimates by CEPAL (2004) are based on FAO data.



a) Simple average of 24 countries; b) Statistical weighted average of 24 countries

for agricultural inputs, most peasants are obliged to leave their community and migrate to megacities, and illegally to industrialized countries in search of a livelihood (figure 33.6). The increasing data on migration

and refugees reflect the deep rural crises worldwide (Negrete/Ruiz 1991), affecting the most sustainable and productive food system in the world, i.e. of the peasants (Barraclough 1995; 1995a) thereby transferring food security to transnational agribusiness. All these factors have forced important rural groups to migrate to megacities or leave their country, confronted with a 'survival dilemma' (Brauch 2008c).

Natural disasters and armed conflicts have further accelerated this flight, and in 2005 there were an estimated 37 million environmentally-induced migrants or displaced people (UN 2005a; see figure 33.5; see chap. 15 by Wisner; chap. 18 by Bogardi/Birkmann/Gebert/Setiadi and chap. 19 by Ahmed). Kofi Annan (2005) referred to one billion environmental refugees due to desertification, water scarcity, and soil depletion.

33.3.2 Latin America

The repercussions of the failed development policies in Latin America are affecting vulnerable groups, especially indigenous and rural children, the elderly, and women. The causes of chronic hunger in the most biodiverse countries of the world are complex and are directly related to the unequal income distribution,

23 An aggravating phenomenon for food insecurity is social inequality. Latin America is the region with the highest social gaps. This is a result of the appropriation of surplus by the military, political and economic elites, using repression, in alliance with transnational capital, The Catholic Church and the mass media were instrumental in creating a clientelist and corporative model of government. CEPAL (2004, 2007) compared the economic growth between 1960 and 1980 of 5.5 per cent/year with that of the neo-liberal phase from 1980 to 2000 of 2 per cent when the IMF applied SAP programmes, consolidating the exclusive model of development (UNDP 1990-2005). Most affected by these developments were peasants and indigenous people during these crises years, which were often pushed from their land and natural resources by TNE that imposed a model of capital intensive production when the country had enough human power. As a model of this unsustainable agribusiness a modern chicken farm must produce yearly about 240,000 birds. After paying credit and inputs to the TNE "this prodigious (and inhuman) production left the farmer only US\$12,000, or five cents/bird" (Gorelick 2000: 5).

and as mentioned above as a result of failed policies. In 2007, still 55 million Latinos have suffered from hunger (figure 33.7), affecting particularly the conflict prone regions, such as Haiti and Central America. Several economic crises have concentrated income during 2000 to 2004 in Argentina, Colombia, Panama, Ecuador, Venezuela, Uruguay and Costa Rica, thus increasing the number of poor people. Countries with higher levels of undernourishment are simultaneously affected by political instability or are recovering from civil wars, such as Haiti, Guatemala, Honduras, Bolivia, Peru, Nicaragua, El Salvador, Guyana, and Mexico from a severe economic crisis.

In terms of food intake 50 per cent of the population in Haiti lack basic food; 20–30 per cent in Nicaragua, the Dominican Republic, Guatemala, Bolivia, Venezuela, Honduras; 10–20 per cent in Panama, El Salvador, Guyana, Cuba, Colombia, Peru, Suriname, Brazil, Paraguay, and Trinidad & Tobago (CEPAL 2004). During the last few years, specific governmental programmes have improved the situation of nutrition in El Salvador, Venezuela, Guatemala, Mexico, Argentina and Nicaragua (CEPAL 2004), and recent efforts of integral food programmes (zero hunger) were implemented in Brazil, Venezuela, and Bolivia (CEPAL 2006).

33.3.3 Mexico

Mexico is one of the most unequal countries, with the richest man in the world (Forbes, 10 August 2007). During the 1980's its model of import substitution and stable development was replaced by a neoliberal globalization process (Klein/Fontan/Tremblay 2003). After joining NAFTA in 1994, the effects in rural areas and for the peasant economy were disastrous. The wealth has been even more concentrated (table 33.2).

Table 33.2: Social Vulnerability and Internal Gaps in Wealth and Income in Mexico. **Source:** INEGI (2005) and Bank of Mexico (2004).

Concept	% of population	% of national wealth	% of financial savings
Very rich	0.23	40.3	78.0
Poor	52.7	18.4	10.0

The effects of free trade, promoted by business monopolies, and the rapid openness by government without compensatory processes permitted an evaluation a decade later. The results are complex: economic

growth was below one per cent; the employment policy was unable to offer to more than one million young people a job and the new employments are precarious, without social protection, and with 'white' trade union leaderships that are favouring enterprises. About half of the labour force is (self-) employed in the informal, often illegal sector, salaries declined by 60 per cent since 1982 and during a decade of NAFTA by 23 per cent. The indigenous and peasant economy is in crisis with half of the 80 per cent of poor people living in perverse poverty. More than one million peasants have left agriculture since the signing of NAFTA, and poverty is affecting half of the population (Wise 2003; Nadal/Wise 2004; Ackerman 2005; Calo/Wise 2005).

Half of Mexican children suffer anaemia and 56 per cent of the indigenous children are severely undernourished²⁴ (INNSZ 2005). The indicator of municipal nutritional risk with 14 variables indicates that 70 per cent of the municipalities in the rural areas with a population of 30 per cent have severe undernourishment as a result of regional and social inequality (figures 33.8 and 33.9). The severe undernourishment hardly declined since 1989 due to inflation and economic crises, while the concentration of wealth owned by a tiny elite has increased dramatically.

Women have developed survival strategies for their children and elders, and often they have to pay the debt for the illegal crossing of their husbands. Also feminization of agriculture rose to 35 per cent (INEGI 2006). Food imports affect both countries: the USA due to pollution of agrochemicals to raise yield productivity, and Mexico due to payment of US\$ 72 billion for food importation and job creation in a foreign country (INEGI 2005). Only a small elite representing 0.23 per cent of the population benefits from this type of modern rape capitalism, owning 40.3 per cent of national wealth and 78 per cent of financial savings (table 33.2).

Nevertheless, these global data do not reflect the existing regional disparities. Table 33.3 explains the

24 The indigenous population is especially marginalized. Only 20 per cent have water connections in their houses, 17.2 per cent have no electricity, 31.3 per cent have no schools; 19.9 per cent of men and 12.3 per cent of women have only a basic education, and only 8.1 per cent live more than 65 years. Mexico has a rich cultural diversity with 85 indigenous languages, where Náhuatl, Maya, Mixteco and Zapoteco represent 51.4 per cent. Nevertheless, languages such as Cucapa, Papago and Kilwa are spoken by less than 500 persons and are on the verge of disappearing (INEGI 2000, 2003).

Figure 33.8: Comparison of national surveys on food, nutritional stage of children below 5 years of age, measuring size and weight in relationship to age. **Source:** National Nutritional Survey (INNSZ 1974, 1979, 1989, 1996).

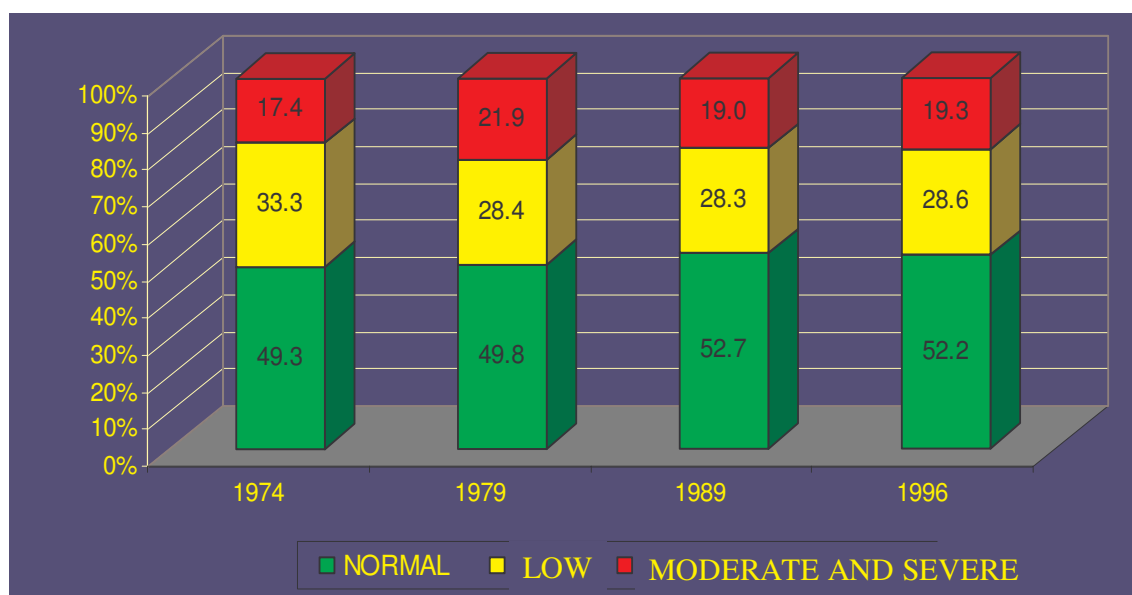


Table 33.3: Nutritional Priority in 2,443 Municipalities in Mexico. **Source:** Chávez/ Ávila/Shamana (2006); based on the National Survey of Nutrition (INNSZ 2005).

Level of marginalization	Municipalities		Level of under-nourishment	Low size/children		Affected municipalities
	Number	%		number	%	
Very low	247	10.1	Very high	50	100	222
Low	417	17.1	High	40	49.9	510
Medium	486	20.0	Medium	30	39.9	365
High	906	37.9	Low	20	29.9	737
Very high	387	15.8	Very Low	10	19.9	369
Total	2,443	100.0	Without priority	0	9.9	240

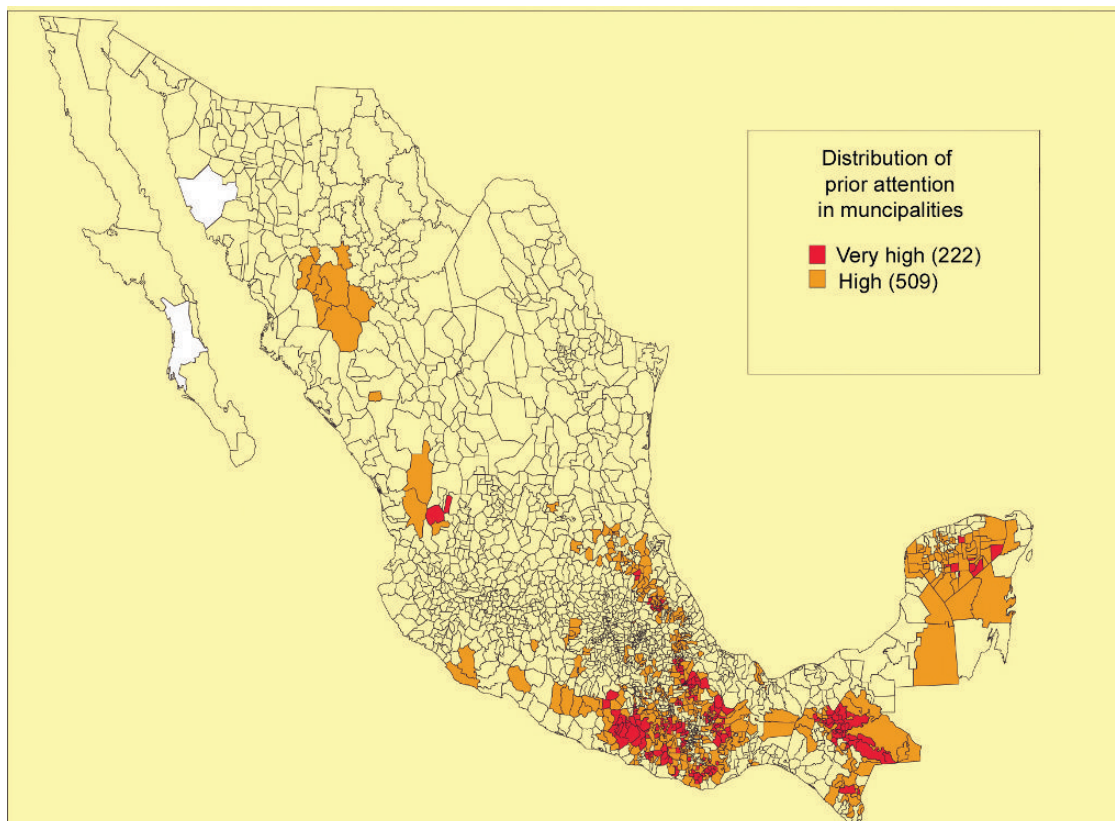
level of marginality of Mexican municipalities where 54 per cent have high levels of poverty. This marginality is directly linked to hunger and low school achievement, mortgaging the future of indigenous and peasant children. There is also a direct relationship among a high level of undernourishment, low size or weight for children under 5 years, with low income in rural marginal municipalities.

Marginality and undernourishment are geographically located in the south of Mexico, where poor peasant and indigenous survive, and also in some indigenous municipalities in the north (figure 33.10). In the last survey on nutrition (2005), the northern states had improved their food access (except the indigenous Tamaulipas) and the traditional poor states in the south, Chiapas, Oaxaca, Guerrero, Veracruz, Yucatán, Hidalgo, Puebla and Campeche, are getting worse

(INNSZ 2005). Regional inequalities are often triggered by internal and interfamilial social and gender discrimination. These processes further aggravate the existing perverse poverty among the most vulnerable within poor families.

The food perspectives for the future are uncertain, and will most likely get worse due to the massive use of corn and oil seeds for biofuel. Furthermore, confronted with climate change, disasters and greater drought, Mexico must take its food security problem seriously, especially if the USA and Canada that presently provide more than 16 million tons of basic grain should become food insecure. Therefore, the term of 'food power', created in 1972 by Henry Kissinger, may generate structural instability, migration, and social riots (figure 33.6).

Figure 33.9: Map of municipalities in Mexico with high and very high needs for nutritional attention. **Source:** Chávez/Ávila/Samanah (2007), based on the National Survey of Nutrition (2005).



Based on global and regional scenarios on temperature rise, precipitation, decline in groundwater, and hydro-meteorological disasters, together with biofuel from cereals, the worldwide supply of basic grain will be reduced drastically. In 2007, still half of the people live in regions with a low level of underground water, including the three large grain producers: China, India, and the USA. Countries such as Mexico, Iran, Israel, Pakistan, Saudi Arabia, Jordan, and Yemen are overexploiting their aquifers and limiting alternatives for the future. Due to projected water scarcity in the next 25 years, cheap grain will disappear from the world market and only very few countries will be able to improve their agricultural production due to climate change. In 2005, the world market price of rice, highly vulnerable to water, increased by 30 per cent reaching US\$ 260/t (USDA 2005). The corn price in Mexico rose between September and December 2006 from 1,500 to 3,500 pesos/ton, as a result of the demand for biofuel for corn in the USA, but also due to speculative practices. Therefore, the future of the world food system is complex and uncertain, and a

new policy of food sovereignty will play an important role in the political stability of many countries.

33.4 Three Models of Food Production

Related to the conceptualization of food security and food sovereignty (see 34.2), three models of food production and commercialization have evolved: a) the *productivity model* based on the green revolution; b) the *life science model* that relies on modern biotechnology and genetics; and c) the *traditional organic or green model*.

33.4.1 The 'Productivity' Model

Throughout the 20th century the productivity model tried to homogenize food crops similar to industry, and during the last two centuries the supply of food and agricultural inputs was in the centre. The green revolution promoted monocultures, intensive use of chemicals, veterinarian drugs, improved seeds, machines, fossil energy, and irrigation systems. Politically, this system relied on high government subsidies (USA,

EU, OCDE, Japan), offering the consumers cheap products. The production was controlled by agronomists, veterinarians, and the chemical industry. Health and environment concerns were marginal. The Ministry of Agriculture managed natural resources such as soils, water, forests, flora, fauna, and fish.

Internationally, this model should have eradicated hunger and given the whole world food security. Until today it remains the basic tool against hunger (FAO 1996a, 2000a, , 2005b, 2005c). High crop yields and 'free markets' were at the centre of the concern and therefore hunger could not be eradicated, owing to the maximization of profit of agribusiness and governmental subsidies in developed countries. Hunger and poverty were considered undesirable side effects for southern countries and for people with a low capacity to modernize. Social, environmental, and cultural factors of diverse food production are only marginally considered. Food is not treated as a cultural good or as a patrimony of thousands of years of human effort. The limits of this model are imposed by negative effects on health (Gallaher 2005) and on the environment (scarcity in water and oil resources).

33.4.2 The 'Life Science' Model

In the 21st century a new model is emerging that establishes links among health, food production, and dietetic habits. It represents the new health safety and food security concerns where individuals with purchasing power are at the centre of attention. Concrete genes were linked to specific illnesses (Nestlé 1999), creating a scientific basis for life or a 'life science' paradigm (Lang/Heasean 2004). This model is demand-oriented and takes into account the consumers and their needs. Productivity is still important. It refers to the balanced daily intake of proteins, carbohydrates, vitamins and minerals, all of them necessary for a healthy life.

This *life science model* integrates the food chain in the form of clusters and relates it to production, transformation, and trade of food. It combines genetic research with field experiments, including biology, engineering, nutrition, pharmacology, health, and mobile field labs. The industries are controlled by multinational food chains. They offer clean, safe, and homogenous products that can stay for weeks on the shelves of supermarkets, thanks to *genetically modified genes and organisms* (GMO). Food is not only modified but also enriched artificially with nutrients to prevent illness, such as enzymes, proteins, minerals, etc. At the centre of concerns is the individual health, improved

by technological proceedings in bio-labs, where specialists are in charge of human lives (Nestle 2002). These processes of 'healthy' food can only be controlled through sophisticated scientific procedures in well-equipped laboratories in universities or research institutes of MNE. The experts are paid by the food MNE, which are simultaneously producers, sellers, and supervisors. When nonconformities arise, due to the complexity of the process, governments rely on these institutions, where those who are interested and involved are both judge and arbiter (Beck 1998; 2000).

Independently of an intensive propaganda in mass media, some undesired effects can not be denied, and NGOs are trying worldwide to carefully educate people on these negative effects. Most evident are genetic modified crops (GMO), which started commercially in 1995. In 2005 more than 80 million hectares were produced in the USA (68 per cent), 22 per cent in Argentina, 6 per cent in Canada, and 3 per cent in China. South Africa, Chile, India, and Brazil are joining this production process. On GMO seeds there exists an oligopoly of four main multinational enterprises. One sole holding (Monsanto) controls 90 per cent of all seeds with two genetic modified properties: a herbicide (roundup) and an insecticide (Bt). Conclusive results are still lacking whether these seeds are innocuous, but there are risks that the recombinant process could produce unknown effects in human and animal health and environment. Unwanted pollution occurred in Canada where wind, water, insects, and other animals have polluted natural crops of canola with GMO ties, destroying the great biodiversity and the natural production of this crop (Schmeiser 2002). Another threat is related to new toxics, new plagues, and insects resistant to GMO and other insecticides. Paediatricians have found a high level of food allergy in babies and therefore baby food is produced without GMO seeds.

In socio-economic terms, eight MNE merged in 2007 into four, able to produce 83 per cent of biotechnological research in the world. This is a threat for the freedom of science and technology in favour of humankind. There is another danger that small farmers may be forced to stop farming due to the expensive productive processes of GMO seeds (40 per cent of cotton production in 2005), what is reinforced through subsidies that are highly concentrated in big enterprises. Finally, these GMO seeds are controlled by patents and the WTO is the arbiter through TRIPS (Heineke 2002; Schmid 2000; Oswald 2000; 2002). The study of FAO (2005a) in different countries has shown that the income of producers in Mexico in-

creased by 12 per cent using cotton GM-seeds from Monsanto, but the benefits were more than three times as high in China where a national research institute produced their own GM-seeds.

The 'life science' paradigm continues with the same model of productivity, but it oriented at the consumers and their health needs. The integration into the food chain is through clusters. This model of production has generated new illnesses (BSE²⁵) and could promote new epidemics such as avian flu, since genetically modified organisms work with virus and bacteria that could have their own dynamism when they are modified and inserted into different plants or animals.

Therefore, the cornucopian vision to resolve by MNE environmental, social, and health problems through science and technology shows its limits, but above all poor people have to pay for the mistakes, and biodiversity can get lost for ever. It is horrific that thousands of peasants have committed suicide when GMO harvests failed and credits could not be paid back (Shiva 2003, 2008, 2009). With regard to food sovereignty there is no doubt. This model of production has enormously increased the costs of production (GM-seeds), and created a monopoly of agrochemicals and the transformation of basic food in the hands of TNEs. These processes are able to concentrate wealth within few hands, increasing poverty not only due to more expensive food, but also due to associated health problems.

33.4.3 'Green Agriculture' Model

The green model generates symbiotic relations and mutual dependence between nature and food production, and therefore uses soft methods of agriculture. They are regionally diverse and utilize polycultivation, association of crops, rotation, mixed agriculture, fixation of nitrogen from air to soil, biopesticides, traditional methods of soil conservation and food, integral management of water, plagues, and environmental services. The combination of traditional and modern

knowledge is consolidating food sovereignty in any region. A biodiverse and regionally adapted use of seeds is conserving diversity of species, and therefore is agro-ecological. This mode of production cannot be globalized. The surplus of production is sold in the local markets and thus reduces environmental pollution and global warming linked to transnational agribusiness and global markets.

Local agricultural production and trade, with access for peasants to water, seeds, credits, as well as technical and financial support could promote this model of agriculture. This green model takes women and peasants as key elements for food issues and agricultural consolidation. It encourages the participation of indigenous, women, and peasants in the national and regional definition of rural policies. It can guarantee women access to land for production and livelihood, and through empowerment they can overcome the violent and patriarchal structures inside families, regions, countries, and the global economic system. It includes the right that peasant organizations have developed their own model of food sovereignty and are now struggling for their right to produce and consume healthy, permanent, and culturally accepted food which is locally produced, sold, cooked, and consumed. Governments have the obligation of protecting their economy from subsidized food imports. They have to establish agricultural prices which are able to cover the production costs and to protect the environment. By linking environmental services with farming, land planning, and participative democracy, this paradigm supports a stable rural development and therefore respects the human right for non-migration. When livelihood in villages and countries is guaranteed with public resources for poverty and hunger alleviation,²⁶ bottom-up efforts can be reinforced. In the medium term, safe ecosystems and stable social relations create synergies and cooperation where safe food and the environment improve public health and cultural diversity at the local level.

This third model reflects the food sovereignty debate. It understands food in a holistic way, where livelihood, sustainability, and culture are the driving elements to maintain the genetic diversity for future generations, offering healthy nutrition and establish-

25 BSE is a result of feeding cows with waste from animals instead of grass. After 15 years research of more than 500 drugs, it was proven that *Bovine Somatropina*, an amino acid able to stimulate growth in cows, is responsible for an increase of 180 per cent of breast cancer in pre-menopausal women and the same number of prostate cancer in men (World Cancer Research Fund 1997). Confronted with avian flu threats, the same MNEs are producing expensive medicaments with dubious results to combat a potential epidemic.

26 Foreign food aid from outside has to be targeted to avoid a distortion of non-market items such as equity, corruption, electoral use, etc., but above all it can destroy the local productive systems. Thus, it must always be an emergency support, limited in time and for specific events.

ing a direct relation among productive, commercialization, and consumption cycles. It represents also an alternative for more than 1.5 billion peasants and small farmers who still depend on their ancient technology. They carefully selected the seeds from the former year that were and are able to guarantee the next harvest. It consolidates the basic right to consume safe, sufficient, and culturally accepted toxic-free food that is locally produced, transformed, and sold.

Thus, in the green agricultural paradigm food is a cultural act of life and more than the intake of proteins and calories. It is until today the only real possibility to overcome existing famine and hunger and offer humankind an opportunity to create justice and well-being all over the world by fulfilling the Universal Declaration of Human Rights in its Art. 25.1. Food sovereignty within the green paradigm represents the rights of people, communities, and countries to define their own ecological, social, economical, and cultural project of the future. Besides maintaining food as a pleasure of life, and not a threat to health and survival, it consolidates the world food culture and consumption for the future.

33.4.4 Food Perspectives: Models of Production, Population Growth, Climate Change, and Environmental Deterioration

'Food security' in the context of the model of agribusiness production or life science has failed to improve the world food situation. It is not a problem of the amount of food and of the knowledge how to produce more, but it is basically a problem of poverty (FAO 2006). Therefore the evidence is that in most poor countries the total number of hungry people has not been reduced, except for China and India and the former countries of USSR. Rather, new threats of food insecurity are rising. This requires the reformulation of the basic assumption of how to reduce hunger and how to achieve the MDGs. The globalization process in its regressive phase has reversed some advances, but in countries with high population growth that are threatened by severe impacts of climate change and disasters, the eradication of hunger is further limited.

Both the 'productivity' and the 'life science' paradigms have also led to higher emissions. Aquifers have collapsed in India and Mexico. Through genetic pollution both models have been destroying the biodiversity of southern countries. Thus, with regard to food

security, but also for the survival of humanity and nature, the present understanding of food security has failed to combat hunger. It has rather increased the threats and risks of more serious famine not only in Africa, but worldwide. Imposing food security instead of food sovereignty, and destroying the traditional green production, could become a boomerang also for northern and developed countries.

From 2000 to 2005 organic food production has grown by 20 to 30 per cent. In Germany organic food products grew annually by 15 per cent. A major increase has also occurred in the US where the *National Organic Programme* (NOP) supports small farmers and promotes the certification of green agriculture where organic products grew from US\$ 1 to 13 billion from 1994 to 2003. In 2005 about 26 million hectares of land were certified and 560,000 farmers were affiliated.²⁷

In most countries, due to the productive model of the political elites, the support for organic agriculture is still limited. Nevertheless, the TNEs have discovered this green option for supermarkets. They are now charging higher prices for naturally grown products. Consumers, confronted with doubts about GMO, are demanding comprehensive labelling, but TNEs have tried to influence national laws to avoid or restrict this. Propaganda on different products is confusing the consumers even more by letting them believe that they determine their own model of life.

Via Campesina has challenged this TNE and has campaigned against gene modified seeds and promoted laws favouring its alternative agricultural model. They insisted that environmental, cultural, and social factors are as important as the economy. Further, economic crises and increasing poverty in rural areas have created among peasants, the indigenous, and women a sense of security that they can manage their own food supply with regional resources and local seeds.

At the international level, FAO has argued that food needs could be linked with a protection of the natural heritage by:

promoting market-based incentives that compensate farmers for their stewardship efforts, thus maintaining their economic viability; replacing polluting agricultural practices with approaches that can reverse the dramatic trends in biodiversity loss; thriving on community par-

27 See: Research and Market, 2005: *Current Organic Agriculture Market Worldwide: A Year in View, 2005*, at: <http://www.researchandmarkets.com/reportinfo.asp?report_id=302678>.

ticipation in land conservation. Meeting food needs while protecting the natural heritage is a challenge shared by all countries of the planet. Organic agriculture can meet this challenge head-on by: promoting market-based incentives that compensate farmers for their stewardship efforts, thus maintaining their economic viability; replacing polluting agricultural practices with approaches that can reverse the dramatic trends in biodiversity loss; thriving on community participation in land conservation (El-Hage Scialabba 2003: 15).

Simultaneously, FAO has also promoted GMO seeds in diverse poor countries, and continues to support the 'green revolution' model. Many existing contradictions are inherent in the three productive models, and reflect the struggle for hegemony. They can be synthesized as follow: the 'productive' model is unsustainable due to the scarcity and pollution of natural resources (water, soil, seeds, and loss of biodiversity). Ministers of agriculture have shifted slowly to the 'life science' model that is supported by ministers of trade who promote free trade and bilateral agreements. Health ministers have supported nutria-genomic research, biosecurity protocols and vaccines that are often produced from genetically modified plants. Productivity concerns dominate over inherent risks and threats for biodiversity and humankind, due to the uncertainty and insecurity of genetic manipulation and nanotechnology. Both could affect the essence of human beings and the future of life (Habermas 2001).

These two models induce a scenario of a 'food war'²⁸ (Lang/Heasman 2004), when multiple factors of aggravation of conflicts intervene: the quality and innocuous food demand, international commerce, governmental regulations, nutritional requirements, control of TNEs, anti-monopoly laws in transportation, financial monopsony, security in food chains, supply of safe food products, coexistence of over- and undernourished people, environmental damages, science and technology (S&T). Arbitration among these many contradictions are often handled by experts associated with TNEs.

But despite the unimaginable advances in S&T; hunger is still increasing and far from being eradicated. Why is this so? There is a second related factor. The model of transnational agribusiness is oriented at

the individual, considering his or her consumption and PPP. As with the modern health system, the individuals become victims and objects of persuasion for food recipes to strengthen their health that are often counterproductive. These two realities have opened for social movements, NGOs, and critical scientists a space for struggle. Confronted with the nutritional and health deterioration, they have denounced these TNEs and often corrupt government allies which try through early alerts and catastrophic predictions about epidemics²⁹ to push the errors and possible consequences of this erroneous productive system to various 'natural' causes.

The global deterioration of life quality and limited progress in hunger alleviation in most developing countries, as well as high levels of obesity and cancer³⁰ in industrialized countries, offer organic agriculture an option for the future. Social movements understood these opportunities and are promoting food sovereignty with native seeds and organic input as a real alternative against hunger and malnutrition.

Table 33.4 summarizes, contrasts, and compares the many advantages and disadvantages of the 'life science' model with those of the 'sustainable organic agricultural' model.

In synthesis, the paradigm of 'science of life' relies on governmental financial resources; however, the consolidation of this model depends on the acceptance by consumers who are induced through advertisements to buy these products. Therefore, the competition among some TNEs could leak information about damages in health through this model of food intake, and strict governmental control can avoid a manipulation of consumers. But often the same pharmaceutical holdings are also selling medicaments, control hospitals through the stock market, and often repel demands to pay compensation for damages caused by unhealthy food. Their treatment (chemo-

28 The authors understand under food war the aggravation of the conflict where a vision between offer and demand of food, new scientific knowledge, unknown technologies, but also global and national policies linked to demographic changes and epidemiological transition could convert food in a generator of illnesses, as a result of private decision-making processes.

29 This has happened with the so-called 'mad cow' disease or Bovine Spongiform Encephalopathy (BSE), an encephalopathy as a variant of the Creutzfeldt-Jakob illness, see chap. 34 by Salih), with the avian flu (SARS), and some chronic degenerative sicknesses plus chronic degenerative processes (strokes to the myocardium, brain stroke, arthritis, osteoporosis, cancer, diabetes, and obesity; US National Institute of Health 1998; Tansley/Worsley 1995; Barker 1992; WHO/FAO 2003; WHO 2003, 2003a; Dalmenry/Hanna/Lobstein 2003; World Cancer Research Fund 1997).

30 45 per cent of deaths from cancer worldwide happens in the industrial countries with less than 20 per cent of the total world population (Times, 15 January 2008: 5).

Table 33.4: Advantages and disadvantages in the food production sectors. **Source:** Compiled by the author.

Concepts	Food Security: <i>'Sciences of Life'</i>	Food Sovereignty: <i>'Sustainable Production'</i>
Food	Scientific: vitamins, proteins, sugar, carbohydrates, synthetic additives of sugar, flavours and colours	Integral, nutritional, natural, empirical and culturally accepted, healthy, regionally produced, diverse and ritual
Food intake	Fast, frozen, homogeneous, pre-prepared, rich in fat and sugar with artificial additives, vitamins and minerals	Elaborated at home, fresh and varied depending on the season of the year and the products available regionally
Hunger	Result of low productivity	Result of poverty, lack of land reform, credits, local markets and governmental support
Food Security	Production and food import (including 'virtual water')	Local and biodiverse production, reinforced by recollection, hunting and environmental services
Land	Big extension of monocultivation	Small plots with orchards, policultivation, mixed agriculture, small livestock
Technology	Highly specialized, heavy machinery, drop system irrigation and by aspersion, agrochemicals to fight against plagues and illnesses, veterinarian medicines, hormones, drugs, capital intensive	Agro-ecological, rotation and association of diverse crops, intensive in human-power, natural combat of plagues and illnesses, natural growing of livestock, horizontal integration of waste for production and recycling
Seeds	GMO protected by TRIPs, animal genetically homogenized	Cultural patrimony of seeds, yearly selected and reproduced during the next cycle, diverse types of livestock
Gender	Patriarchal, male, feminization of paid rural workers	Extensive family integrating men and women, leadership in communities, cooperation, solidarity and mutual help
Market	International with fitosanitary controls, TRIPs, unequal terms of trade, subsidies, dumping	Local and regional with social control and equal terms of trade, social sanction and local saving and redistribution of accumulated capital
Commercialization	TNE are integrated with supermarkets chains, monopolies and oligopolies of nutria-genomics	From farmers to consumers on a small scale
Capital	Financial	Natural, social and cultural
Credit	International and national banks	Public resources, family savings, micro-credits and popular savings and cooperation, economy of solidarity
Transformation	Chains of TNEs inducing artificial proteins, vitamins, minerals and enzymes	In family enterprises with traditional methods
Productive Organization	Contract-agriculture based on paid temporary labour force with temporary unemployment, informal economy	Family unity, diverse, multiple activity during the whole year combined with livestock, forestry, recollection, hunting and environmental services
Environment	GMO induce biodiversity loss, agro-chemical, high pollution, abuse of water, depletion of aquifers, exploitation of natural resources	Sustainable production including integral environmental management, recycling of waste, care about natural resources
Policy	Demand-oriented for international consumer, socialization of pollution	Oriented to cover local supply and demand, minimal environmental impact
Economic Philosophy	Value of change, with maximization of profits and socialization of losses	Value of use with maximization of social relations and collective livelihood

Table 33.4: Advantages and disadvantages in the food production sectors. **Source:** Compiled by the author.

Prices	Artificial international prices due to subsidies, generating <i>dumping</i> in the world market	Local, interchange of products and services fixed by the economy of solidarity and support for the vulnerable
Productive Integration	Monopolies, oligopolies and monopsonies	Local chains of integrated micro-business
Trade organization	Monopsonies integrated in FTA, WTO controls through GATS, TRIPS and international arbitration	Family unity and local market with incipient household transformation, local non-violent conflict resolution
Food disposal	World supply-demand, depending on available capital and prices, speculation with crops, increase of hunger	Proper system of production for local food, family and regional storage
Economy	Free-market	Family and solidarity
Subsidies	Paid to agribusiness in industrialized countries, generating <i>dumping</i> in poor countries	Poverty alleviation programmes, support for green agriculture, care for the environment, job creation at the local level, biodiversity support
Science and Technology	GMO, nutria-genetic, nanotechnology, chemical and genetic conservation, integration of food with pharmaceutical chains, highly specialized	Combination of traditional technology improved with modern natural methods, seed selection, traditional harvests and conservation methods, mixed agriculture
Democracy	Formal electoral, with elements of authoritarianism, vertical and excluding decision-making favouring elites	Democratic and participative decision-making processes favouring majorities and protecting the vulnerable
Future	Inefficient farmers disappear with debts, fusion of enterprises creating <i>holdings</i> , conflicts and violence, authoritarian and vertical model of decision-making, survival dilemma and migration	Political stability, guards of biodiversity and food sovereignty, participative model with direct democracy, care for the vulnerable and good governance

therapy and radiotherapy) creates further collateral effects compensated with other expensive drugs. Their goal is only the maximization of profits by taking away the surplus created by society.³¹ These contradictions in the health, education, and food system were exposed by Ivan Illich (1976).

On the other side, there is the small green production for poor people, peasants, women and minorities. Organizing production and transformation, food diversity, and local markets increase local food security. More governmental support is still lacking, and also scientific and technological efforts to combine traditional and modern knowledge has to be developed, e.g. in New Zealand. There are enough universities that could support green models of production able to facilitate the creation of local jobs and offer

young people an opportunity for employment and a decent life. However, the political and economic elites that benefit from the other two productive models are preventing an enhanced 'food security' combined with 'food sovereignty' and a dignified livelihood (Nord/Andrews/Carlson 2004).

33.5 Conclusions: Food Security with Self-sufficiency, Food Sovereignty, and Cultural Integration

On this dual political and conceptual background, this chapter addressed the following research question: food represents not only a security issue of intake of nutrients, but it forms part of a holistic understanding of life and a constituting element of any civilization. Thus, food includes networks of connectedness, belonging, and relationship of trust, reciprocity, cooperation, solidarity, care, and exchange. It creates social benefits and risk reduction, but also innovative activities through the wider access to infor-

31 The case of old people is often dramatic. They lose their savings for medical treatment and hospitalization. Once without resources they are abandoned and in the best case they go back to the traditional medical sector. However, governmental controls can further limit this alternative.

mation and learning. It is a process of anchoring of personal and group identities (see chap, 88 by Oswald on HUGE; Oswald 2008 a), where social relations reaffirm the integration of a person inside a community establishing rights and obligations, such as access to land, credit, technology, training, market, life quality, and rituals.

Besides guaranteeing physical and cultural survival, 'food sovereignty' creates also new opportunities for people-centred poverty alleviation and new understanding of rurality as a complex social network. It represents a critical response to the accepted development and modernization paradigms, and opens ways for diverse rural life processes where agricultural activities and environmental services coexist with services and industries.

Thus, food is part of a holistic model of life and a constituting element of any civilization. Networks of interrelationships, and processes of identity and social belonging, create relationships of trust, reciprocity, cooperation and exchange. They are at the basis for 'food security' which could evolve into an integral 'food sovereignty'. Confronted with new threats of global environmental change, 'food sovereignty' represents social benefits and contributes to risk reduction through innovative creativity where instant world communication helps to establish new learning processes. During this process of achieving 'food sovereignty', personal and group identity is anchored and social relations may overcome stereotypes by reaffirming the integration of a person or a group within a community. Such a wider understanding of rurality that includes non-agricultural activities facilitates critical responses to historical injustice, abuse and environmental changes, and opens ways for diverse rural-urban life processes, where agricultural activities and environmental services coexist with other services and non-contaminating industries and transportation systems.

The future is getting complex and the world is confronted with unexpected climatic events, generating massive migrations, chaotic urbanization, pollution of natural resources, and loss of biodiversity. The ecological footprint and the size of the 'food footprint' is converted from food consumption by this equation:

$$\frac{\text{FoodQuantity(mt)}}{\text{CropYield(mt/ha)}}$$

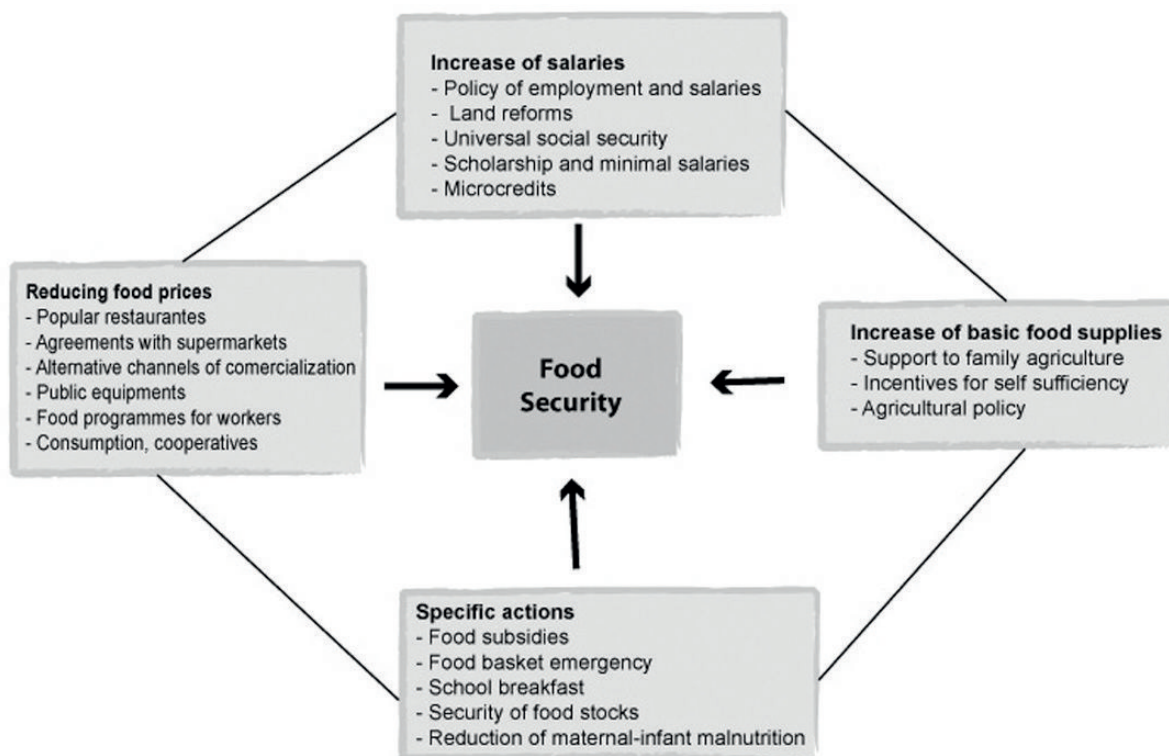
where crop yields are taken from the FAO database (Friends of the Earth 1997). Population growth creates new challenges when billions of young people ask

for dignified employment. On the contrary, the lack of jobs could create complex emergencies. In this multifaceted panorama new agreements among governments at all levels with business and organized civil society should be negotiated where public well-being has to prevail over private interests. This implies to transform through creative activities related to food production, transformation and consumption, the existing monopolies into local chains of micro-enterprises that are able to offer cheap, healthy and, culturally accepted food in a framework of an economy of solidarity.

But market forces are pushing in a contrary direction. The future food sector will experience a competition between the 'life science' and 'sustainable small production' model. New food-related illnesses (e.g. BSE) have created a greater awareness among people, what they are eating. In Europe, some 20 per cent of the population is familiar with the associated risks of agribusiness by TNEs and 80 per cent reject GMO food. Increasing degenerative illnesses and obesity have forced the TNEs to focus on new products, and the culture of 'light' food has been their response. However, only a comprehensive approach with preventive health, vitamins, proteins, iodine, flour, and other microelements for the undernourished will be able to alleviate hunger and create livelihood for all with a distribution of profits. The future will show if the public relations activities by TNEs will be able to counter a wider public awareness on the risks associated with the life science approach or whether small green food production will slowly replace big food monopolies. However, there are some global decision-making processes that may contribute to and speed up a strategic shift aiming at 'food sovereignty' (CLOC 2004):

1. *Global Policy*: The Special Rapporteur of the UN for Food Rights, Jean Ziegler, said in November 2005 that there "are no secrets how to eradicate hunger. There are no new technologies necessary. Simple political will is required to change the existing policies which make the rich richer and the poor poorer".
2. *Poverty Alleviation*: Jeffrey Sachs (2004 or 2005) linked the multidimensional roots of hunger to poverty. In the Kenyan village of Sauri he tried 'the big five' with US\$ 70 per person and year, including retroviral against HIV/AIDS.³²
3. *Support for women in agriculture*: Women are not only more affected by modernization, they represent also an alternative for self-sufficiency and to the food supplies by TNEs. In poor coun-

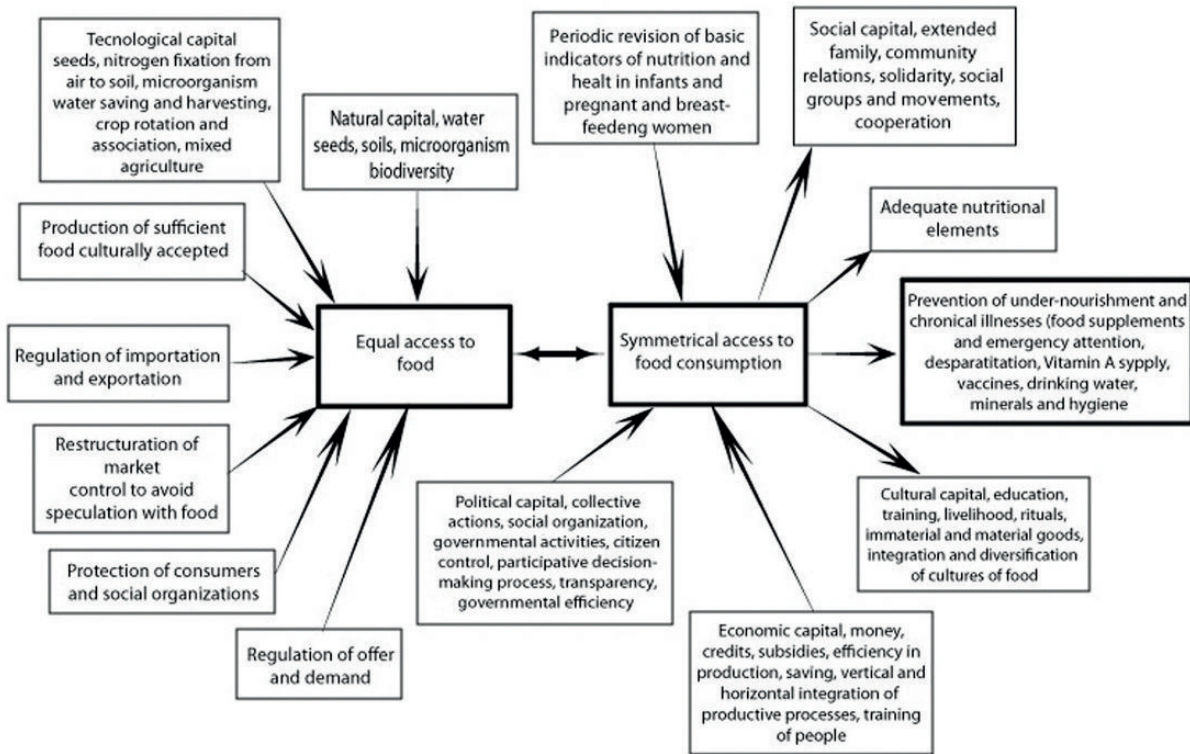
Figure 33.10: Programme 'Fome zero' (without hunger) in Brazil. **Source:** Instituto Cidadania (2001), São Paulo, Brazil.



tries women produce most of the local food (FAO 2002; 2005b).

4. *Regional Food Sovereignty:* Via Campesina, CLOC (2004), MST (2005), and the Peasant University of the South (UNICAM) are promoting an integral model of food with democratic land-reform, credits and local savings, green agriculture, chains of integrated local micro-businesses, an economy of solidarity, and traditional medicine.
 5. *Food policy to alleviate hunger:* Brazil proposed a model of food support for popular sectors linking the small production system with an offer of healthy food, increase of minimal salary of workers, and an urban offer of cheap food for the poor (figure 33.10).
 6. A well developed system of periodic measurement of basic indicators of undernourishment is needed, above all for children below five years, including anthropometric measurements of weight and size related to their age. UNICEF, WHO, and INNSZ have proposed six steps with minimal costs to avoid premature deaths, slow development, and brain damage in infants: Vitamin A complements; a complete scheme of vaccines; nutritional supplements to overcome severe undernourishment; periodic elimination of parasites, complements of iron, iodine, and other minerals (such as flour against caries) depending on the water composition, floors covered with cement, latrines, clean water access, and nutritional education and care (Álvarez/Oswald 1993). Furthermore, the metabolic syndrome of undernourished children with small size should be addressed. They of
-
- 32 1. *Improvement of local food* through a mixed agriculture of fruit trees, plants able to fix nitrogen from the air to the soil, rotation of crops, organic composting, and bio-pesticides; 2. *Community Health Centres* able to treat the most common gastro-intestinal illnesses, malaria, dengue, reproductive health and campaign for vaccination, undesired pregnancy, and sexually transmitted illnesses; 3. *Basic Education:* training in simple technologies for production, and conservation of safe food at the community level, especially for women; 4. *Renewable energies:* solar systems, biogas, oil and other energies able to give children light for studying, energy for water pumps, machines for grain mills, and refrigeration of medicaments and food; 5. *Clean water,* building of latrines, water harvesting, protection of wells, and other simple techniques to conserve safe water and to avoid water-borne illnesses.

Figure 33.11: Food sovereignty: equal access to food and symmetrical access to food consumption. **Source:** Chávez/Ávila/Shamah (2007); modified by Oswald (2007a).



ten rely on a diet that is rich in carbohydrates and fat, and are subsequently frequent victims of obesity, later on diabetes and coronary illnesses.

7. Education, training, and the rescue of traditional elements of food culture are basic requirements to improve the nutritional situation in poor countries. Education and training, especially of women, reduces not only the illnesses in families and premature death, but it opens the cooperation in reproductive health and creates stable livelihood conditions in villages, and colonies, and slums of the urban poor.

Figure 33.11 synthesizes the conjugation of natural, political, social, economic, technological, and cultural capitals (Chávez/Ávila/Shamah 2007; Oswald 2001, 2007a) enabling women, indigenous, and peasants to handle food and nutrition for their families in an integral way, improving their quality of life, and reducing premature death and preventing diseases. Such a new comprehensive security process that combines ‘food security’ with ‘food sovereignty’, and also with ‘water’ and ‘health security’, may be better able to resolve the food problems of the other half of the world population for whom food security has been an issue of daily survival of their families that avoids the overconsump-

tion and loss of life quality with which the food security problems of the OECD world and the elites in the global South are struggling (see chap. 34 by Salih).

The discussion has shown that the evolution of the concept of ‘food security’ within multilateral organizations has failed due to a top-down approach that is neither questioning the demands of the people, nor the interests behind the driving forces of world business. The continuous adaptation of the ‘food security’ concept and model by FAO reflects its basically technocratic approach that is far away from the real problems of hunger and of agribusiness. The FAO has tried to resolve a complex health problem with aspirin (Preker/Feachem/De Ferranti 2000).

Confronted with serious environmental deteriorations and adverse economic conditions resulting from the neoliberal approach, the directly affected people started first with a critical analysis of agricultural and food aid policies from industrialized countries. Greater environmental destruction, new threats due to climate change, and deeper ecological footprints forced organization of civil society to create the new paradigm of ‘food sovereignty’ as a holistic life concept.

This understanding could overcome the limited productive approach, but also the behaviour of converting poor people into victims of their circumstances, when the real causes of their situation of marginalization are precisely the forces of the free market, the political domination and the exploitation of humans and nature for profit. The future is complex and the situation will probably get worse. Then biodiverse and culturally determined approaches to food sovereignty could foster solidarity among human beings and protect their remaining common natural and cultural capital.

34 Governance of Food Security in the 21st Century

M. A. Mohamed Salih

34.1 Introduction

Governance is broadly defined as the exercise of power in an institutional context with the main aim of directing, controlling, and regulating activities concerned with the public interest. It includes but traverses government to denote how people govern themselves in terms of accountability, legitimacy, and transparency. On the other hand, food security denotes access by all people at all times to enough food for an active, healthy life. Its essential elements are the availability of food and ability to acquire it. Conversely, food insecurity is the lack of access to sufficient food and can be either chronic or transitory. Chronic food insecurity is a continuously inadequate diet resulting from lack of resources to produce or acquire food. Transitory food insecurity, however, is a temporary decline in a household's access to enough food. The worst of transitory food insecurity is famine.

Therefore, governance of food security is about the exercise of power within institutional contexts, particularly crafted to direct, control, and regulate activities concerned with food security whereby these institutions are viewed by citizens as legitimate, accountable, and transparent. The ultimate objective of governance of food security is to ensure the availability and ability of the populations to acquire food for an active and healthy life.

However, neither the classic definition of governance as government immune from the scrutiny or global governance, nor the conventional definition of food security as a mere availability and ability to acquire food are sufficiently broad to encompass the requirements of food security governance during the 21st century. At least two factors militate against any non-critical adoption of such narrow definitions:

First, governance of food security during the 21st century differs markedly from that of the pre-Second World War era. Globalization has contributed to a process of increasing integration in the world's econ-

omy and even producing a global culture of consumerism, arts, and music. There is also the integration of global markets, rapid advances of technology, information and communication technologies, highly skilled labour mobility, and flow of investments, global capital and multilaterals operating at a global scale. The globalization of production and products from consumer goods to automobiles, clothes, food, and manufacturing has contributed to an emergence of a dynamic and interdependent world interlocked with vibrant networks and transactions.

One implication of this integration is that globalized food products and production also means the existence of a global network of trade and commerce on a large variety of food products. For example, Coleman, Grant, and Josling (2004: 3) lament,

Despite its rootedness in place and its dependence on the natural rhythms of the seasons, the life cycles of animals and the climate, agriculture is changing rapidly in character as it becomes drawn into globalizing processes in the economy, the world of politics, and culture. As an economic activity, it is losing its exceptionality and becoming one sector among others contributing to economic growth. Politically, the long-standing protective mantle of the nation-state is yielding to new forces, new rules and new constraints defined at regional and global levels.

The emerging governance of food security regime is not only regionally and globally driven, it operates in conjunction with a myriad of powerful institutions, some of which transcend food to health (WHO), intellectual property rights, biodiversity (CBD), trade regime and intellectual property rights (WTO/TRIPS). The new policy space as Coleman, Grant, and Josling describe it is marred with power asymmetries, conflict ridden, and dangerously susceptible to manipulation and high passions engendered by social movements and global justice activism.

So much entangled are food and other security domains that Nestle (2003: 265) warns against the most dreaded scenario linking food safety, food security, and national security. He called "food a biologi-

cal weapon”, with a particular concern being made about the role of biotechnology in developing bioterror weapons. In his words:

The research methods used to transmit desired genes into plants could easily be adapted for nefarious purposes: creating pathogenic bacteria resistant to multiple antibiotics or able to synthesize lethal toxins, or superweeds resistant to herbicides (Nestle 2003).

To be sure, despite its significance, as purported by Nestle above, no area of the current debate on governance has had such a low profile as food security governance, despite the myriad of global food problems which occupy the world’s conscience, from famine to food safety and global food-related disease scares. This omission cannot be explained because of irrelevance or lack of genuine interest in the significance of governance to food security. It certainly cannot be explained on the grounds that a ‘good governance’ regime in food security already exists.¹ It clearly does not. This omission has been the cause of concern for all sectors of society; the economy, political actors, scientists and policy-makers alike, and in particular the impoverished sector of humankind which suffers both chronic and transitory food insecurity.

Second, a notion of food security governance within the context of industrialized, globalized, and highly commercialized food markets by necessity implies more than the mere availability of, entitlement and ability to acquire food. The global food scares which characterized the closing decades of the 20th century (BSE, SARS, Avian Bird Flu, vCJD) are clear signs that while the current level of scientific and technological developments could ensure food availability, the broader objective of food security is difficult to guarantee. The notion that Food Kills by Pennington (2003) offers one of the most succinct descriptions of the history of the most lethal outbreaks of food related diseases such as BSE and vCJD, among others. He warned that the lessons of past outbreaks were not heeded and wondered whether the lessons of recent outbreaks have been learned to prevent them happening in the future.

34.2 Illustration: Food Security as Food Safety

First, Bovine Spongiform Encephalopathy (BSE), popularized as mad cow disease, first appeared in the UK

in 1986, when cattle started to exhibit strange symptoms of nervous collapse. The disease is caused by cows eating other cow meat and bone meal via high protein feed. It caused degeneration of the brain where afflicted cows eventually became uncoordinated and difficult to handle (Wells 1987: 419). The *New Scientist* (29 January 1986) described the disease as belonging to the so-called “unconventional slow viruses, which includes scrapie in sheep and goats, chronic wasting disease in mule and deer and transmissible mink encephalopathy. In a sense, the disease has a wide variety of ways to be transmissible through both domesticated and wild animals, thus affecting the whole food chain.”

The disease struck in Britain again in 1996, considered one of the major outbreaks, and included many countries interlocked in livestock trade, in particular Britain, France, Germany, Canada, the USA, and Japan among others. In 1997 most European countries admitted the existence of BSE, which prompted the EU to issue measures intended to curb the spread of the disease. Import restrictions as well as other quarantine measures and slaughter of animals suspected of having acquired BSE were imposed.

The discovery that BSE is transmissible to humans, and that humans could get a different variant of the disease as 146 patients in the UK alone died of the human form of mad cow disease, known as variant Creutzfeldt-Jakob disease (vCJD), has aggravated an already desperate situation (Coghlan 2004). The interface between what food humans eat and the variety of diseases detectable or undetectable illustrates the increasing vulnerability to food and food-related threats and hazards that fall well within the twin paradigms of food security governance and food safety on a global-scale.

Apart from the fact that BSE and its variant CJD are menacingly dangerous diseases, they can also spread globally in countries that are not really suffering from chronic or transitory food insecurity. It conflates food security and food safety not at the national or regional level, but globally, giving credence to the view that food security in the 21st century requires a more proactive global partnership and networks that transcend government and multilateral organizations and include the currently vibrant global justice movement, activities, and NGOs.

Second, the case of Avian Influenza is well documented and its implications for global food security are horrendous. According to WHO, Avian Influenza (also known as Asian flu from the 1957 outbreak in China) is an infectious disease of birds caused by type

¹ This chapter is inspired by a shorter entry by M. Salih (2005).

A strains of the influenza virus. The disease, first identified in Italy more than 100 years ago, occurs worldwide. Migratory waterfowl – most notably wild ducks – are the natural reservoir of avian influenza viruses, and these birds are also the most resistant to infection. Domestic poultry, including chickens and turkeys, are particularly susceptible to epidemics of rapidly fatal influenza. For example, during the 1983–1984 epidemics, the virus caused a mortality level in poultry approaching 90%. During the 1999–2001 epidemics in Italy, the virus mutated within 9 months to a highly pathogenic form causing the death or destruction of more than 13 million birds.

A subsequent development after so many outbreaks of Avian Flu, the first documented infection of humans with an avian influenza virus occurred in Hong Kong in 1997, when a strain caused severe respiratory disease in 18 humans, of which six died. The killing – within three days – of Hong Kong's entire poultry population, estimated at around 1.5 million birds, reduced opportunities for further direct transmission to humans, and may have averted a pandemic. The most recent cause for alarm occurred in January 2004, when laboratory tests confirmed the presence of avian influenza virus in human cases of severe respiratory disease in the northern part of Vietnam and China.

In essence, in the 21st century (as we have already experienced during the outbreaks of BSE), with the Avian Bird Flu the old notion of food security defined in terms of food availability, access, and quality would increasingly be relegated less emphasis in the broader security debate. It has been argued that the scientific and technological developments during the last century have already mustered the capacity to produce sufficient food to feed the world. But the old regimes of entitlement and access, particularly for the unfortunate sectors of humankind, sadly still loom large.

34.3 Conflating Securities: Human, Food and National

Three plausible interpretations could be put forward as to why food security governance remains on the back seat of the debate, although global food governance institutions do exist. First, it can be explained in relation to two competing definitions of security: human security and national security. For most of the post-Second World War period, particularly during the Cold War, security was predominantly defined as national security. Military security was the dominant

concern of national security, with its evident economic and political connotations. Cold War architects considered national security the defining element of national sovereignty. Concerns with military expenditure predominated over concerns with human security – defined as:

A condition of existence in which basic human needs are met and human dignity, including meaningful participation in the life of community can be realized. At the most basic level, food, shelter, education, and health care are essential for the survival of human beings (Thomas/Wilken 1999: 3).

So food security is essentially part of human security and as such demands a redefinition of the concept of security. This conceptualization was absent during the Cold War, when the heightened ideological divisions between Western and Eastern blocs in many instances sacrificed human security for the sake of achieving national security objectives.

Secondly, it was expected that with the end of the Cold War the emphasis would shift from military to human security. The triumph of multilateralism has contributed to a new and emerging global governance regime, and it was expected that this would foster a new 'humanitarian' understanding and therefore make it possible for humankind to reap the positive outcomes of the democratic peace dividend. Sadly, this has not been the case. Indeed, in some parts of the world, particularly war-torn and famine-stricken countries, the end of the bipolar Cold War has instead produced new forms of polarization (ethnic, religious, economic, regional etc.) that have undermined both state as well as human security (Salih 1999: 132–133).

Thirdly, food security governance should entail the accountability of the governors to the governed through binding commitments, to which most developing countries' leaders are probably fearful of subscribing. The current global mind-set is premised on food trade and competitiveness. Thus commitments to ensure the food security of potential competitors are imperative. These could deter the largest food producing and exporting countries from making concessions in the areas of subsidies and market access to developing countries.

While large food exporting countries and regional entities supply food in complex emergencies – for famine relief and disaster prevention – they are less keen to support long-term food security, including such global visions as food-for-all and a hunger-free world. In short, there are serious food security governance issues at the national, regional, and global

levels, so we must look more closely into the linkages between these and the general debate on governance.

The new forms of polarization could be summarized in terms of food affluence-related food security driven crises – such as food related outbreaks of infectious diseases in the industrially advanced or high-tech modern food production systems – and underdeveloped low food productivity food security problems associated with developing countries.

34.4 Linkages

It might seem from the polarization argument I raised earlier that the 21st century food security governance regime will be highly differentiated according to the level of technology which goes into food production, and it has been translated into food affluence versus food poverty. On the contrary, none of the elements of the conventional definition of food security commonly referred to as “access by all at all times to enough food for an active, healthy life, including availability and the ability to acquire it” has been fully obtained (Reutlinger 1987). The persistence of *‘Famine that Kills’* (de Waal 1996, 2004) and *‘When Food Kills’* (Pennington 2003) has only magnified the problem and made the joints of dualistic vision of two different governance regimes catering for different lives and different needs absurdly cruel and analytically fraudulent.

The current change in the type, patterns, and magnitude of consequences associated with leading healthy life is not just by ensuring food safety, but also by ensuring that an interface between human and non-human diseases is curtailed. This cannot be ensured by subsuming food security under economic governance and financial and market security regimes under which the global market operates – food security is a governance in its own right. Apparently, all four aspects of food security (availability, access, stability, and quality) are matters for a governance regime that underscores the centrality of food as an indispensable part of the support system for human life. In this respect food security encompasses more than the economies of food production, consumption, distribution, and marketing. As such, food security cannot be guaranteed through effective and functioning economic, science, and technology governance institutions alone. Nor can it be ensured through policy reforms dealing merely with economic regulatory frameworks and instruments with societal

and political pressures to ensure that these regulations are acted upon.

In the food security domain, governance is part of a broader context, linking the physical environment health as well as the socio-economic and political aspects of society. This in turn is linked to a global governance regime that has designed policies to respond to global food insecurity. These include buffer stock systems, food price stabilization programmes, food aid, financial food facility schemes, trade policies, and food imports. These conventional food security-cum-safety issues are compounded with recent developments in global trade regimes on food and food products engendered by globalizations (Paarlberg 2002; Roberts/Orden/Josling 2004; Burch/Rickson/Lawrence 1996; Goodman/Watts 1997; Wilson 2001). These developments signalled that there are more non-food entries of food security governance in the 21st century than ever in human history.

Although national and global before food security policies are important for fostering food security, these are often influenced by other non-food policies such as marketing, trade regimes, and transport. Taken on their own they cannot solve problems associated with food entitlement. Obviously, food policies devoid of real concerns with food security have provided poor answers to urgent and critical food needs. Not only have these policies failed to solve food crises, they have miserably failed to ensure long-term food security.

One fallacy associated with the current regime of food governance is that global food security is an aggregate of national food policies designed under the assumption that food self-sufficiency would automatically ensure food security. This argument could be logically constructed, but evidently logic is not always right and here is a case in point. It is not possible to translate food self-sufficiency into food security without a proper agricultural infrastructure, without credit and extension schemes, and without public food distribution policies. The next question is what the main characteristics of food security governance are and how they could contribute to the national and global public policy governance debate.

34.5 Food Security and Democracy

The governance of food security involves many stakeholders – it encompasses both government and society. The significance of multi-stakeholder governance stems from its ability to combine the efforts of all

concerned with food security. It includes government, farmers, environmentalists, the social justice lobby, human rights groups, the 'right to food' activists, food technology producers, and exporters.

The political dimension of food security governance is particularly important because it is only in a democracy that such a regime could be put into practice. This means that for any government to be legitimate, its authority (the legitimate exercise of power) should derive from periodic and regular free, fairly contested elections with inclusive participation. Popular sovereignty is exercised and expressed in the daily practice of political and human rights, guaranteed under constitutional and legal arrangements to restrain the holders of power and to protect those who could be subject to their whim. The holders of political power are held accountable not only to parliament and the state's regulatory institutions but also to the people. The executive branch is also held accountable by law through an independent judiciary and other legal and regulatory frameworks.

Even by the experiences of food-related diseases which were global in nature, it was evident that old democracies (Europe, USA, and Canada) dealt with the case of BSE or mad cow disease and other epidemics more transparently than non-democratic or even new democracies (China, Vietnam, and Russia). Because democracy renders the governors responsive to the governed, old democracies were able to openly inform their populations and the world within a relatively shorter period of time to take the necessary precautions, than for instance in the case of China or Vietnam where disclosures were made only under immense international pressure. One would argue that, thanks to the new democratic dispensation the world is experiencing today, many governments the world over are more prone to push issues of national pride to the side (Pennington 2003; Rowell 2003; Ridely/Baker/Baker).

It is obvious that only in democracies are food policies freely negotiated and binding policies conceived, targets set and implemented, and reviewed in order to gauge compliance with the government's commitments. When governance reflects public preferences it is likely that food will be at the top of the list of priorities. In a sense, governance should be about understanding political institutions' interactions with policy domains such as food security policies and how to make them work effectively also, and largely, for the poor. Those negatively affected by food policies should be able to use the institutions of governance to hold their government responsible. It

is essential that citizens are able to question the record of governments that allow food shortages and famine to ravage their country.

In common with the dominant debate on economic and political governance, food security governance is also about "institutional governance building and supporting cultures of rights and rules that make possible the agreements represented in coalition and common understandings" (March/Olsen 1995). A culture of rights and rules, common understandings and agreements, is as important for the governance of food security as for fostering a polity based on democratic cultures and values. One cannot ensure the one without the other.

So proactive food security governance can be summarized as follows:

- Exerting pressure on government and others involved in food security policies;
- Maintaining accountability and oversight to ensure compliance with commitments made;
- Making corrective measures when policy targets are not met within a specific time frame;
- Establishing an administrative regulatory framework to improve food availability, access, and quality.

A food governance regime needs to ensure the active participation of each layer in this multi-stakeholder approach, otherwise food policies cannot be put into effect. Of course, it is naive to think that there are no vested interests or power structures informing the relationship between the diverse stakeholders. But the fact that an institutional framework has been created for self-governing as well as for negotiating interests is an important step towards breaking the monopoly over critical issues such as national and global food policies.

34.6 Illustration: Food Security, Food Scarcity and Famine

Here I provide two trajectories: one deals with the case of Ethiopia and the other with Zimbabwe in the African continent in order to illustrate the linkages between authoritarianism and famine. First, the case of Ethiopia offers an illustration of the relationship between democracy usurping the contention that democracy is not just about the principles but the practice. During two distinct periods of despotic rule: a) during the 1972-1974 famine, Emperor Haile Selassie's government was hesitant to confront the popula-

tion or declare parts of the country as disaster regions. This famine has among other things contributed to wide discontent and political agitation, which ultimately contributed to a military socialist coup in 1974. Famine struck again during 1984–1988, known in the annals of human consciousness as the “Great Ethiopian famine”, attracting worldwide attention and condemnation of the slow response of Mengistu Haile Mariam’s and his junta. As if famine is not enough, the war against several liberation fronts in Eritrea, Tigre, Afar, Somali, and Oromo populated regions intensified. Because of the authoritarian nature of government, the complete news blackout about the famine, the Ethiopians depended on foreign news sources about the famine in their own country. The forcibly implemented settlement programme as a response to the 1972–1974 famine was a complete disaster and, in fact, the new settlements became hotspots of poverty and in some cases famine.

Since the collapse of the military socialist regime in 1991, Ethiopians have begun to enjoy some democratic rights and have become more vocal in making demands on government to respond to major social problems. The government attitude towards the 2004 famine was different from that of its predecessors. An appeal for famine relief was timely made, NGO operations facilitated, and within a short period of time the situation was contained. The fact that 2005 is an election year also meant that the government will be judged by the electorate on how well it has responded to the famine situation.

I examined the charters or constitutions of the contending political parties in order to attest to whether food security, which is one of the major social problems confronting Ethiopia for millennia, was a major election issue. Unfortunately, the answer is no. Restoring peoples’ dignity by adopting food policies that would ensure food security is somehow subsumed under vague notions of ‘development’, ‘raising the standards of living’, and ‘poverty reduction strategies’. The problem is not that these issues are not important – they are important – the problem is that in authoritarian regimes none of them could be freely debated even when people are not able to attain a minimalist notion of food security, i.e. access by all people at all times to enough food for an active, healthy life.

Second, dictatorship or lack of its dialectical other, i.e. of democracy, can turn a food secure country into food insecure country, such as the case of Zimbabwe. Zimbabwe’s inadequate economic and

political policies have turned it from a regional breadbasket into a famine stricken country. Since the eviction of European Zimbabweans from their farms by the ZANO-PF militia in 2002, it was estimated that at least two million Zimbabweans are in urgent need of food relief. It is also reported that even when relief food is delivered, the government of Zimbabwe uses it as a weapon against its opponents, denying it to those citizens the ruling ZANO-PF party considers as enemies of the state.

Sen (1999) argues that no famine has ever taken place in the history of the world in a functioning democracy, because democratic governments have to win elections and face public criticism, and have a strong incentive to undertake measures to avert famines and other catastrophes. The reverse of this argument is true in the cases of Ethiopia and Zimbabwe. Whereas, the absence of democratic rule during Emperor Haile Selassie and Lt. Mengistu Haile Mariam despotic regimes produced some of the worst famines in the history of Ethiopia, the authoritarian ZANU-PF regime of President Mugabe has transformed Zimbabwe from a food exporting to a famine-stricken country. In the following section I articulate the role of social forces in engendering democratic governance for ensuring food security.

34.7 Harnessing Change

The globalization of food, the exponential development in food technology from biotechnology to genetic modification, and the global competition for farm animal and plant genetic resources carry with them immense risks and probably some potential opportunities. They have the potential to transform what is meant by food security for subsistence producers and indigenous peoples. At the same time it cannot and should not be left to the monopoly of individual states or corporate whim to maintain minimum standards of sustenance.

Naturally the current regime of governance for global food security addresses some of the current concerns. For example, the Food and Agriculture Organization (FAO), the World Food Centre, the Commission for Genetic Resources for Food and Agriculture (GAIN), the Commission on Sustainable Development, the World Food Program (WFP), the Hunger Commission, the WTO Agreement on Trade on Intellectual Property, Food and Biodiversity. There is also a myriad of civil society organizations and NGOs, including the NGOs’ Forum on Food Secu-

rity, the Genome Resources Action International (GRAIN), Rural Advancement International (RAI), and the World Resources Institute etc. However, its direct contribution to alleviating food insecurity for the majority of the world's population is questionable. The gap in perception between global, national, and household food security governance is too great to be bridged by global conventions and treaties alone. It is also doubtful whether the current regime satisfies the requirements for global food security governance set out above.

If politicians felt that their political fortunes are dependent on ensuring food security, food policies in these countries would have acquired a sense of urgency. It is not just an issue for parliamentary committees responsible for oversight. It is more importantly a question of empowering national civil society organizations, NGOs, and pressure groups to exert added pressure on governments to act on food security as a matter of priority.

In the 21st century I contend that governance of food security could then be treated not as a separate and periodic concern, taken seriously only when famine and natural disasters strike, or when outbreaks of epidemics such as BSE and Avian Bird Flu strike, but as an integral part of the overall governance debate. Food safety is no longer a matter for national governments or global corporate power operating in the fields of food science, technology, production and distribution, but also a matter for large and complex institutions reflecting the global-local nexus in this vital arena of human security. But even this broad understanding will not be enough if non-state actors, including the global social justice movement, civil society organizations, NGOs, as well as democracy lobby and advocacy pressure groups and social movements are not able to impress their voice in how food policies are developed and implemented at a global scale. The linkages between human security and food

security can never be more obvious and their implications more complex to comprehend.

The governance of global food security could, however, be hugely aided by democratic governance that is responsive to the immediate concerns of citizens. As voters they can influence policies and priorities and can commit public policy to food security targets. So the relationship between democracy and the quest for transparency, accountability, and public participation cannot be isolated from the debate about food security and its opposite, food insecurity, shortages, and famine.

34.8 Conclusion

I attempted to contribute to the conceptualization of security in the domain of globalized food production and food products, implying certain risks emanating from the intensification of food production through the use of new biotechnologies. The existence of a global food market indicates that food safety issues are no longer country-based but traverse national and regional boundaries. This understanding adds to the complexity of attaining both conventional and new conceptualizations of food security. The former deals with articulating the need for the emergence of regimes of food security governance. They are by necessity informed by the democratic dispensations which characterized the late 20th and early 21st century, whereby governance involves state and non-state actors as well as multilateral, corporate, private and global social movements, social justice networks, and NGOs. Admittedly, food governance regimes are more pro-active in old democracies than new democracies and authoritarian regimes. Reconceptualizing food security governance means giving 'voice' to those forces which could contribute effectively to an efficient and effective integrated governance regime duly conscious of the global-local nexus in the important sphere of human existence.

35 A Research Strategy to Secure Energy, Water, and Food via Developing Sustainable Land and Water Management in Turkey

Selim Kapur, Burcak Kapur, Erhan Akca, Hari Eswaran and Mustafa Aydın

35.1 Introduction

One of the basic contentions of the neo-realist world-view has been the argument that states have to survive in a dangerously competitive and ruthlessly conflictual environment (Waltz 2002: 29). Accordingly, the need to survive in a risky environment forces states to focus on strategies that maximize their power relative to their rivals. In this context, traditional security policy has been concerned primarily with deliberate military attack from certain enemies. However, post-Cold War global processes have been changing the nature of threat and forcing adaptation of basic strategic principles and the patterns of allegiance associated with them. The world's security *problématique* have truly changed in the past decade or two. Our thinking about the *nature* of security must also change, taking account of changes in the nature of threat for survival. There are clearly new and sometimes unexpected linkages between political, security, and economic concerns that challenge the capacity of the state both to recognize and to respond to the new challenges. At the same time, there has been an institutional challenge relating to the adequacy of existing institutions for international action, and to the potential for coordination between state and other non-state (transnational and sub national) forces.

One such area relates to the security of energy, water, and food. It is now increasingly commonplace to securitize formerly non-security-related issues of production of food, ownership of water, and continued supply of energy resources (Brauch 2003). In this context, energy security can be defined as access to steady supply of cheap, clean, and reliable energy resources, while water security refers to continued clean and steady access to potable and useable water; and food security relates to "access to adequate, safe and nutritious food to maintain healthy life", which include freedom from chronic hunger (Collomb 2003: 777). All of these inevitably include the problem of sustain-

ability, which has become more of a problem as a result of realization that neither energy resources, nor food and water, are unlimited commodities in the world, and that their shortages would create security risks. When put together, the security complex of energy, water, and food could be achieved, or at least enhanced, by improvement of integrated programmes for the sustainable management of land, water, and energy resources¹.

Turkey has been one of the countries that experiences energy scarcity, less than self-sufficiency in food production, and an unequal distribution of water throughout the country. There has been increasing concern in Turkey that water availability fluctuates widely among regions, and seasonally within regions. Food self-sufficiency has also become problematic recently with decreasing production, while energy shortage and external dependency creates burdens for the country's economic development. In this context, the ambitious multi-purpose GAP project (Turkish acronym for South-eastern Anatolian Irrigation Development Project), seeks to increase the GNP by 445 per cent, the per capita income by 209 per cent, and to create jobs for 3.5 million people (Tekinel 2001: 13), as well as alleviating Turkey's energy dependency to outside sources, increasing food production and better regulating its water resources. The GAP was launched by the Turkish government with a specific aim in mind: "to develop a strategy for a sustainable and secure production of energy and food" (35.2.). This chapter seeks to present a contextual approach (35.3), i.e. a research programme for developing energy, wa-

1 For extensive scientific definitions of *security* see Brauch (2006); for a Turkish perspective on regional security see Aydın (2006); on *energy security* see the contributions in this volume, part IV, Chapters 23–32; on water security, see the Chapters 41–58 in part VII in this volume; and on food security see the chapters 33–35 in part V of this volume.

ter and food security (35.4) via a *sustainable land and water management* (SLWM) strategy, and to draw policy conclusions (35.5).

A successful SLWM strategy, that anticipates constraints for sustainability and develops action plans to address them, would enable us to deal with security issues beforehand that may otherwise develop to a full-scale crisis. The suggested research strategy for the GAP focuses on technical solutions needed to ensure sustainability, which is needed for any type of planning, as well as creating a security feeling among the larger population for their well-being over the long term. Because the emphasis is on sustainability, system monitoring is considered an essential part of the research strategy. Indicators must be carefully selected prior to project commencement, and they must be monitored during the duration of the research activity. These indicators are used to monitor the system (project area) as a whole and as measures for its quality and health. Socio-economic indicators serve as proxies for such purposes (Scherr 2001: 155; Southgate 2001: 461). Ecosystem indicators are more difficult to determine and require greater effort to monitor. These are as important as the socio-economic indicators when sustainability is being studied (Eswaran/Virmani/ Spivey 1993: 7; Swaminathan 1991: 244).

With food, water, and irrigation security in mind, the GAP is the largest irrigation and hydroelectric power development project undertaken in Turkey. The GAP area (74,000 km²) covers one tenth of the total and one fourth of the irrigable area of the country (figure 35.1), and includes six provinces on the plains formed by the tributaries of the Euphrates and Tigris rivers. It was conceived in the 1960's when productivity and food production was utmost concern². All the research has so far focused on this. There are now considerable data for the management of different production systems for food production. Sustainability emerged as an issue in the 1980's and 1990's, and the integrity of the environment has become an overriding factor. Internationalization of the project and a "security concern" to neighbouring countries also took place at this time (See Aydin in this volume). The established structure that was particularly concerned with enhancing production was ill-prepared to meet the new challenges and paradigm shifts. Though

the agricultural research community appreciates SLWM as a concept, there is still a considerable hesitation launching SLWM-related research activities. The environmental and transnational components still baffle the agricultural scientists. As a result, the progress is slow.

The casual chain that leads to these marked changes in ecosystems of irrigation regions is clear. In several countries they are frequently associated with demands for more land due to the increased rural populations. There is also the impending impact of global climate change depending on the locality. Ecosystem degradation processes are strongly affected by population pressures, poverty, enhanced demand for ecosystem products, and the uncontrolled rates of resource consumption.

The negative effects of ecosystem degradation commence with the imperceptible changes in biodiversity and lead eventually to the process of "desertification" (UNCED 1993). Cropland quality is slowly reduced through land degradation processes. When crop yields reach their marginal utility value or when it is no more economically productive to grow a crop, the land is either abandoned (by shifting cultivation) or used for grazing. A frequent process is overgrazing and an indicator of reduction in land quality is when small ruminants replace large ones. The consequence thereof is a gradual change in the hydrology of the watershed resulting in reduced biomass quality and quantity and leading to reduced carbon sequestration and enhanced albedo³.

Developing new paradigms, designing strategies for the new challenges, and implementing long-term research activities in the area of SLWM are the current needs of Turkey. The GAP provides a unique opportunity for such a programme, addressing various intricate sociopolitical, economic, environmental and security problems at the local, national, and transnational levels. This chapter evaluates the conditions and suggests research areas for implementation.

35.2 The Basis for SLWM

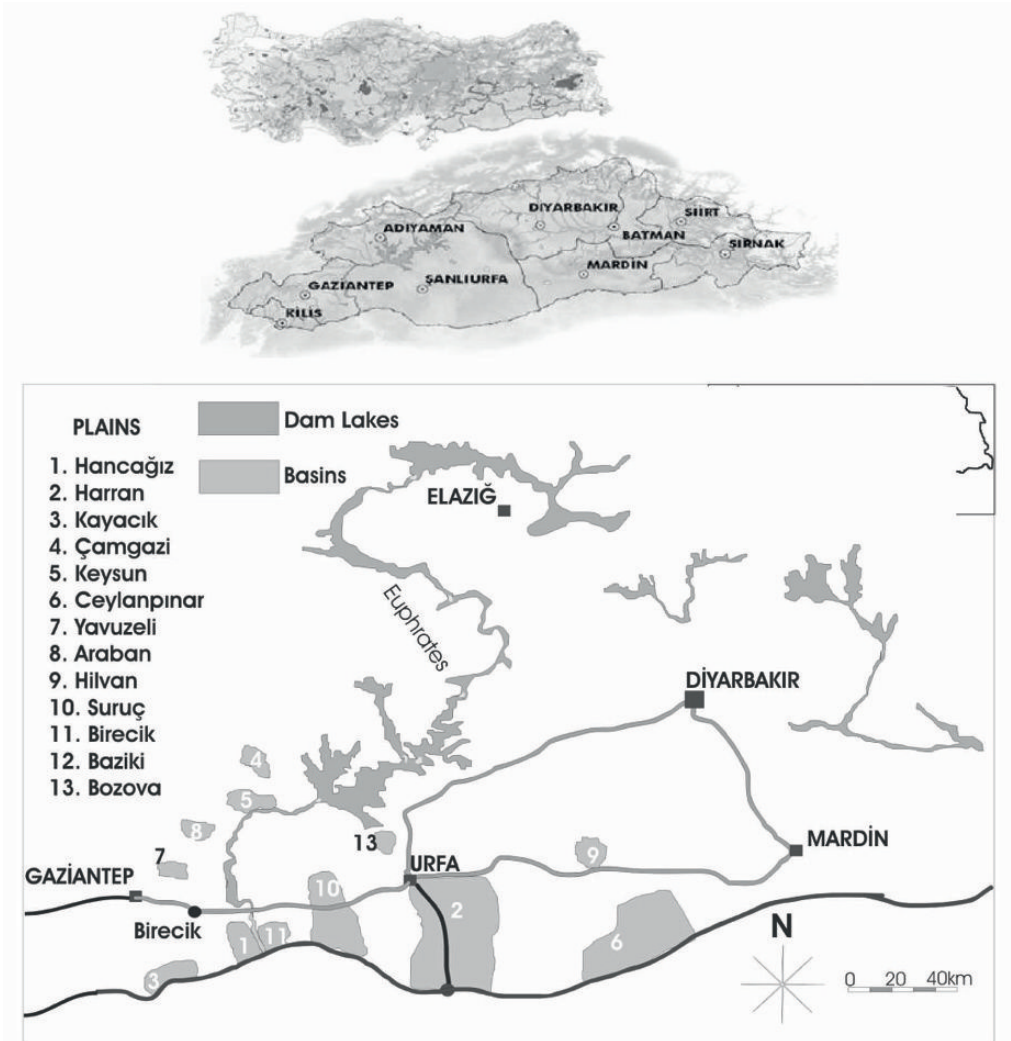
35.2.1 Energy Context

Energy in the GAP is and will continue to be highly crucial with a sectoral distribution of 78 per cent compared to the 15.6 per cent distribution of agriculture

2 In addition to self-sufficiency in food production, various issues related to sustainable economic development, irrigation, social integration of the local population, and political reconstruction of the area were instrumental in launching of the GAP.

3 A measure of reflectivity of a surface or a body in the earth surface.

Figure 35.1: The irrigation basins of the GAP. **Source:** <www.gap.gov.tr (5 May 2005)>.



and 25.5 per cent of tourism according to the reports of 2001. The justification for a colossal project such as the GAP should primarily be considered for energy. The dramatic increase in petroleum imports in the mid 1970's cost US\$ 5.7 billion for a ten-year period. This grew, amounting to US\$ 2.6 billion in 1988 alone, which caused a crisis for energy production growing at 33 per cent, whereas energy consumption increased by 172 per cent. Thus, the Turkish government launched a massive investigation into its hydroelectric potential. Estimates revealed annual run-off figures of 185 bcm for the 21 river basins of Turkey, where 62 bcm is planned to be consumed after the year 2000, leaving 123 bcm for use as hydroelectric power and agriculture (MacQuarrie 2004: 84). Biswas, Kolars, and Murakami (1997: 180) estimated Turkey's hydropower energy potential at 35,618 MW,

or 126,650 GWh. The 400 hydropower plants that were under construction in 2005 are programmed to achieve a production of 63.5 per cent of the estimated potential, and 26 per cent of the estimated electricity needs of Turkey by 2010. The 2001 GAP report indicates that the project contributes nearly half of all hydroelectric energy produced in Turkey, and 9.3 per cent of its total electricity production, with a planned 20 per cent coming from the GAP region by 2010 (MacQuarrie 2004: 84). Tekinel (2001: 13) documents that the added income of the 6 main hydroelectric power plants to the region has been over 690 million US\$/year (11.49 billion kWh), with the immense Atatürk plant contributing 294 million US\$/year (4.9 billion kWh) of the total. Considering an increase of the energy demand by 250-300 per cent for the near future, which brings forward concerns relating de-

pendency to outside sources thus issues of ability to formulate and implement independent foreign and domestic policies, it is highly probable that Turkey will reconsider its plans for managing the Euphrates and Tigris rivers to create relative autonomy in its foreign and domestic policy-making.

35.2.2 Food Quantity and Quality Context: Food Security

The primary task of land management is to enhance productivity of the land with the per capita income which is targeted to reach US\$ 4350 from the previous level of only US\$ 596 (Tekinel 2001: 14) (figure 35.2). But reports have revealed that the 9 per cent added value of agriculture for the Turkish economy in the region had already increased to 12 per cent by the year 2000. Thus, a 2 per cent increase in per capita income was attained from 1985 to 2000. As the Mediterranean region, the GAP area presents a unique suite of soils that has effects on food quality. The high pH and the calcareous nature of most soils, indicates a need for zinc, in addition to nitrogen, phosphorous, and potassium for sustained production. This high pH also immobilizes many trace elements needed for health of both human and animal populations. These elements include selenium, chromium, cobalt, iodine, and fluorine. Currently, these are added as supplements to the feed. Besides the increase obtained in the production of the main crops in the GAP after irrigation (table 35.1), there are opportunities to increase the content of these elements in the grain, and studies are needed in this area (Dinc/Kapur 1991).

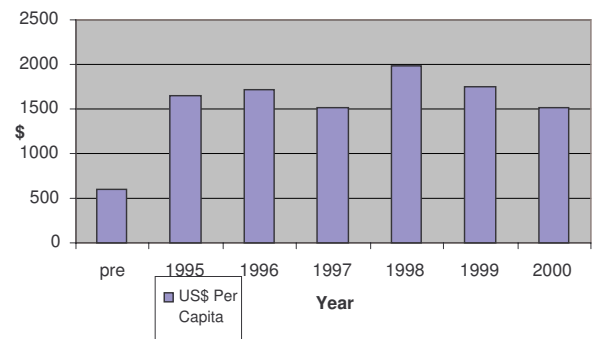
The tremendous increase (table 35.1) in crop production has been a major factor for the income growth in the region. The comparative yield increases with the total production in Turkey highlights the importance of the economic contribution of the region for the overall economy. The changing crop pattern of the GAP region after irrigation shows a trend and demand for increasing cultivated areas for industrial crops, such as cotton.

The main goal of the strategy to achieve food security is to improve soil quality by the carbon sequestration in the soil. C-sequestration improves and sustains biomass and agronomic productivity, which also leads to the reduction in the atmospheric concentration of CO₂. However, irrespective of climate change, the soil organic carbon (SOC) is an extremely valuable natural resource in need of restoration and conservation. Thus, the development of C-management policies, which include regulation based on trading of soil

Table 35.1: Comparison of the whole product in Turkey with increase of some crops after the GAP irrigation.

Crop	Total Production (1986)	GAP Production	(GAP×100)/Turkey
Cotton	580.000	685.402	118
Tobacco	117.529	18.888	11
Sugar Beet	14.304.375	4.098.895	29
Oil seed	1.807.904	1.327.820	73
Maize	1.500.000	117.869	8
Rice	168.000	141.839	84
Vegetable	12.398.950	3.513.842	28
Animal feed	4.836.454	1.092.898	26
Pistachio	23.000	66.458	289
Fruit	1.303.900	660.019	51

Figure 35.2: Agricultural added value in the GAP Per Capita.



carbon, may be successful over a period of 20 to 50 years if strictly implemented, what requires consistent and long-lived subsidies for land users for no till farming (Lal 2004: 1624; Lal/Griffin/Apt/Lave/Morgan 2004: 393).

35.2.3 Water Security Context: Water Availability and Distribution

Water scarcity or unequal distribution of it within the country creates dependency to outside sources, which increases possibility of friction between neighbouring countries when one supplies to the other the resources it needs, either freely or with a charge. The situation is exacerbated when the supplier is also in need of more water, vital for survival. The GAP project, developed in an effort to deal with these problems, includes some 22 dams, 25 irrigation

projects and 19 hydroelectric power plants. It is divided into 13 major subprojects, of which seven are located on the Euphrates and six on the Tigris. On the Euphrates, the Lower Euphrates is the largest subproject, including the Atatürk Dam and Şanlıurfa Tunnels with five smaller subprojects. But despite the enormous amounts of water to be used for the irrigation of projected 1.7 million ha, efficiency of the irrigation system is needed. This has been questioned in many parts of the world. In Turkey, the history of the irrigation projects indicates that success depends, in addition to engineering structures, on the management of the land and water, as well as on human and governance problems. Due to political pressures, many projects have been implemented before their main distribution and drainage networks were completed. The long-term consequences must yet be studied. Water use efficiency is a secondary concern for irrigation engineers. Ad hoc studies have shown water losses of up to 50 per cent in some areas (Tekinel 1993: 4). Inappropriate or inadequate land levelling further reduces the efficiency of water use.

Much of the inadequacy in irrigation systems leads to secondary salinization which is the greatest threat to water security and consequently also to food security. In some of the older projects (Çumra, Menemen, Seyhan) detrimental changes have occurred in the soils as a result of poor drainage facilities. The resultant salinization has discouraged farmers from capitalizing on the irrigation and instead some reverted to dry-land practices. In the Çumra project, it is estimated that 42 per cent of the land is still under fallow. These cannot be corrected without more social and political accountability. Although not directly land related, this is also part of the sustainable land management, i.e. of the security of water and land.

Earlier, a problem of the inadequate amount of water entering a delta was mentioned. With new irrigation projects coming on line and with ever increasing hydroelectric projects, the quantity of fresh water entering the sea will be less. This will affect the salinity of the water on the coastal platforms and have great impact on aquatic life. Further, the irrigation water remains largely on the system (accentuated by poor drainage facilities), evaporates during the hot season and results in salinization of soils. This reduces the soil quality and thus threatens food security. These processes are termed "endoreization" which, if not monitored, has devastating ecological consequences.

35.3 Research Strategy for the GAP Region

The 74,000 km² area presents both a laboratory and a challenge to ensure sustainability of agriculture. In general, the regional climate is similar to the Mediterranean with hot, dry summers and mild and humid winters. The soil moisture regime is xeric⁴ and the soil temperature regime is thermic. A variety of soils, including Cambisols⁵ on the hill slopes in association with shallow Leptosols⁶ and rock outcrops, friable, reddish Luvisols⁷ derived from basic rocks and limestone, are interspersed with sticky, Vertisols⁸. Cambisols are also present but probably were of wider extent in the past. Erosion has decapitated the mollic qualifier⁹ and also reduced the effective thickness of the soils. The water holding capacity of the Luvisols and Cambisols is about 50 to 100 mm/metre while the Vertisols have a higher capacity of about 150 mm/metre of soil. Wind blown sand may cap some of the soils while developing dunes of several metres.

As agriculture is dependent on water, the kind of soil is crucial. A detailed soil map was initiated in 1985. This was complimented with Landsat-3 MSS data, the latter being also used to monitor grain production (Dinç/Kapur 1991). In the last three decades, a large number of agronomic experiments were laid out for several crops. Most were designed to determine crop performance and/or response to management. This research provided databases and experience that assisted in the eventual establishment of the GAP programme. However, as indicated previously, the main focus was on production and not on sustainability.

35.3.1 Elements of a Strategic Plan

Sustainable land management is the system of technologies, with associated objectives, activities, and outcomes, employed to maintain or enhance the quality and productivity of the resource base while prom-

4 Dry conditions in which plant growth may be limited by water shortage

5 Cambisols are typical in temperate or cooler regions, in which soils are either young or, depending on the climate, processes of soil formation occur slowly.

6 Young and shallow soils.

7 Relatively mature fertile soils.

8 Dark soils with high clay contents and characteristic development of cracks.

9 Surface layer of soil that is dark coloured and relatively thick.

ising an improved quality of life and intergenerational equity for the community. Thus, when SLM is evaluated or monitored, these components are considered:

- Quality of life is maintained or enhanced;
- Ecosystem integrity is maintained or enhanced;
- Productivity, including quantity, quality, economics, and acceptance, is also maintained or enhanced.

The following are general considerations in designing SLM projects.

Indicators. The concept of sustainability incorporates a timeframe of decades and SLM ensures the optimal functioning of the system in this period. A most important component of an SLM programme is indicators that are used to monitor the progress of the system. A series of indicators are needed that monitor the stresses (pressure) experienced by the system, the state of the system, and the responses to the stresses. This suite is monitored regularly and analysed to evaluate system behaviour. The *pressure-state-response* matrix becomes a useful tool to evaluate progress. The matrix is applied to all sectors, biophysical, environmental, and socio-economic.

Project design. Since the project deals with a large contiguous area, it must provide for niches for many known plant and animal communities. Preserving biodiversity is as important as the production part of the project. To develop a master plan, the characteristics of the bio-communities, including the needs of migratory birds, must be known or researched. Fragile systems, such as sloping lands or wetlands, must be clearly demarcated and set aside as ecosystem refuges. These fragile systems will be targets for special monitoring as they are most sensitive to changes. This design of the project must be made in consultation with a range of specialists and respected during the implementation phase.

Preserving the heritage. The GAP area has known civilization for more than 5,000 years. Evidence of this is entombed in the soil as burial mounds, *höyük*s or tells, and archaeological fragments. Meeting current food security needs can be done while preserving and protecting the history of mankind. In developing the area for irrigation, a continuous vigilance is necessary for this aspect of sustainability.

Concept ownership. If sustainability remains a research concept, it has minimal impact and the system breaks down. There must be awareness in the community, particularly among land users. They must ac-

cept the notion and this can be achieved through information dissemination and a participatory approach. The added value of biodiversity to agroecosystems can be demonstrated and the land users can be charged to be the guardians of biodiversity.

Economic viability. The economic viability of the farming community is the driver of the sustainability paradigm in the project area. In its absence, the farmers' preoccupation with survival prevents them from contributing to environmental concerns. Appropriate government support, marketing facilities, infrastructures such as road networks, and an efficient extension service assure its viability.

Other Considerations. The GAP area has historically been dominated by a system characterized by grazing by small ruminants and rain-fed grain crops on valley bottoms. Where water was available (tube-wells or aquifers) local irrigated crops were developed and a larger variety of crops (cotton, chickpeas, lentils, tree-crops) were grown. The dramatic increases in performance of irrigation are evident. However, the stability of the system is uncertain. After harvest of grains, the straw is removed as fodder for animals, and small ruminants graze the remaining stubble. A net export of plant nutrients takes place from the fields, as the amount of fertilizers used is minimal. With the establishment of irrigation facilities, and accompanying subsidies available, there is excessive use of agrochemicals to maintain high production. The extent of this has yet to be established.

Water-logging and development of salinity have been experienced in some irrigated areas in Turkey. Both are yield depressing factors as perhaps the greatest hazards of irrigation. Not all soils have the same propensity to develop salinity and thus an important task is to develop maps of the salinity-hazard. An equally important task is to monitor the soils for salinity or to develop early warning indicators. The area is also prone to wind and water erosion. In an irrigated system, ground cover remains for longer time spans and this reduces both kinds of erosion. However, irrigation waters frequently carry high silt loads which when deposited on the soil crusts easily and hampers seedling emergence.

Finally, the success of an irrigation enterprise is strongly governed by its socio-economic milieu. Land tenure is a major issue and this must guarantee to ensure the positive effects not only of productivity but also sustainability of the programme. In addition to land ownership, the project must consolidate and allocate land for its different uses (including biodiver-

sity). A related question relates to the water rights for different users. This must be determined and agreed to from the outset. Finally, there must be adequate support services to ensure help when needed and provide the technical and marketing facilities crucial for the stability of the area

35.3.2 Research Strategy

A good strategy anticipates constraints to sustainability and develops the activities to address them. Although the theme of the paper is sustainable land management, the socio-economic component is critical and in many instances is more important than the technical solutions. Both components are nullified if they do not operate in an appropriate policy environment, from the national to the local level.

The suggested research strategy will focus on the technical solutions needed to ensure sustainability. As the emphasis is on sustainability, system monitoring is considered an essential. The indicators must be carefully selected before the project begins and monitored during its duration. The chosen indicators will supplement data collected in agronomic trials. They are generally monitoring the system (project area) as a whole and are measures of the health of the system. Socio-economic indicators serve as proxies. Ecosystem indicators are more difficult to determine and require greater effort to monitor. Both are equally important for the study of sustainability. Some framing questions for the research strategy are:

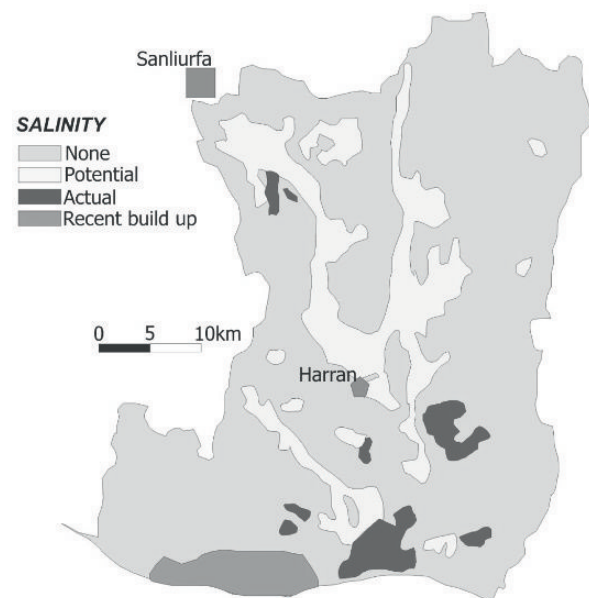
1. Has the quality of life of communities in the area been significantly enhanced?
2. What changes can be recommended to maximize profits and minimize risks?
3. What components of the ecosystem are being aided or hampered by irrigation?
4. Is land degradation (or components of it) being changed and in what direction?
5. Is the productivity of the soil resource base being attained and maintained?
6. Is the current pattern and mix of land use the best for the goal of sustainability?

35.3.3 The Harran Project: A Case Study

Thirteen project areas are defined for the GAP programme and the Harran Plain is the first area to be developed. The area of 225,000 ha is confined in the south by Syria and the Tektek, Fatik, and Urfa Mountains in the east, west, and north respectively. Details

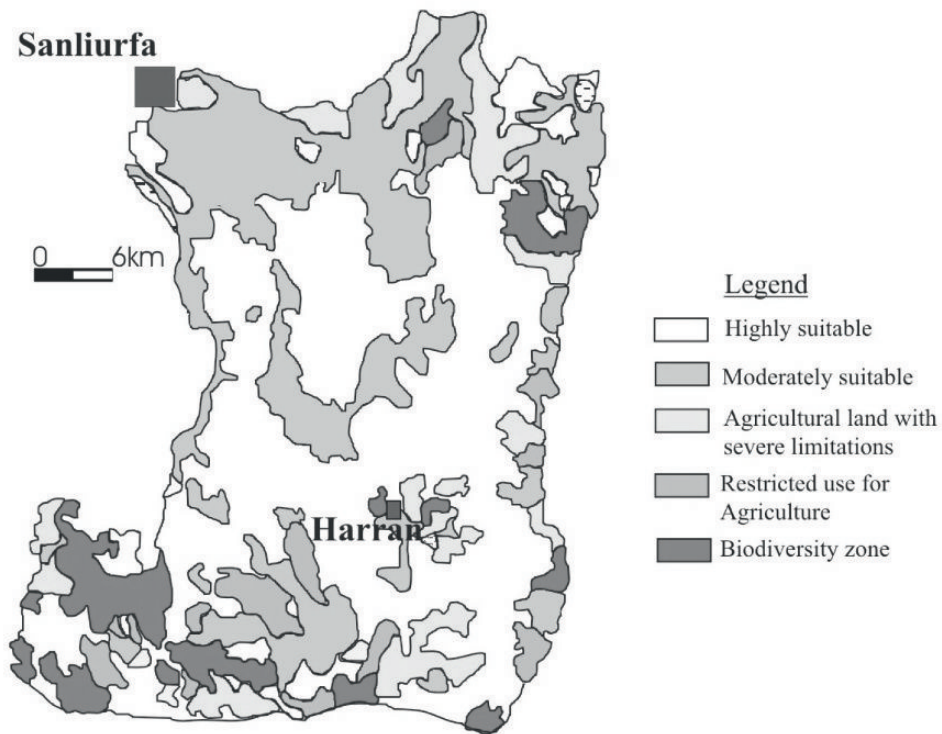
of the soil and physiographic characteristics of the region are given by Dinç and Kapur (1991). A semi-detailed soil survey at a scale of 1:50,000 was made in 1991 and a large number of soils were sampled and analysed for the soil survey programme. The maps were digitized and additional information was included in the attribute files. Using GIS tools, interpretive maps were prepared (figure 35.3), which show the secondary salinization as a major risk for food security that may result from irrigation.

Figure 35.3: Actual and potential salinity of the Harran Plain in 1985. **Sources:** Dinç/Kapur (1991); Şenol/Yeğingil/Dinç/Öztürk (1991); Özkutlu/İnce (1999).



Finally, a land suitability map that demarcated the area for agricultural use (Şenol/Yeğingil/Dinç/Öztürk 1991: 49) was prepared (figure 35.4). This stage of evaluating the baseline conditions was also complemented with socio-economic surveys and demographic information. The Koruklu Agricultural Research Station of the University of Çukurova has been conducting research on farming systems and irrigation. In 2005, project emphasis has been on productivity and developing land for the landless. Since completion of the first project phase sustainability became an issue and a new strategic plan became necessary. Figure 35.5 shows the proposed activity chart for the second project phase. A master plan using the baseline information is being developed. This plan demarcates areas for irrigated agriculture, dryland agriculture and grazing, biodiversity zones, archaeological

Figure 35.4: The land suitability map of the Harran Plain. **Source:** Şenol/Yeğingil/Dinç/Öztürk (1991).



sites to be preserved, and possible sites for new villages. Resource consumption whereby good agricultural lands and anthrosapes¹⁰ are used for urban dwelling is plaguing the country. This is a major long-term sustainability question that must be addressed.

Long-term agronomic sites have been established, following the previous norms of best soils or most extensive soils. Although sites that represent tension zones will also be selected. The latter represent less favourable conditions but actual situations on farmers' fields. Data of farming and cropping systems are now being used in simulation models and as experience in the use of these models increase, they will be used in developing scenarios. The cumulative experience and data will eventually be used to develop decision support systems for farm managers, extension service, and progressive farmers.

The selection of indicators, particularly those on the environment, is difficult to define, and discussions are underway to select appropriate ones. International projects, such as the land quality indicator project of the World Bank, are also working in this area and we will use their recommendations. Impact

monitoring is also being developed by other international organizations and their approach will be adapted for our use. Impact assessment will be made every five years and this provides an opportunity to determine the status of the resource conditions and corrective actions that must be taken if there are weaknesses in the system.

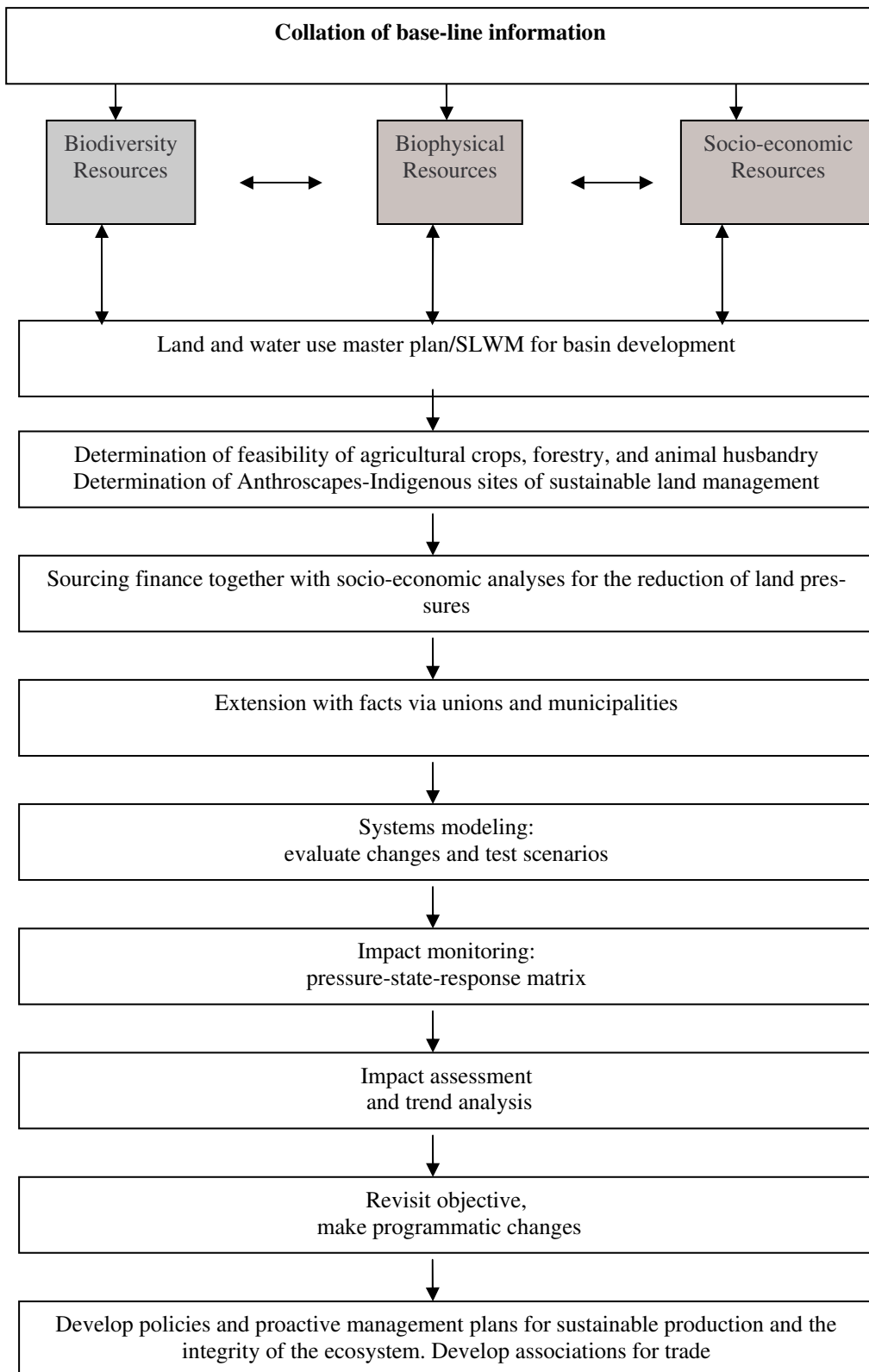
The whole activity is a research area that is new to the authors and we expect it to be an important learning process. There are problems of coordination and communication between specialists from different disciplines. Another conflict area is the desire to accomplish (get the project moving) and the cautious approach of the research scientist. Due to the commitment of national decision-makers, we are confident that progress will be made.

35.4 Conclusion

The paradigm shift that SLWM calls for (as in the water basin development context) is that research must be holistic and systems-based in a basin context. It should include not only agronomic and crop or livestock based observations but also the linkages of these to the ecosystem, the socio-economic and political conditions of the area, and the larger regional

¹⁰ Areas of indigenous and sustainable land use, i.e. inherited human-shaped landscapes.

Figure 35.5: Harran project activity chart. **Source:** modified from Kapur/Eswaran/ Akça/Dingil (2002).



context. It should show specifically how the resource base is maintained or enhanced to provide more energy, food and water security for the whole region, not just for a few people or a single country.

In the final analysis, it should clearly demonstrate that agriculture is environment friendly. The farming community must also demonstrate a paradigm shift as they participate in the programme. Plucknett and Winkelmann (1995: 184) stated that farmers must confront formidable challenges in learning to manage ever more advanced technologies in ways that will increase the productivity of their resources while protecting the environment. They stress that this will be a daunting task in the developing world. In some Mediterranean countries there are still many obstacles against adopting science-based technologies. But this must be the goal of not only national decision-makers but also for any research strategy.

It is clear that sustainability of land and water resources is not only an important input for continued economic development, but also crucial in the long-term survival of regional people. This study demonstrated how an SLWM approach could contribute to that long-term goal. It also highlighted that without such an integrated project, regional as well as national and local long-term survival and short-to-mid-term development would be at risk. This eventuality would inevitably create security problems for regional as well as international levels. To deal with these, the starting point should be the development of a successful SLWM research strategy.

36 Sustainable Livelihood Security. Evolution and Application

Hans-Georg Bohle

36.1 Introduction

The chapter reviews the concept of sustainable livelihood security against the background of the current discourse on human security. It analyses the academic and political context in which the livelihoods approach has emerged and became popular and asks how the concept was utilized by both researchers and practitioners, and to what effect. It focuses on the normative base and the discursive context of the concept.

The chapter argues that the new approach on sustainable livelihood security has emerged as an influential way of thinking on how the rural and urban poor can be identified and targeted, how pro-poor interventions can be planned, and how policy-relevant analysis on local levels can guide research on vulnerability, poverty and development. Analyzing and promoting sustainable livelihood security is closely connected with the concept of human security, putting people at the centre and taking equity, human rights, capabilities and sustainability as its normative basis. New frontiers in livelihoods research are presented in the chapter that seek to compensate for some of the shortcomings of the concept that are outlined in the paper. These include theoretically grounded appraisals of the relationship between structure and agency; politically sensitive analysis of social relations of access and control; and a culturally sensitive recognition of the non-material dimension of sustainable livelihoods security.

36.2 The Concept and its Principles

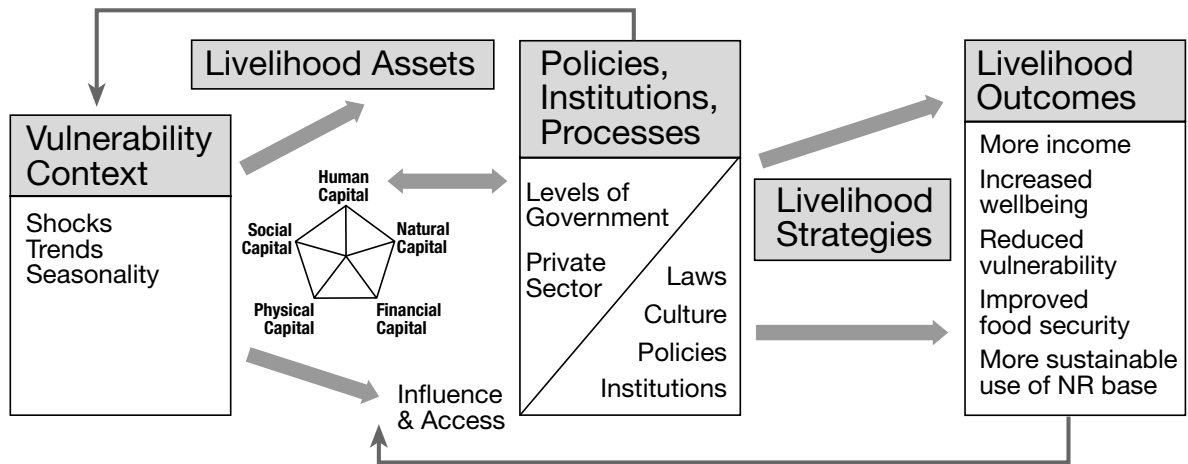
In the late 1990's, development agencies have put reduction, elimination and eradication of poverty as the prime focus of their programmes (AusAID 1997; DFID 1999; UNDP 1999; NZAID 2002; Cahn 2002). The new focus on poverty is also clearly reflected in the UN Millennium Development Goals, which range from halving extreme poverty to providing universal

primary education by the date of 2015. In accordance with this renewed interest in poverty reduction, the livelihoods approach has emerged during the 1990's. It focuses on the everyday life realities of the poor and seeks to identify how the poor secure their living and what it is that can sustain poor households through the stresses and shocks of their lives. The concept of 'Sustainable Livelihood Security' has emerged as a "way of thinking" (Cahn 2002: 1) that can be used as a tool for identifying and targeting the poor, planning pro-poor interventions, reviewing and evaluating poverty-related projects, carrying out policy analysis on local levels, and guiding research on poverty and development. Analyzing and promoting sustainable livelihood security implies putting people at the centre of attention. People-centred approaches to sustainable poverty elimination can only be achieved if analysis and support focus on what really matters to poor people. "Putting the Last First" (Chambers 1983) is thus the guiding principle of analyzing and providing sustainable livelihood security.

Emerging from intensive work at the IDS in Sussex during the 1990's, a set of core principles has been developed which, together, constitute what is now known as the "Sustainable Livelihoods Approach" (Chambers/Conway 1991; Scoones 1998; Carney 1999). This approach was adopted and formalized as the *Sustainable Livelihoods Framework* (SLF) by DFID in 1999 and published in the form of Sustainable Livelihoods Guidance Sheets (DFID 1999, constantly updated).

According to Chambers and Conway (1992), a 'livelihood' comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. 'Livelihood security' refers to secure ownership of, or access to, resources and income-earning activities, including reserves and assets to offset risk, ease shocks and meet contingencies. 'Sustainable' refers to the maintenance or enhancement of resource productivity on a long-term basis. An individual, household or social group may be

Figure 36.1: The Sustainable Livelihood Framework. **Source:** DFID (1999). This figure is in the public domain.



enabled to gain sustainable livelihood security in many ways - through ownership of land, livestock or trees; rights to grazing, fishing, hunting or gathering; through stable employment with adequate remuneration; or through varied repertoires of activities. DFID (1999, glossary) has identified six core principles of the 'Sustainable Livelihoods Approach' in the context of poverty-focused development activities:

- *People-centred:* sustainable poverty elimination will be achieved only if external support focuses on what matters to people, understands the differences between groups of people and works with them in a way that fits in with their current livelihood strategies, social environment and ability to adapt.
- *Responsive and participatory:* poor people must be key actors in identifying and addressing livelihood priorities. Outsiders need processes that enable them to listen and respond to the poor.
- *Multi-level:* poverty elimination is an enormous challenge that will only be overcome by working at multiple levels, ensuring that local-level activity informs the development of policy and an effective enabling environment, and that higher-level policies and institutions support people to build upon their own strengths.
- *Conducted in partnership:* with both the public and the private sector.
- *Sustainable:* there are four key dimensions to sustainability - economic, institutional, social and environmental sustainability. All are important - a balance must be found between them.
- *Dynamic:* external support must recognize the dynamic nature of livelihood strategies, respond flexibly to changes in people's situation, and develop longer-term commitments.

These core principles of the sustainable livelihoods approach should not be confused with the principles of livelihood analysis which relate more specifically to the approaches and activities involved in investigating livelihoods. The core principles of 'Livelihood Analysis' are as follows (DFID 1999; glossary):

- Effort should be devoted to identifying and understanding the livelihood circumstances of marginalized and excluded groups.
- Analysis should take into account important social divides that make a difference to people's livelihoods. For example, it is often appropriate to consider men, women, different age groups, etc. separately. It is not sufficient to take the household as the sole unit of analysis.
- The sustainable livelihood (SL) approach seeks to build upon people's strengths and resourcefulness. When conducting analysis it is important to avoid thinking only about need.
- The SL approach embraces the idea of dynamism. Avoid taking one-off snapshots and instead think about change over time, including concerns about sustainability.
- There will never be a set recipe for which method to use under which circumstances. Flexibility is key. Equally, it is not necessary to produce one definitive 'map' of livelihoods. Different 'maps' may be appropriately used for different purposes.

In order to help understand and analyse the livelihoods of the poor, the Sustainable Livelihoods Frame-

work (SLF) has been developed by Scoones (1998: 4) and made a central part of the Sustainable Livelihoods Guidance Sheets by DFID (1999: 1.1). The framework which is presented in schematic form in figure 36.1 views poor people as operating in a context of vulnerability. Within this context, they have access to certain assets ('capitals') or poverty reducing factors. These gain their meaning and value through the prevailing social, institutional and organization environment. This environment also influences the livelihood strategies – ways of combining and using assets – that are open to people in pursuit of beneficial livelihood outcomes that meet their own livelihood objectives.

36.3 Origins and Evolution of the Concept

The 'Sustainable Livelihoods Approach' was originally developed for the rural poor (Carney 1999: 1). After decades of limited success in eliminating rural poverty, new ideas about pro-poor rural development were emerging in the 1990's, with a remarkable convergence when a number of prominent agencies revised their rural development strategies in broadly similar directions.

The emergence of the so-called livelihood approaches can be regarded as a reaction to the defects of conventional professional analysis and practice in rural development (Chambers/Conway 1992: 2). In social science analysis, and in the practice of rural development, the question of how a vastly larger number of people may gain at least basically decent rural livelihoods in a manner which can be sustained and secure – most of the rural poor living in fragile and marginal environments – had so far been tackled by a conventional conservatism in concepts, values, methods and behaviour. Three modes of thinking in development teaching and analyses had proved singularly resistant to change: production thinking, employment thinking, and poverty-line thinking (Chambers/Conway 1992: 2). In the mode of production thinking, problems defined variously as hunger, malnutrition and famine had been seen as problems of not producing enough food. There is, however, overwhelming evidence that these are much more problems of access and rights, of distribution and entitlements, rather than of production or supply (Sen 1981). In employment thinking, the problems of the rural poor had been seen as lack of employment. The ideal was full employment; the prescription was generating large

numbers of new workplaces. But this misfits much rural reality, in which people are not 'jobless' or 'unemployed', but constantly seeking to put together a living through multifarious repertoires of activities. In poverty-line thinking, deprivation had been defined in terms of a single continuum, the poverty line, which was measured either in terms of incomes or consumption. The aim was to enable more people to rise above this line, and fewer to sink below it. But deprivation and rural poverty, as poor people experience and perceive them, have many dimensions which do not correspond with this measure at all (Jodha 1988). To sum up, these three modes of analysis and development practice share two defects: an industrialized country imprint; and reductionism for ease of measurement (Chambers/Conway 1992: 3).

These ways of thinking clearly reflect the dominant modes of donor support for rural development over the past half century. The defining feature of this support was the tacit equation of 'rural' with 'agricultural' development (Carney 1999: 2). In the 1950's–60's the focus of donor attention fell on increasing the production of staple crops through 'green revolution' strategies, struggling to achieve food self-sufficiency. The emphasis was on import substitution, supply-driven policies and parastatal monopolies of both input supply and output marketing. Although these strategies were highly successful in terms of production-thinking, the benefits tended to be skewed towards richer farmers and more favourable environments (Bohle 1984, 1989, 1999).

The 1970's was the decade of integrated rural development (IRD). This strategy clearly reflected employment and income thinking. Although the complexities of rural life became to be taken into account, IRD projects were driven top-down, often with scant regard to local circumstances and few links to local social and political structures. The 1980's saw efforts to reform or adjust the agricultural sector through economic liberalization and privatization. At the project level, disillusionment with the top-down approach of IRD translated into a new focus on participation, NGO-implemented projects and bottom-up development (Stöhr/Taylor 1981). This created the ground for the emerging sustainable livelihoods approaches of the 1990's with their focus on people-centred, participatory principles. New main themes were the sustainability of the environment, the protection of natural resources, a renewed concern about world food supplies, and an extended access to food for the poorest sections of the population.

Although the sustainable livelihoods approach concentrates on the rural poor, any development strategy for the 21st century has to confront the question of how a vastly increasing number of urban poor people can secure and sustain a livelihood. As in rural development, the focus of pro-poor development of the 1970's and 1980's had clearly been driven by employment, income and poverty-line thinking. This became particularly evident with ILO's approach on promoting the urban informal sector, with an emphasis on supporting informal income opportunities and urban employment (Hart 1973; Bromley/Gerry 1979). Within the urban informal sector approach to urban poverty, new themes have emerged in the 1990's and early 2000's which show a remarkable convergence with livelihoods perspectives; a new focus on the life realities and survival activities in the city (Thomas 1995); attempts to make the 'shadow lives' of the working poor more visible (Chatterjee 1999); and a fresh interest in the livelihoods of the most vulnerable segments in megacities (Chikarmane/Narayan 2000; Köberlein 2003). Accordingly, urban livelihoods also emerged as people-centred approaches to reduce urban poverty (Rakodi/Lloyd-Jones 2002), and an asset vulnerability framework for analyzing urban poverty was developed by the World Bank (Moser 1998).

36.4 The Normative Basis

The livelihoods approach to rural and urban poverty is based normatively on the ideas of rights, security, capabilities, equity, and sustainability. Rights-based approaches to development (DFID 1999: 1.1) take as their foundations the need to promote and protect human rights - the rights that have been recognized by the global community and are protected by international legal instruments. These include economic, social and cultural as well as civil and political rights, all of which are interdependent. Running through the rights-based approach are concerns that constitute central building-blocks of the livelihoods concept: concerns with empowerment and participation, and with the elimination of discrimination on any grounds.

Rights-based and security-driven livelihoods approaches are complementary perspectives that seek to achieve many of the same goals. Concerns with empowerment and participation of the most vulnerable, for example, seek to strengthen the capacity of the poor to achieve stable and secure livelihoods. Although there is a strange absence of explicitly applying the notion of security in the sustainable liveli-

hoods approach, livelihood security is implicitly always present as a precondition of the poor to cope with and adapt to the risks of their lives, to ease shocks and to meet contingencies. While the shortest definition of a livelihood "as a means of securing a living" (Chambers/Conway 1992: 6) strongly underscores security issues, the working definition of sustainable livelihoods by the same authors fails to encompass the notion of security. It has been argued that it was not sustainability, but vulnerability and security that presented Chambers' central concerns when formulating the livelihoods approach (Arce 2003: 202). But it seems that Chambers brilliantly embraced the momentum of the environmental sustainability discussion, then at its height because of the 1992 UN Conference on Environment and Development, and then re-interpreted sustainability as a matter of vulnerability reduction and promotion of human security (de Haan/Zoomers 2005: 30).

In addition to rights-based and security-driven concerns, capability, equity and sustainability were explicitly taken as the normative base to the concept of sustainable livelihoods (Chambers/Conway 1992). The three concepts are again closely linked. Each has two sides, normative and descriptive. And each is also both end and means. Linked together, capability, equity and sustainability can be taken as a framework for development thinking which is both normative and practical. The term capability has been used by Sen (1984, 1987) to refer to the ability of the poor to perform certain basic functions. Quality of life is seen in terms of valued activities and the ability to choose and perform those activities. Within Sen's framework of capability, there is a subset of "livelihood capabilities" (Chambers/Conway 1992: 4) that include being able to find and make use of livelihood opportunities, and being able to cope with stress and shocks (i.e. gaining security). Such capabilities are not just reactive, but also proactive and dynamically adaptable. Equity, in conventional terms, is measured by the way of relative income distribution. But Chambers and Conway (1992: 4) used the word more broadly, to imply a more equal distribution of assets, capabilities and opportunities, and especially enhancement of the livelihoods of the most deprived and vulnerable. Sustainability, in "development prose" (Chambers/Conway 1992: 4), has replaced 'integrated' as a versatile synonym for 'good'. Livelihoods are considered sustainable when they are resilient in the face of external shocks and stresses; are not dependent upon external support; maintain the long-term productivity of natural resources; and do not undermine the livelihoods

opportunities open to others, including future generations (DFID 1999: 1.4). The sustainability of livelihoods raises two questions (Chambers/Conway 1992: 9): whether a livelihood is sustainable environmentally, in its effects on local and global resources and other natural assets; and whether it is sustainable socially, that is, able to cope with stress and shocks, and retain ability to continue and improve the livelihood opportunities of the poor. Sustainability is thus a function of how assets and capabilities are utilized, maintained and enhanced so as to preserve livelihoods.

All these normative bases of the livelihood approach, taken together, bear a remarkable resemblance to the current discourse on human security. Explicit links to this discourse, however, are curiously absent in the discussion on livelihoods. On the contrary, the origins, influences and development of the livelihoods approach are usually only linked to the sustainability discourse. It was in fact the *World Commission on Environment and Development* (WCED 1987a) that put forward sustainable livelihood security as an integrating concept and made it central to its report (WCED 1987). In the further development of the concept, however, the notion of security got lost. Recently, the Millennium Ecosystem Assessment Synthesis Report (2005: vi) has re-addressed security issues when linking ecosystem services with constituents of well being. Security, i.e. personal safety, secure resource access, and security from disasters, is conceptualized exactly in line with the security notions reflected both in the sustainable livelihoods approach and in the human security discourse. Closer scrutiny of the current discourse on human security none the less reveals that most of its debates during the past decade have revolved around the notions of rights, capabilities and equity which are so central to the livelihoods approach.

36.5 The Discursive Context: Human Security

When the notion of human security was introduced as a new paradigm of sustainable human development in the 1994 UNDP Human Development Report (UNDP 1994: 3), the arguments for proposing the concept were much in line with what is now termed the livelihood approach. It was proposed that for most people today, a feeling of insecurity arises more from worry about daily life than from the dread of war or a catastrophic world event. This means that different security concepts are needed for states and

for people, and it acknowledges that even state security will be precarious (and empty) unless based on and consistent with the security of individuals. A new paradigm for human development is thus needed that puts people at the centre and that enables individuals to enlarge their human capabilities to the full (UNDP 1994: 4).

This first discursive strand around human security, initiated by UNDP (1994), applied the languages of safety, protection and freedoms and defined human security basically as ‘freedom from want’ and ‘freedom from fear’. Human security, according to UNDP (1994: 3), means safety from the constant threats of hunger, disease, crime and repression. It also means protection from sudden and hurtful disruptions in the pattern of our daily lives. Loss of human security can thus be a slow, silent process or an abrupt, loud emergency. While ‘human development’ is the process of widening the range of people’s choices, ‘human security’ focuses on how people can exercise these choices freely and safely, and that they can be relatively confident that the opportunities they have today are not lost tomorrow.

This conception of human security is also central to the GECHS (Global Environmental Change and Human Security) programme, an international core project of the International Human Dimensions of Global Environmental Change Programme (IHDP). With foci on conflict, gender and health security in the context of global environmental change, the GECHS Science Plan (1999) has defined human security to be a state that is achieved when and where individuals and communities have the options necessary to end, mitigate or adapt to threats to their human, environmental and social rights; have the capacity and freedom to exercise these options; and actively participate in pursuing these options. While most definitions of human security had so far been based on the concept of ‘freedom from fear’ and ‘freedom from want’, the GECHS definition focuses specifically on freedom to take action on one’s own behalf in response to changing environmental conditions. In particular, it emphasizes the ways that environmental changes contribute to (or exacerbate) pervasive threats and critical situations, while at the same time undermining the capacity to respond to these threats. It interprets environmental change in the context of ongoing social changes, which together may affect the security of some individuals and communities.

A third strand of discussion on human security was initiated by the UN-Commission for Human Rights (2003). It takes a rights-based approach and

also employs the language of freedoms. The requirements for being 'human', in addition to sheer existence, can go far beyond freedoms from want and from fear. According to the Commission for Human Rights (Robinson 2003), "freedom from humiliation, from indignity and from despair" has to be added to fully grasp the notion of human security (Gasper 2005: 225). A fourth discursive strand of the debate on human security revolves around Sen's (2003) capability approach. It is concerned with the stability of the effective (i.e. attainable), valued opportunities that are available to poor people. Instead of addressing freedoms 'from', the capability approach views human security as freedoms 'to', especially the freedoms to act and to attain. In this way, it is very similar to the GECHS approach to human security. A last and currently most important discursive formation within the human security discourse has been stimulated by the Commission on Human Security's report *Human Security Now* (2003). Human security here is to safeguard the 'vital core' of all human lives from critical pervasive threats, without impeding long-term human fulfilment. This commission (known as the Ogata-Sen commission) suggested human security as a fundamental set of human functions related to survival, dignity, and, last not least, livelihood (Alkire 2003: 24). The current discourse on human security brings together the ethics of capabilities, human needs, and human rights, just as the livelihoods approach does. All these types of ethics are closely related and complementary, not competitive: "human security discourse builds on this potential, bringing together what was previously artificially separated" (Gasper 2005: 232).

36.6 Application of the Concept

The livelihood approach has been widely used both in the academic literature and in development practice. The most prominent field of applying the livelihood approach has been in vulnerability analysis. The focus has been on livelihood assets and capital analysis and on the evaluation of livelihood strategies based on the resources identified.

Experience with livelihoods' approaches in vulnerability analysis has shown that the most complex part is probably the analysis of asset portfolios, particularly of intangible resources (Chambers/Conway 1992: 7). The tangible assets commanded (or not commanded) by a household or group can be classified into stores and resources. The intangible assets consist of claims and access. Claims are demands and appeals which

can be made for material, moral or other practical support. Access is the opportunity in practice to use a resource, store or service or to obtain information, material, technology, employment, food or income. The concept of social capital has been widely employed to identify the claims and opportunities that make up livelihoods (Bohle 2005). Institutional analysis has also been utilized (Scoones 1998: 11) to examine the regularized practices that determine the control of livelihood assets and identify the rules and norms that regulate access or exclusion (Bohle/Fünfgeld 2006). On the whole, asset analysis has revealed the complex ways in which the poor and vulnerable combine capitals and dynamically shape and reconfigure their livelihoods' portfolios, and how even narrower forms of assets such as social capital alone are diversified and reconstructed in highly flexible manners, especially in contexts of rapid transformations or violent conflict (Bohle 2006).

In the field of livelihood strategies, vulnerability analysis has shown that wide ranges of activity repertoires, based on complex and dynamic asset portfolios, are being employed to cope with shocks and to adapt to the risks and vagaries of vulnerable livelihoods. In general, coping and adaptation involves "managing resources" (Wisner/Blaikie/Cannon/Davis 2004: 113), but in adverse situations coping and adaptation can include defence mechanisms, active ways of solving livelihoods problems, and methods for handling shocks and stress. In the substantial literature on strategies for coping with stress and shocks (e.g. Ellis 2000), livelihood strategies have been identified to consist of "repertoires" (Chambers/Conway 1992: 7) or "mixes" of stinting, hoarding, protecting, depleting, diversifying, claiming and moving activities (Chambers/Conway 1992: 11). These activities are frequently sequenced in a way that sustainable livelihood security may be protected in the long run, even at the cost of short-term sufferings and losses (Bohle 2001). Sequencing of livelihood activities may also imply the search for establishing a particular livelihood strategy that may serve as a precursor for gaining access to other resources (Scoones 1998: 8).

Livelihood analysis has also become a vital tool in development practice, particularly in terms of participatory vulnerability analysis. DFID, CARE, Oxfam, ACTION AID INTERNATIONAL and UNDP have emerged as the main actors in the field of participatory, livelihoods-based vulnerability analysis. In her attempt to compare the livelihoods approaches employed by DFID, CARE; Oxfam and UNDP, Carney (1999) has provided an outline of each agency's ap-

proach, lessons learnt, and on the differences. She also supplied summary tables on the origins, usage and operational issues of the various approaches, as well as the operationalized frameworks of the agencies involved. It is obvious that the four organizations share much in common, notably the focus on assets and on micro-macro links, as well as common roots in the works of Chambers and Conway (1992). Although commonality certainly exceeds variation (Carney 1999: 17), there is a somewhat different understanding of sustainability between the agencies. Different agencies also put a different level of stress on empowerment. UNDP emerges as the only organization that explicitly stresses technology in its framework.

In their report to DFID, Cannon, Twigg and Rowell (2003) have placed vulnerability analysis and sustainable livelihoods in the context of natural disasters. They argue that the humanitarian policy of DFID is limited in its ability to link relief to long-term sustainability and enhancement of livelihoods, and that the sustainable livelihoods approach offers ample, but underutilized potentials for vulnerability reduction. As such, vulnerability analyses may help to bring humanitarian work in line with DFID's other main objectives and tie it in with the sustainable livelihoods approach (Cannon/Twigg/Rowell 2003: 3). Case studies on *Vulnerability and Capacity Assessment* (VCA) exercises undertaken by IFRC, Oxfam and CARE show that livelihoods-based vulnerability analyses, in the context of disasters, should be capable of directing and targeting development and interventions, seeking ways to enhance and protect people's livelihoods, assist vulnerable populations in their own self-protection and support institutions in their role of disaster prevention (Cannon/Twigg/Rowell 2003: 4).

36.7 Evaluation: New Frontiers in Livelihoods Research

One of the major strengths of the livelihood approach is that it views the poor and vulnerable not as passive victims, but highlights the active or even proactive role to secure their living in contexts of uncertainty, risk, stress and shocks. The livelihood approach clearly marks the shift from the structural perspectives of dependencia and neo-Marxism to actor-oriented perspectives. This new focus on the agency of the poor addressed the everyday-life experiences of the poor, the micro-worlds of their family, community and social networks. As such, it draws fresh attention to issues such as marginalization and exclusion, vulnerabil-

ity and poverty, inequality and powerlessness as key determinants of precarious livelihoods (de Haan/Zoomers 2005: 28).

Contrary to the rather pessimistic outlook of conventional household studies, the new generation of livelihood studies took a more optimistic view and showed how people can mobilize resources to make a living, and how they play active roles in achieving their livelihoods by continuously exploiting opportunities. The livelihoods approach is basically positive in that it first identifies what people have rather than focusing on what the poor do not have (Cahn 2002: 3). The poor are conceived as possessing a lot of agency, and as taking an active role in responding to and enforcing change (de Haan/Zoomers 2003: 38). It has been argued that it was exactly this pro-active, self-help, participatory and optimistic image of the sustainable livelihoods approach that made it so attractive to the UK's development policy under New Labour since 1997 (Solesbury 2003: 2, quoted after de Haan/Zoomers 2005). The improved understanding of the holistic and dynamic meaning of livelihood is certainly an important achievement of the livelihoods approach. However, the worldview of the Sustainable Livelihoods Frameworks in general, and the fresh focus on action and agency, in particular, also poses a number of questions.

A first unresolved problem of the livelihoods approach is the nature of relationships between structure and agency. This is a complex question in development sociology which has been discussed at length in the works of Giddens, especially in his theory of structuration (1984). Here Giddens refers to the "duality of structures" as both constraint and opportunity, and to the dialectic and recursive linkages and feedbacks between (intentional and unintentional; routinized and reflexive) social practice and the social structures that enable and restrict agency. One challenge for livelihoods analysis is therefore to integrate findings from action theory (including Bourdieu's concept of habitus and Luhmann's sociology of risk) into its frameworks to get a sounder understanding of how human agency in the context of livelihood strategies can be understood and explained.

A second problem that has recently been put forward by de Haan and Zoomers (2005) is the relative weight that politics and power play in the livelihood decisions of the poor. They argue that social relations, particularly property relations and configurations of power, play such a major role in determining access to and control over vital livelihoods resources that they cannot be overemphasized. Although transforming

structures, mediating processes, institutions and organizations appear in all livelihood frameworks, there is a tendency within livelihoods studies to downplay these structural features and to focus on agency, capabilities, and opportunities (de Haan/Zoomers 2005: 33). Again, theoretical approaches from political economy, conflict studies and research on power dynamics are needed to integrate questions of access and control, of conflicts and contestations, of struggles and violence into livelihoods analysis.

A third problem is the general neglect of those aspects of livelihoods security that go far beyond the political, economic and material objectives of life. One of the shortcomings of both actor-oriented and structural-functional approaches to livelihoods is the neglect of the role of culture, identity and ideology. As Guyer and Peters (1987: 209 (quoted from de Haan/Zommers 2005: 29) remark, “the socially specific units that approximate ‘households’ are best typified not merely as clusters of task-oriented activities, not merely as places to live/eat/work/reproduce, but as sources of identity and social markers. They are located in structures of cultural meaning and differential power”.

Livelihoods are much more than “a means to secure a living” (Chambers/Conway 1992: 6), much more than getting food and income, a shelter and protection. Livelihoods are equally about the circulation of information, the management of skills, and the affirmation of personal significance, identity and status (Wallmann 1984). Moreover, in the words of Bebbington (1999: 2022, quoted from de Haan/Zoomers 2005: 32),

a person’s assets, such as land, are not merely means with which he or she makes a living: they also give meaning to that person’s world. Assets are not simply resources that people use in building livelihoods: they are assets that give them the capability to be and to act. Assets should not be understood only as things that allow survival, adaptation and poverty alleviation: they are also the basis of agent’s power to act and to reproduce, challenge or change the rules that govern the control, use and transformations of resources.

36.8 Conclusion

The new approach on sustainable livelihood security has emerged as an influential way of thinking on how the rural and urban poor can be identified and targeted, how pro-poor interventions can be planned, and how policy-relevant analysis on local levels can guide research on poverty and development. Analyz-

ing and promoting sustainable livelihood security is very closely connected with the concept of human security, putting people at the centre and taking equity, human rights, capabilities and sustainability as its normative basis. Sustainable livelihood security views poor people as possessing a lot of agency and evaluates the dynamic portfolios of assets and the multifarious repertoires of livelihood activities that vulnerable groups pursue to secure their lives. This new focus on the agency of the poor addresses their everyday-life experiences in participatory modes of enquiry and sheds fresh light on both their livelihood constraints and opportunities.

The new frontiers of livelihoods research address some of the current shortcomings of the approach and involve at least three things. *Firstly*, a theoretically grounded appraisal of the relationship between structure and agency. *Secondly*, a politically sensitive articulation of the social relations of access and control, particularly power relations, that govern the linkages between structure and agency. And *thirdly*, a culturally sensitive recognition of the non-material, needs-based, subjective and psychological dimensions of livelihoods security which, again, cannot be separated from agency, structure and politics. This implies that the basically harmonious, non-political, untheoretical and objectivist worldview of sustainable livelihoods security has to incorporate the experience that the world in which the vulnerable seek to secure a living is a political arena with conflicting interests. It is a world in which livelihoods are contested and negotiated, struggled over, lost and won. And it is a world where it matters a lot what the vulnerable themselves value as sustainability and security.

37 Global Health Security: The WHO Response to Outbreaks Past and Future

Guénaél Rodier and Mary Kay Kindhauser

37.1 Introduction

During the first years of the 21st century, concern about the threat of infectious diseases has rapidly escalated after three dramatic events: a bioterrorist attack, the emergence and international spread of a severe new disease, and the looming threat of an influenza pandemic. Concern has progressively mounted: worst-case scenarios for one outbreak have been replaced by the next. While the three events are distinctly different in their origins and epidemiology, each has delivered a vivid warning that the world is now far more vulnerable to the adverse effects of emerging and epidemic-prone diseases. Together, they have challenged the very notion that an outbreak can be considered 'localized' in a highly mobile, economically interdependent, and electronically interconnected world. Although the number of cases and deaths has been comparatively small (table 37.1), the social and economic consequences have been enormous.

Table 37.1: Cases and deaths from recent outbreaks compared with those from persistent infectious disease threats ^(a) numbers infected in June 2005). **Source:** WHO Statistics; at: <<http://www.who.int/research/en/>>.

Disease	Year	Cases	Deaths
Anthrax	2001	22	5
SARS	2003	8098	774
H5N1 avian influenza	2004 – June 2005	108	54
AIDS	2004	39.4 million ^a	3.1 million
Tuberculosis	2004	8.97 million ^a	1.7 million
Malaria	2004	400 million	1 million

The unprecedented volume of international air travel – airlines now carry 1.6 billion passengers each

year – has opened opportunities for pathogenic agents to be carried to any part of the world within a few hours. The interdependence of economies and commerce means that the disruption caused by an outbreak in one area can likewise spread quickly around the world. Broad access to electronic communications immediately gives outbreaks a large international audience and amplifies the anxiety they provoke, leading to behaviours – avoidance of travel, drops in consumer consumption of certain foods and goods – that further exacerbate the social and economic consequences. Since the start of the 21st century, public perceptions of the severity of outbreaks have been shaped by striking images of investigative squads in full protective gear, masked faces and empty airports, and the mass culling of millions of animals. Politicians, too, now appreciate that outbreaks can have consequences that extend far beyond the health sector. For all these reasons, the risk of further outbreaks, especially when caused by a new pathogen, is increasingly seen as a direct threat to national and international security.

After a brief introduction of the evolution of the health security concept within the WHO (37.2), three health security issues will be discussed for the three outbreaks – anthrax, SARS and H5N1 avian influenza (37.3 and 37.4) – and the specific ways they have altered perceptions of the infectious disease threat (37.5). These changes are then placed in the context of concerns that had been mounting, albeit far more gradually, during the last decades of the previous century (37.6 to 37.8). Changes in concepts of national and international security are discussed in terms of their increased ability to accommodate infectious disease threats (37.9). The remaining sections explain the operational framework put in place by WHO to defend global health security (37.10).

37.2 Evolution of the Health Security Concept within WHO

UNDP (1994) mentioned health security¹ as one of seven dimensions of its suggested human security concept. The concept of a *health security* has been introduced during a WHO Colloquium on Women's Health Security on 5 September 1995 in Beijing as encompassing:

all aspects of the basic human right to health. Health security means the guarantee of accessible and affordable health care to all – men, women and children. Its three cornerstones are equity, choice and partnership. In the case of women, this translates into provision and access to information and education; adequate nutrition; freedom from violence; the right to work in safe environments; and access to appropriate health care

1 This brief section was added by Hans Günter Brauch with the consent of the authors. The new sectoral 'health security' concept is closely related with all five security dimensions: the economic, societal, environmental but also with the political and military. Within the *environmental* dimension of security (ecological security) it is closely linked with 'water security' (referring to the health problems that are generated by *water scarcity* (drought, heat waves), *abundance* (flash floods and inundation) and by *degradation* and *pollution* (water related diseases). In the *societal* and *economic* dimension of security health security refers to totally different discourses in the North (health reform, affordability of public health services for aging societies partly based on solidarity principles) and in the South (bring basic health services to the poor and most vulnerable to both diseases and water related hazards). The health security debate has also acquired a *political* dimension, e.g. due to the use of economic sanctions (e.g. on the health of children in Iraq), and the prevention of scientific assessments of the impact of enriched uranium projectiles during the second Persian Gulf war in 1991 (Haavisto 2003; UNEP 2003, 2003a, 2005, 2007) and a *military* dimension with regard to the impacts of wars (war and post-war periods) but also on the health of combatants and the civilian population (also by the use of both conventional and mass destruction weapons that do not discriminate between both) and more recently primarily of the fear that terrorists may use biological and chemical weapons indiscriminately thus threatening the survival of whole civilian populations in the urban centres of the economically developed world. In the conceptualization of health security differences exist also within the UN system with regard to the referent object. While many have used the state (national security) as the major referent of health security, UNDP (1994) referred to the individual human being, the people or to humankind (human security) as the key referent object.

services. ... Freedom from all forms of violence against women is an essential component of health security. ... WHO calls for governments and health planners to improve their response to the threat to women's physical and mental well-being by regarding violence as an important health issue. ... WHO believes that only through health security, can women have access to quality health care services, and be sure that their health needs will be met from birth to old age.²

The WHO Global Commission on Women's Health adopted at the United Nations' Fourth World Conference on Women a Declaration calling for government action to sustain the realization of women's health security.³ The WHO contributes to *Global Health Security*, and specifically to the concept of *Global Public Health Security*⁴. This is done through WHO Pandemic and Epidemic Alert and Response activities, via a global partnership focusing on three goals: a) contain known risks, b) respond to the unexpected, and c) improve preparedness.⁵

37.3 Anthrax, SARS and an Ominous Influenza Virus

The deliberate use of anthrax to incite terror, which quickly followed the events of 11 September 2001 in the USA, changed the profile of the infectious disease threat in a dramatic and definitive way. Prior to these events, the emergence of new diseases – and most especially, the impact of AIDS on Africa and on economically important nations in Asia – had sharpened concern about the infectious disease threat as a disruptive and destabilizing force, and given it space in national security debates. The reality of bio-terrorism immediately raised the infectious disease threat to the level of a high priority security imperative worthy of attention in defence and intelligence circles. In so doing, it also focused attention on several features of the infectious disease situation that make outbreaks – whatever their cause – an especially ominous threat. As smallpox again became a disease of great concern, both politicians and the public began to comprehend problems, long familiar to public health professionals.

2 See: Press Release WHO/53, 12 July 1995: "WHO calls for better Women's health security", at: <<http://www.who.int/archives/inf-pr-1995/pr95-53.html>>.

3 See: Press Release WHO/65, 5 September 1995, at: <<http://www.who.int/archives/inf-pr-1995/pr95-65.html>>.

4 The World Health Report 2007. A Safer Future – Global Public Health Security in the 21st Century. World Health Organization. <http://www.who.int/whr/2007/en/index.html>.

These have ranged from silent incubation periods that allow pathogens to cross borders undetected and undeterred, through the finite nature of vaccine manufacturing capacity, to the simple fact that outbreaks have a potential for international spread that transcends the defences of any single country.

Speculations about the consequences of a biological attack with the smallpox virus produced many scenarios about how a new or unfamiliar pathogen might behave in the 21st century. Even in the most advanced countries, the non-specific symptoms of a flu-like illness would create diagnostic confusion. Clinicians, unfamiliar with the disease, would initially miss cases, thus delaying the first alert. Inadequate supplies of vaccines and antiviral drugs would fuel social upheaval. Lacking adequate surge capacity, hospitals and health care systems would be overwhelmed. Authorities would resort to enforced isolation and quarantine. The silent incubation period would facilitate rapid international spread by air travellers. Given broad access to electronic communications, rumours would spread with equal speed. Travel and tourism to affected areas would come to a virtual standstill.

When SARS began to spread internationally in late February 2003, many of these scenarios were played out in reality. Others would take on concrete meaning in 2004, when a highly lethal avian virus began moving the world to the brink of another influenza pandemic. SARS – the first severe new disease of the 21st century – spread rapidly along the routes of international air travel. The disease placed every country with an international airport at risk of an imported case. SARS spread from person to person, required no vector, displayed no particular geographical affinity, mimicked the symptoms of many other diseases, took its heaviest toll on hospital staff, and killed around 10 per cent of those infected. In the absence of a vaccine or cure, isolation and quarantine became the principal control measures. SARS caused great social disruption and economic losses far out of proportion to the number of cases and deaths and well beyond the outbreak sites. News on the disease jolted stock markets. Projections for economic growth were revised downwards. Commerce in distant countries dependent on Asian goods and manufacturing capacity suffered. Schools, hospitals, businesses, and some borders were closed. Broad access to electronic communications and extensive media coverage made the public deeply aware of SARS and worries about its spread. Travel to affected areas plummeted, causing airlines with Asian routes to lose an estimated US\$ 10 billion. Fortunately, these consequences, apparent

early on, brought political support at the highest level and increased pressure to contain the outbreak as the only way to regain economic health (WHO 2003a).

SARS did not change the world, but it did reveal how much the world has changed in terms of increased and universal vulnerability to new disease threats. SARS challenged the assumption that wealthy nations, with their well-equipped hospitals and high standards of living, would be shielded from the amplification of cases seen when new diseases emerged in the developing world. Contrary to expectations, SARS spread most efficiently in sophisticated urban hospitals. SARS redefined national responsibilities for outbreaks in two important ways. *First*, given the international repercussions of outbreaks in an interconnected and mobile world, governments are likely to be held accountable, by the international community as well as by their citizens, for failures in their response to an outbreak. *Second*, broad access to electronic communications – from mobile phones to the internet – has made it increasingly likely that official notification of an unusual disease event will be preempted by rumours, likewise giving national events an immediate international audience. It has also made outbreaks too quickly and highly visible for governments to attempt to conceal them. China's initial denial of its SARS outbreak and prohibition of press reports could not stop mobile phone users from sending a text message about a 'fatal flu' in Guangdong Province more than 45 million times on a single day in early February 2003.⁵

SARS stimulated an emergency response, and a level of media attention, on a scale that may have changed public and political perceptions of the risks associated with emerging and epidemic-prone diseases. Reports in scientific publications and the media and from governmental agencies in several countries generally agree that SARS raised the profile of public health to new heights by demonstrating the severity of adverse effects that a health problem can have on economies, social stability and political careers (National Intelligence Council 2003).

At the peak of the SARS outbreak, many infectious disease experts, asked to comment on the significance of the new disease, used the example of pandemic influenza for comparative purposes. While SARS was certainly a matter for grave concern, the true potential of an infectious disease to wreak havoc in a glo-

5 John Pomfret: "Outbreak gave China's Hu an opening; President responded to pressure inside and outside country on SARS", in: *Washington Post*, 13 May 2003.

alized society would be seen with the arrival of the next influenza pandemic, which would be impossible to stop. Far more contagious, and transmitted during a short incubation period, pandemic influenza would extend the devastating consequences seen with SARS in Asia and Toronto, Canada to the entire world within a matter of months. While SARS infected just under 8,000 people, killing almost 800, many millions of people would unquestionably perish during the next influenza pandemic.

In January 2004, six months after WHO declared the SARS outbreak over, intensified surveillance for a recurrence of cases detected a cluster of patients with severe respiratory disease at a paediatric hospital in Hanoi, Viet Nam (WHO 2005). That event marked the start of an outbreak of human cases of avian influenza, caused by the H₅N₁ strain of the virus, that has brought the world closer to an influenza pandemic than at any time since 1968. The scenarios of how a highly contagious and lethal virus will behave under the unique conditions of the 21st century have begun again, but this time with greater urgency in the face of an imminent catastrophe. No one would question the directness of the threat that pandemic influenza poses to national and international security. Should the case fatality rate be as low as 1 per cent, the highly contagious nature of influenza and the size of the world's population could translate into 30 million deaths, concentrated over a short period of time, if less than half of today's 6.5 billion people were infected. Moreover, the concern with national security is so great that international sharing of limited supplies of vaccines and antiviral drugs is considered exceedingly unlikely; in past pandemics, countries have consistently nationalized manufacturing capacity, allowing exportation of vaccines and drugs only after all national needs had been met. Perhaps most important, differences in the capacity of industrialized and developing countries to respond to outbreaks is now much greater than at the start of the previous century. With health services in many developing countries already overburdened by AIDS, tuberculosis, and malaria, an event such as a pandemic influenza is likely to strain fragile health systems to the point of collapse, further increasing the world's present imbalance.

37.4 Microscopic Adversaries: Well-equipped to Invade, Evade, and Surprise

The source of the evolving infectious disease threat resides in microscopic adversaries that change and adapt with great speed and have the advantages of surprise on their side. During the past 30 years, the infectious disease threat has diverged considerably from previous patterns of epidemiology, drug susceptibility, geographical distribution and severity (Lederberg/Shope/Oaks 1992). Such divergence arises from the naturally volatile behaviour of the microbial world, amplified by recent ecological and demographic trends. Constant evolution and adaptation are the survival mechanisms of the microbial world. Infectious disease agents readily and rapidly multiply, mutate, adapt to new hosts and environments, and evolve to resist drugs. This natural propensity to change has been greatly augmented by the pressure of a crowded, closely interconnected, and highly mobile world, which has given infectious agents unprecedented opportunities to exploit (Rodier/Ryan/Heymann 2000). Vulnerability to the threat is now recognized as universal. As adversaries, microbial pathogens have particular advantages in terms of invisibility, mobility, adaptability, and silent incubation periods that render national borders meaningless.

Changes in the way humanity inhabits the planet have disrupted the delicate equilibrium of the microbial world. Population growth, incursions into previously uninhabited areas, exploitation of the environment, and intensified agricultural and farming practices have disturbed the natural environment in which pathogens, plants, and animals have peacefully coexisted for centuries (Heymann/Rodier 2001). These pressures have given pathogens multiple opportunities to exploit new environments and invade new hosts, including humans. As a result, new diseases, which are poorly understood, difficult to treat, and often initially highly lethal, are now emerging at an unprecedented rate (Woolhouse/Dye 2001). During the past three decades, more than 40 new viruses, bacteria, and other pathogens capable of infecting humans have been identified, and this trend is certain to continue (Heymann 2003).

Apart from favouring the emergence of new diseases, demographic trends have created conditions that allow infectious diseases – whether old or new – to flourish. Populations throughout the world are now larger, older, and more closely crowded in urban centres, often living under squalid conditions. Even

the wealthiest nations have pockets of poverty that act like reservoirs, incubating epidemic-prone diseases linked to poor hygiene and sanitation. The growing numbers of complex emergencies and refugees living in crowded camps also provide fertile breeding grounds for outbreaks of both common and exotic diseases. Wealthy nations, too, can contribute to the emergence of new diseases. The emergence of bovine spongiform encephalopathy, or 'mad cow' disease, has been linked to processed animal feeds; processed foods using lower quality meat are thought to have contributed to the emergence of a related disease in humans which, though rare, is invariably fatal (WHO 2002b). The food chain has likewise become globalized with two results: the investigation of food-borne outbreaks has become enormously complex; recalls of contaminated food can stretch across continents and cost millions of dollars (WHO 2002; Tauxe 1997).

The misuse of antibiotics and other drugs is another ominous trend introducing another universal problem: the rapid development of resistance to front-line drugs, leaving some major diseases with no affordable treatment (WHO 2001a). Healthcare in all countries is now compromised by the shrinking number of effective antimicrobials. Fuelled by co-infection with HIV, the return of tuberculosis as a global menace has been accompanied by the emergence of multi-drug-resistant forms costing up to 100 times more to treat (Kindhauser 2003). Malaria may soon be resistant worldwide to all currently available first-line drugs (Kindhauser 2003). Drug resistance to common bacterial infections is now so pervasive that it raises the spectre of a post-antibiotic era in which many life-saving treatments and routine surgical procedures could become too risky to perform (WHO 2001).

These developments have eroded past confidence that high standards of living and access to powerful medicines could insulate domestic populations from infectious disease threats abroad. They have also restored the historical significance of infectious diseases as a disruptive force – this time cast in a modern setting characterized by close interdependence of nations and instantaneous communications (Heymann 2003a). Within affected countries, the disruptive potential of outbreaks and epidemics is expressed in ways ranging from public panic and population displacement to the interruption of routine functions that occurs when containment requires the emergency immunization of populations numbering in the millions. Disruption can also be measured in economic

terms. Outbreaks are always expensive to contain. Affected countries can experience heavy additional burdens in the form of lost trade and tourism—estimated at US\$ 2 billion during the 1994 outbreak of plague in India (Cash/Narasimham 2002). The losses to Asian economies associated with SARS have been estimated as at least US\$ 30 billion (WHO 2003a). As of May 2005, the total direct losses in gross domestic product accruing from the poultry sector in Asia, damaged by H5N1 avian influenza, were estimated at US\$ 10 billion; indirect costs are still being estimated (Cash/Narasimham 2002). At the global level, some of the most telling efforts to measure economic consequences, in terms of international relations and foreign affairs, have centred on determining what the AIDS epidemic in sub-Saharan Africa means for the economies of wealthy nations. At one extreme, the high mortality caused by this disease and the particular age group it affects has been interpreted as the cost to industrialized countries of lost export markets (Kassalow 2001). At the other extreme, the economic costs of AIDS to the international community have been expressed in terms of the price of drugs and services needed to rescue a continent (Sachs 2001). The human suffering caused by this disease defies calculation in any terms.

37.5 Changing Perceptions of Security

Efforts to understand the security implications of emerging and epidemic-prone diseases have taken place within the context of a reconsideration of what constitutes a security threat in the post-Cold War era. In its traditional meaning, 'security' has long been a strictly national pursuit aimed at defending territorial integrity and ensuring state survival. It is intrinsically self-centred, focused on shielding state citizens from external danger in an international system ruled by anarchy (Burchill 1996). Traditional approaches to the defence of national security are military functions: protecting borders, fighting wars, and deterring aggressors (Ban 2001; CSIS 2000).

Two events have challenged these traditional views. First, the end of the Cold War meant an end to security issues polarized by the ideological conflict and geopolitical interests of the superpowers, and kept on edge by the nuclear arms race. As old threats subsided, more attention focused on threats arising from civil unrest, internal conflicts, mass migration of refugees, and localized wars between neighbouring countries, particularly when these had the capacity to

undermine state stability or contribute to state failure (Nichiporuk 2000; Kelley 2000; Weiner 1992; Price-Smith 2002). The absence of a bipolar power system magnified these threats considerably, as intervention to prop up a failing state of geopolitical strategic interest was no longer assured (Fidler i.p.; Tickner 1995; Cooper 1996). As a result, security issues became broader and more complex, and attention began to focus on ensuring the internal stability of states by addressing the root causes of unrest, conflict, and mass population movement rather than defending national borders against external aggressors (Holsti 1996). In the wake of these changes, a number of factors – from environmental conditions to income, education, and health – were put forward as determinants of internal state stability and therefore of potential relevance to the evolving security debate (Elbe 2002).

In a second event, the forces of globalization demonstrated the porous nature of national borders and eroded traditional notions of state sovereignty. In a closely interconnected and interdependent world, the repercussions of adverse events abroad easily cross borders to intrude on state affairs in ways that cannot be averted through traditional military defences (Ban 2001). For example, in the world's tightly interrelated financial system, a crisis in a distant economy can rapidly spread to affect others.⁶ Many other transnational threats – whether arising from environmental pollution or tobacco advertising – were recognized as having an effect on internal affairs that went beyond the control of strictly national actions. Emerging and epidemic-prone diseases qualified as a transnational threat for obvious reasons: they easily cross borders in ways that defy traditional defences and cannot be deterred by any state acting alone (Ban 2001). In the broadened debate, their disruptive potential gave them added weight as a possible security concern, although this potential differs considerably between industrialized and developing countries (Kelley 2000).

This disruptive potential arises from several general characteristics of outbreaks, which are further defined by the pathogen and the political, economic, and cultural context in which the outbreak occurs. Epidemics are disruptive because of the large number of people they can infect within a short period of time. For example, within a single week in February 2006, the Chikungunya virus disease affected an estimated 22,000 people on the small island of La Réunion in the Indian Ocean. A severe new disease of unknown

cause and epidemiological potential is more alarming for the public than an established epidemic-prone disease that recurs according to well-characterized patterns. These characteristics give outbreaks their potential to cause social disruption and economic losses well beyond health care costs and out of proportion to the true severity of the risk.

First, outbreaks are urgent public health emergencies accompanied by rapid efforts to care for cases, prevent further spread, and bring the outbreak under control. Necessary control measures can be drastic: mass emergency immunization, quarantine, border control, travel restrictions, and mass slaughter of animals.

Second, the behaviour of outbreaks is unpredictable, making it difficult for authorities to reassure the public on such key questions as who is at risk, will the outbreak spread, and will the recommended control measures offer adequate protection. The history of recent outbreaks yields many examples of a sudden surge in cases or spread to another country after an outbreak was thought to have peaked. Such setbacks can arise from a single lapse in infection control at a hospital, a hidden pocket of infection missed by surveillance, smuggled animals, or the simple volume of international air travel. Given the propensity of the microbial world to undergo rapid change, new risks groups can emerge, modes of transmission can change, and treatments can fail if drug resistance develops.

As a third feature, outbreaks are usually alarming events that can elicit great anxiety in the general public. This anxiety can endure even when new knowledge about the outbreak is reassuring. A disease that spreads easily from person-to-person by the airborne route will be more frightening than a disease that requires close contact with an infected person or animal, as these behaviours can theoretically be avoided. Other features likely to amplify public concerns include high fatality in the absence of a vaccine or cure, a propensity to spread internationally, suspicions that a disease has been deliberately introduced, and an amplification of cases in health care facilities, thus diminishing response capacity when it is needed most.

Such public reactions give outbreaks a fourth shared feature: their high political profile. The extreme behaviours that can result are well documented and range from the wearing of masks and avoidance of travel, through fear of hospitals and stigmatization of patients and minority groups, to riots, loss of confidence in governments, and consumer avoidance of certain food items. Such public reactions give out-

6 Thomas Homer-Dixon: "Now comes the real danger", in: *Toronto Globe and Mail*, 12 September 2001.

breaks a fourth shared feature: their high political profile. When public anxiety, social disruption, and economic losses accompany an outbreak, it gains attention at government levels far higher – and more powerful – than public health. Such attention can be a major advantage when it brings full political commitment to outbreak control, supported by adequate resources. At the other extreme, outbreak control can be severely impeded when political authorities, motivated by economic rather than public health concerns, decide to withhold information about an outbreak, downplay its significance, or conceal it altogether. Political conditions can also shape the impact of an outbreak. Countries with a democratic tradition, in which politicians are elected and held accountable for their actions and the press enjoys full freedom, will be expected to issue reliable information about an outbreak, and retain public confidence. More authoritarian governments may be less forthcoming with public information but will have the political power to enforce public compliance with control measures and can thus bring an outbreak under control with impressive speed, albeit frequently without regard for public sentiment or human rights.

All of these features working together give outbreaks yet another shared characteristic: they are nearly always newsworthy events closely followed by the national if not the international press. On the positive side, media coverage can be used effectively, especially near the start of an outbreak, to keep the general public informed and communicate recommended protective measures. Unfortunately, media coverage often fuels public alarm and intensifies the associated economic losses. As one recent example, reports in several European countries of H₅N₁ avian influenza in a small number of wild birds brought immediate drops in poultry consumption of 30 per cent and higher. In France, confirmation of H₅N₁ infection in a single commercial farm cost the poultry industry an estimated US \$ 48 million within a month.

In industrialized countries, an event such as an influenza pandemic, where supplies of vaccines and antiviral drugs are clearly insufficient, has the capacity to destabilize populations, especially when life-saving interventions are made available to only a select few groups. This capacity helps explain why avian influenza and the prospects of another pandemic have been so widely discussed as issues important to national security and foreign affairs. All the implications of the intrusion of public health within the security arena still need to be understood and taken into ac-

count to ensure proper coordination between the two sectors.

While neither the timing nor the severity of the next pandemic can be predicted, history shows that these events consistently bring an explosive surge in the number of illnesses and deaths sufficient to temporarily paralyse public services and economic productivity (WHO 2005). Another consequence will be increased absenteeism in all sectors of the labour force, with capacity temporarily reduced in such essential public services as health care, law enforcement, transportation, utilities, and telecommunications. As SARS so amply demonstrated, a new disease with the right features can have a devastating effect on economic activity in some of the world's most sophisticated cities. Conservative estimates indicate that SARS caused economic losses in Asia alone of around US \$ 30 billion. In November 2005, the World Bank estimated that an influenza pandemic could cost the world economy US \$ 800 billion within a year; these losses would largely arise from the uncoordinated efforts of the public to avoid infection. SARS and pandemic influenza are, however, exceptional diseases. In industrialized countries, outbreaks of the more common infectious diseases are always costly but rarely qualify as socially disruptive.

In developing countries, where economies are fragile and infrastructures weak, outbreaks and epidemics are far more directly and frequently disruptive. In these countries, the destabilizing effect of high-mortality endemic diseases, including malaria and tuberculosis as well as AIDS, is amplified by emerging and epidemic-prone diseases, as they disrupt routine control programs and health services, often for extended periods, due to the extraordinary resources and logistics required for their control (Kindhauser 2003).

For example, outbreaks of epidemic meningitis, which regularly occur in the African 'meningitis belt,' disrupt normal social functions and bring routine health services to the brink of a standstill as containment depends on the emergency vaccination of all populations at risk (Kindhauser 2003). During the recent SARS outbreak in China, programmes for childhood immunization, AIDS, and tuberculosis were halted for months as all staff and resources were diverted to SARS control. The resurgence of African sleeping sickness, which is also a disease of livestock, has disrupted productive patterns of land use and jeopardized food security in remote rural areas (Kindhauser 2003). Recent outbreaks of dengue in Latin America required the assistance of military forces,

sometimes from neighbouring countries, for their containment. The response to the 2005 outbreak of Marburg haemorrhagic fever in Angola likewise drew support from military forces.

Outbreaks of new or unusual diseases can cause public panic to a degree that calls into question government's capacity to protect its population, as happened when the Nipah virus encephalitis began killing pig farmers in Malaysia in 1999. As another example, management of the SARS outbreak jeopardized political careers in several countries. In addition, the dramatic interruption of trade, travel, and tourism that can follow news of an outbreak places a further economic burden on impoverished countries with little capacity to absorb such shocks (Cash/Narasimham 2002).

37.6 New Tools: Real-time Disease Intelligence

In 1995, the Democratic Republic of the Congo experienced its second highly fatal outbreak of Ebola haemorrhagic fever, this time in Kikwit. That outbreak, which smouldered undetected for three months, caught the international community by surprise and demonstrated the urgent need to improve outbreak alert and response capacity in several specific ways (Heymann/Barakamfitiye/Szezeniowski 1999). It underscored the need for stronger infectious disease surveillance and control worldwide, for better international preparedness, and for new and faster systems for gathering disease intelligence at the international level and arranging the logistics of emergency response. It also underscored the need to accommodate the demands of the press and the public for authoritative and continuous information. A need for more broad-based international health regulations, and for electronic information systems connecting all parts of WHO, became evident, as did the realization that timely and adequate outbreak detection and response required coordinated support from a broad coalition of partners. The urgency of the situation was formally acknowledged in May 1995, when the World Health Assembly, in its first resolution on emerging infections, asked WHO to draw up plans and strategies for improving world capacity to recognize and respond to new diseases (WHO 1995).

In 1996, WHO began building up an operational system, supported by a 'virtual' architecture, for meeting these needs. Earlier detection of outbreaks was of utmost importance. To expedite the gathering of epi-

demio intelligence, WHO introduced the *Global Public Health Intelligence Network* (GPHIN) in 1997.⁷ This powerful new tool, developed and maintained for WHO by Health Canada, is a customized search engine that continuously scans open web sites, in six languages, for rumours and reports of suspicious disease events. GPHIN operates as a sensitive real-time early warning system by systematically searching for key words in over 950 news feeds and electronic discussion groups around the world. Human review and computerized text mining are used to filter, organize and classify the more than 18,000 items it picks up every day, of which around 200 merit further analysis by WHO. Apart from its comprehensive and systematic search capacity, GPHIN brought great gains in time over traditional systems in which an alert is sounded only after case reports at the local level progressively filter to the national level and are then notified to WHO (Public Health Agency of Canada/GPHIN 2004; Mawudeku/Lemay/Werker/Andraghetti/St. John 2007).

To broaden international capacity and share the burden of outbreak response, the *Global Outbreak Alert and Response Network* (GOARN) was set up in early 2000 to ensure that a 'strike force' of specialized staff and technical resources could be rapidly assembled and deployed for emergency investigations and on-the-spot assistance. This overarching network currently interlinks, in real time, 120 existing networks and institutes which together possess much of the data, laboratory capacity, specialized skills, and experienced personnel needed to keep the level of international preparedness high. As GOARN partners have a broad geographical base and many have staff within countries frequently affected by outbreaks, this network formally complements GPHIN's 'artificial intelligence' as a first-hand human source of early information about outbreaks (Heymann/Rodier 2001).

The establishment of GOARN solved many longstanding problems. First, by drawing on the resources and expertise of a broad range of technical partners, the network obviated the need - with all its associated expenses - to maintain a permanent staff of dedicated experts in the face of a danger that emerges only sporadically and unpredictably. Second, as outbreaks present widely varying demands for their control, GOARN brought much-needed flexibility and a surge capacity that could be tailored to outbreak needs. The network has a light 'virtual' operational structure,

7 D. Balkisoon: "Canada begins global inspection for infection", in: *Capital News*, 12 March 1999.

overseen by a steering committee outside WHO, and has been kept free of heavy administrative or bureaucratic procedures. The establishment of GOARN also helped ensure that experts from any single country would have frequent opportunities, during international responses, to exercise and sharpen their technical skills. Finally, GOARN introduced a formal mechanism for balancing national and international strategic interests, particularly when the response to an outbreak in one country has implications for the international community at large.

A new system of electronic communications was also set up to make better use of a unique geographical and strategic resource: WHO's 141 country offices, concentrated in the developing world and located within or in close proximity to ministries of health. Although the size of these offices varies according to the disease situation in the country concerned, all offices are staffed with medical experts and often with epidemiologists, and all have the essential logistic equipment, including vehicles and local communications, needed for prompt on-the-scene investigation of outbreaks. During outbreak response, these offices facilitate the arrival of international staff by arranging flights, customs and immigration clearance, and accommodations. By electronically interlinking these offices, WHO added yet another channel for feeding in rapid news about unusual disease events within countries, and allowing those countries to tap the resources of GOARN.

With all these systems bringing in abundant rumours, WHO simultaneously introduced a novel approach for the systematic verification of outbreaks, with the goal of rapidly determining which rumoured outbreaks were of genuine international concern, and then translating the results into action-oriented information for electronic transmission to partners (Grein/Kamara/Rodier/Plant/Bovier/Ryan/Ohyama/Heymann 2000). Procedures for outbreak verification rely on an initial assessment that uses standard epidemiological criteria to determine whether an event meets the definition of an outbreak, and additional criteria, developed by WHO, to determine its international significance. These criteria include unexpectedly high rates of illness and death for a particular geographical area or season, potential for spread beyond national borders, interference with international travel or trade, likely need for international assistance to contain the event, and possible accidental or deliberate release of a pathogen. Once an event has been determined to have potential international importance, the process of verification is initiated. This process relies

on confirmation of details from national health authorities, usually through the WHO country office, and from GOARN partners present in the field. For rapid diagnostic confirmation, especially of unusual or highly pathogenic agents, WHO relies on its network of collaborating laboratories, many of which are specialized in the diagnosis of specific diseases or groups of diseases. An evaluation of the effectiveness of this new system of outbreak verification was conducted after two years and revealed that sources other than official government notifications were by far the most frequent origin of initial information about outbreaks in all geographical areas and for all diseases (Grein/Kamara/Rodier/Plant/Bovier/Ryan/Ohyama/Heymann 2000)

To facilitate the coordination of large-scale international assistance, often involving many agencies from many nations, operational protocols were developed setting out standardized procedures for the alert and verification process, communications, coordination of the response, emergency evacuation, research, evaluation, monitoring, and relations with the media (WHO 2000; 2000a). Other guidelines provide a code of conduct governing the behaviour of foreign nationals during and after field operations in the host country. By setting out a chain of command and executing the containment response in an orderly way, these protocols help protect against the very real risk that samples of a lethal pathogen might be collected – under the often hectic conditions that surround an outbreak – and used for bioterrorist purposes. All of these developments became the driving force for initiating a sweeping revision of the International Health Regulations, which govern international procedures for the reporting of epidemic-prone diseases and the application of measures to prevent their spread (WHO 2002a).

37.7 Tools Refined in Practice

Mechanisms for outbreak detection and response were refined as WHO responded to other infectious disease emergencies or strengthened vigilance for especially worrisome diseases. In 1996, the so-called 'meningitis belt', a group of 18 semi-arid African countries that stretch across the bulge of the continent from Ethiopia in the east to Senegal in the west, experienced the largest recorded outbreak of epidemic meningococcal disease in history (Kindhauser 2003). More than 200,000 cases and 20,000 deaths occurred. Neither countries nor the international com-

munity nor the manufacturers of vaccines and other supplies could cope with the scale of the crisis. The emergency response fully exhausted international vaccine supplies and drew attention to the need to be prepared for future outbreaks on a similar scale. In January 1997, WHO established the *International Coordinating Group on Vaccine Provision for Epidemic Meningitis* (ICG) in partnership with UNICEF, the International Federation of Red Cross and Red Crescent Societies, Médecins Sans Frontières, other agencies, ministries of health in affected nations, and the major vaccine manufacturers and drug suppliers. The ICG worked quickly to replenish vaccine stocks and ensure that these were pre-positioned in countries at greatest risk. To date, more than 20 million doses of meningococcal vaccine have been channelled through the ICG mechanism. It has also accelerated improvements in the surveillance system, as the prospect of assistance is a compelling incentive for countries to report cases (Kindhauser 2003).

The dramatic recent resurgence of yellow fever, especially in West Africa, resulted in similar problems with vaccine supply. The seriousness of the problem became apparent during a yellow fever epidemic that began in 2000 in Guinea, where no routine or catch-up vaccination campaigns had been conducted since the end of the 1950's. Vaccine shortage delayed mass immunization in some areas until four weeks after the epidemic's peak. This situation prompted the ICG to establish a similar mechanism for the stockpiling of 2 million doses of yellow fever vaccine, with priority distribution reserved for outbreaks as opposed to routine immunization. As for epidemic meningitis, this mechanism has left the international community better prepared and better equipped to cope with emergency situations. Even so, the present level of preparedness may not be adequate. For example, in 2001, the first outbreak of urban yellow fever in Africa in 10 years occurred in Abidjan, Côte d'Ivoire, necessitating the emergency vaccination of 2.9 million persons in less than two weeks. Although vaccine reserves were again depleted, the emergency response averted an estimated 30,000 deaths (Kindhauser 2003).

The WHO Global Influenza Surveillance Network, the oldest disease-specific surveillance system at WHO, has also expanded its functions in line with recent public health emergencies. The network, which presently unites 110 laboratories in 84 countries, keeps watch over constant changes in the genetic composition of circulating influenza viruses, which are highly unstable. Apart from guiding the twice-yearly composition of influenza vaccines, as recommended by

WHO for the northern and southern hemispheres, the network operates as an early warning system, keeping the world alert to the emergence of influenza variants and novel strains, including those that might herald the start of a new influenza pandemic. The network was put to the test in 1997, when the highly pathogenic H5N1 avian influenza strain, previously thought to infect only birds and pigs, crossed the species barrier to infect humans, causing 18 cases and 6 deaths in Hong Kong. In the current outbreak of H5N1 avian influenza in Asia, which has already caused more than 100 cases, laboratories in the network are again playing an instrumental role in providing diagnostic support to affected countries and performing the essential 'detective work', at the molecular level, needed to understand the origins of the outbreak and interpret its significance for public health (WHO 2005).

All of these new mechanisms, networks, and procedures were put to the test – under extremely challenging conditions – when severe acute respiratory syndrome began spreading internationally in early 2003. Like the 1995 Ebola outbreak in the Democratic Republic of the Congo, which took the world by surprise. SARS was also a surprise, but the international community was far better prepared to respond. The response to SARS also tested an assumption of fundamental importance to public health: all these safeguards, working at their best, might be able to prevent a new disease from establishing endemicity, and thus spare the world untold suffering and expense. From the outset, this was the goal pursued by WHO in coordinating the activities of many partners. Although the emergence of SARS went undetected and then unreported at the national level, international mechanisms for outbreak alert and response performed well (Heymann/Rodier 2004). The spread of a severe new disease along the routes of international air travel was promptly detected and immediately brought to worldwide attention through two global alerts. The international response worked on two main fronts to manage cases and interrupt transmission at the main outbreak sites, and to seal off opportunities for further international spread.

The possibility of stopping SARS 'dead in its tracks' brought all-out support at levels ranging from heads of state to community volunteers, and in forms ranging from reverse transcriptase PCR assays of virus isolates to mass distribution of thermometers. The interruption of all known chains of transmission was accomplished less than four months later, largely through the use of 19th century public health measures

and 21st century communications tools (Heymann/Rodier 2004). As telling evidence of the importance of accrued experience, the ability to recommend these public health measures, with technical confidence in their efficacy, drew largely on international experience using case detection, isolation, and infection control to contain Ebola outbreaks.

37.8 Revised International Health Regulations: Faster, Stronger, Broader

In May 2005, the 192 member states of WHO unanimously adopted a significantly revised and modernized version of the *International Health Regulations*, which constitute the only legal framework governing the reporting of outbreaks and prevention of their international spread (WHO 2005a). Revisions in the regulations respond to several problems identified by WHO, its GOARN partners, and national authorities during outbreak responses. First, the scope of the previous regulations, in legal force since 1969, was far too narrow, confined as it was to only three diseases: cholera, plague, and yellow fever. The revised regulations recognize that the infectious disease threat has grown in terms of both the number of diseases that need to be watched very closely and the risk that more new diseases will emerge. Scope has been expanded accordingly, and now encompasses all public health emergencies of international concern, including those caused by chemical agents and radio-nuclear materials. Second, reporting requirements and timeframes have been tightened, reflecting the heightened sense of urgency and the greater speed allowed by electronic communications. Third, procedures have been put in place to compensate for weak detection and response capacities in many countries. The kinds of support offered by GOARN response teams are fully recognized. The regulations further acknowledge that strengthened national capacities are the best solution, as they aim to detect and stop an outbreak at the source; core capacity requirements for surveillance and response in individual countries are set out in an annex. The regulations also recognize that media reports may pre-empt official notification of an event, and include provisions for WHO actions in such a situation. Finally, by assigning responsibilities and establishing internationally agreed rules and procedures, the regulations can exert pressure on nations that fail to comply.

37.9 Strengthened Defences, Formidable Foes

Public health emergencies throw into sharp relief the strengths and weaknesses of infrastructures for protecting the public on a daily basis. The outbreaks experienced so far in the early years of the 21st century have underscored the capacity of the microbial world to deliver lethal and disruptive surprises, raising the profile of public health in the eyes of politicians and the public. The anthrax incident, by turning the unthinkable prospect of bioterrorism into a reality, made outbreaks a high-profile security concern (Heymann 2003). SARS vividly demonstrated the far-reaching social and economic costs of a new disease that spread along the routes of international air travel (Heymann/Rodier 2004). These consequences will be far more dramatic when the next influenza pandemic arrives. Ironically, the certainty of a pandemic's direct impact on national security has diminished the prospect of international collaboration that was the hallmark of the SARS response. When every nation is directly threatened by a disease, defence strategies turn distinctly towards national self-interests, especially when essential medical interventions for reducing morbidity and mortality are available in grossly inadequate quantities. Public health, chronically short of resources in even the wealthiest countries, cannot be asked to shoulder the full burden of responsibility for defending the world against diseases that have such severe implications for national and international security.

Nonetheless, few would question that recently developed infrastructures and mechanisms have strengthened collective defences and have performed well under the demanding conditions - particularly favourable to the international spread of diseases - of the 21st century. Adoption of the strengthened International Health Regulations has established the legal framework for increased global security against the threat of emerging and epidemic-prone diseases. GPHIN brings in the intelligence, systematically screening rumours for the first alerts to an outbreak. From January to March 2005, 40 per cent of the initial alerts to outbreaks, subsequently investigated by WHO, came from the media and other non-official sources. GOARN provides the operational mechanism for deploying a strike force when international assistance is needed. From 1 May 2002 to 31 March 2005, WHO detected and verified 760 outbreaks of potential international concern in collaboration with 138 affected countries. International assistance was re-

quested for more than 70 of these events. For more than 50, international teams were deployed to provide on-the-ground support using expertise from WHO and its GOARN partners.

Every outbreak presents a unique set of problems that have to be solved, innovatively and quickly, under emergency conditions. Each outbreak of international concern leaves WHO and its partners with more experience and more technical innovations to draw on when the next event inevitably occurs. For example, experts in medical anthropology were first used during an Ebola outbreak in 2003 to introduce community behaviours conducive to outbreak control. These experts are now a standard part of international teams deployed to control viral haemorrhagic fevers in Africa. The technique of mathematical modelling, first used during the SARS outbreaks, is now a strong component of pandemic influenza risk assessment, forecasting, and testing of strategies for delaying international spread. Risk communication to the public was introduced during the SARS outbreak as a strategy for mitigating the excessive social and economic consequences attributed to an anxious public. It is being used again, now supported by new guidelines, as part of preparedness for the next influenza pandemic.

While these mechanisms and accrued experiences have strengthened the world's collective defences against the infectious disease threat, they cannot provide full protection as long as national capacities to detect outbreaks remain weak. The world's largest and deadliest outbreak of the rare Marburg haemorrhagic fever, which occurred in Angola in early 2005, smouldered undetected for months. Tragically, the outbreak came to the attention of public health officials only after iatrogenic infection in a paediatric ward led to a sudden surge in cases of severe illness and deaths in children hospitalized for other conditions. As is often the case in developing countries, detection of the outbreak at its start was delayed by the large number of other severe infectious diseases that commonly kill young children. On the positive side, the speed and intensity of the international response to this outbreak, including rapid funding of activities and support from more than 100 international staff drawn from GOARN institutions, underscore heightened concern about emerging diseases and illustrate the resources this concern can generate in an emergency situation – even when the threat of international spread and economic disruption is far less than that posed by diseases such as SARS and pandemic influenza or the prospect of a bioterrorist attack (Ndayimirije/Kindhauser 2005).

37.10 Conclusions and Remaining Needs

To make the world more secure against the threat of emerging and epidemic-prone diseases, several activities need to be undertaken. *First*, mechanisms for using international teams to stop an outbreak have proven their effectiveness. Their value as a defence strategy must not, however, be overestimated. Such mechanisms are, at best, a 'fail-safe' operation, specifically compensating for failures to detect and contain an outbreak locally, thus quelling spread at the source. This reality, brought into focus by the revised *International Health Regulations*, has sparked a special WHO effort to strengthen outbreak detection and response capacity in epidemic-prone developing countries. Nor should the success of the SARS response create a false sense of security that WHO teams will always be able to stop new diseases "dead in their tracks". The spread of pandemic influenza to all corners of the world might be delayed somewhat, but never stopped (WHO 2005).

Second, more needs to be done to protect the world against the risk of outbreaks arising from laboratory accidents. This risk has been vividly illustrated by laboratory accidents resulting in SARS infections, some of which were fatal, in Singapore, Taiwan (China), and mainland China, and by the accidental distribution of an influenza virus, responsible for the 1957 pandemic, in test kits sent to hundreds of laboratories around the world.

Finally, when outbreaks and epidemic-prone diseases are regarded as direct threats to national and international security, defence strategies should become a priority for political leaders and government sectors, including finance, trade, and defence, that rank higher than public health and command far more resources. Trends witnessed during the first years of the 21st century are certain to continue, if not intensify. Investment in improved public health infrastructure is the best strategy for defence against this persisting threat. But unlike the response to individual outbreaks, which aims to quickly end an emergency, this investment will need to be ongoing. The threat posed by emerging and epidemic-prone diseases – and the risk to national and international security – cannot be stopped 'dead in its tracks'.

38 Health and Human Security in the 21st Century

Jennifer Leaning

38.1 Introduction¹

Security is a most important concept to human beings and can be seen as applying at the level of the family, the community, the nation-state, the region, and the entire world. Historically, the notion of ‘national security’, founded on military capacity and political projection of the self-interest of the nation-state, has dominated policy discussions of this concept since the end of World War II. In the last half-century, however, worldwide social, economic, political, and environmental changes have forced the recognition that many other elements play into what makes human beings in families, communities, and nations feel secure. These other elements have been approached in policy discussions through more recent conceptualizations of human security and health security.

It is argued here that profound and dramatic accelerations in these global changes over this next century will require vigorous attention to these issues of human and health security (38.2) (CHS 2003; Chen/Leaning/Narasimhan 2003). The overarching framework of human security is advanced as encompassing within it the more specific health and health system elements of what the medical and public health community usually consider to be ‘health security’ (38.3 and 38.4). It is further argued that the newly introduced term of health security, focused on response to international threats of bioterrorism and pandemic disease, is the international enhancement of the traditional concept of ‘national security’, in that the resources of the state (now the international community of states) are marshalled to protect its (their) citizens against external threats (38.4, also chap 37 by Rodier/Kindhauser). A strategy aimed solely at these dangers, however, does not suffice. The weight of evidence regarding near-term risks to human societies suggests

that the 21st century harbours far more disruptive and widespread threats to our individual and collective wellbeing. The concluding sections assess the relevance of the human security framework for addressing these global threats (38.5 and 38.6). This assessment suggests that it will require a most robust and creative application of this framework, on a scale that could only be described as a truly comprehensive international security strategy, to withstand what lies ahead and not lose what we have collectively achieved so far.

38.2 Major Global Issues

The major issues of this century that have particular bearing on human and health security are:

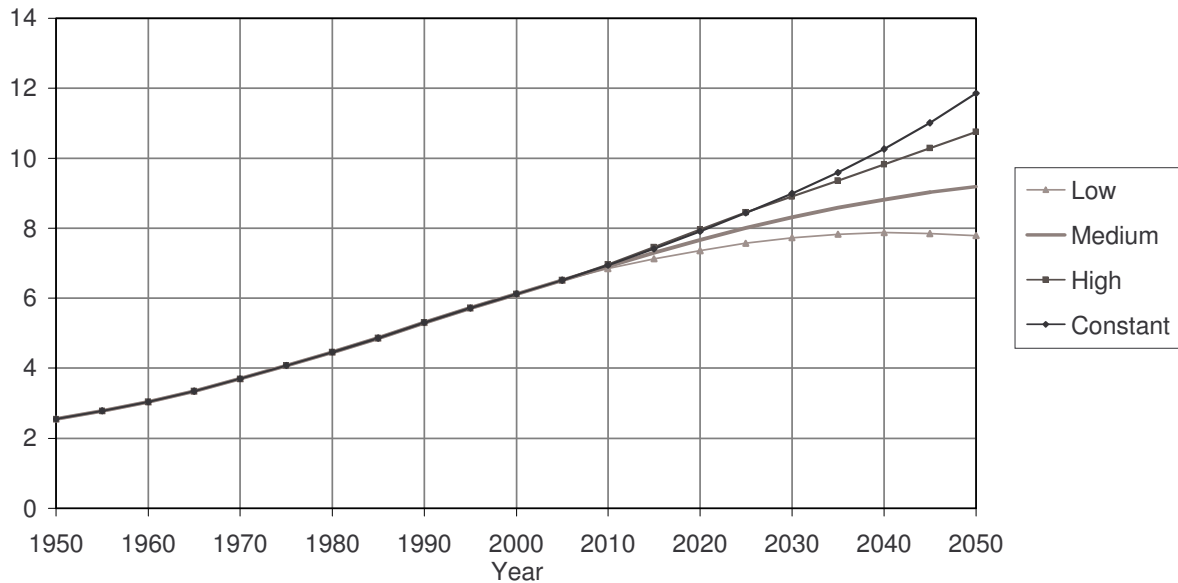
- the underlying dynamics of globalization;
- demographic change (chap. 12 by Lutz);
- environmental change, especially global warming (see preface essay/foreword by Pachauri; chap. 4–7 by Brauch; Kinnas; Bluemel; Issar/Zohar)
- growing disparities between the rich and the poor; and
- migration, especially forced migration from war or desperate economic circumstances (chap. 19 by Ahmed).

38.2.1 Globalization

The chief characteristics of globalization are accelerated trans-national movements of people, ideas, and trade (Held/McGrew/Goldblatt/Parraton 1999; Held/McGrew 2007). These trends are all enhanced and supported by extraordinary advances in information technology (Castells 1996/2000, 1997/2004, 1998/2000). The positive impacts appear as expansions in communication and access to knowledge, which in turn have supported a profusion of diverse social networks variously linked to diffusion of a common culture drawn from myriad sources; the rapid growth in economies that have linked to international

1 The author would like to thank Nicholas Rizzo for his contribution as research assistant to the preparation of this chapter.

Figure 38.1: Population of the World 1950-2050 according to different projection variants. **Source:** Created by the author based on data from: United Nations Population Division, World Population Prospects: The 2006 Revision Population Database. <<http://esa.un.org/unpp/>>.



trade networks and multinational corporations; and the development of international civil society (Kaldor/Anheier/Glasius, 2003). This last development in particular has spurred the elaboration and adoption of important international norms of international law and human rights and raised expectations regarding the reach and responsibility of international institutions.

The negative impacts of globalization have intensified underlying social vulnerabilities and accelerated unwanted trends (Speth 2003; Scholte 2005). Travel, crowding, and interacting proximities now create increasing potential to expose human and animal populations to new, emerging, and re-emerging diseases. Explosive corporate growth in industry and technology can undermine local political authorities and social diversity, hasten environmental degradation, and raise the risk of accidents involving hazardous and deadly materials.

38.2.2 Demographic Change

Demographic changes in the 21st century are projected to have two distinctly different patterns of impact, one on poor countries, who will witness growth, and one on rich countries, who will witness aging. These changes entail a projected stabilization in population growth worldwide to an estimated plateau of 9-12 billion people worldwide by 2050 (UN 2001, 2003, 2005a, 2007; figure 38.1).

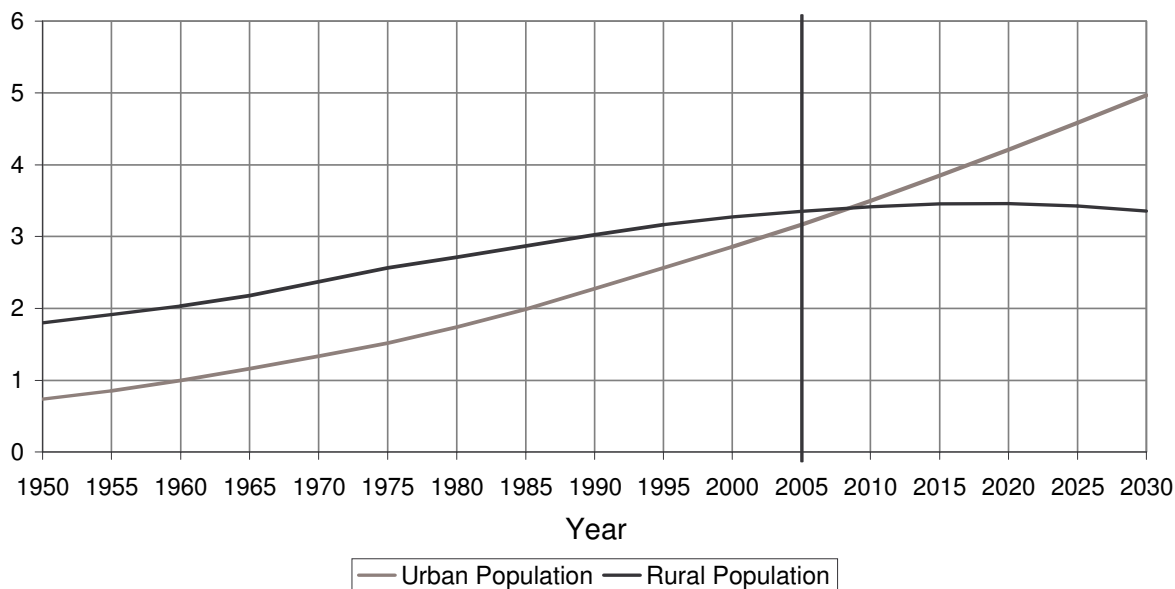
Between 2005 and 2030, the population is expected to grow to at least 8.2 billion worldwide. Of this growth, over 90 per cent will be in the less developed regions of the world; and of that growth, 97 per cent will be in already dense urban settlements (UN 2000a, 2002, 2004, 2006a; figure 38.2).

Population growth for the poor countries of the world over this century means intense strain on natural resources, marked escalation in current crises of urban water, sanitation, and other essential services, and enormous physical crowding in vast slum perimeters of current cities of the south. Population change for the rich countries in this same timeframe brings a minimum net growth but marked shift in population age structure, whereby at the end of this century most countries in Europe, as well as China and Japan, will have over 30 per cent of their population over 60 years old (UN 2007a). Predictions for the United States vary depending upon projections in immigration policy and the same could be said for Europe, if the pressing need for an increased young labour force were to cause an easing in current controls on immigration (Lee/Haaga 2002: 5).

38.2.3 Global Environmental Change and Global Warming

Global environmental change, particularly if the trends predicted in global warming go unchecked, will have devastating effects on many human, plant,

Figure 38.2: Urban and rural population of the world, 1950-2030. **Source:** Created by the author based on data from: United Nations Population Division, World Urbanization Prospects: The 2007 Revision Population Database. <<http://esa.un.org/unup/index.asp>>.



and animal populations by the end of this century (Munn 2002, vol. 1-5). Rising sea levels, drought, extreme weather conditions, and floods spell grave loss of inland habitat and coastline, threatening all living creatures with major disruptions in life supports and livelihoods. Independent of global warming, projected current patterns of human interaction with the environment pose serious risks to human welfare throughout the world (Crutzen/Stoermer 2000; Crutzen 2002; Clark/Crutzen/Schellnhuber 2005): encroachment on supplies of fresh water; pollution and contamination of air, water, and land; loss of forest cover; erosion of agricultural terrain; and progressive desertification (MA 2005; Adeel/Bogardi/Brauel/Chasek/Niamir-Fulleer/Gabriels/King/Knabe/Kowsar/Salem/Schaaf/Shepherd/Thomas 2006).

38.2.4 Growing Disparities Between the Rich and the Poor

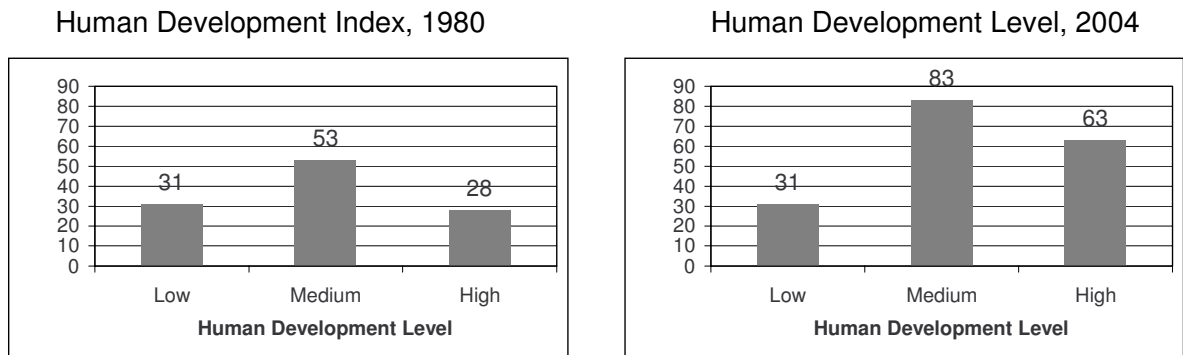
In 1998, on the occasion of receiving an honorary doctorate at Harvard University, Nelson Mandela stated his belief that the major issue facing the 21st century would be the growing worldwide disparity between the rich and the poor.² This disparity is closely

tied to the three major factors of globalization, environmental change, and demographic trends, all of which, unless modified by a human security framework, will accentuate the gap between the developing and the developed world. The 2006 UN Human Development report places 31 nations in the index category for Low Human Development; 28 of these countries are in Sub-Saharan Africa (UNDP 2006). The same report provides sufficient information to indicate that the observed HDI gap in 1980 has only somewhat improved by 2004 (figure 38.3). According to the latest estimates, over 15 per cent of the world's population live on less than one dollar per day, while more than 40 per cent of the world's population live on less than 2 dollars per day³ (Chen/Ravallion 2007). Statistics abound with which to elaborate upon this picture.

2 This address by President Nelson Mandela of 18 September 1998 can be found at: <<http://www.anc.org.za/ancdocs/history/mandela/1998/nm0918.htm>>.

3 The paper cited as Chen/Ravallion 2007 records the percentage of the population living under \$1 per day as 18.09 per cent and the percentage of the population living under \$2 per day as 47.55 per cent. However, these percentages are based on the population of the less developed world. Therefore, the statistics given above were calculated by the author using the 2004 estimates for the world population from the World Bank; total number of people living in aforementioned conditions divided by total population yielded the percentages given above.

Figure 38.3: Growing Disparities between the Rich and the Poor. **Source:** Based on data from: UNDP (2006: 288-290). In 1980 data were available on fewer countries than in 2004.



Despite some good efforts undertaken in discontinuous steps over the last few decades, as a world community we have lost ground in Africa, made mixed headway in Asia, and probably stabilized most countries of Latin America. The averages belie the misery, however. A significant fraction of the world's population live in desperately poor areas of Africa and Asia, have seen their standard of living and possibilities for the future continue to decline over recent decades (Collier 2007: 3-13), and now stand to experience the greatest increase in population projected over this next century (Population Reference Bureau 2006: 5). If current trends continue, these large populations of very poor people will become increasingly impoverished and increasingly more numerous.

38.2.5 Forced and Distress Migration

Forced migration is the term used to describe population flight from war and disaster. Desperate economic migrants could reasonably be included in this category. However they are classified, the numbers of people who are seeking entry to the perceived safe havens of this world, the West and the North, are very large and growing every year. Many studies have identified the range of options and consequences this phenomenon presents to developed societies, including disruptions of social ecology, challenges to economic relationships, and injection of increasingly diverse political and cultural discourses (Weiner/Russell 2001).

38.3 Human Security

Human security, as an idea and an aspiration, is grounded on a view of the world that centres on people rather than nation-states. The exploration of this idea can be seen in the 1982 Palme Report, *Common*

Security, where international preoccupation with the nuclear arms race was countered with the argument that peace rested in the minds and aspirations of people, not sovereign leaders (Independent Commission on Disarmament and Security Issues 1982). The discussion of human security culminated in the international effort that produced the Human Security report of 2003. A range of socio-economic and civic concerns animates this report, leading to the basic point that the world's security lies not in accumulation of arms or elaboration of international political arrangements but rather in strengthening the foundations that make people healthy and comfortable within their own communities and regions.

The concept of human security invoked here is based on the recognition that human beings share common psycho-social needs of identity, recognition, participation, and autonomy (Amoo 1997). These human needs obtain regardless of economic status or political stability but can best be assessed when absolute minimum requirements for food, shelter, water, and security from grave assault have been met. This concept was developed as an analytic guide to agencies engaged in post-conflict settlement and recovery activities but its components can be seen to apply to the dynamics of communities and societies in a wide range of situations (Leaning/Arie 2001).

The three main components of this concept of human security involve a sense of home, a link to community, and a positive sense of the future, or a sense of hope. Human beings hold strong attachments to place, often laced with memories of physical sensations (a hill in distant view, the tree by the road, domestic scents or sounds, a night sky). A large part of being home, however, means being together with one's family. The presence and strength of close family bonds establishes home, or at least essential ele-

ments of home, for many people who have been forced to leave their geographic homeland.

Links to community include all those relationships that are based on extended kinship or secure economic and social interactions with familiar places, people, markets, schools, and civic institutions. Levels of predictability, reliability, and trust are embedded in these relationships. Large and small transactions, of diverse social and economic import, take place on the basis of these relationships. Shoes are left to be mended; money is exchanged for food; marriages can be arranged; loans are made and repaid; deeds and wills negotiated and copies safely deposited in collective systems of records.

A positive sense of the future has great bearing on whether a person is willing to believe that the future will, in fact, arrive and that efforts expended in the present moment will have impact at some future date. This sense defines a stance towards investment and risk that is ultimately hopeful. A positive sense of the future will promote investment in education, saving seed for the next harvest, letting one plot of land lie fallow for greater harvest in two years, reluctance to engage in short-term behaviours that carry high negative risks.

38.4 Health Security

38.4.1 Health Security: An Issue of International, National and Human Security

Within the medical and public health communities, the concept of 'health security' has long been used to describe the cumulative effect of many different efforts undertaken to ensure the health of a given population or target group (Chen/Leaning/Narasimhan 2003; Chen/Narasimhan 2003: 183-194). In recent years, since the U.S. terrorist events of 9-11 and ensuing anthrax deaths, and then the SARS epidemic and outbreaks of avian influenza, the term health security has been applied to a very particular set of international and national strategies designed to prepare and respond to biological, chemical, and nuclear threats from terrorism and the threat of pandemic influenza.

The Global Health Security Initiative, established in November, 2001, brings together Canada, the UK, the U.S., the European Commission, France, Germany, Italy, Japan, and Mexico to plan coordinated activities in this context.⁴ The World Health Organization serves as the technical advisor to this initiative

and has recently established its own platform for promoting what it terms international health security (WHO 2007; chap. 37 by Rodier/Kindhauser).

These two concepts of health security are very different. The first one, aimed at improving health of individuals and populations through time, rests easily within the larger humanist dimensions of human security. It is people-centered, development oriented, and tied to more broad-scale initiatives that seek to improve the human condition. The second concept, focused on planning to respond to terrorist events using weapons of mass destruction and to mass epidemic disease, particularly pandemic flu, has a tight focus on international and national security that harkens back to the nation-state perspective on world stability and peace that the Palme Report sought to counter.

38.4.2 Health Security from a Human Security Perspective

In the discussion that follows, the emphasis will be on the first concept of health security, the one familiar to medical and public health professionals throughout the world. They may not all use the term but they would understand the meaning - that the health of people rests on policies and programmes that protect populations from harm and promote well-being throughout their life span. The second concept will be invoked in the context of addressing global trends, including the threat of pandemic flu and proliferation of armed conflict.

Health security, in its more traditional sense, can be seen as a subset of human security and as an essential attribute of each of its three elements of home, community, and positive sense of the future. The concept of health, as used here, is an attribute of an individual, described as a state of physical and mental well-being. The WHO definition of health as "a complete state of physical, mental, and social well-being, and not merely the absence of disease or infirmity" (WHO 1948) has struck many engaged in the provision of health care as so visionary as to be elusive as a policy goal. Attaining even an absence of disease or infirmity is far out of reach for millions of people today and may well become even more difficult to attain in the years ahead. Further, the concept of health, as a state of well-being, is also seen to be derivative of many different inputs and processes, all depending upon choices and resources available at the level of in-

4 WHO: "Global Health Security Initiative", at: <www.ghsi.ca/english/index.asp>.

dividual, family, community and nation. Increasingly, as the global trends described above begin to impinge at the regional level, these factors will also prove pivotal to human health.

In this regard, it is argued that health security must be conceptualized within a larger framework of human security. Life is lived in relationships, with other humans and with the environment. Hippocrates had it at least partly right when he said that a physician who knew of the air, water, and wind in the area affecting his patients would know much about their health (Lloyd 1978: 148-149). In other words, health as a state of being is not a unitary, independent, concrete concept that is either present or absent, conferable or not. It is a state of being that can be developed and nurtured but never entirely controlled or predicted. It is not something obtained with fame or fortune; not something proclaimed through fiat; nor can it be won through war.

As a state of being that is diffusely permeable to and susceptible to externalities, health can only be reached in some larger context and framework. It is argued here that the elements of human security provide this larger framework. This argument can perhaps be appreciated most readily in its negative form. Without home, community, or a positive sense of the future, it is exceedingly unlikely that any person can attain a moderate state of physical and mental well-being.

38.4.3 Health Security Issues in the Developing World

Home provides the micro-environment for supports to the basics of individual health, in terms of food, shelter, water, protection from assault, and emotional nurturing and bonding. Many families on earth cannot maintain even this minimum micro-environment. Furthermore, from the perspective of family health, several of these inputs can only be provided at the village level. Yet villages in the developing world often lack accessible sources of safe drinking water, are comprised of people with undifferentiated and meagre skill sets, and lack roads or transport to markets and other services. Young children join the adults in a physical struggle to wrest fuel and sustenance from their surroundings. In many situations the villages are themselves stagnant sources of disease, illness, poor diets, and few options. If the larger towns at the district level lack adequately stocked and manned health posts and schools, the entire region suffers from neglect, underemployment, and high rates of infant mor-

tality from entirely preventable conditions (diarrhoeal illness, respiratory infection, malaria, measles, and parasites). Fully one out of every fifth baby born in these homes and villages of the developing world dies of these causes before he or she reaches the age of five years old. Women in these villages, weakened by anaemia, malnutrition, and sheer hard work, find child birth a life-threatening event. The main causes of maternal mortality (obstructed labour, haemorrhage, or infection) could be addressed with adequate secondary obstetrics at district level hospitals. Many regions in Africa and Asia do not have these services at the district level and so many women die. Maternal mortality ratios (maternal deaths per 100,000 adjusted live births) in the developed world (Norway, UK, US) are 16, 13, 17; in the developing world (Afghanistan, Niger, Chad) are 1,600, 1,100, 1,900 (UNDP 2006).

38.4.4 Health Security Issues in the Developed World

In developed societies (characterized by greater wealth, education, and decades if not centuries of stable improvements in infrastructure, systems, technology, and governance) the human security components of home and community have far greater potential to provide the complex inputs that are required to attain a moderate state of physical and mental well-being. Overall, this potential has been realized in these societies, as reflected in their much higher average health indices of infant mortality, maternal mortality, and life expectancy.

Health in the developed world relies upon and enjoys much tighter and more robust linkages between home and community that serve to create and integrate the many social and economic factors that contribute to the attainment of physical and mental well-being. Families in communities can rely on transport and road systems and technologically stable utility grids to provide safe water and reliable energy for electricity and fuel. Transport and road systems permit access to a wide variety of markets and goods and services, including healthcare facilities.

People in homes and in communities are enmeshed in regulations and monitoring processes that directly and indirectly protect and sustain health: environmental and health and safety regulations, food inspection and safety systems, traffic codes, and school and workplace health assessment and promotion programmes. Homes that fail to provide basic elements of physical and psychological care for their members

may get identified in community systems of surveillance and often community-based groups or individuals can fill some of the gaps that individual homes cannot meet. Aggregations of communities usually manage to make the financial and administrative arrangements for access to an expected array of adequate and appropriate primary care services and referrals to secondary and tertiary care when needed. Although these health care arrangements within and among developed countries vary dramatically in quality and scope, in general the kind of health care available at the community level in rich countries is very difficult to obtain except at best in some of the capital cities of the developing world.

38.4.5 Requirements for Achieving Health Security

All health systems require at the national level a network of law and policy that establishes the financial and administrative systems required to fund and maintain this very complex network of human resources, infrastructure, and technical and social operations. Rich countries have put in place the major components of this underlying law and policy network. Poor countries usually have never done so, or if they had at one time, these components have been destroyed in war or degraded by decades of neglect, poverty, corruption, and mismanagement.

A positive sense of the future is the third core element of human security. Its health security analogue has several aspects. The first is simply and fundamentally an expectation that one may live to old age. The second is that members of your family and your friends may also look forward to long life, so that as you go forward you will not be alone. The third is that these later years may be characterized by continued health and vigour, so that longer life is associated with sustained capacity for enjoyment and ongoing contribution to one's family, community, and society. Much of this multi-layered confidence in one's health future, so to speak, is based on habits, processes, and systems of care put in place when one was young. If you were the product of a full term birth, vaccinated, fed, sheltered, and loved during your early years, trained in healthy habits and educated enough to hold a job, if whenever necessary you found access to adequate health care to treat you when you were injured or ill, it is highly likely that you will reach late middle age in fine form. At that point a process of aging and chance appears to assert itself, in a manner that medical science still has not deciphered, and begins to exert

stronger force on one's prospects for old age and really old age (Olshansky/Carnes/Cassel 1993: 46-52).

38.4.6 Health Security and Social Welfare in North and South

It is also at this phase of your life that the final layer of health security must be in place for you to have full confidence in what remains of your future. This layer is a system of health care and social welfare that is organized and financed to support people through all phases of life and disability. Since older people consume a disproportionate share of health care expenditures, the developed world is now experiencing the increasingly heavy costs of caring for an aging population. The rich countries will soon be joined in this experience by the middle income countries of Asia and Latin America. After several decades of improvements in primary health care and vaccination campaigns, their health care burden has two peaks: the first a residually high but declining level of morbidity among infants and young adults, the decline now slowed by the effects of the HIV/AIDS epidemic; and the second at the other end of the demographic spectrum, where a growing number of people are surviving to reach old age. The situation remains different for the poorest countries of this world, which still have few people surviving into old age. (And those that do have few options for health care so the potential impact of these older people on the national burden of care is not yet being felt.)

38.4.7 Health Security Challenges of Aging Societies

A challenge to health security, for rich and middle income countries alike, is how to structure and pay for the health care costs and social needs of this growing section of their older population. Health care has rarely risen to the top of political agendas in any country at any time, except perhaps for Cuba, whose revolution has been defined and based on provision of health care to all its citizens (Flanz 2004; Hadad/Macintyre 2002: 445-461). Yet it could be argued that a positive sense of the future is pivotal in a society's overall stability and workforce engagement. From that perspective, as the productive members of the wealthier nations begin to confront the uncertainty in national and community arrangements for organizing and financing their later health and welfare needs, it is possible to envision growing tensions between age cohorts, increasing contestation over scarce goods,

and intensifying political debates at the highest level of the nation-state.

The collective challenge to health security, shared by all, is how to address the marked differential in health status and health care capacities between the poor countries and the rest of the world. In the ensuing decades it is certain that first world medicine and clinical science will continue to evolve and continue to bestow benefits on the people fortunate to live within the reach of these innovations. The task is to design and implement policies and services that will help the poorest countries build their own systems of care and raise the level of public health and clinical care for their own populations. Clearly this task has become more difficult with the expanding impact of the HIV/AIDS epidemic, although international attention and funds now attracted by this crisis have already begun to encourage a wider debate on the strategies for improving all forms of health care in these regions.

38.4.8 Priorities of Health Security in the Developing World

The major priorities continue to be reductions in infant and maternal mortality and combating the HIV/AIDS pandemic, malaria, and tuberculosis. The list of what is needed is moderately long and can be categorized by which branches of first world health care must focus on which needs:

Medical science: vaccines, new pharmaceuticals and therapeutic agents, rapid and/or more reliable diagnostic tests suitable for field conditions

Clinical medicine: professional education of students, physicians, nurses, and other health personnel, incentives to keep trained people in the region, and health systems capacity building, including improvements in medical schools, clinics, hospitals, and district level laboratory facilities

Public health: training and education of health professionals and government authorities in public health systems to support vaccination campaigns and routine vaccination of target populations, ongoing monitoring and surveillance of key disease and health indicators, malaria control, access to clean water, reduction in air, water, and ground pollution from all sources, and tobacco control.

The health security perspective has been given added empirical momentum by a recent body of work establishing that improvements in health lead to demonstrable improvements in economic indicators, at the level of national data sets (Bloom/Canning 2000:

1207–1209). The force of this finding is that directly targeting health strategies may prove to be one of the more effective means of encouraging social and economic development, from raising standards of literacy to reductions in unemployment. Although the linkage has not been made explicitly to the human security framework, this research indicates the close ties, in terms of policy and programme, between the two concepts of health security and human security.

38.5 Impact of Global Trends on Health and Human Security

Yet the scope and scale of these challenges to health and human security, grave as they are, do not begin to encompass the range and destructive force of the threats posed by the global trends that in the next fifty to 100 years are highly likely to alter fundamental dynamics of human settlement and stability (McMichael/Haines/Sloof/Klovats 1996; IPCC 2007a)⁵. These global trends, described at the outset of this chapter, will create sweeping hardship, dislocation, and risk to lives and livelihoods for many developed as well as developing societies. Furthermore, all populations, but particularly the most poor, will continue to suffer from the high human and social costs of war, internal conflict, pandemic disease, and major disaster. These crises may themselves increase in frequency and magnitude because of the global trends that exacerbate population pressure on resources and disrupt established weather and climate patterns.

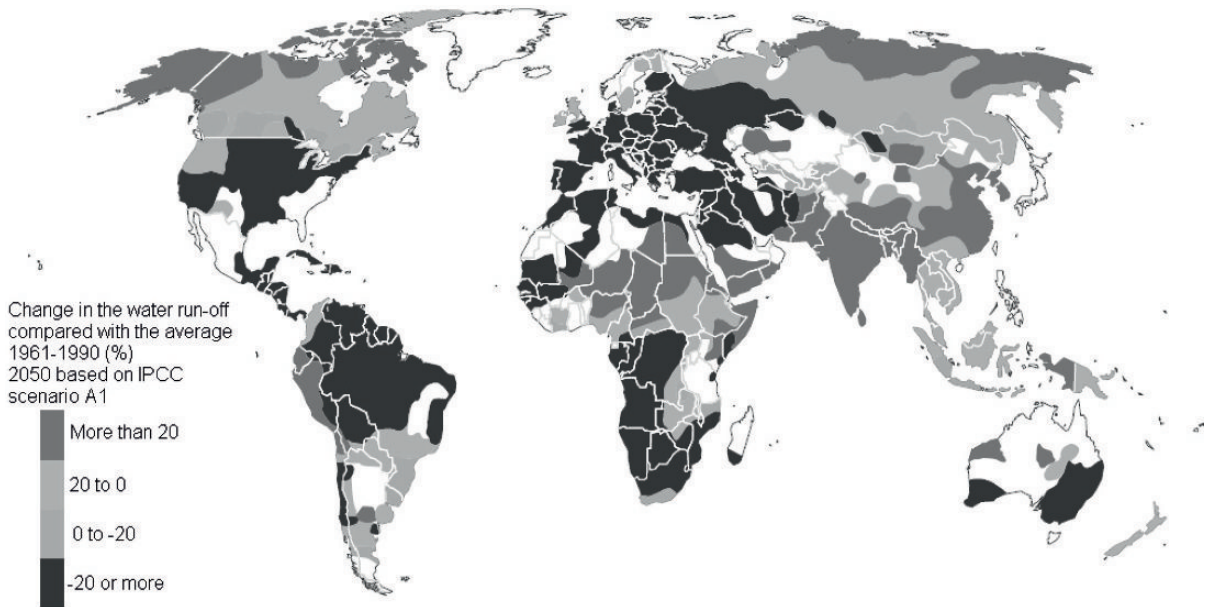
The impact of these trends on health and human security cannot be projected except in general terms, and even then much must remain speculative, given unknown interactions between and among predicted trends and social and political responses over the years ahead. A few major possible impacts merit brief mention here.

38.5.1 Accelerated Forced Migration

Several global trends, in particular climate change and population growth, will accelerate the frequency and magnitude of forced migration (Brauch 1997a, 1998, 2000/2001). When this migration occurs rapidly, as in natural disasters, or in great magnitude, as may be the case with population flight from sea-level rise, it

5 See for the debate and scientific assessments: IPCC 2007, 2007a, 2007b; McMichael/Haines/Sloof/Klovats 1996.

Figure 38.4: Change in water run-off compared with average 1961-1990 (%) for 2050 based on IPCC Scenario A1.
Source: UNDP (2006:162); at: <<http://www.hdr.undp.org>>.



can be expected to bring about significant increases in human morbidity and mortality (Reed/Keely 2001). Regional weather changes, such as increased heat waves, diminishing rainfall in drought-prone areas, and extreme wind and flood events will increase the numbers of people who episodically flee from disaster-stricken areas, will increase the annual death rate from such natural disasters, will expose increasing numbers of people to vector-borne disease threats, and will prompt longer-term migration away from terrain that can no longer support agriculture or animal husbandry (WHO 2007). This longer-term migration will undoubtedly arise only after more frequent and intense episodes of prolonged drought and famine for populations in these marginal zones.

Overall warming by the end of the century poses certain risks of rising sea levels that, depending upon the levels predicted, could jeopardize vast swathes of heavily populated areas on earth and cause forced migration from environmental threats on a scale never seen in recorded history. Hundreds of millions of people now living on low-lying Asian coastlines may be forced to move in relatively short time frames and may face very few options, given dense populations in their interior (Small/Gornitz/Cohen 2000). Entire Pacific island nations may be submerged, under projected levels of sea rise (chap. 7 by Kinnas).

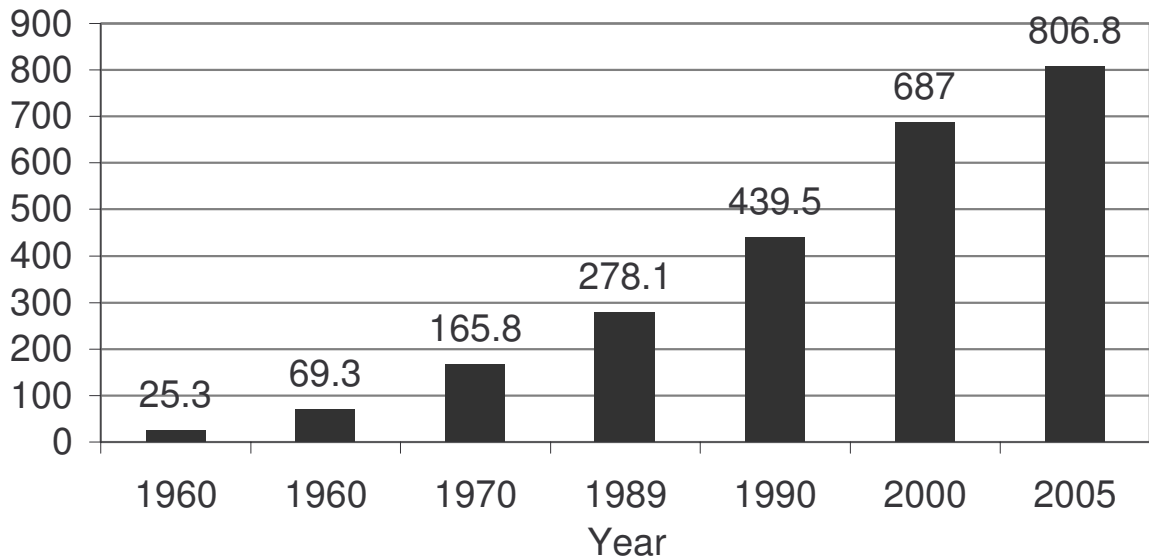
38.5.2 Increased Potential for Armed Conflict

Contestation over dwindling shares of arable land and diminishing access to water sources may prove increasingly pivotal factors in promoting armed conflict, particularly in areas now already stressed by drought and over-population (figure 38.4).⁶ The number of people living below the water-stress threshold of 1,700 cubic meters per person per year, now 700 million world wide, is expected to grow to 3 billion over the next 20 years (UNDP 2006).

The literature on environmental causes of war suggests that usually good governance and economic development can mitigate potential struggle between groups over scarce water and land resources. However, this literature is based on historical examples and what lies ahead suggests on a global scale far more extreme conditions than populations have faced in the past. Current assessments suggest that regional and sub-regional conflict over water may pose a large threat in the Middle East and many parts of Asia, and that struggles for arable land and grazing rights will intensify across the Sahel and Horn of Africa (CNA 2007).

⁶ See the comprehensive debate with contributions by Homer-Dixon 1991, 1994, 1995b, 1996, 1999, 2000; Homer-Dixon/Blitt 1998; for recent reviews of the debate: Brauch 2003, 2005, 2009, 2008a; Dalby 2008.

Figure 38.5: International Tourist Arrivals (1950-2005). **Source:** Created by author based on data from: UNWTO (2006: Annex 3); at: <<http://www.worldtourism.org/facts/menu.html>>.



38.5.3 Greater Risk of Pandemic Disease

The number of people who travel each year as an underpinning of globalization also serves to transport and disseminate contagious disease on an ever increasing scale of risk (Wilson 1995: 39-46; figure 38.5).

Systems for tracking and containing disease transmission have developed rapidly since the SARS epidemic of 2003 but much still needs to be done to ensure that early warning and mitigating strategies are instituted in an effective time frame. Furthermore, projections of new disease entities, such as pandemic influenza or bird influenza, include the sobering recognition that no effective remedies now exist to prevent or treat these infections once they begin to move into human populations. Most analysts maintain that a major pandemic is very likely to occur in this century and are likely to have disproportionately heavy consequences for people in the developing world, who already suffer from malnutrition and lack access to minimum health care services (Murray/Lopez/Chin/Feehan/Hill 2007: 2211-2218). The health security apparatus that has been constructed, linking WHO and nations throughout the world, has the potential to institute the necessary systems for ascertainment but can only advise on how to organize the response at the national and sub-national level, relating to constraints on human behaviour, measures to contain spread through animal populations, and access to essential drugs and vaccines.

38.5.4 Greater Burden of Social Distress

Driven by global trends, these impacts of forced migration, war, and disease will only augment endemic levels of hunger, desperation, loneliness, and grief. The UN Human Development Index does not directly include these indicators of social distress but they are implied by the indices that are monitored, aimed to assess healthy lifespan, knowledge, and decent level of living. The distance between those countries on the upper end of the scale and those at the lower end is increasing each year. Predictors of health and human security for the 21st century would suggest that this disparity will become ever more extreme (Desjarlais/Eisenberg/Good/Kleinman 1995, UNDP 2006).

38.6 Response Strategies

A range of actors and institutions from the entire world community will need to engage in meeting these challenges and addressing their potential impacts. It is argued here that a broad approach based on shoring up human security, rather than the narrow one based on strengthening health security in either of its two meanings, is more likely to make headway against the global scale of what lies ahead. The increased threats of forced migration, war, and pandemic disease, arising against background projections of concerning trends in health and social disparities,

can only be dealt with through concerted and integrated efforts undertaken at the level of international institutions, national governments, and international and local civil society.

The approach begins by recognizing that the calamitous consequences of these 21st century trends will fall most disproportionately on the poorest sixth of the world's population. These people, approximately 1 billion in number, live in geographic regions that will be most prone to climate-driven forced migration, wars over scarce resources, and mass epidemic disease. The consequences of their misery will be felt by the rest of the world, in that people will flee to areas of relative prosperity, local wars may well become regional and spawn global instability, and disease reaches all societies, whether prepared or not. Responding to these terrible events will also incur financial and social costs that will be borne by the developed world, in terms of expanded humanitarian response.

The approach moves to the next step by acknowledging that these dire global trends may be interrupted or at least deflected or slowed by comprehensive and sustained strategies aimed at reducing poverty, improving food, water, and public health delivery to all people in grave need, and intervening at key nodal points in the predicted trends (population growth, energy use, local sources of instability and potential conflict). These strategies may be developed and funded at international levels of engagement but to be successful must translate into local priorities, at the national and sub-national level, for policy and implementation. It is suggested here that these priorities focus on strengthening the human security parameters of home, community, and sense of hope. Health, as a state of wellbeing, may be too much to ask for in the next 100 years. But measures taken against poverty and disease, interventions to protect against climate change and war and major disaster – if made priorities for international action – may allow us to hold on to the hard-earned and meagre gains achieved to date. If there is work, if the children live past five, if there is a school and a clinic within reach, if it seems as if the world cares, people will plan and make sense of their own futures.

39 AIDS – Challenge to Health Security in Africa: Politics in Africa and Case Study on Botswana

Fred Eboko and Tereza Nemeckova

39.1 Introduction

AIDS constitutes the most deadly pandemic in the history of mankind. This pandemic has challenged the world order and security. Since the year 2000, HIV/AIDS is no longer seen by international organizations solely as a public health problem but also as a threat to the national security for those states most affected by the epidemic, and also for states (mainly Western) which perceive this situation as an external threat to their own security. Its implication for the notion of security of African states and the question of a certain world order are addressed in the first part (39.2).

The dynamics of the expansion of AIDS, mainly in Sub-Saharan Africa, has produced and reinforced new dangers in international relations. These various international poles of what Marc Dixneuf (2003: 213–225) called the “world public health governance” (UN, UNAIDS, WHO, Security Council, etc.), which are illustrated in the fight against AIDS in particular for Africa, highlight the latter’s place in an abrupt perspective (39.3). The aim of this chapter is to show how ‘the security’ theme was developed in the domain of AIDS in Africa, the most HIV/AIDS affected region in the world (39.4 and 39.5). The example of Botswana, a relatively developed country in the region, yet one of the countries with the highest HIV/AIDS prevalence among its population, aims at presenting firstly that AIDS is not only a threat to the poorest countries in the world, and secondly, a sound national multi-sectoral approach to the national security threat is needed to combat the pandemic and save the nation (39.6). The case study also illustrates the evolution of an approach to the AIDS threat from a national perspective. The conclusions place the AIDS challenge into a broader global context (39.7).

39.2 HIV/AIDS in Africa

Since the outbreak of the AIDS pandemic in Africa, various attempts of political regulation were made from the international sphere down to local political and health arenas (Eboko/Chabrol 2005: 193–216). The global expansion of the AIDS pandemic during the past decades (1980–2000) was accompanied by evolutions which underscore the unity of a tragedy, the relative diversity of epidemiological dynamics and the variety of international and national responses. The first institutional response at international level was the creation of the *Global Programme on AIDS* (GPA) within the *World Health Organization* (WHO) in 1986, and in most states the creation of *National anti-AIDS Programmes* (NAP)/*National AIDS Committees* (NAC).

From 1986 to 1996, the key goal of international policy in the fight against AIDS was ‘prevention’ and security of blood transfusion. The problems of coordination of the activities of the various United Nations (UN) agencies involved in the management of the problem of AIDS and, especially, the obvious failure of ‘all prevention’ efforts, led to the abandonment of the GPA in 1996 and to the creation of the *UN Common Programme on AIDS* (UNAIDS) which brings together all major UN agencies and the World Bank

During the mid 1990’s other notable changes occurred at the international level, with the scientific validation and the publication of the effectiveness of antiretroviral drugs and tri-therapies at the international Conference on AIDS in Vancouver in 1996. While this major discovery provoked a significant drop in HIV/AIDS in the North (e.g. in a more than 80 per cent decline in deaths in Paris hospitals, after the tri-therapies since 1996), countries of the South and in particular of Sub-Saharan Africa, continued to pay the highest tribute. More than 22.5 million Africans presently live with HIV, and almost 61 per cent of adults living with HIV in 2007 were women (UN-

Table 39.1: HIV and AIDS statistics in Sub-Saharan Africa, 2001 and 2007. **Source:** UNAIDS (2007: 7).

	Adults and children living with HIV/AIDS	Adults and children newly infected with HIV	Adult prevalence (%)	Adult and children deaths due to AIDS
2007	22,5 million [20,9 - 24,3]	1,7 million [1,4 - 2,4]	5,0 % [4,6 - 5,5]	1,6 million [1,5 - 2,0]
2001	20,9 million [19,7 - 23,6]	2,2 million [1,7 - 2,7]	5,8 % [5,5 - 6,6]	1,4 million [1,3 - 1,9]

AIDS 2007: 6). Nowadays the prevalence in Africa for the 15–45 year old persons is 5.0 per cent (UNAIDS 2007: 8).

In Sub-Saharan Africa, adults (15–49 years) HIV prevalence declined from 5,8 % [5,5%–6,6%] in 2001 to 5,0% [4,6%–5,5%] in 2007. AIDS continues to be the single largest cause of mortality in Sub-Saharan. (WHO, 2003); of the global total of 2.1 million [1.9 million–2.4 million] adult and child deaths due to AIDS in 2007, 1.6 million [1.5 million–2.0 million] occurred in sub-Saharan (UNAIDS, 2007: 8).

In 2001, international agencies already estimated that close to 15 million Africans have died of AIDS since the beginning of the epidemic.¹ These figures indicate a gross reality: no war, no phenomenon, and no epidemic has killed as many people in Africa at any given period of its history. AIDS constitutes the most deadly pandemic in the history of mankind (Eboko 2003). This pandemic has already challenged ‘world order’ and security when the UN Security Council took up this issue in 2000.

Since early 2000, HIV/AIDS is no longer seen by international organizations solely as a public health problem but increasingly as a security challenge to the national security of those states most affected by this epidemic, and also for states (Western) which perceive this situation as an external threat to their own security and as more than a risk of contagion from one continent to the other, but as a risk of a profound destabilization of the states which is perceived as a security threat.

39.3 Securitization of HIV/AIDS

In January 2000, the international scope of HIV/AIDS and the perception of the epidemic have changed when the UN Security Council for the first time in history addressed the HIV/AIDS epidemic as the “the No. 1 security threat in Africa”. This meeting marks a turning point not only because it endorses a specific perception of HIV/AIDS, notably on the Af-

rican continent (as a security threat), but because it also opens the way for new developments in the international fight against AIDS (priorities in terms of prevention and treatment). It was followed by a special session of the UN General Assembly in June 2001 which led to a ‘Declaration of Engagement’ by all UN member states. During these deliberations, the states, notably in the North, promised to reinforce their financial contributions for the fight against AIDS by creating a *Global Fund against AIDS, tuberculosis and malaria*.²

HIV/AIDS and its scope in Africa also contributed to a widening of the notion of security in international relations, which has been underway (Brauch 2008, 2008a, 2008b, 2008c). The security concept in international relations has widened and deepened since the end of the Cold War, an evolution which is however always subject to discussions between proponents of the traditional approach and the promoters of a wider vision of security.³ The HIV/AIDS epidemic contributed to an evolution of the notion of security at the end of the 20th century, also as ‘human’ (see chap. 74 to 96 in part IX) and ‘health security’ (see chap. 37 by Rodier/Kindhauser and chap. 40 by Fischer/Salehin). The existence of threats which are not posed by states but that are equally dangerous and destabilizing included health threats as well as the various intra-state and transnational threats like terrorism. The HIV/AIDS epidemic has coincided with the emergence of the notion of ‘human security’ by UN Development Programme (UNDP 1994) that closely associates individual security with ‘health’, ‘food’, ‘environmental’, ‘economic’, and ‘social security’.

These conceptual innovations at the end of the 20th century were based on observations of the social

1 The number of deaths due to AIDS in Africa varies from 13,5 million to 17 million (UNAIDS 2001a, 2004; and the epidemiological synthesis by Delaporte/Laurent 2001).

2 This *Global Fund* has been operational since January 2002 (<<http://www.globalfund.org>>).

3 The traditional or narrow approach to security reflects the realist theory in international relations where the term ‘security’ refers to these two propositions: 1) the existence a threat to security coming from outside; and 2) a threat which is first of all military in nature (though not exclusively) and generally calls for a military response in order to preserve the security of the state in question (Graham/Poku 1998).

and political life which are presented here as characteristics of African states. Africa has been first of all the epicentre of the HIV/AIDS epidemic with more than 70 per cent of affected persons. Some states in southern Africa have alarming prevalence rates surpassing 30 per cent of the population (Botswana, Zimbabwe, Namibia). In the absence of large-scale treatment in most of these countries the demographic forecasts are alarming, especially regarding the drop in life expectancy (Ngoma/le Roux 2008: 815).

The relation between AIDS and security challenges enables some analysts to establish probabilities of new conflicts or the explosion of violence due to HIV/AIDS (chap. 17 by Benz). The phenomenon of AIDS orphans feeds these studies, as well as the question of war children who are regarded as future street children, with the risk of becoming new desperate slaves and taking up to gratuitous violence.

Looking at the manner in which AIDS embraces the new aspects of security, there is a correlation between the epidemic, the political system, and the peace or war situation in question. In many regards the relation between AIDS and security seems to be an African specificity. HIV/AIDS was primordially seen as an aggravating factor of numerous destabilizing elements already present in Africa which become a new dangerous security issue. The already precarious social and political equilibriums are seriously challenged in all scenarios making AIDS a 'national security' threat.

Given the many analyses on AIDS and security in Africa, it is necessary to critically reflect on the bases and implications of this reasoning. In the case of prospective analyses it is often a question of suppositions and projections. Sometimes a rhetorical constitution is based on subjective truths and not on objective realities. Numerous authors willingly acknowledge the shortcomings that exist at this level. To understand the effects of this security vision of the epidemic, from a pragmatic perspective, it seems appropriate to discuss these mechanisms used by those African states that are primarily concerned.

The 'securitization theory' (Wæver 2008, 2008a) developed during the 1990's by the Copenhagen School is of interest that addresses the importance of the dynamics and the process by which an object is transformed into a security stake (*securitization*), who the actors and what the rationales are (Buzan/Wæver/de Wilde 1998) for emphasizing the logic of security. These deliberations inspired this analysis. How did AIDS in Africa change from the 'African

tragedy' to a 'security' stake for the international community?

39.4 HIV/AIDS in Africa and International Security

On 10 January 2000, for the first time the problem of AIDS in Africa was put on the agenda of the UN Security Council as: "the situation in Africa: the impact of AIDS on peace and security in Africa" (Chabrol 2002: 129-136). This session launched a cycle of meetings and discussions, from Washington to Paris, on 'security' and AIDS in Africa. This link was then taken up by the US government and its then UN ambassador, Mr. Richard Holbrooke who formalized the scourge represented by the HIV/AIDS infection for African armed forces, and especially for peacekeeping forces in Africa. The AIDS prevalence rates of security forces are sometimes five times higher than the national average (Ngoma/Le Roux 2008: 815-816). Based on these facts, the American diplomat concluded that the conflicts, the displacements of populations, and their contacts with soldiers could provoke the collapse of the capacities of defence and peacekeeping in Africa.

In this context, Mr. Al Gore, the then US Vice-President in charge of international cooperation with countries of the south ('e-education', AIDS prevention, etc.) declared that AIDS was endangering international security. In April 2000, US President Bill Clinton argued that AIDS poses "a threat for American national security". Several dailies, among them *The Washington Post* and *Le Monde* (30 April 2000), reported on these discussions which thus became highly newsworthy. The 'African tragedy' thus changed its image at the international level. Did this justify the 'efforts' initiated by the American Executive in the fight against AIDS for poor countries to American public opinion and to Congress, with a potentially global nuisance of AIDS in Africa?

In the US, the Democrats thus extended the fight against AIDS in the Caribbean to Africa. When in 2000 the seroprevalence for North America was 0.5 per cent compared with 5.5 per cent for Haiti, the Governor of Florida, Mr. Jeff Bush, started a campaign of cooperation with Haiti to enhance the health 'security' of the American population in contact with migrants from Haiti. The Security Council thus became a catalyst for the reorientation of American policy by converting AIDS into a challenge for the international community, on the fringes of the responsible

UN agencies (UNAIDS, WHO). In July 2001 the Security Council adopted resolution 1308 that “aimed at intensifying prevention and the fight against AIDS amongst armed and peacekeeping forces” (Bonnet 2002 cited in Chabrol 2002: 132).

It is a ‘scourge’ if it is compared with other social effects of AIDS. So far no army has been completely decimated or numerically weakened due to AIDS. But it is already clearly established that AIDS already has a formal impact on the education system due to the deaths of teachers who are more difficult to train, recruit, and replace than soldiers; on agriculture in certain zones, such as on the Rakai agricultural region in Uganda in the late 1980’s due to the disappearance of young adults (men and women). It is appropriate to ask whether the ‘health’, ‘economic’, and ‘social security’ of Africans is less relevant than the perception of ‘national security threats’ of world powers at the international level.

Several developments preceded the turning point of the year 2000, in the international fight against AIDS, for poor countries and especially in Africa. In January 1996, the failure of the *Global Programme on AIDS* (GPA) led to the *UN Common Programme on AIDS* (UNAIDS). In April 2001, UN Secretary General Kofi Annan launched the *World Fund for the fight against AIDS, tuberculosis and malaria* as a sort of international subscription for rich countries and private donors to reduce the financial burdens of countries in the south due to the high prices for medicines fabricated by big laboratories. In June 2001 an extraordinary session of the UN General Assembly on AIDS that was initiated by Kofi Annan again referred to the ‘international security’ option, at the same time when the idea of the *Global Fund* was launched.

While the function, role, and mission of this Fund have been supported by the international community and activists, the financing by large states did not always conform with their previous promises, especially for the United States. Meanwhile the Fund is functioning and initiated several programmes in several countries which have been able to permit access to tri-therapies for thousands of patients. Mr. Annan’s Fund, mostly suffers from what is supposed to be its force and its vocation: the multilateral nature of international cooperation.

39.5 International Security between ‘Health Security’ in the South and ‘Economic Security’ in the North, or American Domination vs. Multilateralism

During the presidency of George W. Bush, in 2003 the US government set up a rival programme in 2003 to the *Global Fund* with the *President’s Emergency Plan for AIDS and Relief* (Pepfar) that allocated 15 billions US\$ to fifteen African, Caribbean, and Asian countries. It finances access to tri-therapy treatment programmes based on two key conditions: a) exclusive recourse to big pharmaceutical firms (no generic drugs); and b) prevention campaigns based on abstinence. This modality of the ‘abstinence’, ‘fidelity’ and ‘condom’ triptych has been denounced by NGOs for its moralist character. These organizations also regret the monopoly granted to ‘Big Pharma’ (the nickname representing the big pharmaceutical groups) to the detriment of generic drugs which would have permitted to take care of millions of additional patients.

Despite these legitimate criticisms, the *Pepfar* presents a major advantage due to its unipolar nature: rapidity of execution and therefore celerity in taking care of persons benefiting from the funded programmes. It seems to constitute an archetype of a co-operation policy whereby elected officials guarantee the economic interests of multinationals by entirely controlling the invested funds. *Pepfar* also strengthens the unilateral approach of the United States in the ‘new world order’, including the area of aid which appears as ‘humanitarian’, but is so only partially. Therefore, AIDS as a danger for ‘international security’ also concentrates its resources in the ‘financial security’ of economic allies of the United States. The idiom ‘abstinence’ may be counterproductive, if one takes the case of Botswana as an example.

The results in terms of prevention and the delays with which the civil society adheres to voluntary screening in these countries clearly translates the situation of a society that suffers from the cleavage between the elites and the rest of the population, despite the economic redistribution and the welfare state. With close to 38 per cent of seroprevalence rate among the sexually active population and 17 per cent of the general population, Botswana offers a tragic illustration of a fundamental contradiction between the economic integration and the separation of elites from subordinate social groups.

Figure 39.1: Political Map of Southern Africa (2005). **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection.; at: <http://www.lib.utexas.edu/maps/cia07/botswana_sm_2007.gif>. This map is in the public domain.



Table 39.2: Botswana key figures (2007). Source: OECD (2007: 135).

Population	1,8 million
GDP p.c. (PPP)	11,611 USD
Life expectancy	34.4 years
Illiteracy rate	18.8 per cent

39.6 Case study of Botswana

Botswana belongs to the top performing countries in Africa based on sound macroeconomic policies, good governance, reliable institutions, and political stability. The country has managed its diamond wealth efficiently. It has the reputation of being the least corrupt country in Africa and also carries the highest sover-

eign credit rating on the continent. Since the 1960's Botswana has transformed from a very poor agricultural country to a country ranking among the richest countries in Africa, with GDP per capita above US \$11,600 in 2007 (OECD 2005: 105).

For African standards, the achievements of Botswana in the human factor area are also admirable. Almost 100 per cent of children have access to free primary education, the literacy rate has risen above 80 per cent, nearly 90 per cent of the population is within the reach of state health facilities, and nearly all children enjoy basic immunization.

But these achievements are threatened as the country is devastated by the HIV/AIDS epidemic and faces its future national, regional, and international consequences.

39.6.1 Extent of the HIV/AIDS Pandemic

AIDS was first reported in Botswana in 1985. At that time AIDS was seen as a disease that affects mainly male homosexuals in the Western states. Almost 20 years later, in 2003, the National AIDS Coordinating Agency of Botswana released a survey on the HIV/AIDS surveillance of the population. Despite the macroeconomic success of the country, HIV/AIDS has spread throughout and affected 37.4 per cent of the sexually active population. The speed of the HIV/AIDS spread has been alarming - HIV/AIDS prevalence has more than doubled within only a decade (from 18.1 per cent in 1992). Eight of 25 districts in Botswana reached even higher than 40 per cent of HIV/AIDS prevalence, and other 8 districts ranked between 30-40 per cent. The worst hit districts lie in the north-west, where Selebi and Phikwe noted an AIDS prevalence of 52.2 per cent.⁴ However, almost 5 years after, latest data show a declining HIV prevalence in Botswana, which reached 'only' 24.7 per cent in 2007 (UNAIDS 2007: 11). It seems that the triple approach of prevention, care and treatment (see 40.6.2) has already begun to yield dividends.

As Botswana is a transport hub for Zimbabwe, South Africa, Namibia and Zambia, all of which share the high HIV prevalence rate, districts situated closely to these borders welcome thousands of work migrants who tend to have more free sexual behaviour. Therefore, demographic mobility presents a key factor of the high HIV prevalence in Botswana, or in se-

lected districts respectively (Government of Botswana 2003: 65).

Two relevant conclusions could be drawn from the survey. First, there is no marked difference in HIV prevalence between rural and urban areas (see table 39.3).

Table 39.3: HIV prevalence by residence and age (2003), in percentages. **Source:** AIDS surveillance 2003; at: <www.naca.gov.bw/documents/flyer_english_A4.pdf> (10 May 2006): 3.

Age	15-19	20-24	25-29	30-34	35-39	40-49
Rural	24,1	40,4	50,4	42,2	35,2	34,6
Urban	22,1	37,9	49,4	47,5	44,5	34,4

Secondly, the data show a significantly higher prevalence among young women (15-29 years) than among men of similar ages (see table 39.4). Similarly, men above 35 years show higher HIV prevalence than women.

Table 39.4: HIV prevalence among men and women aged 15-49 years (2003), in percentages. **Source:** AIDS surveillance 2003; at: <www.naca.gov.bw/documents/flyer_english_A4.pdf> (10 May 2006): 3.

Age	15-19	20-24	25-29	30-34	35-39	40-49
Women	15,4	29,7	54,1	61,5	55,9	45
Men	1,2	8,4	29,7	49,9	59,6	56,9

The reason for negligible differences between the rural and urban population could be found in the already mentioned demographic mobility. Rapid economic growth forces people to move from rural to urban areas. While urbanization rises there is a high number of people living in towns but still having strong rural roots to which they frequently return. Such an environment that leaves children often unattended when commuting between towns and fields, possibly increases the risk of infection.

The significantly higher prevalence among women and among older men respectively, could be explained by the socio-cultural determinants of HIV/AIDS. Subordination of women underlines many aspects of their vulnerability, especially their weak position in decisions about sex. This is highly important at the young age of a woman. Another key role play the multiple sexual relationships mostly by men (Government of Botswana 2003: 68). The above data stress the urgent need for appropriate measurements. Oth-

4 AIDS surveillance 2003, at: <www.naca.gov.bw/documents/flyer_english_A4.pdf> (10 May 2006): 2.

erwise the nation will pay a very high price for the epidemic.

39.6.2 Government Response to the Epidemic

The government of Botswana failed to realize the real extent of the HIV/AIDS threat in the early stages. Its response to the AIDS epidemic can be divided into three stages:

- The *early stage* (1987–1989) focused, according to international recommendations, mainly on the screening of blood to eliminate the risk of HIV transmission through blood transfusion. There was not much information provided either to the public or to the hospital staff.
- The *second stage* (1989–1997), and the first *Medium Term Plan* (MTP I), saw the introduction of information, education, and communication programmes focusing on AIDS as one of the diseases which have started to spread throughout all segments of society. But the public response was rather narrow. Therefore, in 1993 the Government of Botswana adopted the first *Botswana National Policy on AIDS* (Government of Botswana 1993), the first action plan to combat the spread of the HIV/AIDS epidemic throughout the country.
- The *third stage* (since 1997) marked a paradigm shift from tackling HIV/AIDS as a health issue to HIV/AIDS as a development issue that needed a multi-sectoral response. The *second Medium Term Plan* (MTP II) aimed to involve many stakeholders who had been previously excluded (e.g. teachers, employers or broad civil society), with the overall goal of not only to reduce the HIV/AIDS infection and transmission rates, but also to reduce the socio-economic, demographic or political consequences of the rapidly spreading HIV/AIDS epidemic. HIV/AIDS in Botswana has been lifted to the level of a security threat to the nation.

Due to the urgency of this threat the *National AIDS Coordinating Agency* (NACA) was formed in 1999 and given responsibility for mobilizing and coordinating a *multi-sectoral national response* to the epidemic. Key agencies in Botswana were assigned as follows:

- The *President* presents the political leadership for the national response and ensures that all sectors of society are mobilized;
- The *Ministry of Health* is responsible for the implementation of the health sector based on interventions regarding the prevention of sexual,

blood-borne, and vertical transmission of AIDS, for implementing and managing the antiretroviral therapy, epidemiological research, etc.;

- The *Ministry of Local Government* is responsible for providing care and support services to families affected by HIV/AIDS, including orphans and vulnerable children;
- The *Ministry of Education* will ensure that HIV/AIDS awareness is mainstreamed into all aspects of the educational system;
- The *Department on Information and Broadcasting* plays an active role in disseminating information on HIV/AIDS;
- The *Directorate of Public Service Management* develops a policy for managing HIV/AIDS in the public service and ensures that HIV/AIDS programmes are fully implemented;
- The *Ministry of Labour, Home Affairs and Social Welfare* is tasked to ensure that the rights of all HIV-infected people are protected;
- The *private sector* has been asked to develop HIV/AIDS programmes for their staff in line with national strategies, to mobilize resources, and to integrate HIV/AIDS awareness into their training programmes; and
- *Civil society* takes responsibility for advocacy and social mobilization, the design and implementation of innovative and prevention programmes, etc.

In 2003 Botswana completed its *National Strategic Framework* which offers a real strategy for combating the epidemic until 2009. The Framework stresses that HIV/AIDS poses a significant *threat to national security* in terms of loss of human resources and the ability to mobilize for the protection of national interests (Government of Botswana 2003: 65). The framework also stresses the need of an efficient HIV/AIDS *prevention and treatment*.

39.6.2.1 HIV/AIDS Prevention

The National Strategic Framework outlines several areas where HIV/AIDS prevention is needed:

Public awareness and education. Public awareness and education have previously been based on the ABC of AIDS: Abstain, Be faithful and, if you have sex use Condoms. Previously, Botswana has been flooded by safe-sex billboards and posters, but people did not pay much attention to them. As stated above, the reason for the public attitude can be found in the moralist character of the campaign, e.g. in pressure to change sexual behaviour, which has been regarded

mainly by the older generation as taboo. The new strategy has changed in a way. It targets the young people who are just about to start their sexual life and who are more willing to talk about issues. Several new initiatives appeared, e.g. the development of a radio drama, Makgabaneng that deals with culturally specific HIV/AIDS-related issues, or the Youth Health Organization (YOHU), a youth-run non-governmental organization (NGO) which conveys messages of safe sex through art festivals, dramas, and group discussions. The *Ministry of Education of Botswana* and UNDP, in collaboration with the Government of Brazil and with support from the *African Comprehensive HIV/AIDS Programme* (ACHAP), introduced a programme to improve primary and secondary teachers' knowledge in this area, in order to demystify and destigmatize HIV/AIDS, and to break down cultural beliefs about sex and sexuality.

Condom distribution and education. Condom use presents a crucial part in effective HIV/AIDS prevention. *Population Services International (PSI)* has helped to promote the 'Lovers Plus' condom since 1993 and the 'Care' female condom since 2002. One of the key strategies for marketing condoms in Botswana has been chosen peer education, conducted in a variety of settings such as fairs and festivals, shopping malls, at work places and bars. Besides, in 2003 the Government of Botswana, with funding and technical support from ACHAP, launched an extensive condom distribution and marketing campaign, providing for the installation of 10,500 condom dispensers in traditional and non-traditional outlets throughout the country. Millions of condoms have been procured for free distribution.⁵ Indeed, condom use has substantially increased. Condom use at last with non-marital or non-cohabiting partners reached 84 per cent by men and 77 per cent by women (aged 15–24).⁶

Improvement of blood safety. The Ministry of Health, the Safe Blood for Africa Foundation and other partners, with funding from ACHAP, have helped to improve the safety of blood transfusion in Botswana. The national supply of HIV-free blood doubled in size in two years up to September 2005. Over the same period, the amount of HIV-infected blood given by donors fell by half, largely due to better screening of donors and counselling. One of the

projects contributing to the improvement of blood safety is called 'Pledge 25'. This project recruits young people to become blood donors and teaches them how to prevent HIV infection.⁷ Botswana lacked for a long time an HIV/AIDS laboratory. All blood samples had to be sent to South Africa for testing. In 2002 a new laboratory was opened in Gaborone, funded by the Government of Botswana, Bristol-Myers Squibb and ACHAP, and it has been operating with technical assistance from the Botswana-Harvard AIDS Partnership.

Prevention of mother-to-child transmission of HIV. As was stated above, the prevalence rate among pregnant women in Botswana reaches 35.4 per cent. In the absence of any interventions, around a third of the babies born to HIV-positive mothers become infected during pregnancy and delivery or through breastfeeding. This rate could be substantially cut through the use of antiretroviral treatment and safer feeding practices. A prevention of mother-to-child transmission programme was the first programme in Botswana starting to distribute antiretroviral drugs for free. However, enrolment of women in such a programme is still disappointingly low (range of 11–20 per cent).⁸ One of the reasons could be a severe shortage of hospital staff and an inadequate infrastructure. The Government of Botswana has already responded with training and recruitment for new counsellors.

HIV testing. HIV testing plays a key role in HIV prevention and treatment. It is particularly important as a starting point for accessing other HIV/AIDS-related services. Since 2000, the Government of Botswana supported the Tebelopele network of voluntary testing centres providing immediate and confidential services for sexually active persons from Botswana aged 18–49. By October 2005, the network had provided free services to over 230,000 visitors. The Tebelopele centres have been supported by the "Know Your Status" and "Show You Care" campaigns, as part of the marketing strategy developed in collaboration with PSI. These campaigns do not pressurize on sexual behavioural change as before, but concentrate on prevention and on provoking an interest in HIV/AIDS affected people. Botswana became the first country in Africa having a national policy of routinely

5 "Condom marketing and distribution", at: <www.ACHAP.org/news> (10 November 2005): 1 of 2.

6 "AIDS surveillance 2003", at: <http://www.naca.gov.bw/documents/flyer_english_A4.pdf> (10 May 2006: 3).

7 "Young Botswana blood donors spread hope, not AIDS"; at: <<http://www.reuters.com/international>>: 1 (21 October 2005).

8 "Free Aids Therapy Provokes Wide Response"; at: <<http://www.AllAfrica.com>>: 1 (10 January 2003).

offering HIV tests at medical clinics. Apart from that, HIV tests are required when applying for a new job, for studying at the university, etc. Health officials believe that such a broad testing is a good way to help prevention programmes and to access antiretroviral treatment at an earlier stage of the disease.

39.6.2.2 HIV/AIDS Treatment - MASA Programme

In 2000, the Government of Botswana declared AIDS as a 'national security' threat. The President declared his intention of making antiretroviral drugs⁹ available to every HIV-infected citizen in need. Already in 2002, Botswana became the first country in Africa offering antiretroviral drugs to HIV-infected citizens throughout the public health system *for free*. The national programme was called MASA.¹⁰

By the time of the start of MASA, there were already warnings about the financial sustainability of such a programme. It was estimated that it would cost US \$ 24.5 million to include 19,000 people in 2002 (or about US \$ 1,300 per patient), and an additional 20,000 people were projected for the subsequent year. Thus, expenditures on the health system have steadily been expanding. In 2003 all HIV-related government programmes amounted to 6 per cent of the total budget (OECD 2005: 112). Fortunately, MASA has been substantially supported from abroad – US \$ 3.3 million came from the *Global Fund* and US \$ 26 million from different NGOs, charities or foundations.

The initial proposal found 110,000 people eligible for the programme. MASA identified the following main target groups:

- pregnant women and their partners with less than 200 CD4¹¹;
- all infected children older than 6 months;
- all infected tuberculosis patients with less than 200 CD4;
- all adults infected with less than 200 CD4.

MASA was launched initially only in the four biggest cities of the country. By the end of 2002, the number of enrolled patients reached only 2,000. Records of these patients showed that the average CD4 count on registering with the programme was about 57, but for some patients even zero. This proves that people came to enrol only when they felt really sick.

By mid-year 2005 the number of enrolled patients reached already 54,000.¹² The introduction of free antiretroviral therapy requires a broadening of the infrastructure, including testing centres and skilled personnel in order to facilitate more patients. Within the last three years a significant change has been recorded, but it was obviously insufficient.

MASA's greatest challenge is a critical shortage of skilled personnel, mainly in hospitals. To be eligible to prescribe the antiretroviral drugs for the MASA programme, doctors must go through specialized training where they learn everything from virology and immunology to drug interactions and side-effects of the antiretrovirals. The Harvard AIDS Institute helps to organize such training for them. Another training programme sponsored by ACHAP tries to speed up the number of personnel understanding the illness and being able to counsel the people. HIV experts from renowned international institutions work with clinic staff mentoring them and giving them lectures. Unfortunately, the number of patients increases much faster than the number of skilled personnel.

39.6.2.3 Active Role of the Private Sector

As already mentioned, in the multi-sectored approach to the HIV/AIDS epidemic the private sector has been involved. The first pioneer in implementing HIV/AIDS programmes for employees was the Debswana Diamond Company,¹³ the biggest private employer in the country.

The first case of an HIV-infected employee appeared in 1987 in the Jwaneng Mine Hospital. As a consequence of that, in 1991, the company decided to

9 Antiretroviral drugs reduce the level of HIV in the body, so that the immune system is allowed to recover partially and further damage is slowed or prevented. But it does not cure HIV/AIDS.

10 In Setswana, meaning "new dawn".

11 HIV mainly infects cells in the immune system called CD4 cells, gradually destroying them and causing the number of CD4 to drop, so that the immune system is weakened.

12 "Merck Official Says Partnership in Botswana is Learning from Experience and Passing It On"; at: <http www. allafrica.com>: 1 (13 May 2005).

13 Debswana is owned in equal shares by the Government of Botswana and De Beers Centenary AG. The company mines diamonds at three operations in Botswana, namely the Orapa, Letlhakane and Jwaneng mines. Debswana has two fully-owned subsidiaries, the Botswana Diamond Valuing Company, which sorts and values diamonds, and the Teemane Manufacturing Company, which cuts and polishes diamonds. The total number of employees exceeds 6,000.

publish posters, pamphlets, and videos showing people with AIDS. Due to significant percentage increases in AIDS-related health retirements between 1996 and 1999 (75 per cent), the company conducted a survey on the HIV prevalence rate of its employees. This survey was made in May 1999 and it showed that 28.8 per cent of the employees of Debswana were HIV positive.

Thus, in May 2001 Debswana introduced its *Debswana HIV/AIDS Strategy*. The vision was to become a global benchmark company in fighting against HIV/AIDS at the workplace. The most visible part of it was the introduction of a new rule that every HIV-infected employee and his/her legally married spouse who is also HIV positive were offered to be paid 90 per cent of the antiretroviral therapy costs. Further measures have been undertaken, e.g. every new job candidate got HIV tested, plans of replacement for critical posts have been developed, the company strictly protects the rights of all their employees (regardless of their HIV status) etc. Debswana took a leading role in the Botswana private sector's contribution to the fight against AIDS. Other private companies started to follow.

39.7 Conclusion

In 2007, 22.5 million Africans lived with HIV/AIDS and, 61 per cent of them are women and 90 per cent of all HIV-positive children live in Sub-Saharan Africa (UNAIDS 2007: 9). These figures indicate a gross reality: no war, no phenomenon, and no epidemic has killed as many lives from Africa at any period in history. AIDS is the most deadly pandemic in the history of humankind.

At the turn of the third Millennium, the international scope of HIV/AIDS and the international perception of the epidemic have been changed by the UN Security Council. In January 2000 for the first time in its history, the Security Council referred to the HIV/AIDS epidemic as a threat to international security, and as "the No. 1 security threat in Africa".

The emergence of HIV/AIDS and its scope in Africa have also contributed to a widening of the notion of security in international relations. Since the end of the Cold War the security concept in international relations has also deepened. But this reconceptualization of security has been disputed between the proponents of the traditional narrow approach and the adherents of an enlarged and elaborated vision of security.

The existence of threats which are not necessarily posed by states but who are considered as equally dangerous and destabilizing has included health threats as well as various intra-state and transnational threats like terrorism. Particularly, the HIV/AIDS epidemic has coincided with the emergence of the notion of 'human security' developed by UNDP (1994) that has closely linked individual security to health, food, environmental, economic, and social security. In this sense, national authorities across Africa were asked to respond to this growing and rapidly spreading new security or health threat.

Botswana presents a relatively developed African country that has been severely devastated by the HIV/AIDS epidemic. Several attempts have been made to reverse it. In 2000, when the epidemic reached a catastrophic dimension, the Government of Botswana declared HIV/AIDS as a national security threat. Botswana representatives correctly realized that AIDS constitutes not only a security threat to the nation and region, but also a threat to humankind as life expectancy had dropped to 35 years.

The declaration of HIV/AIDS as a security threat has been important but not sufficient to reverse this epidemic. Several conclusions can be drawn from the Botswana experience.

- *First*, the HIV/AIDS epidemic is not solely related to the gap between prevention messages (abstinence, be faithful, use condom - "ABC"), AIDS policies and the reality of sexual behaviour which are very different to moralistic prevention messages.
- *Secondly*, massive national prevention programmes need to take the cultural and social differences into account, as well as the national treatment programmes and their financial sustainability.
- *Thirdly*, the impact of the HIV/AIDS epidemic should not be underestimated. Botswana has severe problems due to the shortage of skilled hospital personnel, who are also vulnerable to the virus. The increasing scarcity of skilled personnel is visible not only in hospitals, but also in schools, in other government institutions and in private sector, and has large economic consequences. Beside the impact on the decline in the productive workforce, the epidemic has an impact on increased poverty and human suffering, and last but not least, weakens the government's capacity to deliver essential services and sustain human development.

40 Health and Poverty as Challenges for Human Security: Two Case Studies on Northern Vietnam and Bangladesh

Isabel Fischer and Mohammad Musfequs Salehin

40.1 Introduction

About one fifth of the world population, that is 1.2 billion people, live in extreme income poverty with less than one US\$ a day. Another 1.6 billion have less than two US\$ a day (CHS 2003: 73). Most of the poor live in severe livelihood uncertainty and lack access to basic education and health services. The United Nations' *Millennium Development Goals* (MDGs) aim at cutting poverty in half by the year 2015. As health¹ is considered crucial for poverty reduction, three MDGs focus directly on health, covering maternal mortality, infant mortality, HIV/AIDS, malaria and tuberculosis. The MDGs 4-6 directly concern health issues, while other MDGs such as goal three ("Promote gender equality and empower women") and seven ("Ensure environmental sustainability") deal with nutrition, water and sanitation and thus impact on health² (see box 40.1).

The concept of 'human security' has emerged slowly but steadily over the 1990's -influenced by the end of the Cold War, the awareness of previously neglected insecurities and globalization- and the question was raised about the expected implications of this concept for health and human development (Chen/Narasimhan 2003a). There are various definitions³ of 'human security', which obviously "means different things to different people"⁴. This chapter applies the definition of the Commission on Human Security (CHS), that stated as the objective of human security "to protect the vital core of all human lives in ways that enhance human freedoms and human fulfilment" (CHS 2003: 4).

The emergence of the concept of 'human security' will be briefly reviewed (40.2), before focusing on human, livelihood and health security (40.2.1) including current debates of human and health security in South and Southeast Asia (40.2.2) as well as the linkages of poverty, health and human security (40.2.3). Empirical evidence will be presented based on two case studies (40.3) on Vietnam (40.3.1) and Bangladesh (40.3.2). Lessons learned (40.3.3) will be summarized, before turning to the conclusions (40.4).

The emergence of the concept of 'human security' will be briefly reviewed (40.2), before focusing on human, livelihood and health security (40.2.1) including current debates of human and health security in South and Southeast Asia (40.2.2) as well as the linkages of poverty, health and human security (40.2.3). Empirical evidence will be presented based on two case studies (40.3) on Vietnam (40.3.1) and Bangladesh (40.3.2). Lessons learned (40.3.3) will be summarized, before turning to the conclusions (40.4).

40.2 The Concept of Human Security

Today's idea of human security is generally thought to go back to the United Nations Development Program (UNDP) report of 1994 and Mahub ul Haq⁵. The UNDP Report stressed that "the concept of security must change - from an exclusive stress on national security to a much greater stress on people's security, from security through armaments to security through human development, from territorial security to food, employment and environmental security" (UNDP 1994: 2). The report calls for "faster economic development, greater social justice and more people's participation ... (for) the new concepts of human security" (UNDP 1994: 3). Human security was defined as "...safety from chronic threats as hunger, disease and

1 Health is defined by the Commission on Human Security (CHS 2003: 96) not just as the absence of disease, but as "a stage of complete physical, mental and social well-being".

2 WHO, 2005: "Fact sheets: Health, poverty and MDG", at: <http://www.wpro.who.int/media_centre/fact_sheetsfs_20050621.htm>.

3 Cf. Sabina Alkire, 2002: "Conceptual Framework for Human Security" (Excerpt: Working Definition and Executive Summary); at: <<http://www.humansecurity-chs.org/activities/outreach/frame.pdf>>.

4 Lincoln C. Chen and Vasant Narasimhan, 2002: "Health and Human Security - Pointing a Way forward"; at: <http://www.fas.harvard.edu/~acgei/Publications/Chen/LCC_Health_and_HS_way_forward.pdf>.

5 Kanti Bajpai, 2001: "Human Security: Concept and Measurement", posted on 21-06-2001; at: <<http://www.cpdsindia.org/globalhumansecurity/measurement.htm>>.

Box 40.1: Millennium Development Goals on Health Issues. **Source:** United Nations Millennium Declaration, at: <<http://www.un.org/millennium/>>; UNDP (2000): Millennium Development Goals, at: <<http://www.undp.org/mdg/basics.shtml>> and at: <<http://www.undp.org/mdg/goallist.shtml>>. Text is in the public domain.

The Millennium Development Goals (MDGs) are eight goals to be achieved by 2015 that respond to the world's main development challenges. The MDGs are drawn from the actions and targets contained in the *Millennium Declaration* that was adopted by 189 nations and signed by 147 heads of state and governments during the UN Millennium Summit in September 2000.

The 8 MDGs break down into 18 quantifiable targets that are measured by 48 indicators.

- Goal 1: Eradicate extreme poverty and hunger
- Goal 2: Achieve universal primary education
- Goal 3: Promote gender equality and empower women
- Goal 4: Reduce child mortality
- Goal 5: Improve maternal health
- Goal 6: Combat HIV/AIDS, malaria and other diseases
- Goal 7: Ensure environmental sustainability
- Goal 8: Develop a Global Partnership for Development

The MDGs 4–6 and the targets 5–8, and indicators 13–24 are devoted to Health Issues

Goal 4: Reduce child mortality

Target 5: Reduce by two thirds the mortality rate among children under five

- 13. Under-Five Mortality Rate (UNICEF)
- 14. Infant Mortality Rate (UNICEF)
- 15. Proportion of 1 year-old Children Immunised Against Measles (UNICEF)

Goal 5: Improve maternal health

Target 6: Reduce by three quarters the maternal mortality ratio

- 16. Maternal Mortality Ratio (WHO)
- 17. Proportion of Births Attended by Skilled Health Personnel (UNICEF)

Goal 6: Combat HIV/AIDS, malaria and other diseases

Target 7: Halt and begin to reverse the spread of HIV/AIDS

- 18. HIV Prevalence Among 15–24 year-old Pregnant Women (UNAIDS)
- 19. Condom use rate of the contraceptive prevalence rate and Population aged 15–24 years with comprehensive correct knowledge of HIV/AIDS (UNAIDS, UNICEF, UN Population Division, WHO)
- 20. Ratio of school attendance of orphans to school attendance of non-orphans aged 10–14 years

Target 8: Halt and begin to reverse the incidence of malaria and other major diseases

- 21. Prevalence and Death Rates Associated with Malaria (WHO):
- 22. Proportion of Population in Malaria Risk Areas Using Effective Malaria Prevention and Treatment Measures (UNICEF):
- 23. Prevalence and Death Rates Associated with Tuberculosis (WHO):
- 24. Proportion of Tuberculosis Cases Detected and Cured Under Directly-Observed Treatment Short Courses (WHO)

Goal 7: Ensure environmental sustainability

Target 9: Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources

- 25. Forested land as percentage of land area (FAO)
- 26. Ratio of Area Protected to Maintain Biological Diversity to Surface Area (UNEP)
- 27. Energy supply (apparent consumption; Kg oil equivalent) per \$1,000 (PPP) GDP (World Bank)
- 28. Carbon Dioxide Emissions (per capita) and Consumption of Ozone-Depleting CFCs (ODP tons):

Target 10: Reduce by half the proportion of people without sustainable access to safe drinking water

- 30. Proportion of the Population with Sustainable Access to and Improved Water Source (WHO/UNICEF)

- 31. Proportion of the Population with Access to Improved Sanitation (WHO/UNICEF)

Target 11: Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020

- 32. Slum population as percentage of urban population (secure tenure index) (UN-Habitat)

Implementation of the MDGs

In 2005, the Secretary-General prepared the first comprehensive five-yearly report on progress toward achieving the MDGs. The report reviews the implementation of decisions taken at the international conferences and special sessions on the least developed countries, progress on HIV/AIDS and financing for development and sustainable development.

repression...and protection from sudden and harmful disruptions in the pattern of daily life” (UNDP 1994: 24).⁶

In 2003, the CHS, supported by the Japanese government and co-chaired by Sadako Ogata and Amartya Sen, has released its version of the holistic approach. Overall, human security is a multi-faceted concept that articulates the following issues: human

rights, rule of law, democracy, accountability, participation, empowerment, diversity, conflict resolution, peace, income security, poverty, food security, health security, and sustainability.

These two policy reports, the different approaches of Canada (‘freedom from fear’; see Dedring 2008) and Japan (‘freedom from want’, see chap. 84 by Shinoda), as well as the policy agenda of the *Human Se-*

curity Network (HSN, see chap. 75 by Fuentes/Brauch) were accompanied by an intensive scientific discourse (Brauch 2003; 2005, 2005a, 2008, 2008a, 2008b) that gradually spread from the OECD world (North America, Europe, Asia Pacific) to the developing countries with a special interest in South and Southeast Asia (chap. 76 by Sabur). From this 'Southern' perspective, human security concerns were conceptually linked with other debates on livelihood (chap. 36 by Bohle) and health security (chap. 37 by Rodier/Kindhauser; chap. 38 by Leaning).

40.2.1 Human, Livelihood and Health Security

Following Chen/Narasimhan (2003) health and human security are tightly interlinked and several major policy papers on health and human security were produced. Poor health - illness, injury, disability, and death - are critical threats to human security. Figure 40.1 displays relevant linkages that occur due to (1) violence and conflict, (2) global infectious diseases and (3) poverty and inequity.

The recognition of the linkages between health and development has grown on the global political agenda (cf. UN's MDGs in box 40.1). According to Acharya (2000)⁷, however, the concept of human security, which has attracted much attention in the West, remains poorly understood and contested in Asia. The next part will briefly review current debates in Asia.

40.2.2 Conceptual and Empirical Debates on Human and Health Security in South and Southeast Asia

In contrast to the international appearance of the human security concept in the post-Cold War area, it's emerge in Asia can be linked to the Asian financial cri-

sis of 1997. Following Acharya (2000)⁷, ongoing debates over the exact definition and scope of human security persist in Asia, as elsewhere. Many definitions have adopted a holistic concept, tackling human rights, environmental degradation, poverty, crime, terrorism, gender and social biases, health and natural disasters⁸.

Japan and Thailand have most vigorously promoted the broader approach, which was favoured by several Asian intellectuals, among them Tadashi Yamamoto (Japan Center for International Exchange), some members of ASEAN and the Institute of Strategic and International Studies (ISIS) group, as well as Obuchi Keizo, Surin Pitsuwan, and Kim Dae-jung (Evans 2004). Despite varying conceptions, the key lesson of the Asian crises is that it would be counterproductive to pursue a notion of human security through economic growth and political stability alone - without regard to human rights and democratization.

Three case studies on health issues in Cambodia, Indonesia and the Philippines show how the concept of human security is translated into action in Southeast Asia.⁹ Human security has the potential to act as a viable policy framework in addressing urgent problems. Primary health care is such an issue. It is not yet considered a priority by most policymakers who often care more about jobs and inflation. A similar reasoning can be found in Gutlove/Thompson (2003). They argue that health is a crucial concern for human security. The concern for health provides a context for building partnerships across disciplines, sectors and agencies - offering the potential for discussing and acting upon shared interests and mutual vulnerabilities.

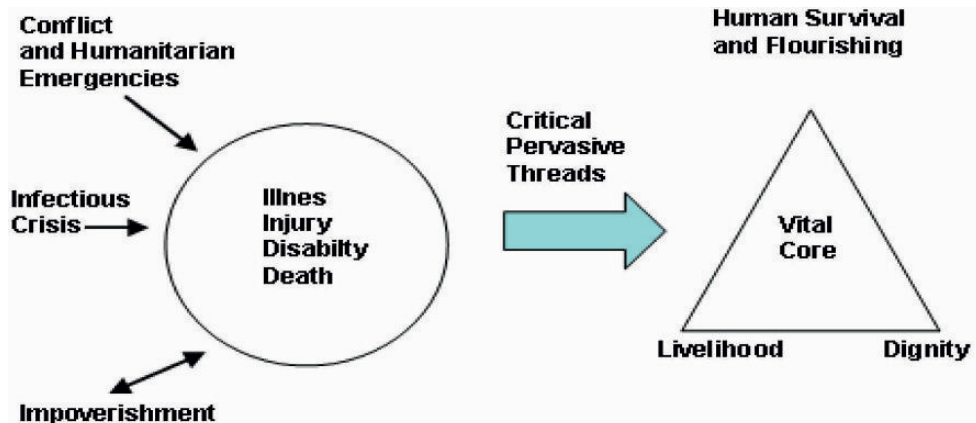
6 The UNDP report identified seven categories of human security: *economic security* (freedom from poverty), *food security* (access to food), *health security* (access to health care and protection from diseases), *environmental security* (protection from the danger of environmental pollution), *personal security* (survival of traditional cultures and ethnic groups), *community security* (physical protection against torture, war, criminal attacks, domestic violence) and *political security* (civil and political rights, freedom from political oppression).

7 Amitav Acharya, 2000: "Human Security in the Asia Pacific: Puzzle, Panacea or Peril?", posted on 24 October 2000; at: <<http://www.cpdindia.org/globalhumansecurity/puzzlepanacea.htm>>.

8 Many Asian scholars argue that the broad range of threats constituting the human security paradigm is a rehash of the old Asian notion of "competitive security" developed by Japan and the Association of Southeast Asian Nations (ASEAN) members - however the emphasis on human rights, which is missing in the competitive security approach, is crucial for a conceptual differentiation of both concepts. While some scholars regard human security in terms of its economic and social aspects (social safety nets, poverty alleviation) others stress its political dimension (e.g. human rights) (Acharya 2000, note 7 above).

9 Mely Caballero-Anthony, 2002: "Overview of Health and Human Security Case Studies", in: *Health and Human Security: Moving from Concept to Action - Fourth Intellectual Dialogue on Building Asia's Tomorrow*; at: <http://www.jcie.or.jp/thinknet/pdfs/health_overview.pdf>.

Figure 40.1: Human Security and its Relationship to Health. **Source:** Chen/Narasimhan (2003: 6).



Focusing on South Asia, Abdus Sabur (2003 and chap. 76) provides an overview on regional human security debates. In contrast to other regions, an overall emphasis on national security –against human security– has severely deteriorated the security situation (particularly in India and Pakistan) and significantly increased security concerns. Eventually, it has transformed South Asia into the poorest and most deprived region of the contemporary world. However, Najam (2003) shows that the South Asian experience can contribute to the larger literature on human security and sustainable development by arguing “that chronic and structural impoverishment – rather than resource scarcity alone – forges the connection between environmental degradation and conflict. It also states that poverty and weak institutions of governance are the more immediate triggers of environmental insecurity” (Najam 2003a: 59).

40.2.3 Poverty, Health and Human Security

The relationship between poverty, health and human security (cf. figure 40.2) was vividly revisited during the Asian financial crises, when millions of people were suddenly impoverished due to macroeconomic shocks¹⁰. Global infectious diseases, poverty-related threats, and violence and crisis are three health challenges that are closely linked to human security (chap. 17 by Benz).

According to the CHS (2003), poverty and disease produce a vicious spiral with negative economic and

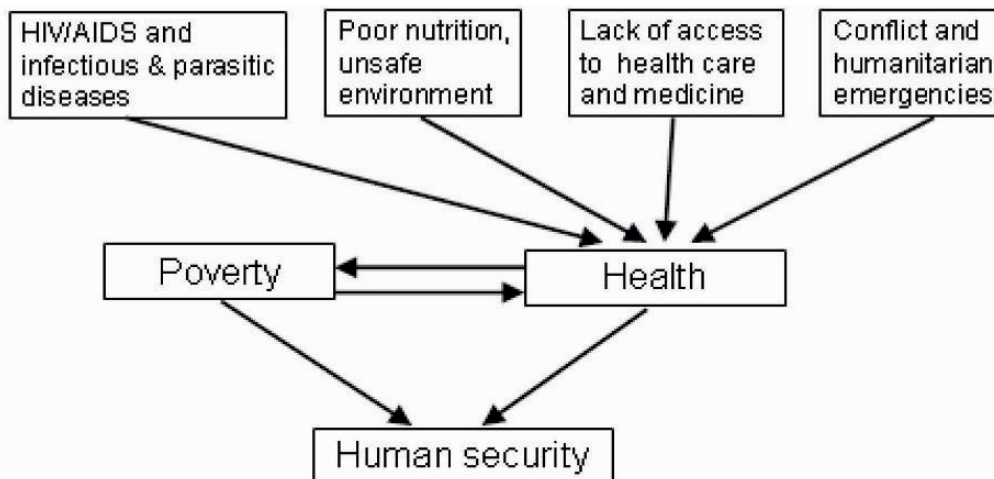
human consequences as not only is people’s health severely affected by poverty, but at the same time, ill health can lead to poverty. Lack of access to nutritious food, safe water and sanitation facilities, and poor or overcrowded housing make people vulnerable to illness which are caused by poverty. For the poor with a fragile livelihood, sickness may deprive the family of daily wages and compulsory health expenditures may put enormous pressures on their limited capital assets.

Poverty and infectious diseases are fellow travellers. The poor are at higher risk of infectious diseases, and sickness can deepen poverty, creating again a vicious cycle of illness and poverty. About 80 per cent of the total population is living in developing countries where 90 per cent of those with HIV/AIDS are living. In contrast to Eboko and Nemeckova (chap. 39) Fenton (2004) argues that there is a positive correlation between HIV prevalence and poverty whether it is measured in gross domestic product (GDP) per capita, income inequality or the *Human Poverty Index* (HPI)¹¹.

Furthermore, health issues are linked to *gender security* (Shepherd/Weldes 2008; chap. 89 by Serrano) and integrated into Human, Gender and Environmental Security (chap. 90 by Oswald and Oswald 2001). Worldwide, 70 per cent of the poorest people are women and children who suffer from malnutrition, illiteracy and severe health problems. Female education has a positive correlation with child health and child education. Gender inequality, female poverty and poor-health issues keep a part of the workforce away

¹⁰ The connections between poverty, health and insecurity were highlighted by the World Bank’s series of *Voices of the Poor studies* for its *World Development Report* 2000 (Washington, D.C.: World Bank, 1999).

¹¹ The HPI attempts to assess the percentage of the population suffering from a variety of basic deprivations, and which ranks 95 developing countries for which adequate data are available.

Figure 40.2: Health, poverty and human security interactions. **Source:** Salehin (2005: 10).

from participating in income generating activities (Derbyshire 2002 cited in Thomson 2004). Thiesmeyer (2005)¹² argues that for women in developing countries, the capabilities of education and health are less dependent on progressive national politics, but more on the availability of facilities in walking distance as women often lack time and transportation to reach existing facilities.

About 30 per cent of the world population lack access to essential medicine. This applies to over 50 per cent of the poorest parts in Africa and Asia (WHO 2004). Data on life expectancy at birth show that it ranges from 38 years in Sierra Leone to 82 years in Japan¹³. Clearly, this huge gap can be minimized if more efforts are undertaken to control major diseases, improve health systems and minimize the level of poverty (Marmot 2005). Two case studies on Bangladesh and Vietnam will discuss in detail the poverty and health links and their impacts for ‘human’ and ‘livelihood security’.

40.3 Case Studies on Northern Vietnam and Bangladesh

Two case studies were selected to explain why health and its link to poverty has become crucial for human

security. The first case on Northern Vietnam¹⁴ reviews health as a major human capital asset, and poverty in the livelihoods of ethnic minorities. The second case on Bangladesh¹⁵ focuses on the general health situation. Based on findings from both cases the results and their impact on human security will be discussed.

40.3.1 Case Study on Northern Vietnam

Despite the achievements of the ‘doi moi’ reform process¹⁶, which was launched in 1986, Vietnam is still one of the poorest countries in the world, with 28.9

12 Lynn Thiesmeyer, 2005: “Gender, Public Health and Human Security Policy in Asia”, at: <http://www.un.org/womenwatch/daw/egm/enabling-environment2005/docs/EGM-WPD-EE-2005-EP_2_%20L_Thiesmeyer.pdf>.

13 WHO, 2005: *The World Health Report 2005 – Make Every Mother and Child Count* (Geneva: WHO); at: <<http://www.who.int/whr/2005/overview/en/index.html>>.

14 This case study is based on Fischer (2005). The research was carried out within the framework of the German-Thai-Vietnamese Collaborative Research Programme ‘Sustainable Land Use and Rural Development in Mountainous Regions of Southeast Asia’. Funding from the Deutsche Forschungsgemeinschaft (DFG) and co-funding from the Ministry of Science, Technology, and Environment of Vietnam is acknowledged.

15 This case study is based on Salehin (2005). The research was carried out at the Centre for Peace Studies, University of Tromsø, Norway.

16 Vietnam’s economy grew by 7.2 per cent in 2003 despite challenges from the Severe Acute Respiratory Syndrome (SARS) and a lacklustre global economy. In the first quarter of 2004, the economy faced the challenge posed by the Avian flu, which overall economic impact remains relatively negligible and disruptions to the general economy have been avoided. See: World Bank: “Vietnam Country Brief, 2005”; at: <<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EAST-ASIAPACIFICEXT/VIETNAMEXTN/0,menuPK:387575~pagePK:141132~piPK:141107~theSitePK:387565,00.html>>.

per cent (50.9 per cent in 2003) of the total population (85 million in 2004) living below the national poverty line¹⁷. Especially the mountainous, rural areas of Northern Vietnam are underdeveloped and the poverty rate in this region was still 68 per cent in 2002, which is the highest in Vietnam (World Bank 2003a). In the HDR 2007/2008 Vietnam is ranked 105 out of 177 countries with a HDI¹⁸ of 0.733 (table 40.1). This development reflects the country's successful attempts to reduce poverty. Nevertheless, vulnerable groups are still affected by poverty and insecurity. According to the Vietnamese *Ministry of Labour, Invalids and Social Affairs* (MOLISA), vulnerable groups are women, ethnic minorities, those with low education or illiterates, the disabled and the ill, families with many children, especially when they do not have enough labour and more generally the poor and hungry, but also those above or near the poverty line (Conway/Turk 2001).

The Vietnam's Health Sector Report (World Bank 2001a) states that many of the 'doi moi' reforms affected the health sector (e.g. the introduction of user fees for health services, legalization of private medical practice and the deregulation of the retail trade in drugs and medicines) and thus the household's health seeking behaviour. A study by Tuan (2004)¹⁹ provides insights into the provincial rural health system ten years after the health sector reform was launched.

Health insurance services offered by the Vietnamese government are still limited to some target groups, making up to 20 per cent of the labour force and a faction of students as well as about 20 per cent of the poor (ILO 2004). Other previously initiated transfer programmes (e.g. free basic healthcare under the Hunger Eradication and Poverty Reduction (HEPR) programme) only supported few people to escape poverty and protected even fewer from slipping into poverty (Van de Walle 2003). All remaining people, including most of the households in the

Northern Uplands, still have no access to formal insurance services and thus have to rely on their own risk management strategies²⁰ in case of a crisis.

Empirical evidence (Fischer 2005) shows that limited endowment with and access to capital assets and institutions, as well as human and economic risks are the main components affecting rural livelihoods²¹. The *Sustainable Livelihood Framework* (SLF) of the *Department for International Development* (DFID), UK, was applied for investigating the complex livelihoods of people in a given vulnerability²² context (Carney/Drinkwater/Rusinow/Neeffjes/Wanmali/Singh 1999), including the socio-economic structure of society at large and their formal and informal institutions. According to DFID's SLF approach, people have access to five forms of capital assets, i.e. natural, physical, human, social, and financial capital assets. Health, beside education, is one of the most important human capital assets, which helps the poor to increase their income and thus reduce vulnerability.

Decision-making is linked to the ownership of capital assets. Formally, ownership is mostly in the hands

17 UNDP, 2007: "HDR 2007/2008 - Country Data Sheet Viet Nam", at: <http://hdrstats.undp.org/countries/data_sheets/cty_ds_VNM.html>.

18 The HDI measures achievements in key areas of human development, such as standard of living, health and education. Vietnam's HDI has continued to steadily improve since the mid-1980s, from 0.590 in 1985 to 0.672 in 1995, 0.711 in 2000 and 0.733 more recently.

19 Tuan Tran: "Community-Based Evidence about the Health Care System in Rural Vietnam", University of Newcastle, 2004, in: Australian Digital Theses Program; at: <<http://www.newcastle.edu.au/service/library/adt/public/adt-NNCU20050806.101920/index.html>>.

20 While less vulnerable households often have access to so-called (ex-ante) adaptive risk management strategies (e.g. accumulation of savings in cash or kind), which keep the level of vulnerability lower, more vulnerable households have to rely preliminary on (ex-post) risk coping strategies (e.g. sale of livestock), which negatively affect its long-term development (Carney/Drinkwater/Rusinow/Neeffjes/Wanmali/Singh 1999).

21 Chambers and Conway (1992) were among the first to give a scholarly definition of livelihood, as comprising "the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base" (Chambers/Conway 1992: 7-8).

22 Vulnerability refers to "the relationship between poverty, risk and efforts to manage risk" (Alwang/Siegel/Jorgenson, 2001: 1). Vulnerable households are characterized by the potential for well-being to change in a negative direction or by no change within an existing negative status i.e. remaining in poverty (Conway/Turk 2001). This research applies the definition of Dercon (2002) that "vulnerable households are those likely to fall under an agreed poverty line over time with a particular high probability". In 2001, one third of the Vietnamese population lived in poverty and many of those who were not poor lived close to the poverty line. This sums up to 45 per cent of the population, if 'the vulnerable' are defined as the poor population in 2001 plus those who were near-poor within a line of 10 per cent above the poverty line (Conway/Turk 2001).

of men. They possess all livestock as well as the land right certificates. The later is especially important as formal credit is given to those who possess land, thus it is difficult for a woman to obtain a credit from a bank²³. Population growth, intensified agricultural production, the strict implementation of forestry policies and individualized land use rights are main reasons for a dramatic reduction of grazing land in Northern Vietnam, which also affects directly health management (Hager/Fischer 2005). Diminishing or disappearing natural resources have a negative impact on poor rural household's risk management as it limits their livestock raising potentials. In the absence of cash savings, livestock is commonly used as in-kind savings to be divested when cash is needed.

Dealing with financial assets, research showed that credit and financial transfers from informal sources are crucial, as no credit lines are available for health care so far. Even if people possess health insurance cards, they usually face additional expenses including costs for transport, special treatment and medication. People staying in hospital must further cover the expenses for food or a second family member has to provide food for the hospitalized person. A complex administration system and language difficulties are further constraints that are particularly faced by members of ethnic minority groups - especially women.

As suitable and accessible formal insurance markets hardly exist in developing countries, informal risk-sharing arrangements, so-called social networks, are crucial for the survival of the poor. In Vietnam gender, marital status, kinship and wealth influence the formation and size of social networks and within these networks, self-interest is the main motivation for helping each other (Beuchelt 2004). Hence, mutuality is of utmost significance and when not guaranteed or anticipated, support is very limited, even within the own family. Due to limited resource endowment, the capacities of networks of poor people are exhausted earlier than those of richer households. These informal risk-sharing networks provide basic support, but are insufficient to entirely buffer severe crisis of vulnerable households, thus intervention by the state is needed.

40.3.2 Case Study Bangladesh

In 2005, the population of Bangladesh was more than 153 million people, of whom 49.8 per cent live below the national poverty line²⁴. Even though significant progress could be reached in income and poverty reduction, poverty is still wide spread. During the 1990's the proportion of people below the poverty line declined by one per cent per annum while income inequality worsened, increasing faster in urban than in rural areas. In the HDR 2007/2008, Bangladesh is ranked as 140 out of 177 countries and its HDI value is 0.547 (cf. table 40.1).

The poor in Bangladesh receive very inadequate governmentally subsidized health care. They must finance health expenses themselves or rely on self treatment in case of illness. In most cases, visiting a *kobiraj* (traditional healer) is used first and transfers to tertiary health care facilities occur at a very late stage. Especially in rural areas, most poor people are either unaware of these facilities or do not have access to formal health care at all. A union-level (lowest tier of government administration) health and family welfare centre, which is the nucleus of primary health care, usually provides the first contact between people and the health care system.

In 2006, less than 40 per cent of the population had access to modern primary health care services. If available at all, the quality of health care provided by the government and in private clinics is often very poor. Lack of appropriate diagnostic facilities, over prescription of antibiotics, post-operative infections, doctor absenteeism, inadequate nursing services, lack of attention for patients and lack of sensitivity to women patients are just some examples (GOB 2002). A discrimination against female children in the provision of food was noted (Chen/Huq/D'Souza 1981). Despite some progress regarding this sad issue, discrimination in health care for women and girls has persisted (Perry 2000).

The status of reproductive health is very unsatisfactory and in addition, HIV/AIDS is a severe threat. The reasons are poverty, lack of access to health care, illiteracy, social stigma and other factors, including micro-nutrient deficiency. Despite several improvements, the maternal mortality rate is still very high, with 3.2 to 4 maternal deaths per 1,000 live births, of which 25 per cent are associated with haem-

23 According to Thomson (2004), the encouragement of female farmers to participate in credit and extension projects has largely succeeded and positive correlations between female loan-taking and rise in the knowledge level in families have been shown.

24 UNDP, 2007a: "HDR 2007/2008 - Country Data Sheet Bangladesh", at: <http://hdrstats.undp.org/countries/data_sheets/cty_ds_BGD.html>.

orrhage and anaemia, due to iron deficiency²⁵. According to the World Health Report 2005²⁶ children spend nearly 75 per cent of their life in illness, mostly due to malnutrition related debility and infections. Poor nutrition affects physical, cognitive and mental development.

Poor people must bear many hidden costs to get access to health service. They are exploited by the government medical staff with bribery, overcharging, and delay in the treatment of poor patients (Narayan 2002). People who visit private doctors must pay for the service. This may force them to reduce their current and future consumption or tap into the existing social networks. To ensure a more equitable and appropriate access to health services, it is essential to take the needs of previously underserved minority groups into account (WHO 2000b).

While there has been substantial progress in disease prevention and control and a decline in childhood communicable diseases, new and old infectious diseases, such as malaria, tuberculosis (TB) and acquired HIV/AIDS are still important health threats (for more details see table 40.1). Malaria is a major public health problem in Bangladesh, where 13 out of 64 districts belong to the high-risk malaria zone, affecting 14.7 million people. TB is also a major public health problem and it is estimated that about 70,000 people die every year in Bangladesh.

According to UNAIDS estimates Bangladesh had about 18,000 adults and children living with HIV infection at the end of 2005. Significant underreporting of cases occurs because of the country's limited voluntary testing and counselling capacity and social stigma, which leads to the fear of being identified and detected as HIV positive. Risk factors include a large commercial sex industry and low consistent condom use, which also increase the already significant prevalence of *sexually transmitted diseases* (STDs) among sex workers in central Bangladesh, where about 43 per cent of female sex workers and 18.2 per cent of male sex workers have syphilis. The incidence of STDs and HIV/AIDS are closely associated with the level of poverty and the overall situation of the health status shows how and why health should be addressed as a human security issue in Bangladesh.

Poverty is also often associated with a lack of education and illiteracy. This indicates that the knowledge of the risks as well as the prevention of HIV/AIDS is inaccessible for the poor people. The Bangladesh Demographic and Health Survey (2001) shows that only 31 per cent of women and half of the men heard of HIV/AIDS. Among currently married men only 23.3 per cent with an education ever heard of HIV/AIDS, whereas 85.1 per cent having secondary education heard of HIV/AIDS. 76.7 per cent of respondents without education do not know how to avoid HIV/AIDS. For those with secondary education the percentage is 14.9 per cent. Poverty related lack of education reduces health and increase human insecurity. One could say that poverty often forces people to engage in 'high risk behaviour'. Poverty driven labour migration and commercial sex work are activities that increase and spread the HIV infections (Collins/Rau 2000).

40.3.3 Lessons Learned

In recent years the governments of Vietnam and Bangladesh attained several notable achievements, including good economic performance, income growth, improved nutrition, health and education levels as well as reduction of population growth and poverty (table 40.1). However, with about half of their population living below the national poverty line, poverty rates are remaining high and the access to basic human capital assets, e.g. education and health care facilities remains insufficient.

Concerning maternal-, infant- and under-five mortality rates, the situation in Vietnam is less severe than in Bangladesh, where it is about three times as high (table 40.1). This confirms statements of the HDR 2004²⁷ that stressed Vietnam's ability to translate income growth into human development. Nevertheless, both countries still face deficiencies in the quality of social services and the case studies stressed that despite existing improvements, there are still many constraints vulnerable persons have to overcome.

People's livelihoods and hence their human security are affected by various constraints related to poverty and health, e.g. lack of nutritious food, safe water and sanitation facilities, poor or overcrowded hous-

25 WHO, Bangladesh, 2005: "Health Profile of Bangladesh", at: <http://www.whoban.org/country_health_profile.html>.

26 WHO, 2005: "The World Health Report 2005 - Make Every Mother and Child Count", at: <<http://www.who.int/whr/2005/overview/en/index.html>>.

27 UNDP, 2004: *Human Development Report (HDR) 2004: Cultural Liberty in Today's Diverse World* (New York: UNDP - Oxford University Press); at: <<http://www.undp.org.vn/undp/unews/mr/2004/eng/0726a-e.htm>>.

Table 40.1: Country Facts Vietnam, Bangladesh and Japan. **Source:** UNDP's HDR 2007/2008, selected Indicators for Vietnam, Bangladesh and Japan; at: <<http://hdrstats.undp.org/indicators/>>.

Indicators	Vietnam	Bangladesh	Japan
Total population (millions), 2005	85.0	153.3	127.9
Annual population growth rate (%) 1975-2005	1.9	2.2	0.5
Human Development Rank, 2007	105	140	8
Human Development Index (HDI) value, 2005	0.733	0.547	0.953
GDP per capita (PPP US\$) (HDI), 2005	3,071	2,053	31,267
Life expectancy at birth (years) (HDI), 2005	73.7	63.1	82.3
Population living below nat. poverty line (%), 1990-2004	28.9	49.8	..
Adult illiteracy rate (% ages 15 and above), 1995-2005	9.7	52.5	1.0
Public expenditure on health (% of GDP), 2004	1.5	0.9	6.3
Private expenditure on health (% of GDP), 2004	4.0	2.2	1.5
Health expenditure per capita (PPP US\$), 2004	184	64	2,293
Physicians (per 100,000 people), 2000-2004	53	26	198
Birth attended by skilled health personnel (%), 1995-2003	85	14	100
• bottom quintile	58*	3**	..
• top quintile	100*	40**	..
Infant mortality rate (per 1,000 live birth), (1970) 2003	(55) 19	(145) 46	(14) 3
• bottom quintile	39*	90**	..
• top quintile	14*	65**	..
Under-five mortality rate (per 1,000 live birth), (1970) 2003	(87) 23	(239) 69	(21) 4
• bottom quintile	53*	121**	..
• top quintile	16*	72**	..
Maternal mortality ratio adjusted (per 100,000 live birth), 2000	150	570	6
Malaria cases (per 100,000 people), 2000	95	40	..
Tuberculosis cases (per 100,000 people), 2005	235	406	38
One-year-olds fully immunized (%)			
• bottom quintile	44*	57**	..
• top quintile	92*	87**	..
One-year-olds fully immunized against			
• tuberculosis (%), 2005	95	99	..
• measles (%), 2005	95	81	99
Children underweight for age (% under age 5), 1996-2005	27	48	..

Note: * survey year 2002, ** survey year 2004; The figures from Japan are included to facilitate a regional comparison.

ing, lack of accessible public health care facilities and skilled personnel. Imperfect/non-existent insurance markets, gender inequality, political will and stigma worsen the situation. The 'freedom from preventable diseases', equitable access to health care services and prevention of STDs and HIV/AIDS combined with suitable poverty reduction strategies can help to ensure the freedom to survive.

Strategies and interim success stories of achieving the MDGs still vary in developing countries, including Bangladesh and Vietnam. Specific targets were devel-

oped for each country and preliminary results are published in various reports²⁸. The government's efforts to reach the MDGs mainly aim at supporting the country's sustainable development²⁹ and thus bear the

28 UNDP, 2006: *MDG Reports* (New York: UNDP); at: <<http://www.undg.org/content.cfm?id=79>>.

29 UNDP Vietnam, 2005: *MDGs and Viet Nam's Socio-Economic Development Plan (SEDP) 2006-2010* (New York: UNDP); at: <<http://www.un.org.vn/undocs/sedp/mdgsedpe.pdf>>.

potential to improve human security. However, no literature could be found that discuss the application of a specific 'human security concept' for Vietnam or Bangladesh.

40.4 Conclusion and Recommendations

Two case studies on Vietnam and Bangladesh were selected to review the linkages of poverty, health and human security in developing countries. Based on current debates of the concept of human security, particularly in Asia, the country's achievements in terms of poverty alleviation and improvements in the health sector were analysed.

Empirical results, especially from Vietnam, showed that government's efforts to reach the MDGs can be considered as a first step to improve the country's overall development and thus the 'human security' of its people. Nevertheless, vulnerable groups are still considerably affected by poverty and health constraints. The situation in Bangladesh, one of the most hazard prone countries in the world, is even worse.

Poverty related lack of education reduces health and increase human insecurity. Spread of knowledge on basic health care and reproductive health, STD and HIV/AIDS, particularly among the vulnerable groups, is as important as the political will to change cultural bias which so-far avoids efficient prevention programmes. In general, it is crucial to ensure good governance in the whole public sector, not only in the health care sector. New projects should be developed for areas that are left behind. For example, (micro-) insurance schemes in combination with improved extension services and knowledge transfer for all people, especially women, could support a sustainable future development of poor households and therefore, in the long-run, lead to poverty alleviation.

The concept of human security is a reliable tool for facilitating academic and political discussions as well as research and development activities - particularly in combination with the MDGs. Nevertheless, a common definition is still not available for this holistic approach and governments seem not yet to integrate a specific concepts of 'human security' in their policies, as it can be found e.g. for concepts of 'sustainable development'.

41 Global Trade: Balancing Existing and Future Regional Water Resource Deficits

Tony Allan

41.1 Introduction: What is Water Security?

This chapter evaluates the extent to which the well-established international ‘virtual water’¹ trade will continue to mobilize the ‘soil water’ and freshwater in the global system to meet future local water needs. The chapter emphasizes the role of virtual water ‘trade’ but it also examines the contexts and driving forces that have and will determine whether peoples and nations enjoy water security. These contexts and driving forces are first, demography, secondly the extent to which returns to water can be increased in agriculture to meet future food and energy (bio-fuel) needs, thirdly, the extent to which water use efficiency can be improved in industry and services, and fourthly, the pace at which economies can lift themselves out of poverty. The discussion emphasizes the need to conceptualize water security by accounting for all the types of water that meet the gross water requirements of societies, economies and environments. The analysis ranges, therefore, beyond freshwater – that is, surface and ground waters.

Two types of water security are addressed in this chapter. The main focus is on the water security of communities, economies and regions. It will be shown that local water security can be achieved, even

when there is insufficient water locally, by ‘importing’ virtual water embedded in water intensive commodities. Since about 1970, all the Middle East and North African region has depended on such trade. Virtual water fills the gaps between the water actually needed by the local society, its economy and the environmental services provided by water and the smaller volumes of water actually available.

The second type of water security is water security at the global level. The present global population of 6.5 billion needs about 6.5 billion cubic metres of water per year; about 86 per cent for food, and the rest for drinking and domestic uses and for other jobs in industry and services. A balance has also to be struck vis-à-vis the needs of the environment. The volume needed by the future population of about nine billion will be 9000 billion cubic meters per year. The purpose of this chapter is to highlight the very successful achievement of local water security by those economies that diversify so that they can ‘import’ virtual water. Water surplus regions meet the needs of water deficit regions through trade in water intensive commodities. The extent to which the global system can provide water security for the overall water demands of future populations is also discussed. The main aim of this chapter is to establish the importance of economic processes beyond the water sector in the achievement of a form of water security by the water scarce. This form of water security is heavily dependent of orderly international relations. These last are beyond the scope of the analysis

Having established the role of virtual water and commodity trade in providing local water security in a world at peace it is possible to use the same political economy concept to define different levels of water scarcity. An economy which is not self-sufficient in food because it lacks water, or does not manage its water resources in agriculture efficiently, is water scarce. An economy that does not have sufficient water for food self-sufficiency almost always, however,

1 Virtual water is the water needed to produce a commodity. Water is embedded in the commodity in the sense that if the commodity were to be produced by an importing economy local water would have to be mobilized. It requires about 1,000 m³ (tonnes) of water to produce one tonne of wheat. It requires about 16,000 m³ to produce a ton of beef. For one cotton tea shirt it requires about two m³ of water; for one pair of leather shoes it requires eight m³ (Hoekstra/Chapagain 2007). The ‘virtual water’ and ‘virtual water trade’ concepts have been developed by: Allan (2001, 2003, 2003b); Chapagain/Hoekstra (2003, 2004a); Chapagain/Hoekstra/Savenije 2005; Hoekstra/Hung (2002, 2005).

has sufficient water to support a diverse and strong economy. More than half of the world's 200 economies are water scarce in the sense that they are not food self-sufficient. All the 22 economies of the Middle East and North Africa endure water scarcity as they are not food self-sufficient.

The chapter also emphasizes the different types of water that enable economies to be water secure or economically secure. Water in the soil profiles – normally ignored – is shown to be the major water resource for many economies and for the world's populations as a whole. Globally soil water is the major type of water that when embedded in agricultural and livestock products is 'conveyed' virtually to water and food deficit economies. It is this international trade that enables water scarce economies to be water and food secure. Water scarce economies avoid the economic and political stress of mobilizing and over-using scarce local water and further damaging their water environments by 'importing' water embedded in commodities – mainly in food.

Soil water is ignored by water resources professionals and by those making water policy. because it cannot be pumped or easily valued. As a consequence it has also escaped the attention of engineers and economists. Invisible soil water and the invisible 'trade' in virtual water have been securing economies facing water scarcity for millennia. The invisible remedy has been particularly important during the last quarter of the twentieth century when scores of economies encountered serious water deficits as their populations increased.

The national and regional water deficits that emerged across the world in the last quarter of the 20th century have stimulated a number of responses: *first* there is a range of technological measures to increase supply; *secondly*, technical, behavioural and institutional measures that have reduced demand, by increasing water use efficiency and sometimes by reclaiming the environmental services of water; *thirdly*, and most significant have been the adaptations made possible by the global trade in water intensive commodities.

The analysis emphasizes the rich explanation derived from a political economy approach. Social and economic development brings about diverse, strong and capable political economies that multiply the options for those facing water scarcity. The analysis will highlight the numerous options available to those consuming and managing resources in rich and diverse political economies. These economies have the capacity to adopt powerful and flexible economic proc-

esses. But it is political processes that are most important as they create the contexts that enable effective economies.

Politics also mediates the way economic solutions are perceived. For example solutions such as trade have worked miracles in ameliorating water scarcity but in the political domain they are subordinated to the interests of those leading and managing the economies. For the detached outside analyst, without political entanglements, the 'import' of virtual water in food commodities is an evident underlying positive fundamental. It explains the economic security of a national economy and of the global economy as a whole. For a water professional or prime minister of a food importing economy such imports are evidence of insecurity. If attention is drawn to such insecurity there could be very high political prices to pay. For example a president of a water short country enjoys the actual security brought by importing subsidized food commodities. But it is an imperative for them that they obscure the absence of self-sufficiency; this task is a small challenge for the experienced politician.

Those, such as the author and most readers of this chapter have a particular perspective [*positionality*]. They can identify the underlying fundamentals of getting high returns to water and protecting the environmental services of water. Their perspective is different from that of water users and politicians who have not, until recently, experienced water scarcity. Some regions and their water users have often enjoyed water surpluses for millennia. Outsiders are concerned with underlying fundamentals such as water economics and environmental sustainability. These outsiders are concerned with the concrete. Water users and politicians allocating resources, on the other hand, operate in an abstract world of constructed knowledge. Such knowledge is projected to re-assure water users and citizens so that those in power stay in power. As Marx pointed out 150 years ago, the abstract always overwhelms the concrete. A bad idea with power always overwhelms a good idea, such as water security via trade, without power. At least in the short and medium term a very prominent example of such a discourse is the current debate on climate change.

The purpose of this chapter is *first*, to provide a perspective on the status of global water resources (4I.2 and 4I.4). *Secondly*, to evaluate their capacity to meet the needs of current and future human populations and at the same time sustain the environmental services provided by water resources (4I.3). It is shown that 'soil water' plays a major role in securing water security for water deficit economies. It plays

this role when embedded in agricultural and livestock products. It is 'conveyed' virtually from water surplus economies to water and food deficit economies enabling them to be water and food secure. These water scarce economies then avoid the economic and political stress of mobilizing and over-using scarce water and further damaging their water environments.

Thirdly, this evaluation of global water security requires an analysis of the main driving forces that determine the changing nature of the water supply/water demand relationship (4I.5). The numerous factors affecting current and future water resources security can be summarized into five major driving forces and ameliorating processes. The four driving forces are: a) the future demands for water related to future demography; b) the capacity of the agricultural sector to increase returns to water; c) the capacity of other water using sectors to manage water demand to increase water use efficiency and at the same time protect the water environment; d) most important are the over-arching socio-economic processes that enable economies first, to lift themselves out of poverty and to engage in international trade to address, if necessary, their local water scarcity. It is poverty that determines water poverty. Water poverty does not determine poverty. e) The fifth factor affecting the water security of an economy is the ameliorating process of virtual water 'trade'. The process currently enables water surplus economies to meet the water needs of the water scarce (4I.6).

Currently it is this fifth, virtual water 'trade', factor that is meeting the water needs of water deficit economies such as those of the Middle East, Japan and Europe. In the long term, however, it has to be a combination of the management of all four driving forces and international trade that will address, or not, the challenge of providing secure water for all needs for all economies.

Fathoming the world's water futures is fraught with uncertainty. The uncertainties are socio-economic and relate to population trends, the capacity of water users to use water more efficiently in agriculture and industry, as well as the patterns of the future consumption of food and industrial commodities. Most important are the uncertainties deriving from political instability and armed conflict. Political instability determines whether the global trading processes that bring water security will operate or even exist. Most economies endure water deficits and their current water security depends on international political stability. Armed conflict and political instability currently are seriously impacting the capacity of some eco-

nomies - especially in Africa - to be water secure. Conflict impairs their access to local and international trading systems. A global conflict would reveal the extent of the dependence of water security - of almost all economies - on international commodity, mainly on food trade.

4I.2 Political Economy of Regional and Global Water Security

Evidence of water scarcity is normally evidence of the extent to which a political economy is well-functioning, but not of the status of its water resources. The chapter will take a political economy approach. Poorly governed economies tend to be poor. Poverty determines water poverty. Well functioning political economies have invested in effective water infrastructures. They have provided domestic, industrial and agricultural water services as well as water treatment to protect health and the environment. These well functioning political economies can also generate incomes and revenues with which to engage in international trade. Through international trade water and food scarce economies can access commodities that cannot be produced using the limited water resources available in the local economy.

People in poor non-diverse economies have poor water services and infrastructures and frequently cannot mobilize their local freshwater and soil water effectively to raise sufficient food. Nor can they generate the incomes to access water intensive commodities, for example food, on the global market. Evidence of water scarcity is normally evidence of the extent to which a political economy is well-functioning, not of the status of its water resources.

Strong and diverse economies do not have water problems. In rich economies in Europe and North America, poor households have water problems. They cannot pay for their water services. In poor and non-diverse economies in the South rich families also do not have water problems although they do not enjoy the reliability of water services as those who live in OECD countries. But vast numbers of households in these poor, non-diverse economies have serious and enduring water problems. *Water poverty does not determine poverty. Poverty determines water poverty.*

The analysis emphasizes the way economies have adapted to water scarcity rather than quantifying the water endowments of individual economies. It is also essential at the outset to conceptualize and understand the nature of water resources. Water resources

come in two main forms – freshwater and soil water. Our economic systems overall need water for drinking water, for domestic water, for water to provide food and for other agricultural products (for fibres), and for industry and the services sector. Our environments also need water to sustain the environmental services of water.

The water in the environment is found in a hydrological system of flows and storages. These flows and storages take place at the surface, in groundwater aquifers and in soil profiles. Freshwater in surface and groundwaters is special because it can be diverted, pumped and conveyed by users to new locations. It can also be drawn upon for all uses – domestic use, agricultural use, industrial use and services use. Soil water can only be used for crop and livestock production.

By the end of the 20th century 4.6 per cent of water was being used for domestic purposes, 9.6 per cent for industry and services and 86 per cent of the water used world-wide for agriculture. Freshwater from surface and ground waters accounted for 26 per cent of global water use. Soil water accounted for 74 per cent. It should be noted that freshwater, despite being only 12 per cent of the water devoted to agriculture, it accounted for over 40 per cent of the output.

Freshwater is very valuable, *first*, because its strategic role in food production. *Secondly*, it can enhance the value of soil water by supplementing water in the soil profile. *Thirdly*, it is valuable because it can be devoted to all economic sectors, some of which use water so effectively that they enable the development of diverse and strong economies. These strong economies secure the prosperity of even the extremely water scarce, such as Singapore. But freshwater is not the major volume of water used in our economic systems.

The major value of freshwater is its third value in underpinning a very high proportion of the jobs in diverse and strong economies. It makes possible more jobs per drop. There can also be more jobs per drop in agriculture if higher value crops are raised which need more labour inputs. Agriculture can be managed to increase the labour input two- or threefold. Although market forces and the mechanization and industrialization of agriculture tend to reduce farm labour, industry, by contrast, can increase jobs per drop a hundred fold. In service activities the contrast is even starker. In marketing, commerce, education, civil service administration, in some tourism, and in advertising and financial services the increase in jobs can be a thousand-fold that of agriculture. It is this economic diversification in water scarce economies that enables

them to be secure, *provided there is enough water in the global system* to meet the food needs of future populations. The task of this analysis is to estimate whether there will be enough water to meet the water demands of a diversified global economy.

41.3 Water Availability and Future Requirements

There is sufficient water to meet the needs of the world's currently configured economies. Fathoming the world's water futures, however, is fraught with many uncertainties. These uncertainties include *first*, population trends, *secondly*, the capacity of water users to use water more efficiently in agriculture and industry, *thirdly*, the patterns of future consumption of food and industrial commodities, and *fourthly*, the unfathomables of political stability and armed conflict that determine how economic processes and globalization play out.

Water professionals tend to assume that solutions to water scarcity will be found in the water sector. They have technologies that address rising water demand by supplying and treating more water. More recently the approaches of demand management have been adopted. These approaches also focus on the water within national watersheds. But effective water resources allocation and management within watersheds is just one of several inputs that lead to the creation of diverse and strong economies.

Where an economy cannot meet its water needs for domestic uses, for its food needs, and for the jobs in its industries and services it has to look beyond its own watersheds. A hydro-centric approach is a very narrow and dangerous analytical perspective (Brichieri-Colombi 2004). The second half of the 20th century has witnessed a little heralded adjustment. The peoples and economies of the world's 200 or so national economies have adapted to demographically driven increased water demands. These adaptations are discussed briefly here to provide a flavour of the uncertainties integral to understanding the future global and regional water security. The scale and pace of adaptation to water scarcity has been patchy.

The neo-liberal economies of North America and Europe in the temperate northern hemisphere have produced a surge in rainfed crop production in the second half of the 20th century. This surge came at a time when other economies were coping less successfully in terms of socio-economic transformation with increases in their populations and very sluggish eco-

conomic development. The major Asian economies did, however, also produce a surge in crop production and productivity in the same period. Africa meanwhile has rapidly rising populations and stagnant economies.

The late 20th century challenge of, and adaptation to, evidence of increasing water scarcity has fortunately occurred in a period when the neo-liberal industrialized economies in temperate North America and Europe put in place a remarkable experiment. They tested how much farmers would produce, especially on rainfed farms, if given strong incentives. The purpose of this agricultural experiment in these neo-liberal economies was in some cases to increase food self-sufficiency. For others it was judged necessary to secure rural livelihoods in rapidly mechanizing farming systems. Rural societies were in rapid and stressful transition to part-time farming. The outcome of this experiment in the new high input and high output farming in North America and Europe was to almost double by the 1990's the already high returns to soil water at mid-century. Populations also rose. But very little compared with the rates of the late 19th century and the first half of the 20th century. In some European economies populations fell below replacement rates by the 1990's.

Together the farmers of the European Community and North America achieved much higher returns to soil water between 1950 and 1990. The controversial subsidized systems of the EU and of the US Department of Agriculture created global market circumstances in which they competed down the world prices of staple grains. World prices were on occasions half the costs of production. For many economies world-wide this was good news. Many economies, in for example the Middle East and North Africa, encountered water scarcity for the first time after 1950. Even more did so after 1970. Where they could devote some of their national revenues to food imports – and they mainly could – the low price of grain was very good news. For many economies in Africa South of the Sahara, however, where yields were less than one tenth those on rainfed European farms the new circumstances were malign. These economies had neither the hard currency to afford the low world grain prices nor could they price their own agricultural commodities locally to match their farmer's costs of production. Languishing yields and poor performances of agricultural sectors are evidence that farmers lack the stimulus of fair commodity prices (Berkoff 2001). Underperforming but strategically important rural economies in turn slow down the development of the economies of which they are a part.

Diversification of the economy as a whole is also slowed down. The relevance here is that it is non-diversified economies that have water problems.

That the global market can secure economies, including their water security, is spectacularly evident in Europe. Some major European economies have been dependant on the global market for their water and food security for well over a century. This dependence on imported food was highlighted by the disruptions to trade of the 1939–1945 war. As a consequence a post-war experiment was launched to reduce this dependence on global trade. The experiment has had unintended global consequences – for example on world grain prices – and these consequences have been complicated by some other social challenges which had to be faced by the governments of both Europe and North America. They had to cope in the area of social policy with an unprecedented mid-twentieth century agricultural revolution. The revolution involved technologies transforming cultivation, nutrient management, weed and pest control, and harvesting. Most of these radically impacted agricultural productivity and/or rural employment. A new priority emerged. The support of farm incomes in rapidly expanding industrialized economies became salient. Rapid socio-economic development and rising incomes forced governments to address the social impacts. Production and trade subsidies were introduced to enable farmers and farming to survive. These subsidies have been stubbornly enduring and have severely tested European unity. The subsidies were high but generally acceptable for the strong and diverse North American and European political economies. By the second half of the 20th century the US and EU agricultural sectors were contributing progressively smaller proportions of national GDPs, in some countries only one per cent. The proportion was rarely over five per cent. The contribution of agriculture to most of these Northern economies was within the precision with which GDP can be estimated.

By the end of the century European economies had got used to agricultural sectors producing much less than five per cent of their GDPs with similar proportions of farmers in the employed population. Other economies with substantial agricultural economies and with surplus production to meet the needs of the water and food scarce, in for example the southern hemisphere – Argentina and those in Australasia – had to endure unreasonable international competition in the grain trade (ABARE 2000). Commodity surpluses and low world commodity prices

were the consequence of European and North American agriculture over-producing strategic food commodities and not reflecting the fiscal impacts of subsidies in their export prices. The subsidies secured the incomes of their farmers and funded some of the costs of alleviating the impacts of agricultural intensification on their natural environments. Strong and diverse economies have many options in an unregulated trading regime. This nexus of productivity and social policy have been associated in the agricultural sector with the use of soil water more productively but also with the abuse of the environment.

The reason why the North American and European experiment has been examined in a little detail is that the 'experiments' of the past half century have highlighted how a number of processes integral to the global economy play significant roles in enabling national water security. The impacts can be negative, however, at the global scale in worsening the options of some weak economies. At the same time the impacts can be positive by enabling - without either economic or political stress - the national water resource security of most of the water scarce economies of the world. Such economies may be poorly endowed with water - Japan and Singapore for example, or not sufficiently diversified to be economically secure - many Middle Eastern economies, or even economically dysfunctional - many Sub-Saharan economies.

41.4 Global Water Resources: A Summary

What are the water resources available for human users and the protection of environmental services? The water resources of the world are vast. But most are of an unusable quality - for example sea water - and most groundwaters as they are saline or currently too costly to develop.

The demands on the water environment have only increased in the relatively recent five millennia and mostly in the past century. Through several millions of years of evolution human individuals needed less than five litres of freshwater per day to survive for drinking. They did not need additional domestic water. Nor did they raise crops until relatively recently. It did not matter that the hydrological and ecological systems on which human societies and economies depended varied greatly spatially and seasonally. The demand for freshwater was trivial and the consumption of food derived from natural vegetation and animals also had negligible impact on the water environment

- whether soil water or fresh water. The five litres per day of easily available water has, unfortunately, been 'hard-wired' into the expectations of the human race. This unchallenging entitlement is a deep and dangerously embedded assumption as it is only about half a per cent of the water used by the world's inhabitants today.

Hoekstra and Chapagain (2004) estimate that 1,250 litres per day are needed by an individual to survive comfortably in an industrialized society in the early 21st century. They have shown that the levels of water use range from 2,500 litres per person per day (ppd) in the industrialized United States to about 700 litres/ppd in China. Most highly industrialized economies in the EU and Japan manage with between 1,100 and 1,500 litres/ppd. Human societies have, unfortunately, chosen very frequently to expand their numbers in places where the water resources are not available to meet the high water volumes needed by industrialized societies, e.g. in the arid and semi-arid regions of Asia, Africa and the Middle East.

Water resources that supply these water demands come in two main forms - freshwater and soil water. All the freshwater and soil water available for human and natural use is delivered originally by rainfall. Freshwater can be diverted and pumped from surface water - from rivers, lakes, and reservoirs - and from groundwater. Groundwater is the water lying some distance beneath ground level. It has percolated from the surface after precipitation. Soil water is located in the soil immediately below the surface and is used by natural vegetation and crops. They draw water from soil water in the soil profile as it is percolating downwards to the groundwater table. Soil water is not stored in the profile. It is accessed by the roots of vegetation and crops to enable plant development and growth and for transpiration. The water which is not intercepted by the roots of vegetation can continue on its way to recharge the groundwater reservoir.

Hoekstra and Chapagain (2004) have estimated that most of the water - 86 per cent - used in human economic systems derives from soil water (table 41.1). This is not the same thing as saying that most economic value derives from the use of soil water. Most soil water is used in agriculture and it produces a very low return to water in terms of value. These vast collective low returns are of great strategic importance, however, as they provide the majority of our agricultural commodities globally.

The message from table 41.1 is that the water security of the world is mainly provided by soil water, as 86 per cent of the world's water derives from soil pro-

Table 41.1: Estimates of global use of water and 'trade' in virtual water. **Source:** Hoekstra/Chapagain (2004) and author's estimates (*)

	Used in economies				Proportion of global food production	'Traded'	
	Total applied	Losses	Used				
	km ³				Per cent		
Total agriculture	.	.	7451	85.8		78	
Soil water	.	.	6390	73.5	60		71 *
Freshwater-irrigation	2669	1590	1060	12.2	40		7 *
Freshwater-industry	.	.	834	9.6		22	
Freshwater-domestic	.	.	399	4.6			
Total			8684	100		100	

files. Unfortunately soil water is everywhere counted as a free good. Its value is indirectly reflected in the higher rental value of land that has moist soil profiles either seasonally or perennially. Calculations of productivity in relation to soil water are usually, and properly, made with reference to area rather than to water use. In semi-arid countries that have advanced industrialized economies, such as Australia and the United States, the returns to millimetres of rainfall in rainfed farming are often quoted. To compare the productivity of rainfed agriculture with the productivity of irrigated farming it is necessary to quote returns to a cubic metre of water use.

Crop yields in terms of area are much higher from irrigated farming. But the water inputs are roughly proportional in terms of output. As a consequence irrigated farms produce about 40 per cent of the world's agricultural production while only calling on 14 per cent of the water used in crop and livestock production. Freshwater in irrigation systems supports yields per hectare as much as four times those from rainfed farms.

The role of soil water is very significant in global trade. There is no researched figure for the proportion of virtual water derived from soil water but it can be approximated. All the major traded agricultural and livestock commodities - wheat and barley, tea and coffee, and most of the maize, soya, sugar, bananas, and almost all the livestock - are raised in rainfed systems. It is likely that over 80 per cent of these commodities in global trade are raised with soil water.

The significance of the proportion of soil water in global agricultural systems is important. This water has stabilized many of the world's economies during the first phase of water scarcity where some economies - such as those of Europe, Japan and Korea and

all the Middle Eastern economies - would have been seriously destabilized by their inadequate water resource endowments. Soil water is also of pivotal strategic significance as it is in rainfed farming that there is significant potential for increased productivity in for example Africa. The advances made in the industrialized economies over the past century show that it is possible to increase by many times the yields and the productivity of soil water used in crop land and pasture production. Effective agronomic practices and a diverse range of market and institutional arrangements were shown bring major advances in water productivity. It has taken centuries to mobilize effectively tens of inputs and countless institutional forms in advanced agricultural systems. The farming systems in many impoverished economies in sub-Saharan Africa have not yet mobilized these numerous farming practices and enabling institutions, including price incentives, which would bring about high returns to scarce water and especially scarce soil water.

These higher returns to water cannot be obtained in circumstances of poverty, civil insecurity, and the consequent absence of sustained market incentives. Yields of half a tonne a hectare were common in 18th century Europe when the rural economies were as insecure, unhealthy and afflicted by poverty as those of Africa are today. Africa's water problems will be substantially solved when poverty is eradicated and institutions and markets can operate effectively and safely. Increases in returns to water of ten times will not be necessary. Increased water productivity of only two to three times in crop and livestock production will be sufficient. Such improvements have been achieved in the industrialized economies that farm unpromising semi-arid tracts in Australia and North America (Chatterton/Chatterton 2006).

41.5 Driving Forces and Scenarios

In order to answer the questions associated with the challenges of achieving current and future water security it is necessary to cope with a number of uncertainties. The absence of a definitive understanding of current and future water security reflects these major uncertainties. In brief the uncertainties are:

- Demographic trends and the pace of the demographic transition;
- Water use efficiency in agriculture;
- Water use efficiency in industry and the services sector;
- The dynamics of food consumption patterns;
- The dynamics of consumption patterns of industrial commodities and services;
- The consideration given to the environmental services of water;
- The levels of diversification and strength achieved by the water using economies.

It is not possible to treat each of these issues exhaustively. Particular remedies such as desalination and water re-use will be of strategic significance for many economies, but they have not been discussed here. There will be an attempt to highlight the main features of the uncertain water futures to show how they are likely to figure as driving forces in the next half century and beyond. All the issues are associated with high levels of uncertainty. The combined uncertainties make the reliability of any predictions very low indeed.

41.5.1 Demographic Trends and Demographic Transition

What will be the impact of demographic dynamics on the global demand for water? There is a close relationship between the demands for domestic water together with the demand for water for food and the number of consumers.

The volume of *high quality* domestic water used by an individual is small – 10–50 m³ per person per year provided at a cost of about US\$ 1/m³. The volume of *low quality water* needed to meet the food needs and preferences of an individual is, however, large. It ranges from 500 to 1000 m³ per person per year. This water has to be provided at very low costs ranging from zero to US\$ 0.10 /m³. It has been calculated that the global average consumption of water per day by an individual is about 1,250 litres/p/d. In more developed economies with tendencies to high

consumption of all types of commodity – for example the United States – the levels of water use are higher at about 2,400 litres/p/d. China's consumption is much lower at about 900 litres/p/d.

An approximation of how future estimates of population will impact on the demand for water requires assumptions about:

- the pace of the demographic transition in the more and less developed economies, and
- the future levels of use of water by the more developed and the less developed economies.

The more developed – industrialized – countries have reached the final phase of the demographic transition where populations are at replacement levels or just below. The less developed countries have different demographics. China with 1.3 billion people has had a strong population policy for the last decades of the 20th century and is already approaching replacement. India with over one billion people is still expanding but is showing signs of reducing its rate of growth. The economies that have populations that could more than double by 2050, and even grow beyond mid-century are the least developed economies of Sub-Saharan Africa, such as Ethiopia.

An attempt has been made to summarize the nature of population in table 41.2 that shows estimates of the combined effects of demand for water driven by the median variant of the UN population projections, augmented by other estimates including some interpolations by the author.

Table 41.2: Population estimates for more and less developed economies – UN medium variant in millions. **Source:** UN (2004), Medium Variant, US Census Bureau, historic estimates and author's interpolations.

	1800	1850	1900	1950	2000	2050	2100
More developed regions	300	400	550	812	1193	1236	1100
Less developed regions	660	850	1100	1707	4892	7840	7500
Total	960	1250	1650	2519	6085	9076	8600

It is clear from the above data that the population driving force is extremely important. Whether one uses the low or the medium variant is also very significant. Estimating future populations has proved to be a very unreliable activity. On the basis of our past tendency to underestimate the rate of the demographic transition it is likely that future populations will be

Table 41.3: Water use estimates per head in litres per day assuming level use by less developed economies and a reduction by users in more developed economies. **Source:** Hoekstra/Chapagain (2004) and author's estimates.

	1800	1850	1900	1950	2000	2050	2100
More developed regions	950	1100	1200	1400	1700	1500	1400
Less developed regions	900	900	900	900	900	900	900

Table 41.4: Water use in more and less developed regions on the basis of population estimates [medium variant] and projected use in Laces same as in 2000. **Source:** Author's estimates.

	1800	1850	1900	1950	2000	2050	2100
More developed regions	285	440	660	1137	2028	1854	1540
Less developed regions	661	851	1101	1708	4893	7841	7501

nearer the low variant than the medium variant. The main challenge will be in the economies of Sub-Saharan Africa where population increases will drive up demand and current adaptive capacities are very limited.

41.5.2 Water Use Efficiency in Agriculture

The unprecedented population increase in the second half of the 20th century was fortunately matched by an unprecedented adaptation in the economies of the high income economies of North America, Europe and Oceania. The productivity of soil water doubled between 1950 and the 1990's. Even more important was the adaptation in China and South Asia. A combination of extensions of cultivated and irrigated area and the mobilization of more water – especially groundwater – enabled production of key grains such as wheat, maize and rice to increase by four and five times.

It is unlikely that the more developed economies will achieve further increases in water use efficiency. It is probable, however, that the Asian economies will achieve further water use efficiencies. In regions with rainfed farming low cost soil water is available in soil profiles. The costs of water services in irrigation systems are high. But they are frequently avoided by users as governments find it very difficult to charge the full economic costs of irrigation water. A very high proportion of irrigated crops are subsidized as a con-

sequence. The costs of irrigation water are frequently avoided by irrigators because, understandably, they do not want to pay for unreliable water and in addition their incomes are very low.

There has been a groundwater revolution in the last quarter of the 20th century (Llamas/ Martinez-Santos 2005; Llamas/Garrido 2006; Gordiano/Villholth 2006). The intensification of irrigated farming based on groundwater has been responsible for substantial increases in agricultural outputs associated with increased water productivity. Groundwater is much more easily controlled by the irrigator as the wells are usually on the land of the irrigator. Irrigators prefer reliable groundwater under their own control provided through their own investment and operating costs than unreliable water from a public system.

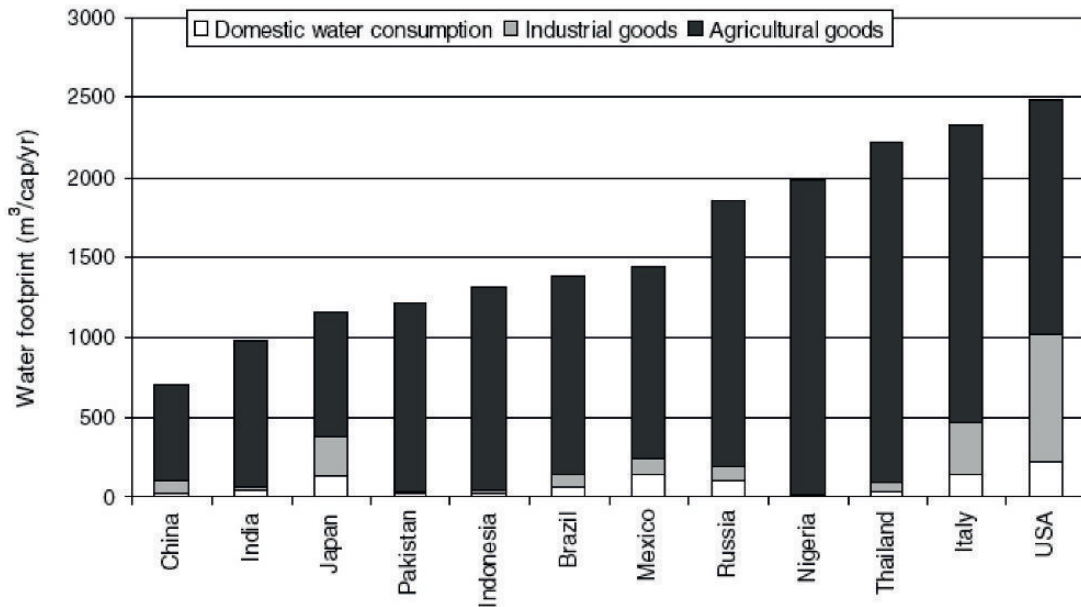
41.5.3 Water Use Efficiency in Industry and the Services Sector

Water users in industry and services in the industrialized countries have been very responsive to the calls to improve water productivity. Private sector companies have responded to the economic pricing of water and to the progressive increases in the regulation of water use and water quality. The research of Chapagain and Hoekstra (2004b) on virtual water and water footprints has been very useful in providing approximations of water use in the major sectors and in the different types of economy. Figure 41.1 shows that industrialized economies have a significant water footprint in consuming industrial goods. They also show that a significant proportion of the water in industrialized goods is associated with imported manufactures – often coming from water scarce economies in Asia.

41.5.4 The Dynamics of Food Consumption Patterns

Consumption preferences change with income. Unfortunately there is a tendency for people to consume more livestock products as their incomes improve. China is already demonstrating this trend and its imports of fodder are increasing steadily. Fortunately China's population is approaching replacement and as a consequence the increase in the consumption of livestock products is viable in terms of its capacity to purchase meat and fodder from abroad. India has a different culture. The majority of its population is vegetarian and therefore the 700 million extra consumers

Figure 41.1: The national water footprint per capita and the contribution of different consumption categories for some selected countries. **Source:** Hoekstra/Chapagain (2007: 44). Permission to reprint this figure has been granted.



by the end of the century will not have such a serious impact on its own and the world's water footprint.

41.5.5 The Dynamics of Consumption Patterns of Industrial Commodities and Services

41.5.5.1 The Experience of Industrialization and Post-industrialization

Estimates of water consumption by people living in pre-industrial, industrial and late industrialized political economies have not yet been adequately researched. The work of Hoekstra and Chapagain (2007) suggests that the consumption of water related to food consumption falls in a late industrial economy such as the US. However, these *late industrial* economies in the North do have a strong capacity to indulge in the consumption of non-agricultural goods (figure 41.1).

A number of trends will affect the future. The *industrialized* economies will tend to reduce both their consumption of agricultural and of non-agricultural goods. This reduction will be the consequence of the increased efficiency of water use and the impact of changed consumption patterns, partly associated with responses to awareness of climate related environmental change. Progressive regulatory regimes will reinforce these tendencies. The industrializing economies will at first increase their water use and some

time before mid-century it is likely that they will adopt the consumption patterns of the late industrialized economies.

Future trends in the non-industrialized economies in sub-Saharan Africa (SSA) are difficult to predict. They have been very slow to diversify and at the same time populations are rising rapidly. Many economies will experience a doubling of population with predictable doubling in food consumption. Africa is not everywhere short of water, however. The economies in SSA have had little investment in their freshwater resources to enhance storage and provide irrigation services. Their farmers, mainly living on rainfed tracts, are subject to serious variability in rainfall and the even more negative impact of low agricultural commodity prices. There is potential to match the increased demand for food with higher levels of water productivity from these underdeveloped rainfed tracts (FAO 2000e). This potential could be significantly augmented by the development of small and large scale irrigation (IWMI 2007).

41.5.5.2 Consideration of the Environmental Services of Water

The water requirements for the maintenance and/or recovery of sustainable environmental services of water is a complicated element of the water needs equation. The late industrialized economies have demon-

Table 41.5: Estimates of water use per head – more and less developed economies. **Source:** Chapagain/Hoekstra (2004b) and author's estimates.

	1800	1850	1900	1950	2000	2050	2100
More developed regions	950	1100	1200	1400	1700	1500	1400
Less developed regions	900	900	900	900	950	1500	1400

strated their capacity to put water back into the environment (Allan 2001). It will take some decades for the industrializing economies to adopt such policies but they are already attempting this approach in China and the other industrializing economies will adopt such measures in the coming decades.

During the period of writing and editing this analysis the world economy was very strongly impacted by the oil price spike after 2006. Oil prices reached US\$100 per barrel; equivalent in constant prices to the spike of 1979–1980.

One of the many consequences of the heightened awareness of energy scarcity was the reinforcement of investment in biofuel production. Brazil had responded to the earlier 1979–1980 price spike by establishing a viable biofuel production systems based mainly on sugar-cane. The post-2006 price spike has led to investment in biofuel in the highly developed economies of both the United States and in Europe, and to a lesser extent in the South Asia and Africa. The initiatives have proved to be very controversial for two reasons. First using land and water to produce energy instead of food has major implications vis-à-vis food availability and just as important for food prices. Secondly, clearing tropical forests to provide land and water for biofuel production has already had serious impacts on the environmental services and carbon sequestration capacities of these tracts.

In the space of only half a decade that which seemed to be a good approach in terms of energy security and environmental services by 2008 was heavily criticised. It now appears very unlikely that biofuel and biodiesel will play a significant role in achieving energy security

41.6 Conclusion: Will There be Enough Water?

The essential question in this analysis is – will there be enough water in the global hydrological system to meet the current needs of the world's peoples and

economies as well as for the demands of the environment? In the discussion so far it has been shown that the extent to which water managing technologies and trading capacities will evolve to meet future demands have also been shown to be very important but they are difficult to quantify.

Water demand will be driven by population and the future consumption patterns of the global society. Food production, the main user of water, will be required for a global population estimated by the United Nations (2004 - medium variant) as about nine billion by 2050.² The global water systems have enough water and food raising capacity to meet the needs of the current population of 6.5 billions. However, data on undernourished populations (FAO 2005) shows that despite the world's endowments of fresh and soil waters the least developed, non-industrialized economies have not yet been able to mobilize their endowments to meet their food needs.

It is the economies of sub-Saharan Africa that have least mobilized their water resources (FAO 2004b). These economies endure second-order scarcities. That is they lack social adaptive capacity and as a consequence they lack the capacity to install the technical and institutional water allocating and managing infrastructures. In addition, they cannot mobilize the necessary surpluses to import water intensive commodities from the world market.

What evidence do we use to establish the adequacy of the world's water resources? Do we assume that because there are some water resources crisis spots that society does not have the capacity to respond and adjust. Using evidence from water scarcity hotspots is not a safe approach. The scarcity hotspots exist because the political economies in those regions have not adapted to their water circumstances. It is the approach of the blind man and the elephant. Using evidence from touching the elephant in diverse places does not provide a useful version of the elephant when the analyst is blind to the whole creature.

In relation to global water resources there is strong evidence that there are some seriously water short basins or parts of basins. The Yellow River does not always reach the sea. The Nile discharges much

2 The United Nations' (2005a) world population prospects of 2004 suggest that a median population estimate would be 9.1 billion by 2050, with a low projection of 7.7 billion and a high projection of 10.6. By 2050 most of the regions will be converging on replacement level or lower. The populations of Africa and the Middle East will still be increasing but at a declining rate.

Table 41.6: Global Virtual Water Crop and Livestock Related 'Exports' and 'Imports' by region. **Source:** Chapagain/Hoekstra (2004a): 46.

	Central Africa	Central America	East & South Asia	Eastern Europe	FSU	Middle East	North Africa	North America	Oceania	South America	South East Asia	Southern Africa	Western Europe	Total gross export
Central Africa	1.00	0.00	0.25	0.12	0.01	0.09	0.05	0.05	0.21	0.00	0.05	0.64	2.12	3.60
Central America	0.25	9.87	125.15	0.78	4.31	0.44	1.53	55.09	0.30	2.97	0.42	0.17	15.07	206.85
East & South Asia	3.66	0.72	122.83	4.48	13.75	30.59	13.61	5.00	16.29	1.06	76.38	10.11	23.74	199.62
Eastern Europe	0.02	0.26	3.34	31.83	15.97	12.99	8.12	1.57	0.30	0.17	1.00	0.16	58.91	103.22
FSU	0.01	0.33	8.33	16.14	51.89	30.43	3.07	1.12	0.04	0.07	0.41	0.00	41.36	101.32
Middle East	0.79	0.14	11.76	2.87	1.84	32.61	13.31	2.47	0.96	0.50	2.75	0.04	19.32	56.90
North Africa	0.16	0.15	2.51	1.17	0.22	5.95	5.83	4.19	0.06	4.61	0.16	0.43	14.53	34.14
North America	2.89	180.21	510.71	11.30	14.48	65.16	129.75	159.72	18.00	90.78	92.57	10.65	190.82	1317.31
Oceania	0.85	4.96	151.41	2.09	2.66	25.63	14.69	58.42	13.78	6.39	60.14	6.15	25.33	362.61
South America	1.92	9.11	66.67	8.46	5.12	25.67	19.18	22.27	8.11	181.82	18.04	3.19	228.95	414.91
South East Asia	1.82	2.16	229.10	2.58	6.00	25.83	31.59	13.96	4.81	3.51	96.41	11.85	14.21	347.41
Southern Africa	0.79	0.89	5.55	0.52	0.27	0.44	0.43	1.91	0.29	1.32	1.27	3.13	8.63	22.07
Western Europe	3.49	4.50	69.15	43.88	33.69	38.19	40.21	10.70	7.96	3.50	4.27	5.89	553.46	266.41
Total gross import	16.69	203.22	1183.91	94.40	98.29	261.42	275.73	176.72	55.33	114.89	257.46	40.09	642.96	3436.82

less than is environmentally sound into the Mediterranean Sea. The Central Asian surface water resources have been irreversibly damaged. These major, but second order regional rivers that have been very important in human history and economic development have been over-used. Most first order rivers - for example the exceptional Amazon with a 7,000 cubic kilometres annual flow, and the others that carry about 1,000 cubic kilometres annually - the Congo, the Mississippi, the Mekong and the Yangtze have been relatively lightly developed in terms of abstraction. Others such as the Ganges and Indus have been seriously developed for irrigation and hydropower with significant impairment. It is the third order rivers that have been most intensively developed and effectively 'closed' to further development. When closure is recognized as it has been in some basins in the Western United States and in the Murray River in Australia - both partly at least in semi-arid regions - it has been shown that policies can be put in place to reduce abstractions. The Colorado in the New World with a flow of 18 cubic kilometres annually is an overused relatively minor water resource. The Orange River at 11 cubic kilometres annual flow in southern Africa is another closed water resource where there is need to put water back into the environment rather than extract further water for irrigation and other uses.

Groundwater resources have also been seriously over-used in all the continents with the exception of Africa. But Africa is not well endowed with renewable groundwater although much research needs to be done to establish Africa's groundwater potential. Groundwater has proved to be a major element in meeting the increased water needs of the unprecedented population increases of the second half of the twentieth century. Groundwater is, however, a fatally attractive water resource for users (Allan 2006). Groundwater is usually high quality, it can be used at

will rather than when nature determines or the schedules of irrigation managers allow. Unfortunately ground waters are even more difficult to manage collectively than surface waters. And when an aquifer closes the tragedy of the commons is normally impossible to reverse at a pace which is relevant to the livelihoods of affected local communities (Handley 2001: 53). There is at the same time strong evidence that over-intensive use of groundwater has assisted rural communities to cope with a transition involving improved farm income, the education of a younger generation and the migration of most of the family to nearby cities. This process is evident in the Middle East where permanent shifts have occurred (Allan 2006), and in South Asia where there are flexible and diverse adaptive part-time modes of rural-urban interaction (Moench 2006). In both these cases the 'solution' of urbanization can only be effective if there are water resources in the global system to meet the needs of these expanding urban populations.

Relatively prosperous rural communities also face problems when aquifers close. The experience of the farmers and agricultural enterprises using the High Plains Aquifer in Nebraska, Kansas and Texas is one of expansion, retrenchment, litigation and ethical challenges (Peck 2006). This US case is also a good example of how solutions that served one generation apparently rather well until technological, economic and environmental circumstances change. Then water managing practices are neither economically efficient, environmentally sound nor ethically acceptable. Although they may be legal.

In the span of this chapter it has only been possible to pose the four most important questions on how local water security can be achieved. If they could be answered with high levels of precision the answers would provide useful estimates of future adequacy of water resources to meet future demands of

societies, economies and environments. The four questions addressed related to, a) demography; b) the efficiency of water use in agriculture and in the other economic sectors, c) the changing patterns of consumption of economies at different phases of development and d) the role of socio-economic development in bringing economies to the stage where their adaptive capacities enable them to solve their water problems outside the water sector.

The consideration of these factors has led to the conclusion that there will be enough soil water and freshwater in the global system to meet the needs of well adapted future populations and their environments. There will be regions which will face major water deficits. But the past half century, in fact the past three millennia, have shown that the water in the global system can be accessed by individual economies via 'trade' in virtual water. Table 41.6 shows how about twenty per cent of the virtual water related to crop and livestock production is moved between the world's economies. That this virtual water 'trade' is not increasing in some key staple food commodities such as wheat - despite increases in the human population - suggests that there are important water resource management efficiencies being achieved.

The future is complicated by many unknowns. The impact of bio-fuel production on the use of water is as yet unclear. Such production could reduce the availability of food commodities on the international market. This in turn could affect world food commodity prices. But stronger food staple prices are needed to provide the incentives for subsistence farmers, in for example sub-Saharan Africa, to increase their crop and livestock production.

What about the future? The world's political economies have coped with a threefold population increase since the mid-20th century. They will have to mobilize a further 2,500 km³ (billion m³) per year to secure a global population which will level off in the second half of the century. There have been spectacular advances in rainfed and irrigated agricultural productivity and it is argued here that these advances in late industrial economies will be emulated to some extent in as yet non-industrialized economies. Another unknown is the extent to which, and how quickly, the water needs of the environment will be addressed.

The pressures of water demand, the possibilities of further advances in water use efficiency in all productive sectors and the uncertainty of the pace of adaptive capacity of all the political economies, are impossible to predict with certainty. Nor is it possible

to predict the future stability of the world's political systems. It is this stability that will be crucial to the continued mobilization, and where necessary the expansion of virtual water 'trade'. Such 'trade' has been shown to have the capacity to meet the needs of the water scarce with products from economies that are water rich. It is important to grasp that it will be in the domain of politics that the water security of a particular region or of the whole global system will be determined. It is in stable politics that the remedies to water scarcity outlined in this chapter will be mobilized. Conflictual politics will prevent these remedies being combined effectively to bring water security to the water scarce.

42 Water Wars in India

Vandana Shiva

42.1 Introduction

Water has already become blue oil – commodified, dwindling, yet overused and abused. From a renewable resource, it is being converted into a non-renewable resource like fossil fuels – from a community resource it is being transferred into a privatized commodity – to be traded and sold. The transformation of water into a commodity to be traded for profit is also leading to its overexploitation and its long distance transport. Instead of following the laws of ecology and the hydrological cycle, water is being forced into markets. Instead of following the law of gravity – flowing downwards, it is flowing against – upwards to money. And as water is diverted, rerouted, mined and privatized, water conflicts and water wars are an inevitable result.

42.2 Large Dams and Water Conflicts

River valley projects are usually considered the solution for agricultural water needs, flood control, and drought mitigation. In the past three decades, India has seen the erection of some 1,554 large dams. Between 1951 and 1980, the government spent US\$ 1.5 billion on large or medium irrigation dams. Yet the return from this large investment has been far lower than anticipated. Where irrigated lands should have yielded at least five tons of grain per hectare, output has remained at 1.27 tons per hectare. The annual loss due to unexpected low water availability, heavy siltation, reduced storage capacity, water logging now amounts to US\$ 89 million.

The Kabini project in Karnataka is a perfect illustration of how water development projects can themselves disrupt the hydrological cycle and destroy water resources in basins. While the dam submerged 6,000 acres of land, relocating displaced villages required the cleaning of 30,000 acres of primeval forests. Local rainfall fell from 60 inches to 45 inches, and high siltation drastically reduced the life of the dam. Within

two years, water logging and salinity destroyed large areas of coconut and paddy fields nearby.

The damming of two of India's most sacred rivers, the Ganges and the Narmada has generated vehement protest from women, peasants, and tribals whose life-support systems have been disrupted and whose sacred sites have been threatened. The people of Narmada Valley are not merely resisting displacement due to the Sardar Sarovar and Narmada Sagar Dams; they are waging war against the destruction of entire civilizations. As the internationally acclaimed novelist Arundhati Roy puts it:

Big dams are to a Nation's development what nuclear bombs are to its military arsenal. They are both weapons of mass destruction. They are both weapons governments use to control their own people. Both Twentieth Century emblems that mark a point in time when human intelligence has outstripped its own instinct for survival. They are both malignant indications of civilization turning upon itself. They represent the severing of the link, not just the link – the understanding – between human beings and the planet they live on. They scramble the intelligence that connects eggs to hens, milk to cows, food to forests, water to rivers, air to life and the earth to human existence.

Over the past two decades, many men and women have dedicated their lives to the protest of the damming of Narmada Valley and the Ganges. Since the 1980's, two old men have been engaged in Satyagraha (Gandhian nonviolence) on the banks of the two rivers. Sunderlal Bahuguna has been living in a small hut at the Tehri Dam site on the Ganges to block the flooding of Tehri and stop the building of a dam on an earthquake fault. Baba Amte, who resisted dam building in Maharashtra, has been stationed on the banks of the Narmada for years. In 1984, Amte wrote a letter to the Prime Minister, in which he referred to the dams as genocide. Although bedridden due to a severe back problem, he still remains by the valley and says he will go with the river. Medha Patkar, a leading activist of the Narmada Bachao Andolan, and Arundhati Roy have also committed themselves to the fight

against the Narmada Dam Project – the world's largest water project.

The Narmada project consists of 30 large, 135 medium and 3000 minor dams on the Narmada River and its tributaries. It is expected to uproot one million people, submerge 350,000 hectares of forest, drown 200,000 hectares of cultivable lands, and cost US\$ 52.2 billion over the next twenty-five years. The Sardar Sarovar Dam, already under construction, is facing major opposition from human rights and environmental groups as well as tribals likely to be displaced. The dam threatens people in 234 villages. Next in line for construction is the Narmada Sagar project, which promises to submerge 91,348 hectares of land and displace people from 254 villages.

The Narmada Valley protest, which once was a fight for a just settlement of the displaced people, has rapidly evolved into a major environmental controversy, calling into question not only the method of compensation for the evictees but the logic of large dams altogether. The movement has taken inspiration from earlier successful struggles that led to the withdrawal of two major dam proposals – the Silent Valley and the Bodhghat Dam projects. Large coalitions of local communities, environmentalists, and scientists worked together in the 1980's to stop these dams. As dam tensions emerge and grow, they will not only address problems created upstream due to submergence they will also raise questions about problems created downstream due to water overuse and misuse by intensive irrigation.

The construction of the Ukai Dam across the Tapi River in Gujarat displaced 52,000 people. The farmers who once occupied fertile agricultural lands were forced to resettle in an area cleared of forests. Prior to their settlement in their new site, the government promised to level the land, clear the tree stumps, sink wells free of charge, and install power connections.

Once the farmers arrived, however, they found that most of the promises were not kept. The land was levelled with some assistance from the Government, but the farmers cleared the tree stumps themselves with great difficulty. Moreover, the clearing of the forest and the removal of the remaining tree stumps led to topsoil erosion and made farming impossible. The government reneged on the wells, saying it had promised to sink wells only for those who had wells in the old villages. However, most of the old villages were near the river, and not many farmers had needed to sink wells. With insufficient water, little food, and almost no work, the settlers soon be-

came migrant labourers in surrounding sugar cane fields.

The Pong Dam in Himachal Pradesh in the Himalayas displaced 16,000 families. The government then attempted to rehabilitate about half of them in the far-away deserts of Rajasthan, and each family was given 16 acres of land – the largest compensation in the country so far. Despite these efforts, the families were unable to adjust to the new climate, water, people and language, and most of them sold their lands and returned to their native place.

The Bhakra Dam was responsible for the displacement of 2,180 families of Bilaspur in Himachal Pradesh. The families, who were promised land in surrounding Haryana 25 years ago, have yet to be fully compensated; only 730 families (33 per cent) have been rehabilitated. Moreover, while the land taken from them between 1942 and 1947 was estimated at the prevailing rates during the time, the lands they actually received were appraised at rates prevailing between 1952 and 1957, leaving them with a mere one to five acres per family. Like the people displaced by the Pong Dam, they too fled their harsh new environment and returned to Himachal Pradesh.

Dam conflicts in the past revolved around displacement. Today, the ecological imperative for the protection of nature has added a new dimension to the struggle of displaced people. They are now fighting for their own survival as well as for the survival of their forests, rivers, and land. In East India, tribals of 121 villages, who faced eviction by the Koel-Karo project in Bihar, successfully stopped the construction work. Had the project been completed, it would have taken water from the Koel River at Basia and diverted it to another dam near Lohajamir village in Topra block, Ranchi district, and to the Karo River. It would also have submerged more than 50,000 acres of land, including 25,000 acres of forests under tribal control by customary law.

In postcolonial India, most large dams have been financed by the World Bank. I was personally involved in assessing the impact of the World Bank-financed dams on the Krishna, Kallada, Suvernakha, and Narmada Rivers. In each case, the ecological and social costs far surpassed the benefits. Typically, the benefits were grossly exaggerated in order to accommodate the World Bank's logic of returns on investment.

Table 42.1: The Himalayan and the Peninsular Components. **Source:** Compiled by the author.

The Himalayan Component	The Peninsular Component
<ul style="list-style-type: none"> • Kosi–Mechi Link • Kosi–Ghaghra Link • Gandak–Ganga Link • Ghaghra–Yamuna Link • Sarda–Yamuna Link • Yamuna–Rajasthan Link • Rajasthan–Sabarmati Link • Chunar–Sone Barrage Link • Sone Dam–Southern Tributaries of Ganga Link • Brahmaputra–Ganga Link (Manas–Sankosh Tista–Ganga) • Brahmaputra–Ganga Link (Jogighopa Tista–Farakka) • Farakka–Sunderbans Link • Ganga–Damodar–Sundernarekha Link • Subernarekha–Mahanadi Link 	<ul style="list-style-type: none"> • Mahanadi (Manibhadra)–Godavari (Dowlaiswaram) Link • Godavari (Polavaram)–Krishna (Vijayawada) Link • Godavari (Inchampalli)–Krishna (Nagarjunasagar) Link • Godavari (Inchampalli Low Dam)–Krishna (Nagarjunasagar Tail Pond) Link • Krishna (Nagarjunasagar)–Pennar (Somasila) Link • Krishna (Srisaillam)–Pennar Link • Krishna (Almatti)–Pennar Link • Pennar (Somasila)–Cauvery (Grand Anicut) Link • Cauvery (Kattalai)–Vaigai (Gundar) Link • Parbati – Kalishindh–Chambal Link • Damanganga–Pinjal Link • Par–Tapi–Narmada Link • Ken–Betwa Link • Pamba–Achankovil–Vaippar Link • Netreavati–Hemavati Link • Bedti–Varda Link

42.3 The River Linking Project: New Conflicts in the Making

Free-flowing rivers are free, in the sense that they do not need capital investment, they are not enclosed, and their waters are accessible to all. Water locked in dams and canals are captive waters. They can be privatized, commoditized, bought, sold, and controlled by the powerful. The massive US\$ 200 billion River Linking Project, supported in part by the World Bank, is a key to the privatization of water and the enclosure of India's water commons.

The River Linking Project is divided into two broad components: the Himalayan component and the Peninsular component. The Himalayan part consists of 14 river links with an estimated cost of 3,750 trillion rupees, and the peninsular component consists of 16 river links, estimated at 1.85 trillion rupees.

Even the minimum estimated cost of 5,600 trillion rupees equals one quarter of India's annual gross domestic product (GDP), two and a half times India's annual tax collection, and twice our present foreign exchange reserves. The cost of this project, according to the government's economic survey for 2001–2002, is higher than India's gross domestic savings and more than US\$ 12 billion higher than India's total outstanding external debt. Where is capital of this magnitude available?

The only option would be funds from international sources. Such funding would place a debt of about US\$ 112 on every Indian – 20 per cent of the av-

erage annual income. The annual interest would range between 200 and 300 trillion rupees. It also raises questions about how this loan would be repaid and what guarantees will be needed to secure it.

External borrowing on this scale would also make future governments more vulnerable to foreign financial pressures. The real threat is that after starting the project with much fanfare and investing thousands of crores into it, a future government would have to simply abandon the project as its financial implications become clear, leaving billions of cubic metres of earth dug up and the face of the country scarred for centuries. In that scenario the only alternative left would be to hand over the project – along with the country's entire water resources – to multinational corporations.

The Research Foundation has studied the first link – the Ken–Betwa link – which is being financed by the World Bank. The Ken–Betwa river linking project includes constructing a 73-metre-high dam on the Ken in Bundelkhand, on the border of the Chhattarpur and Panna districts, and a 231-kilometre-long canal which will connect the Ken and Betwa. Seventy-five per cent of the estimated 20 billion rupees will be extracted from the local peasants out of various taxes imposed over the next 25 years. That is why the government is proposing such crops, which are water intensive, leading to a hike in the water tax.

Fifty square kilometres of Panna Tiger National Park would be submerged by this interlinking project. This national park, through which the Ken flows, is a natural homeland of 10 endangered species listed un-

der Schedule 1 of the 1972 Wildlife Protection Act. This interlinking and transfer of water will affect not only these animal species but also the vegetation, as hundreds of thousands of trees would be cut down.

This project proposes five dams altogether, one on the Ken and four on the Betwa, which would displace around 18 villages. All five dams are proposed to be built in protected forest area. The four dams on the Betwa would submerge 800 hectares of forest. Besides creating conflicts with local people, the River Linking Project also threatens to generate water wars with India's neighbours, Nepal and Bangladesh, since diversion of water out of the Ganga basin will leave less water for sharing with neighbouring states.

42.4 Water Wars Due to Privatization

Water privatization transfers water from where it flows to where there is money – cities and industrial areas. Two examples of 'water wars' caused by privatization are the diversion of the Ganga waters to Delhi for privatization by Suez Degremont, and the diversion of the Baner River in Rajasthan to Ajmer and Jaipur.

For two years, from 2004 to 2006, the supply of water from the Ganga was held up due to water conflicts between the Government of Delhi and the Government of Uttar Pradesh whose farmers are to lose because they would have no irrigation water. Studies by the Research Foundation show that the losses of farmers amount to Rs. 70 billion because of this diversion.¹

The ADB gave a loan to Rajasthan to divert the Baner River water to Ajmer and Jaipur. As a result the fields and wells of farmers went dry. They protested on 26 August 2005 and five farmers were shot dead during a protest. The martyrdom of Prakash Mali, M.S. Gujar, Madan Lal Jat, Krishan Lal Chaudhry, and Ram Narayan Chaudhry is just one reminder that 'water wars' are not the issue of the future. They are already taking place.

1 RFSTE: *Ganga: Common Heritage or Corporate Commodity* (New Delhi: RFSTE/Navdanya, 2003, 2005).

43 Sustainability of Environmental Regimes: The Mekong River Commission

Bastien Affeltranger

43.1 Introduction

As a natural consequence to the increase in inter-governmental agreements on transboundary environmental issues or challenges, the evaluation of environmental regimes has become a topic of study by scholars in political science, International Relations, geography etc. Lindemann for instance, develops an analytical framework that explains the success of international water regimes “*with the complex interplay of problem factors; process factors; institutional factors; country-specific factors; and factors of political context*” (Lindemann, 2005). However, only few publications so far have focused on the management of technical data and information as a condition to the institutional effectiveness and sustainability of such regimes. Considering that access to data is critical for sound water-related decisions, this chapter advocates that the unavailability of water-related information deprives basin organizations from technical credibility and political legitimacy¹.

The *Mekong River Commission* (MRC) is an environmental regime and an attempt to establish a basin organization for the Lower Mekong. The MRC was created in 1995 by its member states: Lao PDR, the kingdoms of Thailand and Cambodia and the SR Vietnam,² under the auspices of the United Nations.³ Until now, the MRC has but shared the characteristics of the river itself: “a turbulent past and an uncertain future” (Osborne 2001). The MRC is actually still

fighting to be acknowledged as an institutional framework for assessing the state of the resource, and as a forum for making water-related decisions. Unsurprisingly, its member states remain reluctant to delegate pieces of the sovereignty to the Commission – the more developed these countries are, the more reluctant they are to co-operate with the MRC.

This chapter introduces the circulation and exchange patterns of environmental information as an analytical tool to understand and assess the day-to-day operation and effectiveness of an environmental regime such as the MRC. In particular, difficulties experienced in the sharing of water-related (hydrological/hydraulic) data and information help identify the players, issues and power relations of Mekong hydro-politics. A multi-scalar, institutional analysis guides the approach described below.

This chapter introduces flood and drought hazards in the Mekong river basin, and details related to data needs for forecasting activities (43.2); research results on the present status of the Mekong Commission are offered (43.3); the concept of the “value(s) of hydrological data” is introduced (43.4); and the conclusion comments on the recent (2004–2005) recruitment of a new *Chief Executive Officer* (CEO) at the MRC (43.5).

1 This chapter presents research results from a Ph.D. conducted at Laval University in Quebec, Canada (2003–2006). It also elaborates on consultancy (flood warning) for the MRC in 2002 (Affeltranger 2002). The views presented in this chapter do not reflect the opinion of any country, government, organization or individual, neither in the Mekong river basin nor elsewhere, nor does the text endorse any official boundary.

2 Countries are listed upstream to downstream.

3 See the: *United Nations Economic and Social Commission for Asia and the Pacific* (UN-ESCAP). For the full-text of the MRC Agreement, visit the *Water Page*: <http://www.africanwater.org/mekong_river.htm> (15 September 2006). For a historical review and analysis of the institutional processes that have shed the environmental regime of the Lower Mekong, see: Browder/Ortolano (2000).

43.2 From Water-related Hazards to Data Needs

Basic facts on the Mekong river basin are provided below:

- Basin size: 783,000 km² and river length: 4,200 km.
- Basin countries: China, Myanmar, Thailand, Laos, Cambodia and Vietnam.
- Basin population: 60 million (est. 2006). Per capita GDP: varied from US\$ 2,565 (Thailand) to US\$ 265 (Cambodia).
- Water uses: Irrigation, fisheries, power generation, transportation, industrial and domestic supply.

Respective contribution of each riparian state to the total annual discharge of the river is given in table 43.1.

Table 43.1: Mekong River Basin-Hydrological contributions from riparian countries **Source:** Wolf (1999a).

Country	Basin area (km ²)	Basin share (%)
Laos	198 400	25,42
Thailand	194 100	24,87
China (Yunnan Province)	168 400	21,58
Cambodia	157 000	20,11
Vietnam	35 000	4,49
Myanmar	27 500	3,53

Floods have always been a fact of life in the Mekong river basin, and since 2000, floods have caused annually between 300 to 800 victims, 100 to 400 million US\$ of damage, and 1 to 8 million people were affected each year. No wonder that flood mitigation remains high on the present institutional agenda of the Mekong Commission (MRC 2006). For instance, an estimation of the impacts caused by the 2005 flood season on Lower Mekong countries is given in table 43.2.⁴

It should be noted here that beyond their humanitarian and economic goals, flood mitigation and management activities have also a strong political dimension in the Mekong river countries. In short: by managing risk, authorities gain technical credibility

from the public which backs their political legitimacy to rule the nation.⁵

Flood mitigation has progressively been an objective of intergovernmental cooperation and institutional developments on the Lower Mekong. Major floods in 1966 triggered riparian countries of the lower basin to set up a flood forecasting system in January 1968, based on the *Streamflow Synthesis and Reservoir Regulation* (SSARR) model, developed by the U.S. Corps of Engineers (1966). After the 1978 and 1981 floods, the forecasting system was extended to the Mekong delta (DELTA Model developed with support from UNESCO) as well as to major tributaries.

More recently, the 1995 Agreement has confirmed that flood mitigation should be key objective and task of the *Mekong River Commission* (MRC). Consequently, the *Flood Management and Mitigation Strategy* (FMMS) has been established in 2001 to serve as a framework to MRC's policies and activities related to floods.⁶ In 2004–2005, the MRC established a regional centre for flood mitigation and management in Phnom Penh (Cambodia). Observers have interpreted this decision as a balance to the recent move (2004–2005) of the MRC Secretariat to Vientiane (Lao PDR). Despite a steady interest in flood mitigation (MRC 2006), other natural hazards, such as drought and salinization, have however started to rank higher on the political agenda of riparian governments. This was confirmed at the 3rd Annual Flood Forum, held in April 2005 in Vientiane, where strong requests from Member States were made that the MRC Secretariat should increasingly address these hazards (personal observation).

On the Mekong main stem, flood mitigation still heavily relies on short-term measures, such as emergency intervention and relief. To perform well, these activities need sufficient lead time over hazardous events. This can only be gained through appropriate forecasting – hence requesting fine hydrological knowledge, data and models. In particular, data must be sufficient both in quantity and quality, and provided timely to forecasting teams at the MRC Secretariat (Operational Hydrology Unit and the *Flood Forecasting Core Team* (FFCT)).

Similar to the situation in other large river basins throughout the world, floods on the Mekong's main

4 For additional information on Mekong floods, see the OFDA-CRED database; at: <<http://www.em-dat.net/>> (15 September 2006).

5 See the concepts of “hydraulic civilization” (Wittfogel 1957) and “mandate of heaven” (Granet 1994).

6 See details at: <<http://www.mrcmekong.org/programmes/flood.htm>> (15 September 2006).

Table 43.2: Estimation of damages of the 2005 flood in the Lower Mekong countries (consolidation of data considered as sufficiently coherent for comparison. **Source:** MRC Website; at: <<http://www.mrcmekong.org/programmes/flood.htm>> (15 September 2006).

Provinces	Lao PDR	Cambodia	Thailand	Viet Nam	Total
People affected					
No of provinces affected	16	4	5	8	33
No of districts affected	84	35	23	2	144
No of communes affected	NA	195	234	NA	NA
No of villages affected	2,510	NA	NA	NA	NA
No of families affected	85,553	29,549	78,121	NA	NA
No of people affected	480,913	14,408	NA	NA	NA
Houses severely damaged/collapsed	NA	NA	1,275	4,303	NA
Deaths from floods (2)	4	19	0	77	100
People evacuated to safe places	356	4,805	NA	NA	NA
Agricultural production					
Rice planted (ha)	687,555	NA	NA	NA	NA
Paddy field loss (ha)	55,955	9,906	39,538	3,876	109,275
Loss of livestock (Unit)(1)	2,124	28	0	0	2,152
Loss of fishponds (ha)	296	NA	759	NA	NA
Damages to infrastructure					
(only scattered information is available - consolidation for LMB may not be done)					
Total estimate of damage US\$mil	28.56	NA	NA	15.27	NA

stem are actually *combined* hydrological and hydraulic events. These are formed on tributaries to the Mekong, with basins featuring both shorter and longer concentration times – and hence with both ‘flash flood’ and ‘slower flood’ characteristics. The very nature of the Mekong, a transboundary river, therefore requires technical co-operation of basin countries. In particular, sharing of technical data – in short, hydrological data – is key to improved flood forecasting and mitigation.

The next section does, however, explain why circulation of water-related data is difficult on the Mekong river basin – both among basin countries, and inside them. The process of *politization* of water-related data is explained, with the Mekong river basin and hydro-politics as a case study.

43.3 The Politics of Hydrological Data

Field observations show that access to, and quality of hydrological data remain a challenge in the Mekong river basin. Intra-national features, such as lack of technical and financial capacities for data collection and management often limit the possibility of international data exchange. The lack of political will or commitment also plays a role, both in terms of investment in data management and transboundary access to data produced. In short, control over hydrological data remain a political tool.

Key features explaining for the difficulty or absence of information circulation include:

- *At the national level:* data are utilized by civil servants as a currency to navigate (or survive) through power relations within and among organizations, institutions or administrations⁷. This is particularly the case in countries where state bureaucracies are confronting major changes. Such changes are usually a by-product of joining market economy or globalization, and / or a conditionality to loans granted by international financial institutions.
- *At the inter-national level:* non-disclosure of hydrological data deprives downstream countries from technical clues on upstream water withdrawals, hence protecting upstream governments from scientifically-based hydro-political claims.

The dynamics of these two key groups of features are detailed in the next sub-sections.

43.3.1 Institutional Instability

The Mekong river countries, including the PR China, have undergone major changes during the past 20 to 25 years. A key feature has been the transition from a command to a market economy. Thus, the role of the

⁷ This confirms, when applied to intra-national hydro-politics, findings in Sociology of Organizations made by Crozier (1964) and by Crozier/Friedberg (1977).

state is being redefined. In some cases, even its actual *capacity* is being discussed or challenged. The water management sector, including flood management and relief activities, has also been influenced by these changes.

The overall result of the process is an institutional instability of hydrological administration. State services in charge of water-related issues and tasks are confronted with major or repeated organizational changes. Consequently, power relations are jeopardized, allocation criteria for public spending are revised, the performance of civil servants is questioned and salaries are kept low – if not lowered. In this context, hydrological data appear as a key asset to navigate through these rough institutional waters.

43.3.2 Competition over Water in the Mekong River Basin

Contrary to public perceptions, at the basin level water is not yet under quantitative stress, but water availability faces a rising stress in some sub-regions, for instance in the Khorat Plateau in North-eastern Thailand (Affeltranger 2005). Besides, water is a matter of competition among users – at least for those players with a political and economic bargaining clout strong enough are in a position to voice out their views or concerns.

Due to water competition – for instance in relation to hydraulic or hydroelectric developments, both on the Mekong main stem and major tributaries – national authorities believe that sharing water-related information opens the door to a more transparent understanding of hydrological impacts caused by their projects. Thus, sharing data is perceived as a potential risk of later criticism from downstream stakeholders. Sharing data implies becoming accountable on the sub-regional hydropolitical scene.

43.3.3 Values of Hydrological Data

As a consequence of these two major features, the *value* of hydrological data rises as a social and political construct. There are as many facets to it as there are reasons (not) to share water-related information. Based on interviews conducted in Mekong basin countries, a typology of the *total value* of hydrological data is suggested below:

- *Operational value*: Data enable informed decision-making and help reduce negative externalities;
- *Economic value*: Data as a commodity help data owners make up for insufficient budget or salary. In some cases, data can be used to start an external business activity;
- *Organizational value*: Data help civil servants negotiate power deals through institutional instability. Data serve as currency in organizational and power transactions;
- *Financial value*: Exclusive access to data enable owners to report first to authorities allocating water resources development budget or post-disaster assistance;
- *Strategic value*: Non-transmission of data help planners conceal downstream environmental impacts of projects;
- *Political value*: Control over data helps authorities limit public scrutiny, stakeholders' protest and political controversy over water issues;
- *Cultural value*: Some data owners are not confident in data quality – or data simply do not exist. These actors are therefore reluctant to share data for fear of losing face, or being made responsible for data misuse, or unsuccessful projects. In addition, political heritage and culture has been found to play a role.

43.3.4 Consequences

In theory, *hydro-meteorological data* (HMD) are a key feature of water-related decision-making. By increasing the probability of negative externalities (ecologically, socially, economically), the lack of HMD usually jeopardizes the sustainability of decisions made. In practice, it is far from certain that all water-related decisions in the Mekong basin have been made only after careful scientific check and consideration of multiple scenarios. In addition, a lack of data also deprives parties of water-related debates or controversies to support their views and discourses with official figures and scientifically robust back-up. The parties involved can be riparian countries, donors, aid agencies, or non-governmental organizations (NGOs).

Basically, the actual patterns of HMD circulation on the Mekong basin reflect the geopolitical landscape of the subregion. Competition over data is tied to competition over water. However at this stage, it seems unrealistic to advocate for a 'de-politization' of water-related data.

Indeed: an inherent fear of governments in the Mekong basin is that they endanger themselves by providing water-related data. In particular, governments fear that sharing this knowledge will limit their

capability to conduct domestic policies and projects in the water sector. There are two kinds of players: upstream governments are reluctant to provide data to downstream countries, for these might complain of unfair basin-wide water allocation; then, environmental NGOs might mobilize public opinion (and donors) against potentially destructive (ecologically and socially) water resource development projects. Thus, the total value of water-related information reflects a variety of coexisting rationalities that must be reconciled.

As an environmental regime, the MRC process offers an opportunity for basin countries to introduce technical and political transparency in the management of water resources. A wider access to hydrological data also facilitates public scrutiny and environmental advocacy based on informed opinion and discourse. But is this in the interest of riparian governments? Next, key features influencing the institutional capacity, stability and sustainability of the Mekong River Commission are discussed.

43.4 Institutional Sustainability of the MRC

43.4.1 The Mekong Commission: Ten Years of Commitment

The governments of the lower Mekong basin have shown a high degree of resilience in developing institutional cooperation on water issues since the late 1950's.⁸ Despite years of political turmoil and manifold tensions, the process of shaping an institutional mechanism for transboundary cooperation has been maintained. Although extra-regional players have influenced this process, the repeated commitment of the lower Mekong governments must be acknowledged. Without such an involvement at the highest political level, cooperation on the Mekong would already have ceased to exist. This resilience of the 'Mekong Spirit' is also witnessed in the upper reaches of the basin. Cooperation with China should also be acknowledged, since hydrological data from two stations in Yunnan Province are now provided to the

MRC Secretariat on a daily basis during each flood season.

Thanks to these efforts and commitment, the MRC and its Secretariat have achieved numerous tangible results since 1995. These results go beyond mere theoretical research and studies. The MRC has developed as a political forum for lower Mekong countries to maintain a dialogue on basin issues, and to establish a link with upstream neighbours Myanmar and China. The MRC Secretariat has also matured into a well established organization that relies on a unique knowledge base, a multifaceted technical expertise and a broad spectrum of sectors and programmes. The contribution of the staff of the Secretariat and of national and international experts must also be acknowledged.

Despite these remarkable political and technical achievements however, hydropolitical clouds have formed over the river basin. The present situation is a mix of strengths, challenges, threats and opportunities for the future cooperation on the Mekong. This also applies to the MRC Secretariat as an organization. What tell us those voices foreseeing only a gloomy future for the Mekong River Commission?

43.4.2 The Mekong Commission: Ten Years of Tensions

Ever since the early 1950's, when the U.N. *Economic Commission for Asia and the Far-East* (ECAFE) and the U.S.A. supported efforts to set up a common future for countries of the lower Mekong basin, the related institutional efforts have always experienced numerous tensions among players from within and outside the region, including extra-regional organizations, entities or individuals. The Mekong basin is both a geopolitical space, where these players meet and interact, and a geopolitical object that is instrumental for their goals.

The tensions over the Mekong Commission boil down to the controversy, on what role water resources should play for the social and economic development of basin countries. An easy way to summarize this debate is to divide the political ecology landscape in terms of pro-dams and anti-dams groups. But the controversy is more complex and goes way beyond this divide. Rather, it questions what development models, or paradigms, should be used in the Mekong basin. An easy way to summarize these past decades is to oppose extra-regional donors (mostly Western and European) to governments of the Mekong countries. The former are often presented as ad-

8 The agreement setting up the *Committee for the Coordination of Investigations of the Lower Mekong Basin* was signed on 17 September 1957 by the governments of Cambodia, Laos, Thailand and Vietnam. For text details, visit Oregon State University's (OSU) database at: <<http://ocid.nacse.org/cgi-bin/qml/tfdd/treaties.qml>> (15 September 2006).

vocates of sustainable development, while the latter are said to be interested only in structural water resources development. Yet again, this simplified view does not adequately reflect reality. This can for instance be observed in the differentiated patterns of water resource development that upstream and downstream Mekong countries advocate for or against.

Neither on the Mekong nor elsewhere is the advocacy for, and the implementation of sustainable development policies a smooth process. Already early in the process of hydrological co-operation on the Mekong, most players have been aware of these tensions over choices for the basin future(s). These tensions have been accepted as a price to pay for the development process to continue and for related projects to be carried on. Despite these difficulties, players, especially western donors, to leave the region.

A recent illustration of these tensions is the debate that emerged when the present Chief Executive Officer (CEO) came into office (2004–2005). Based on interviews, conducted in 2004 and 2005 with staff of the MRC Secretariat, with donor governments and agencies, and with the CEO himself, it is reasonable to say that the apparently clear-cut discourse of the CEO (e.g. on dam building) has somehow made more tangible the disagreements or clashes on what should look like the economic, hydrological and environmental future(s) of the Mekong basin.

Ever since his arrival, the present CEO has stressed that he had been recruited by Mekong governments to implement their will in terms of basin development. This includes for instance supporting the development of hydraulic infrastructures (e.g. dams and reservoirs). The present CEO also initiated a communication strategy with China, and soon after his arrival he was invited by the authorities in Beijing.

These elements may be interpreted as an encouraging sign of a burgeoning MRC strategy closer to the expectations of its member states. In that respect, this discourse of the CEO – perceived by some as a hardliner – probably also serves the integration of riparian countries into a common vision for the basin's future. But to some observers this position of the CEO has been found as being too much 'pro-dam'. In particular, donor governments and aid agencies – mostly those from Northern Europe – have started to consider this approach as a direct threat to sustainable development in the Mekong basin.

43.4.3 Line Agencies: Last Frontier for Hydrological Cooperation?

Improving the technical efficiency of the MRC Secretariat cannot be achieved without a parallel improvement of the overall capacity of line agencies in MRC countries. Practice shows that a sustainable process of institutional cooperation can be obtained only if the players have an equitable, technical and organizational capacity to interact with each other. So far, this has not been the case as will be illustrated with these three examples:

- *Financial capacity.* The budget of hydrological or meteorological departments is usually very limited, e.g. an estimated annual budget of 15,000 US\$ for one of the visited meteorological departments. In many cases, salaries are extremely low and varied – ranging from a monthly average of 30 US\$ to more than 1000 US\$. Thus, staff members have no choice but to find other sources of income and look for additional jobs.⁹ This multitask occupational pattern has two major consequences. First, time actually spent in office can be reduced, as well as motivation to commit, thus jeopardizing official duties. Second, in some cases, conflicts of interest arise when the purpose of additional job selected contradicts the official duty (e.g. application of regulations).
- *Human resources.* Besides, human resources management in many line agencies is also problematic: technical skills are usually quite low¹⁰, and the capacity of using English as a professional language is also very limited if it exists at all. This last point is a clear limitation for the capacity of line agencies to engage in, and be accountable for cooperation with the English-speaking staff of the MRC Secretariat. In addition, in some cases, water-related line agencies have been created only recently – and for some, even after the creation of the MRC. This is one explanation for the relative lack of experience in engaging in transboundary or international cooperation – for instance with the MRC Secretariat. Besides, the political history and

9 These include: business, tourism, driver, engineering, consultancy, teaching, etc.

10 In some cases, the selection or appointment of head of department may not necessarily reflect professional excellence, but rather personal or political preferences. Although this may be an asset for legitimacy and team management, it is of little help in terms of transparency of the recruitment process.

tradition of some Mekong countries have influenced the professional culture of civil servants. This makes some staff of MRC line agencies not really keen on cooperating with partners from outside the country or the Mekong region.

- *Political capacity.* The political capacity of these agencies must also be discussed. More precisely, it appears that the *National Mekong Committees* (NMCs) are not necessarily staffed with delegates of the 'real' decision-making ministries in their country. According to a western diplomat: "depending on ministries and individuals, the readiness to cooperate, and the actual capacity to cooperate, varies a lot among Lower Mekong countries." For instance, ministries of transportation, economy, finance, army, etc. are traditionally not members of NMCs. Thus, these Committees only have a limited capacity to actually influence water-related policies and projects in their country. NMCs may not want to see the situation change drastically, as a privileged relation to the MRCS may also mean priority access to donors' funding and financially valuable positions at the MRCS. This may explain why these Committees are reluctant to share their power with other ministries in their country. Matters of sovereignty have probably limited the capacity of donors to voice their views (or concerns) in terms of how relevant the composition of NMCs might be in its present form.

These weaknesses of line agencies and water-related administrations in Mekong countries have a direct influence on the availability and circulation of hydrological data. Symptoms of these induced difficulties include:

- Data are simply not available in countries. When available, data series are not consistent, scientifically robust or have blanks. A resource-consuming (both time-wise and money-wise) process of data reconstruction is then needed at the MRCS.¹¹ In some cases, countries accept to provide data to the MRCS only if the Secretariat subscribes to a series of conditions describing data utilization and dissemination;
- Line agencies in MRC countries are often not capable of devoting sufficient resources (staff and fi-

nancial) to operation and maintenance costs of hydrometric networks – even when these networks have been installed with donors' assistance. Consequently, line agencies usually ask for additional agreements to be signed, so that they can be paid by the MRCS for providing data. This situation also mirrors that governments chose not to devote more resources to these line agencies.

- There has been a lack of public spending in hydromet data collection and management and a double inconsistency of riparian governments. High-level agreements are signed under the aegis of the MRC, whereby governments commit to data sharing or exchange. But MRC governments do not invest enough money for their line agencies to be capable of actually delivering the data promised under these agreements. Sometimes, the very political will of delivering available data is simply lacking. According to an ADB expert: "the national bureaucratic machineries are not keeping pace with the agreements signed by Mekong governments."

Thus, the lack of data is compensated by the development of parallel, often less rational processes of knowledge production. For instance, rumours often served as instrumental in filling knowledge gaps. In practice, when confronted with a lack of data, some segments of society develop their own information sources and explanatory patterns for understanding their social and technical environment – and for acting upon it. Again, the problem can be that this kind of knowledge is biased by value judgements or instrumental for specific purposes. According to a senior expert in hydraulic modelling "some day these parallel, unconfirmed and ideologically motivated descriptions of the river basin will have become *the* reference truth on the state of the Mekong river basin."

There might, however, be reasons for hope. Countries of the lower Mekong basin have started to implement international regulations and standards (e.g. of the World Meteorological Cooperation) in collecting and managing hydromet data. In this process, economically least advanced countries of the basin are much less advanced than stronger nations. Data users are also being progressively charged for access to data. However, pricing patterns remain unclear in many cases. Usually a 'data care' or 'data handling' fee is calculated and charged, although interpersonal connections appear to still play a role as a condition to access to data. Still, and despite some normative advances, existing regulations are usually not enforced by state agencies themselves in Mekong countries. A

¹¹ A senior expert even mentions rumors in a lower Mekong country providing the MRCS with biased data sets, with the only purpose to later make the MRCS have to pay for obtaining corrected data sets.

reason for it can be that these prescriptions are too vague to be operational – or too constraining – or simply because they are not known to the staff involved.

43.5 Do Mekong Countries Need the Mekong River Commission?

The Mekong River Commission is not, and has never been, the only catalyst for water-related cooperation in the (lower) Mekong basin. Since the late 1950's, and despite successive institutional frameworks until the creation of the MRC in 1995, governments of the basin have maintained bilateral patterns of cooperation with each other.¹² This represents multiple, co-existing tracks of hydro-diplomacy that may or may not run parallel to each other, and in some cases take opposite directions.

Observers of the Mekong region have witnessed that in several occasions, major water-related projects have in the recent past not been designed, nor implemented, through the MRC. These projects include: the Vietnam-Cambodia controversy on the Se San dam; the considered water transfers from a Mekong tributary into the Chao Phraya River in Thailand; the Nam Theun II dam in Lao; the Lao-Thai-Birmese-RP China cooperation on the navigability in the Upper Mekong. In none of these developments, the MRC nor the MRCS have been involved in the decision-making process – neither as a political facilitator, nor on technical aspects of this process.

The absence of the MRC/MRCS from several water-related debates or controversies on the Mekong is quite surprising. Current discourse of Western scholars on hydropolitics does advocate for environmental regimes to level out regional power differences on environmental issues. In the case of transboundary river basins for instance, river basin organizations are expected to help 'weak' countries to better negotiate with more powerful ones. However, in the case of the Mekong, it appears that Cambodia could not utilize the MRC to voice its concerns in the Se San debate. Or maybe it did not want to. Or maybe Vietnam would not accept the MRC to play such a role of 'neutral facilitator'. The same seems to have happened for water diversion schemes in Thailand.¹³

Another example is the Upper Mekong navigability projects. Neither Thailand nor Laos did request

the MRC to get involved in the signing of an agreement with Myanmar and China. The *Lao National Mekong Committee* (LNMC) had not even been involved in this process. In Laos for instance, only the Ministry of Transports did join the negotiation process with its Chinese ministerial counterpart. It was only when regional and international public opinion and NGOs voiced concerns on the potential ecological consequences of reef blasting (for clearing of navigation channel) that the LNMC was invited to join the discussion. "The MRC is shying away from any transboundary conflict", according to a western scholar who has been studying the basin for about a decade.

Does this mean that the MRC/MRCS is only here to serve as an 'environmental legitimization resource' for governments of the basin? Are these governments worrying that any involvement of the MRC would only end up in making water-related projects more complex to manage (ecological considerations; public scrutiny; etc.)? At this stage, the MRCS as an organization has no real capacity to influence water-related policies and projects in Mekong countries. Nor does the MRC have this capacity, although this is not surprising, as governments appoint members to the Council and Joint Committee of the MRC. For instance, the difference with the ADB reads in terms of bargaining clout. According to an Asian ADB expert: "the ADB is more a catalyst than the MRC, because it comes with money."

If MRC should be useless, should it disappear? "Not at all", according to a member of a National Mekong Committee, "we are too poor!" An easy interpretation of the situation would be to say that the MRC is considered by governments of the basin only as an instrument to channel donors' money in – and to increase environmental legitimacy and 'sustainable development' image of riparian countries.

43.6 Conclusion

Water remains a major resource in development plans for Mekong countries. As long as water is an important contributor to GDP formation, it will remain a resource for competition. In turn, and as long a competition over water is maintained, hydrological data will

12 Technical cooperation goes beyond mere hydrological issues, to include topics such as: meteorology; domestic security; border patrols; hydropower; etc.

13 Likewise, it is a fact that Mekong countries do not have similar capabilities in terms of economical, political and military bargaining clout for backing up their views or complains on water-related issues.

remain politicized information. So far, the race for water on the Mekong basin has only jeopardized the institutional sustainability of the Mekong River Commission. But the MRC and its Secretariat remain key assets for riparian states of the Mekong in the field of water-related information management.

This is of course mostly the case for the least developed countries of the basin. The contribution of the Mekong Commission in this field includes: upgrading the hydrological data collection; standardization of data and products; training line agencies of the MRC; wider access to environmental information; etc. However, a basin-wide accepted framework for data exchange was still in the making in mid-2005. Should hydrological administrations in MRC member states be considered as the 'last frontier' to hydrological co-operation on the basin?

Though this is likely to be the case, the burden of making this environmental regime a success should be shared with donors and other lending or aid agencies. Indeed, the hydropolitical challenge of this river basin depends today on the capacity of regional and extra-regional players to reach a consensus on what development pattern(s) should be opted for on the Mekong basin. As discussed above, the tensions generated by diverging, or opposed views of the future(s) of the river basin are a common thing on the Mekong. A renewed interest can however be found in recent developments that make these tensions more perceptible and visible than before. It is the opinion of the author that the recruitment of a new CEO at the MRC (2004-2005) has been a key feature of that shift. Considering that the head of the MRC Secretariat should carry on the task member states have recruited him for, the CEO has preached - at least until mid-2005 - a discourse overtly in favour of (structural) water resource development. Unsurprisingly, this policy has done nothing but comfort most of Mekong riparian countries - and upset those donors that are more accustomed to a pro-environment line.

Reaching a point where some European donors request external auditing of the MRC institution and performance (Hirsch 2006), it appears more critical than ever to involve riparian countries, donors and other stakeholders in a reconstruction of a negotiated, common representation of the Mekong's possible future(s).

44 Water Scarcity and Political Wrangling: Security in the Euphrates and Tigris Basin

Mustafa Aydin and Fulya Ereker

44.1 Introduction

Water scarcity as a security issue has been analysed with an increasing interest since the 1980's, mostly with an emphasis on the causal linkage between the shortages of water in a given locality and the possibility of conflict thereby (Gleick 1993; Westing 1986; Frey 1993). A majority of the case studies in this context have been concerned with the probability of conflicts over water sharing in the Middle East (Naff/Matson 1984; Starr/Stoll 1988; Starr 1991; Bershorner 1992; Lowi 1993; Libiszewski 1995). Similar focus on disputes over water can also be found in the analyses from environmental perspective (Homer-Dixon 1994). Following the widening and broadening of the security agenda, since the late 1980's (Buzan/Wæver/de Wilde 1998; Brauch 2003, 2008, 2008b, 2008b) the way in which environmental and thus water issues are analysed has included new concepts such as *global environmental security* and *human security*.¹ There are now studies on environmental and water problems ranging from critical (Smith 2001; Blatter/Ingram 2001) to Marxist analysis (Selby 2005 and chap. 46), with traditional approaches still dominating the scene (see chap. 41–58).

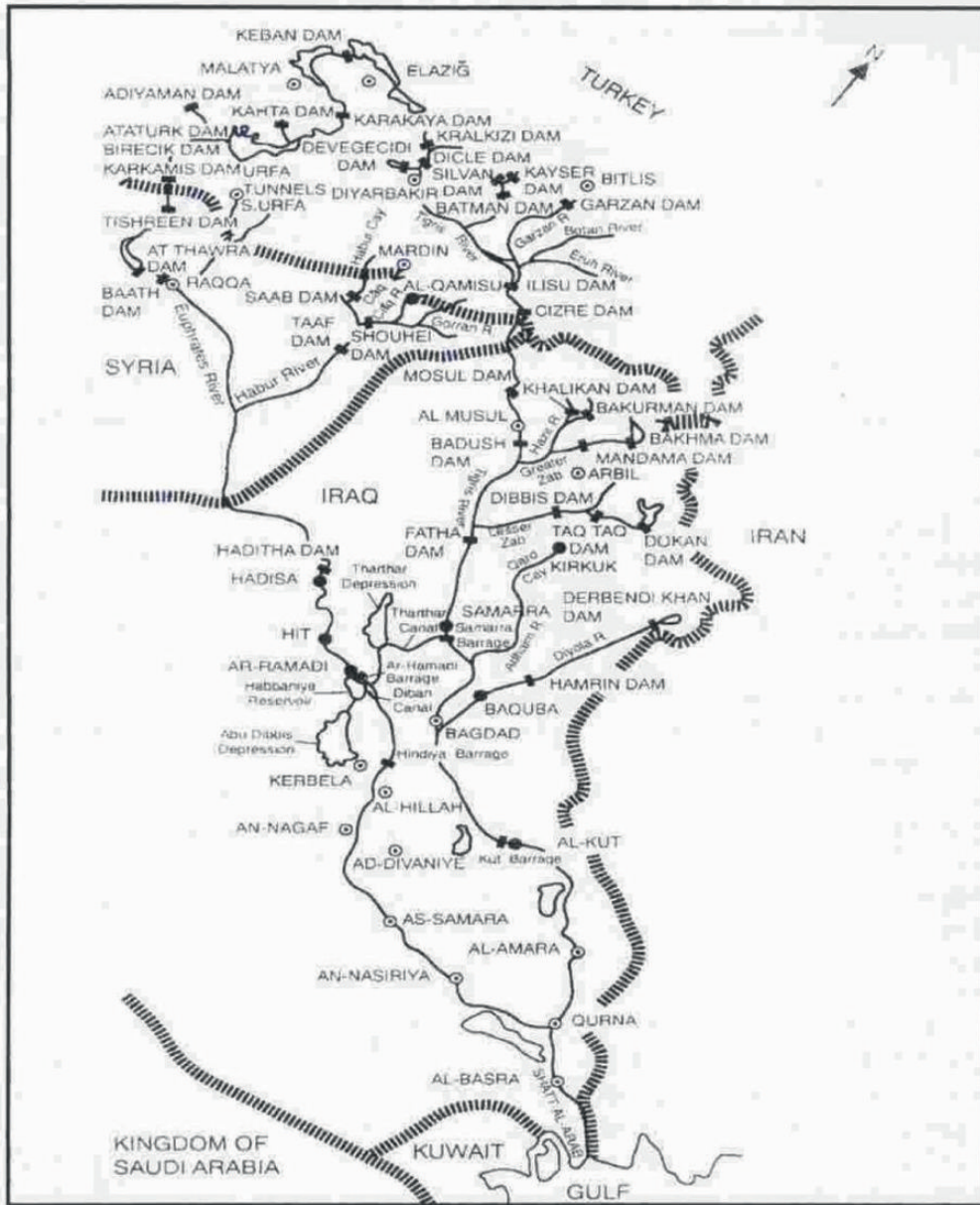
A glance at the literature on environmental issues clearly indicates the fact that outside the scholarly research and mainly the West, new understandings of the environment have not made much progress. The overwhelming tendency of the countries involved in

disputes with their neighbours is to use the traditional understanding of power politics as the main analytical tool. This is more evident in cases where official security conceptualization of the country is still dominated by traditional 'hard security' issues. With their traditional understanding, these countries approach water disputes as one of the threats to national security and find themselves in a zero-sum game in which effective cooperation can not be expected. Turkey, as the upstream country of the Euphrates-Tigris Basin, is an example of these countries though economic, cultural, environmental and humanitarian issues have started to factor in the analysis alongside traditional hard security conceptualization (Aydin 2003: 178). The other riparians of the Euphrates-Tigris basin (Syria and Iraq) also possesses similar views in their approach to the water issue. In this regard, it is hard to expect cooperative structures among them, though not impossible as will be shown below.

This chapter focuses on the discussion over the waters of the Euphrates-Tigris (*Fırat* and *Dicle* in Turkish) river basin, analyzing the tension between the three riparian states: Turkey, Syria and Iraq (45.2). The technical data about the available water resources, water use and demands of the riparian countries and the underlying reasons of the tension between them, as well as their conflicting arguments and initiatives for cooperation will be discussed. It will be argued that their dispute over water has a clear connection with the level of overall relationship between them. As the 'basins at risk' (BAR) project, a comprehensive quantitative global exploration of the relationship between water and conflict, demonstrates, the countries that cooperate with each other in general also cooperate over water issues and *vice versa* (BAR Project 2002). The chapter will also show that, although the current literature of the water sharing disputes is inclined to see the opportunity for cooperation solely in connection with the efforts of the powerful upstream riparian countries, for positive-

1 The *global environmental security* approach (part VIII, chap. 59 to 73) differs from traditional studies that focus on environmental problems as threats to national security, with its primary focus on threats to the environment itself. The *human security* approach (part IX, chap. 74–96) though also emphasizes the protection of the environment for the broader human security, avoid privileging any aspect of security, thus the environment (Sheehan 2005: 109–112).

Figure 44.1: General Layout of the Euphrates-Tigris Basin. Source: Altınbilek (2004: 17).



sum results the actions of the downstream states serve a critical function, where uncompromising and unreasoned rhetoric against the upstream states leaves no room for further steps towards an agreement (Williams 1997: 77).

44.2 The Euphrates-Tigris River Basin: Scarce Water and Unsatisfiable Demands

The Euphrates and Tigris rivers emerging from the highlands of Turkey are often considered as forming one basin (al-Qudsi 1995: 175; McCaffrey 1993: 93; figure 44.1). The River Euphrates (table 44.1) emerges where the Murat and Karasu rivers join each other in Keban, around the town of Elazığ and flow through Turkish, Syrian and Iraqi territories without enriched

Table 44.1: Potential Water Demands on the Euphrates (mcm). **Source:** Beaumont (1998: 179).

Country	Irrigation Water Use	Evaporation	Total
Turkey	10.830 - 13.000	1.100	12.000 - 14.000
Syria	4.750 - 12.500	630	5.400 - 12.600
Iraq	24.400 - 27.500	600	25.000 - 28.100
Total Demand			42.300 - 54.800
Available Water			31.800
Balance			-10.500 - -23.000

Table 44.2: Potential Water Demands on the Tigris (mcm). **Source:** Beaumont (1998: 182).

Country	Irrigation Water Use	Evaporation	Total
Turkey	5.600 - 6.700	630	6.200 - 7.300
Syria	0	0	0
Iraq	37.200 - 60.000	1.00	38.200 - 61.000
Total Demand			44.400 - 68.300
Available Water			52.700
Balance			+ 8.200 to 15.700

by any other stream in the latter. It merges with the River Tigris near the Gulf and becomes the Shatt al-Arab which flows into the Gulf. The entire length of the Euphrates is 2,780 kilometres. A total of 35 per cent of the river's basin is in Turkey, 22 per cent in Syria and the remaining 43 per cent in Iraq. The average annual discharge of the Euphrates is about 32 bcm (billion cubic meters) and Turkey contributes approximately 90 per cent of its waters, whereas Syria contributes the remaining 10 per cent and Iraq makes no contribution to the run-off (en 1999; Kibaroglu/Ünver 2003; MacQuarrie 2004).

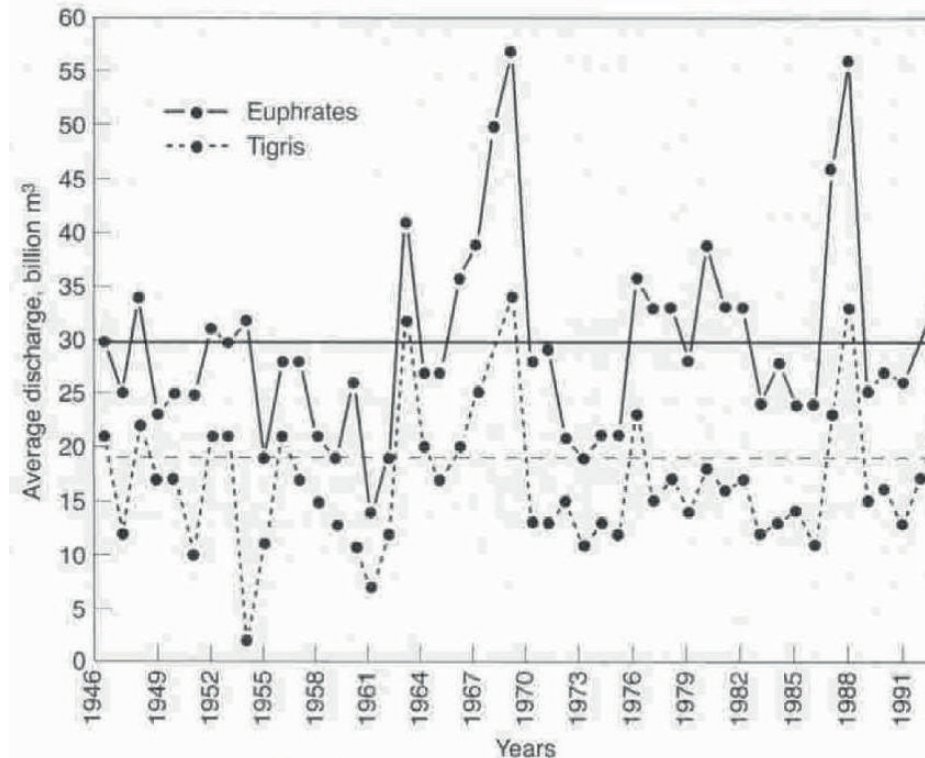
The Tigris (table 44.2), originating from the eastern Anatolia's Hazar Baba Mountain range, is 1840 kilometres long and flows through Turkey for 532 kilometres, follows the Turkish-Syrian border for 30 kilometres and the Syrian-Iraqi border for eight kilometres, and enters the Iraqi territory reaching the Gulf after joining the Euphrates near Kurna. The average annual discharge of the Tigris is about 53 bcm and Turkey's contribution is 40 per cent of the total annual flow, whereas Iraq contributes 51 per cent. The remaining 9 per cent is contributed by waters from Iran; Syria has no contribution into the Tigris (en 1999; Kibaroglu/Ünver 2003; MacQuarrie 2004).

Although looking solely to the total amount of water carried by the Euphrates and Tigris, it can be argued that they should be sufficient to satisfy the demands of the three riparians, physical characteristics of the rivers and fluctuations coupled with the effects

of development projects reduces the available supply of the rivers, thus creating seasonal shortages for lower riparians. Though technical data on the available water and water demands are disputed among riparians (for national figures see for example: MFA 2005; DSI 2006a; Iraqi MoW 2007; AQUASTAT-FAO 2006), it is clear that the waters of the Euphrates and Tigris are scarce resources, especially problematic for satisfying irrigation demands. Water demands estimates for the Euphrates show that the potential water deficit might be as high as from 10,500 to 23,000 million cubic meters/year (mcm/y) whereas with minimum data estimates the waters of Tigris will be sufficient with a surplus of 8,000 mcm/y, but the maximum values shows a deficit of 15,700 mcm/y.

To draw a reliable conclusion on the adequateness of the amount of water, not only the total amount of available water but also the estimated annual volume of water available per capita should be taken into account. In this respect, the picture is not good even for Turkey which is generally counted as rich in terms of existing water potential. According to the *UN World Water Development Report* (2006: 133-135), the total amount of water resources of Iraq, Syria and Turkey are 75.42 bcm/y, 26.26 bcm/y and 229.30 bcm/y respectively, while the per capita annual water shares are 2.920 cubic meters (m³) for Iraq, 1.440 m³ for Syria and 2.950 m³ for Turkey.² These figures show that the three riparians have insufficient water resources and could be classified as 'water stressed countries'.³

Figure 44.2: Average Annual Flow Values for Euphrates-Tigris Rivers. **Source:** Altınbilek (2004: 19).



The irregularity of the flow both between years and within years of the Euphrates-Tigris river system is also a considerable factor affecting the availability of water for the riparians. There are vast differences between monthly flows (which is nearly 80-fold for the Tigris and 28-fold for the Euphrates) and this irregularity causes not only extensive flooding, but also losses of water required for irrigation and power generation purposes during the much-needed summer season. Annual flows of the rivers are also instable as shown in figure 44.2, making it harder to compromise over the amount of available water per country (Altınbilek 2004: 18–19).

Moreover, with the high population growth in these three countries, the amount of water available per person will shortly decline to serious low levels.

- 2 In Turkish official documents the total available amount of water for Turkey is indicated as 193 bcm, while the available annual volume of water per capita for the year 2000 is stated as 1500 bcm (DSİ 2006: 4–5).
- 3 Those countries that have less than 1000 cum annual water volume per capita are classified as *water poor*; while countries with less than 2000 cum/y water volume per capita are classified as *insufficient* or *water stressed*; and those that have an amount of water more than 8,000–10,000 cum as *water rich* countries.

According to the General Directorate of State Hydraulic Works, the annual available amount of water per capita in Turkey will be about 1,000 m³ by the year 2030 as a result of Turkish population reaching an estimated 100 million (DSİ 2006: 5). As for Syria it is forecasted to decline to 770 m³ per person by the year 2025 (UN Economic and Social Commission for Western Asia 2006: 7). The expected decrease of the available water rate is similar for Iraq while an increase of two-fold of the population is estimated (Zawahri 2006: 1045).

Furthermore, all three riparian countries have vast irrigation plans along the Euphrates-Tigris Basin. Syria aims to increase its irrigated area along the Euphrates from officially reported 863,300 hectares (ha) to 1.4 million (ha) (Kibaroglu 2002: 199). Iraq has already undertaken a number of water management schemes on the Euphrates to irrigate 1 million ha and the waters of the Tigris are used to irrigate 2.2 million ha, as well as the Shatt al-Arab is used to irrigate 105,000 ha, though the current picture is uncertain due to the economic disruption caused by wars (Olçay 2004: 389–90). Turkey plans with its Southeastern Anatolia Project (Turkish acronym GAP) to cover an irrigated area of 1.8 million ha. 65 per cent of the total amount will be irrigated using Euphrates and 35 per cent will

be irrigated through Tigris (DSİ 2006: 11). As⁴ a result of these plans, irrigation demands will increase and cannot be satisfied by the actual water volumes (see the chap. 35 by Kapur/Kapur/Akca/Eswaran/Aydin).

In addition to the population growth and irrigation demands, the inefficient use of water, especially in Syria and Iraq, is another cause of the stress over the water resources of the basin. The main problem is excessive use of water for irrigation as a result of outdated irrigation systems. According to a World Bank Report (2001b: XI, XIV), improvement in water use efficiency through both irrigation efficiency development and utilization of less water-intensive crops appear to be the primary avenue for increasing water availability for Syria in the short term, and in the longer term it needs a comprehensive structural reform in all its agricultural production system. However, the capacity of the government organization for support such a water management is limited as the report indicates.

Iraq faces similar problems because of an un-modernized irrigation system and thus excessive use of water. According to Sultan, Becker, Al-Dousari, Al-Ghabdan and Bufano (2003: 19), Iraq should immediately develop nationwide programmes to modernize water usage and alternative water resources (e.g. groundwater and non-conventional water resources) instead of exerting all its efforts to water allocation issues with its neighbours. On the other hand, the rate of the water consumption for irrigation in Turkey's total use of water is also remarkable with 74 per cent (industrial consumption is 11 per cent and water supply is 15 per cent) but its modernization programme is well-developed compared with Syria and Iraq.

The current conditions of the Syrian and Iraqi agricultural and irrigation systems indicate that they are far from carrying out their vast irrigation plans in the near future and therefore their demands based on an estimated future irrigational water use seems exaggerated.

44.3 The Euphrates-Tigris Dispute: From National Development to National Security

Until 1960's the main user of these two rivers was Iraq. Turkey had focused on Western Anatolia for water resource development until the late 1960's (Rob-

erts 1991: 157), when the Euphrates and Tigris attracted energy-hungry Turkey's interest for their potential in producing hydro-electric energy for industrial development as rapidly as possible (Kolars 1986: 62). Syrian and Iraqi interests in harnessing the waters of the Euphrates, on the other hand, are closely associated with their agricultural productions. These demands exacerbated by requirements of national economic developments of the riparian countries turned the water issue into a serious concern over national security and even survival. Over the years, the issue of water security has been intertwined more and more with hard security issues, and it became difficult to discern the genuine causes of disputes and to make a judgement whether the essential cause of the conflicts between the riparians is water or another aspect of their relationship. However, a detailed analysis of the riparian relations will show that the water issue is deeply connected to the overall relations of the three countries and that a rapprochement between the riparians in other areas of cooperation could induce a cooperative structure regarding the water issue.

44.3.1 Historical Background

It was not before 1970's that the use of the water of the Euphrates-Tigris Basin has become an inducement of major disagreements between the three riparian countries. However, regulations over water have been a subject in the relationship between these countries since the 1920's. First regulations were made in 1921 with the Ankara Treaty between Turkey and France (the then mandatory power in Syria) that included an article over the equitable use of the Koveik Water (flows from Turkey to Syria) to ensure water supply to Aleppo, and in 1923, article 109 of the Lausanne Treaty pointed out that issues over transboundary waters should be dealt with separately and in a way of mutual respect (Kut 1994: 225). There was also an agreement between Syria and Turkey signed in 1939 regarding the equal share of the water of the Orontes (Asi) River. The first regulation related to the Euphrates-Tigris rivers were made in 1926, an agreement over the Turkish-Syrian frontier which stipulated commitments of joint usage of the Euphrates (MacQuarrie 2004: 61). Another and more known agreement of the Euphrates-Tigris is the Friendship and Good Neighbourliness Treaty signed in 1946 between Turkey and Iraq, which committed Turkey to inform Iraq of its plans for construction works on the rivers.

Like the regulations, the first dispute over water between the three countries was not about the

4 Currently the area that are in operation is 213,924 ha; under construction 160,260 ha and planned 1,351,471 ha.

Euphrates-Tigris waters, but the Orontes (Asi) River when Syria attempted to initiate the Ghab Valley project in 1950 (Kut 1993: 4). Turkey as a downstream riparian of that river felt uneasy with this project fearing that Syria would decrease the flow of water. Half a century later, it became clear that Turkey's fears were not without grounds as Syria, notwithstanding its commitment to the 1939 arrangement of equal share of the water, leaves generally very few and depending on the seasonal variation nearly no water flows into the Turkish province Hatay (Picard 1994: 217). Due to Syria's refusal of negotiation on the Orontes (Asi) River, this issue has been left unresolved.

After establishing the General Directorate of State Hydraulic Works (Turkish acronym DSI) in 1954, Turkey entered incrementally the phase of planning to develop the Euphrates' waters. Syrian plans on the Euphrates and Iraqi plans on the Tigris also began simultaneously. The activities of Syria and Turkey in ambitious development plans on the Euphrates-Tigris Rivers for irrigation and energy increased during the early 1960's. Although Iraq also announced new projects for irrigation, its efforts remained modest compared with Syria and Turkey.

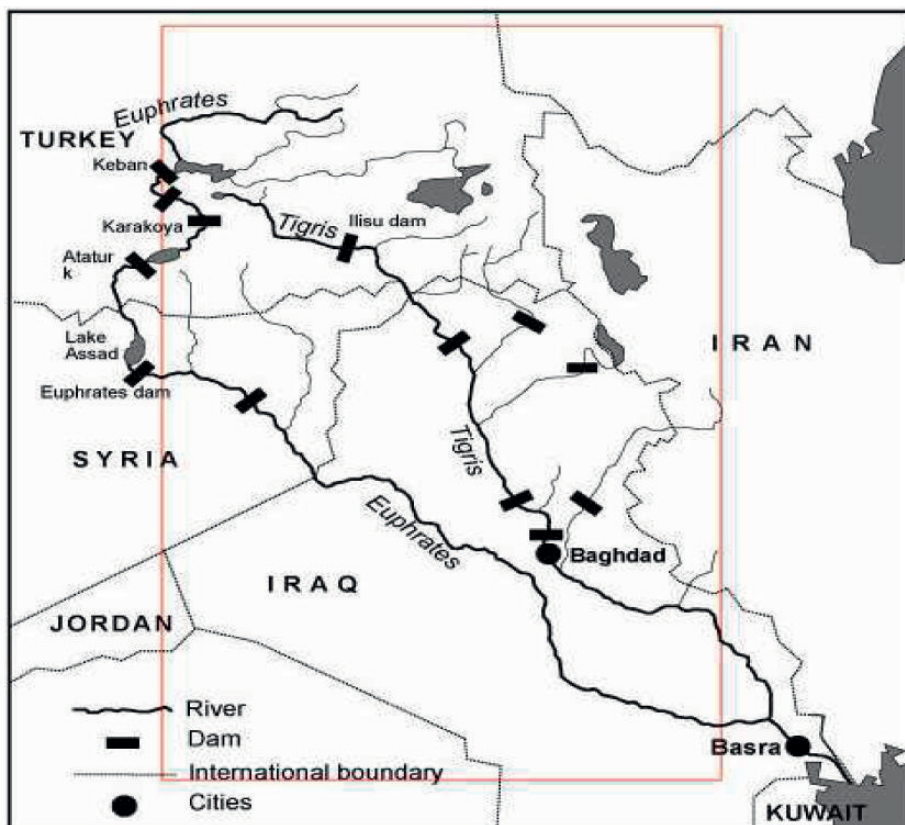
Turkey put into practice its first project with the construction of the Keban Dam in 1965 on the Euphrates, which moved the relationship between the three riparian states into a new phase over water development. Iraq and Syria as downstream riparians began to express their demands for guaranteed flows of 350 cubic meters/second (m^3/sec) at a minimum during the impounding period. Turkish and Iraqi experts held a meeting in 1964 on this issue and although Turkey stated that a final formula for the flow of water could not be reached before the impounding of the dam. Turkey guaranteed the release of $350 m^3/sec$ as minimum after the negotiations. However, this unilateral guarantee was prompted by the conditions of an agreement reached between Turkey and U.S. Agency for International Development (USAID) on financing the construction of the Keban Dam than by the demands of Syria and Iraq (Kut 1993: 4). Nevertheless, the idea of establishing a Joint Technical Committee (JTC) between the three riparians was raised for the first time during this meeting held with Iraq in connection with a proposal by Turkey to establish a regular technical body between riparian countries (Kibaroglu/Unver 2003: 4). After another bilateral meeting held between Syria and Turkey in 1964 during which information of the two countries' dam construction projects (Turkey's Keban Dam and Syria's

Tabqa Dam) were exchanged, the first trilateral meeting was held in 1965 in Baghdad. Besides the exchange of technical information on the Keban, Tabqa and Haditha (Iraq) dams, the negotiations were concentrated on the draft agreement submitted by the Iraqi delegation to establish a permanent *Joint Technical Committee* (JTC). However, Turkey strongly refused the status of the JTC with powers to supervise a water sharing agreement as proposed in the Iraqi draft. In the meantime, the Syrian suggestion to divert the waters of the Tigris to the Euphrates to compensate water shortages in Iraq faced strong opposition from Iraq. Although no agreement was achieved, technical meetings continued to be held between the three riparians.

This relative cooperative scene was changed when the Keban and Tabqa dams became operational a year apart, and the first major crisis between the riparians erupted in 1975. During the impounding of the Tabqa and Keban dams in 1974 and 1975, Iraq accused Syria of reducing the water flow to an intolerable level. Syria on the other hand refused to take the blame, and in turn accused Turkey of reducing its water flows. While Iraq was not satisfied with this response, the tension increased to a level which brought both countries to the brink of an armed conflict that was averted due to intense mediation efforts of Saudi Arabia (Naff/Matson 1984: 93-95).⁵ Iraqi accusations of Syria regarding the amount of the flow of water repeated on several occasions.

In the mean time, Turkey's second major step in its plan for developing the Euphrates was initiated the same year when the construction of the Karakaya Dam started. Iraq reacted to this by cutting its oil exports to Turkey in 1977 and called for an immediate debt repayment. Iraq resumed its oil supplies in 1978, when Turkey agreed to a $500 m^3/sec$ flow during the impounding of the dam (Scheumann 2003: 748). In any case, both the Karakaya and Keban dams were designed solely for hydroelectric power generation and therefore did not require any water consumption. In fact, instead of causing harm, these two dam's impact on downstream users was beneficial as they regulated the river discharge (Roberts 1991: 158). But, the worst crisis erupted when Turkey decided to proceed with

5 As a result of Syria's unilateral decision at this time to release an additional amount of water from Tabqa Dam, Iraq came to regard this decision as an unwritten agreement about apportion of the Euphrates waters for 40 per cent to Syria and 60 per cent to Iraq (Naff/Matson 1984: 94).

Figure 44.3: Dams in the Euphrates-Tigris Basin. **Source:** Allan (2002, Annexes).

its comprehensive *Güneydoğu Anadolu Projesi* [Southeastern Anatolia] (GAP) Project that prompted fierce opposition from both downstream countries due to their fear of a reduction of the water flows and subsequent possible harm to their own agricultural and energy projects.

44.3.2 The Development of GAP and Worsened Relations

The GAP was initially undertaken as a programme to develop water and land resources of the south-eastern Turkey and planned as a package comprising 13 projects envisaging irrigation schemes and hydraulic power plants in the Turkish part of the Euphrates and Tigris basin. As a whole, the package included 22 dams, 19 hydraulic power plants and irrigation of 1.8 million hectares of land. It is expected that upon the completion of the project, energy production in the region would reach 27 billion kWh, per capita income will rise 209 per cent and about 3.8 million people would be provided employment opportunities (GAP RDA 2006: 2; see the chap. 35 by Kapur/Kapur/Akca/Eswaran/Aydin).

Table 44.3: GAP Land and Water Resources Development Projects. **Source:** GAP Regional Development Administration (2006: 2).

EUPHRATES	TIGRIS
Karakaya Dam/HPP	Kralkızı Dam/HPP
Atatürk Dam and Şanlıurfa Tunnels	Batman Dam
Border Euphrates (inc. two dams/HPP)	Batman-Silvan (two dams)
Suruç-Baziki (irrigation projects)	Garzan Dam and irrigation projects
Adıyaman-Kahta (two dams)	Ilisu Dam
Adıyaman-Göksu-Araban (irrigation projects)	Cizre (dams/HPP and irrigation projects)
Gaziantep (irrigation projects)	

As the technical information shows, the GAP is above all a domestic project to develop a very poor region of Turkey. It is expected to affect the entire structure of the region in its economic, social and cultural dimensions through a process of transformation to be trig-

gered by agricultural modernization (Bağış 1994: 18). Yet the main problem that prompted the strong opposition from both downstream countries lays actually in this fact. With the GAP, Turkey shifted its emphasis from its mainly hydroelectric use of water to an integrated project, including broad irrigation schemes (Çarkoğlu/Eder 2001: 59). Because irrigation meant that Turkey would increase its water consumption with a possibility of reduced water flows, Syria and Iraq reacted anxiously with an effort to hinder the development of the project. The first considerable attack towards the GAP came when Turkey sought for additional international funding. Syria and Iraq succeeded through their ability in mobilizing the entire Arab world to thwart the World Bank funding for the GAP. Since donors demanded a comprehensive agreement between the riparian countries, Turkey approached Syria and Iraq to negotiate an agreement but was rejected by them (Zawahri 2006: 1046). While Turkey eventually decided to finance the GAP through its own means, this caused both a slow down of the GAP project, and the decline of Turkey's economic rationale for seeking downstream riparian countries' approval for its project (Williams 1997: 74).

Although Iraq was more active in the above mentioned incident, during the 1980's the water issue was not the main problem on its agenda because of the Iran-Iraq war. When Syria in 1982 shut down the pipelines transporting Iraqi oil to the Mediterranean through Syria, Iraq's dependence on Turkey increased since the only outlet for Iraqi oil was through Turkey (Çarkoğlu/Eder 2001: 59). Syria on the contrary began to play the terror card against the GAP. Damascus was providing the PKK (Kurdistan Workers' Party) forces with training and equipment and was also a major patron of the ASALA (Armenian Secret Army for the Liberation of Armenia) which conducted terror attacks on Turkish representatives abroad, killing over 40 Turkish diplomats and citizens between 1973-1983. In this context the water issue and Syrian support for terrorist organizations acting against Turkish interests were linked and the dispute of water became a national security concern for Turkey with strong ties to territorial integrity.

44.3.3 The JTC: Cooperation in a Hostile Environment

Through the worsening of the relations in the early 1980's, the *Joint Technical Commission* (JTC) that has been under discussion since the 1960's was established and many meetings were held until 1993 when

it was discontinued. The formation of the JTC was agreed in a meeting of the Turkish-Iraqi Joint Economic Commission in 1980 and held its first meeting in 1982. Syria joined the JTC in 1983 and up to 1993 sixteen meetings were held. The 17th meeting that was scheduled for 1993 was cancelled by Syria's decision not to attend along with strongly worded accusations against Turkey in December 1992. Syria accused Turkey of "intransigence, violation of international law, usurpation of rights, misuse of right, lack of desire to improve atmosphere of relations, imposing conditions and resorting to procrastination to delay final agreement on sharing Tigris and Euphrates waters" (TFDD 2003). Since then no JTC meeting has been held. The mandate given to the JTC was defined as to "determine the methods and procedures which would lead to a definition of the reasonable and appropriate amount of water that each country would need from both rivers" (Kibaroglu/Unver 2003: 6).

The JTC failed in performing its goal and except the exchange of technical data no progress was made on water allocation. Among others, the most important reason for the failure was that all three countries differed in their approaches on the description of both rivers. While Syria and Iraq claimed that the rivers are *international watercourses* which can be classified as *shared resources*, Turkey argued that since both rivers emerged and gathered their waters in one country (Turkey) and then cross international borders, the rivers are *transboundary waters*, as opposed to *international rivers*. Reaching an agreement about the rivers proved impossible when the riparians disagreed on their classification. The difference in definition emerges from different interpretations by riparian countries on international law on water resources, and remains the main source of the dispute. Accepting the Euphrates and Tigris as international waters would require an *equal share* of the water, as Syria and Iraq have claimed. On the other hand the transboundary waters in Turkey's approach implies that Turkey has sovereign rights over the use of these waters and they are not subject to sharing but only to *equitable and reasonable use* without prejudice to sovereign rights by states' obligation *not to cause appreciable harm* to others. In other words, Syrian and Iraqi interpretations stressed the principle of sharing waters to the fore while Turkey's perspective emphasized the principle of optimal and rational utilization of waters.

In addition to the disagreement over the classification, the three riparian countries could not agree on which waters to negotiate. Turkey claims that for an

efficient allocation, they should not only negotiate on the Euphrates and Tigris rivers, but on all the waters that contribute to the riparians' total water amount. However, Syria and Iraq wish to abstain from including the waters of Orontes (Asi) and the waters flowing to Iraq from Iran into the negotiations. Turkey has also argued that both rivers should be seen as a *single water system* since both join before reaching the Gulf, while Syria and Iraq have objected to this interpretation, arguing instead that each river should be discussed separately (Çarkoğlu/Eder 2001: 58).

During the period when the JTC was active, major crises occurred between Syria and Turkey. First, in 1983 Syria blamed Turkey for the water shortage in the Lake Assad. Then in 1984 Turkey submitted a *three-stage plan* to the JTC. Although it was meant as a step towards an agreement, it became another obstacle to an efficient cooperation. The plan rested on two principles; the first is that the Euphrates and the Tigris make up a single *transboundary river system*, and secondly that the three countries need to work together on preparing and assessing a common inventory of water and land resources in the basin. To reach the most efficient allocation of the available water resources, the Turkish proposal suggested to proceed in three stages: In stage one, an inventory of water resources would be made, in the second stage the inventory would be made of land resources and in the third and last stage in light of the outcomes put forward by the inventories, the most efficient methods of irrigation would be established (MFA 2005: 1). The plan suggested the application of appropriate technologies in order to minimize water requirements for agriculture and proposed to allocate resources 'equitably', according to the needs of the riparian states and benefits they would get using their allocated amounts (Kibaroglu 2002: 256).

It was rejected by Iraq and Syria mostly because it appeared that the results would have favoured Turkey (Zawahri 2006: 1047). Instead, they proposed an arithmetic formula, whereby the waters would be shared 'equally' but not 'equitably' as the new formula did not consider the discrepancies between the riparian states' actual needs for water (Kibaroglu 2002: 256). While discussions in the JTC meetings on the plan were continuing another tension arose between Syria and Turkey during the filling of the Karakaya Dam in 1986. Syria again raised its voice claiming reductions of the water flows and Turkey responded by ordering higher water releases for the downstream countries (Scheumann 1998: 121).

This was followed by a signing of two protocols between Turkey and Syria in 1987. The first one was an economic cooperation agreement but at the same time it included an article that contained a unilateral commitment by Turkey to "release a minimum annual average of 500 cum/sec from the Euphrates until the ultimate allocation of the river's waters between the three countries", thus making this protocol the first bilateral agreement which dealt with water sharing. The second protocol was a security cooperation agreement and it was related to Turkey's pressure on Syria for ending its support to PKK terrorism (Kut 1993: 8). This is a clear indicator of Turkey's approach in that security and water issues are intertwined. However, Turkey saw immediately after the signing of the protocols that its expectations were not met by Syria when the dramatic increase in the activities of the PKK occurred in 1988. Thereupon, Turkish governmental circles discussed playing the water card in response to Syria's play with the Kurdish card, but did not put them into practice (Scheumann 1998: 121).

Turkey developed another initiative in 1988 regarding water sharing in the Middle East. It proposed to establish two parallel pipelines carrying fresh water supplies from the Turkish rivers of Seyhan and Ceyhan to Syria, Jordan, Israel, Palestine, Saudi Arabia and the Gulf States. Named appropriately as the *Peace Pipeline Project*, it was rejected by the Arab countries due to a fear of dependency on Turkey and the involvement of Israel as well as the high cost estimates (Martin 2000: 91).

The 1990's started with major tensions between the three riparians. In January 1990, Turkey began to divert water from Euphrates in order to fill the Atatürk Dam reservoir. Although Turkey had notified its downstream neighbours and released twice the usual amount for two months prior to the impoundment (Kibaroglu/Ünver 2003: 6), Syrian and Iraqi protests could not be stopped. Turkey also sent delegations to other Arab countries to prevent the perception that this cut-off was a political manoeuvre to oppress its neighbours (Bağış 1994: 20). Nevertheless, Turkey was unable to prevent a pan-Arabic outcry against Turkey and the incident triggered an Iraqi-Syrian rapprochement in joint opposition to Turkey over the water issue. The two longstanding rivals signed an agreement for sharing the waters of the Euphrates under which Syria would receive 42 per cent and Iraq 58 per cent of the flow reaching their territory from Turkey. This rapprochement since then, except the rift during the Gulf War due to the Syrian participation in

the U.S.-led coalition forces, has continued (Berman 2002: 44).

On the other hand Iraq indicated its dissatisfaction with Turkey in 1990, by refusing to renew the security protocol signed in 1984 under which Turkey had the right to follow Kurdish terrorists into the Iraqi territory. Turkey's support to the coalition forces during the Gulf War worsened the relations and Iraq declared after the war that, if normal relations between Turkey and Iraq were to continue, the final arrangement of the water issue was essential (Bölükbaşı 1999: 29). During the Gulf War, although there were behind the scene suggestions to Turkey to cut-off of the Iraqi water supply in response to its invasion of Kuwait, Turkey declined to do so (Gleick 1993: 89; Aydin 2002: 59).

Another phase of Iraqi and Syrian protest over the water issue came in 1996 when Turkey started the construction of the Birecik Dam. Even though this dam was designed only to regularize the water level and therefore was not consumptive, both Syria and Iraq opposed its construction by sending official notes to Turkey (Kıbaroğlu/Ünver 2003: 7). In the same year, Syria made a diplomatic bid to acquire more water from Turkey during the Syrian-Israeli peace negotiations. Syria tried to persuade both the United States and Israel to exert pressure on Turkey to supply it with more water, to compensate it for the loss of Golan Heights' water resources. Turkey rejected the Syrian effort to make the availability of the waters of the Euphrates a precondition for the Middle East peace negotiations (Sever 2001: 91). Syria repeated this move in 2000 when Syrian-Israeli negotiations over the Golan Heights restarted but Turkey successfully stopped such a deal at its expense with strong protests (Çarkoğlu/Eder 2001: 62).

The tension between Syria and Turkey escalated in 1998 when Turkey issued an ultimatum that it was ready to resort to military means if Syria continued to support the PKK and to host its leader in Damascus. In response to Turkey's massing of troops along its border, Syria expelled Abdullah Öcalan, the leader of the PKK, from its territory and the two countries signed the Adana Accords in 1999 where Syria agreed to stop its support for the PKK (Altunışık 2004: 367). This eased up Turkish-Syrian relations in general, having also a positive effect on the water dispute between the two countries, though not yet to the level that they were finally able to shelf the problem once and for all.

44.3.4 Opportunities, Expectations and Steps for a New Phase of Cooperation

The 2000's witnessed an increasing rapprochement between Iraq and Syria, as well as a gradual warming up of the relationship between both countries and Turkey, including the water issue. Here the first step was the opening of the Iraqi and Syrian talks on the sharing of the Euphrates waters in 2001: While Turkey was uninterested in tripartite negotiations on water sharing despite Syria's call⁶ to Turkey to join such negotiations, unexpectedly Turkey signed a Memorandum of Understanding (MoU) with Syria in August 2001 promising further cooperation on agricultural water research and training. During a visit to Syria in 2002 by the Turkish Minister of Irrigation, it is agreed to implement the 2001 MoU,⁷ though no substantial progress has been achieved yet. Since then Syria and Iraq had repeatedly announced their wish and the need to restart the JTC meetings. Although no trilateral meetings were held until end of 2006, the growing number of bilateral meetings mainly on exchanging technical information has created a noteworthy climate of cooperation.

Turkish policy towards the war on Iraq had another improving effect on its relationship with Iraq and Syria as well. After the rejection of the Turkish Parliament of the deal that would have allowed U.S. troops to pass through Turkish territory to open a northern front in the war, although the situation in Iraq has still punctuated with uncertainties (particularly the future of the Iraq as a unitary state has been a concern for Turkey), the atmosphere between Turkey and Syria raised hopes for an effective cooperation between them over the water issue. For example, during the visit of Bashar Asad to Turkey in January 2004, there was an extra positive mood especially in Turkey as if all its problems between both countries were about to be solved.⁸ It was mainly as Asad said in an interview to the Turkish CNN Türk TV that "...when we improve the relations more, we will see

6 "Damascus Hopes of Turkish participation at negotiations about the Tigris", in: *Arabic News Online* (26 March 2001).

7 "Syrian Turkish Water Coordination", in: *Arabic News Online* (23 August 2002).

8 While some parts of the Turkish media support this view (i.e. Mehmet Ali Birand in an article in a Turkish daily newspaper *Milliyet* on 7 January 2004), some were critical about turning a deaf ear to the real problems (i.e., Serpil Yılmaz in the same newspaper on the same date).

that our interest are the same, even on the issue of water.” This statement clearly indicated that water has become a problem among the riparian states in connection to their overall relations. On the other hand, it would be a mistake to overemphasize the current positive climate since no tripartite meeting on the water issue has yet taken place and the approaches of the three countries still diverge.

In late 2006, Iraq has tried to mobilize a diplomatic campaign against Turkey’s decision to start the building of the Ilisu Dam on the Tigris River. Iraq asserted that the irrigation projects of Turkey on the Tigris, and especially on the Ilisu Dam, will deprive thousands of hectares of Iraqi lands of water and that all irrigation projects Turkey intended to construct on the Tigris River will cause a reduction of about more than half of the water quantities (estimated about 11 billion m³/year) currently reaching Iraq (MoW: 2006).

While the positions of the riparian governments has not made enough progress towards an effective cooperation, track-two efforts for cooperation have produced a result: The Euphrates Tigris Initiative of Cooperation (ETIC) was established in 2005 with the initiatives of scholars from the three riparians and the USA. It aims to provide opportunities for dialogue among the riparians; develop project concepts that will be attractive to decision makers and implementers in the region; create sub-networks by bringing together different private stakeholder groups including farmers, community-based organizations, NGOs, business and professional societies; provide a venue for public officials and professionals to address common problems; implement joint pilot projects that benefit all riparians; increase public awareness regarding the issues in the Euphrates Tigris region; facilitate education and capacity building to ensure sustainability for cooperation and development (ETIC 2007: 3). Although ETIC is an important step towards creating cooperative structures among the riparians, the history of the relationship between the riparians clearly indicates that, in order to get desired results, it is imperative to engage the states.

44.4 Conclusions

Water is first of all a vital resource for human security, as well as for the socio-economic development of states. Thus, water scarcity makes it instantly a ‘national security’ issue, as in the case of Euphrates-Tigris Basin. In one respect, the ongoing dispute over the

water issue between Turkey, Syria and Iraq is an outcome of the inter-state relations but it can also be argued that the water issue is mainly related to the development plans of the riparians. The situation is so complex that it has political, economic, social, and ethnic dimensions and comprises terror and conflict along with cooperation. Even the classical idea to use water as a weapon has a place in this case, as it was discussed during the Gulf War.

In this complex web of relations where non-water issues are as important as they are, the way for an effective solution seems hard to find. The best option for a peaceful resolution may be based on international law, but the law on the shared water resources is still emerging. The *1997 Convention on the Law of the Non-Navigational Uses of International Watercourses* is the most important international instrument that specifically focuses on shared water resources but it is not yet in force. Only 12 countries have ratified the Convention that requires 35 ratifications to enter into force. However, it is increasingly used as a framework, at least for the analysis of water sharing issues. But even if it will be implemented, a problem on the Euphrates-Tigris Basin would remain as Turkey was one of three states (besides Burundi and China) who opposed the Convention in the UN General Assembly. Iraq did not vote whereas Syria voted for the Convention and has already ratified it in 2000 (Allan 2001: 302–3). Moreover, Turkey’s opposition was strong and it asserted that “...the draft convention goes far beyond the scope of a framework convention and in contradiction to its intent and nature establishes a mechanism ... [which] creates an obvious inequality between states...” (UN General Assembly 1997: 4–5). This is not surprising since Turkey’s approach towards transboundary waters has been that the originating country has sovereign rights over the waters until they left its borders.

In this context, the improvement of the overall relationship and an effective cooperation between Turkey, Iraq and Syria to a level to conclude a comprehensive agreement would be the most appropriate expectation to solve the water-related disputes among the three countries. The idea that the best solution is “sharing the benefits not the water” (Kibaroglu/Ünver 2003: 1) can be fulfilled with such a cooperative relationship. The continuing rapprochement among the three riparians has been encouraging. However, if and how this level of cooperation could be intensified has remained uncertain due to the ambiguity on Iraq’s future as well as the continuing zero-sum perception of the countries vis-à-vis their water rights.

45 Water Resources in the Arab World: A Case Study on Jordan

Bassam Ossama Hayek

45.1 Introduction

Water is vital to sustain lives of the people of the planet earth. Water resources available for use are only three per cent of the total available water. Due to the uneven distribution of the usable water, some nations are deprived from the minimum amount, while other nations receive too much water and in some areas floods cause disasters. People living in areas of scarce water resources became increasingly vulnerable due to increasing water demand from a growing population and the associated needs for development and food security. In water scarce areas, water is a very valuable commodity and water saving is essential. Many people in the Middle East have experienced water scarcity in their daily life.

In Jordan availability of water is a top priority. For his Majesty King Abdullah II water in Jordan is a strategic challenge that cannot be ignored, and that a balance among the drinking, industrial, and agricultural needs must be achieved, while drinking water remains the main and the most important subject.¹ The per capita share of renewable fresh water resources declined from 905 m³/year in 1955 to 327 m³/year in 1990 and is expected to decline to 121 m³/year in 2025 (Royal Scientific Society 2000).

Most Arab countries are located in the arid and semi arid area, thus water availability is a major challenge due to population growth and development needs. According to the *World Resources Institute* (WRI) with regard to fresh water availability, most Arab countries suffer from severe water shortage (figure 46.1). Abdin Salih (1995) claimed that in 1990 the per capita water resources in the Arab world were 1490 m³/year, which are projected to decline to around 440 m³/year in 2030 assuming a three per cent population growth. This illustrates the degree of water insecurity the Arab region is facing. Since the

year 2000 water scarcity started when the available water per capita started to fall below the bench mark of 1000 m³/capita/year (Salih 1995: 53). Due to the continuous increase in urbanization and industrialization the water competition will be at the expense of the agricultural sector what affects the culture and security of local communities.

The availability of food is also a major concern in arid and semiarid regions. With the shortage of water resources, people suffer from securing the amount of food needed for a healthy diet. Due to high population growth 'food security' and 'water security' may become a major cause for crises.

This chapter analyses the case of Jordan's water and food (45.2). A background of its water status is given linked to demographic change, present water uses and future needs (45.3). Then current official plans for meeting the future water demand based on comprehensive studies are summarized (45.4). The key question is how Jordan will be able to adjust its economic practices to cope with this challenge, what the role of policy-makers will be, and which contributions will be needed from the international community (45.5). This analysis is based on available data and scenarios. It compares present water uses with future water needs and the projected supply, taking current and future national plans, the role of institutions and the international community into consideration.

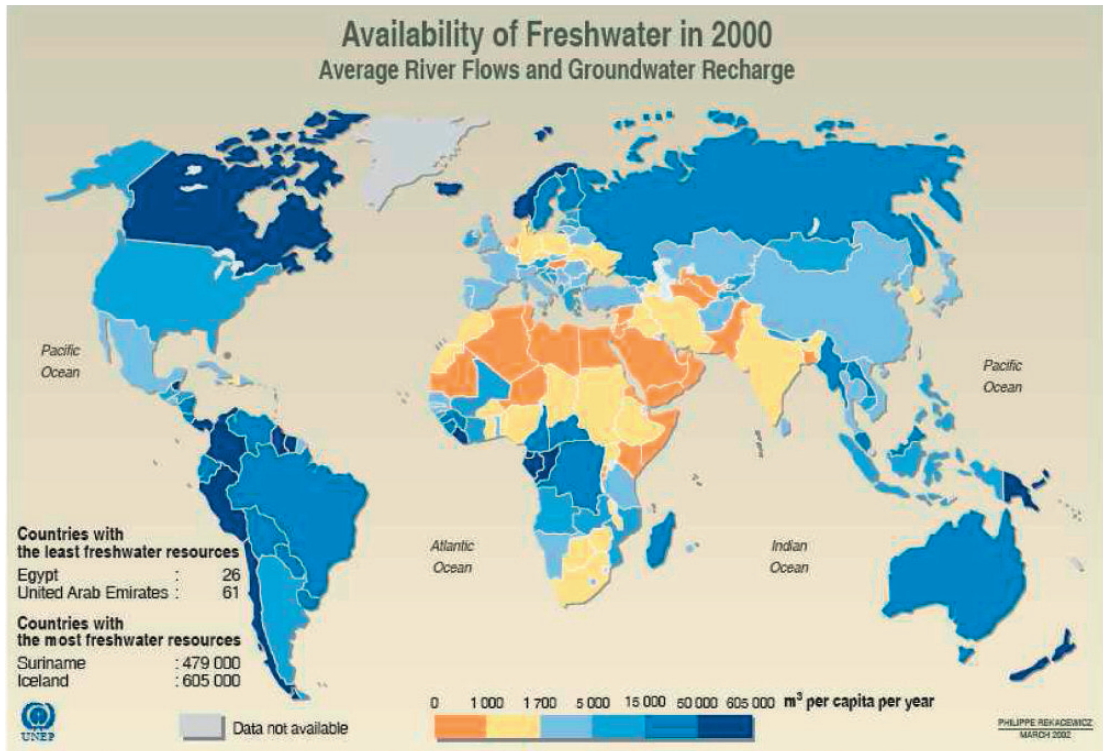
45.2 Jordan

Jordan – in the eastern Mediterranean – has an area of about 90,000 km² and a semi arid to arid climate, where temperature ranges from -3°C to 45°C. More than 70 per cent is covered by desert (figure 45.2). Precipitation ranges from less than 50 mm in the Badia to about 650 mm in the highlands, but only about four per cent of Jordan receives more than 300 mm of rain.

Jordan's population has significantly increased during the past five decades, and reached 5.6 millions

1 His Majesty King Abdullah II introduction on water; at: <<http://www.mwi.gov.jo/>>.

Figure 45.1: Availability of Freshwater in 2000. Average River Flows and Groundwater Recharge. **Source:** Designed by Philippe Rekacewicz, UNEP/GRID-Arendal (2000); in: World Resources Institute: *World Resources 2000-2001, 'People and Ecosystems: the Fraying Web of Life'* (Washington, D.C.: WRI); at: <<http://maps.grida.no/go/graphic/freshwater-availability-groundwater-and-river-flow>>. Permission to reproduce was obtained from the designer.



in 2004 (national census of 2004) compared with less than 0.5 million in the 1940's. The population growth, however, has greatly been affected by the in-flow of immigrants, refugees, and returnees due to the conflicts in the region (in 1948, 1967, 1991, and in 2003). At present the population growth rate is (3 per cent), which is also being controlled and expected to decline to 2.5 per cent.²

In addition to water, sources of energy are very limited and only minor quantities of oil and gas were found in the eastern part of Jordan. Phosphate, potash, limestone, oil shale, in addition to the Dead Sea minerals are the key natural resources and thus comprise the major industries.

2 See reports of the Jordan Department of Statistics and World Bank data for 2005 that refer to a population of 5.5 millions and a population growth of 2.3 per cent; at: <<http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20535285~menuPK:1192694~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html>>.

45.3 Water Resources in Jordan

The scarce water resources are the major constraint for the development of Jordan. At present, the per capita consumption is around 160 m³ per year, why Jordan is one of the most water stressed countries what has also challenged different economic sectors.

Jordan's renewable water resources available for use are estimated at 780 MCM/Y, including ground and surface water. The safe yield from ground water amounts to 275 MCM/Y, while the maximum amount of useable surface water is 505 MCM/Y. In addition, fossil water is being made available (143 MCM/Y) together with the use of brackish water (50 MCM/Y). Reclaimed or treated wastewater has also become an additional resource that is estimated at 80 MCM/Y. Thus, the total water that can be made available in the short term is about 1053 MCM/Y.

45.3.1 Water Demand

The water demand increases due to population growth, agriculture and a better quality of life. In Jor-

Figure 45.2: Map of Jordan. **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection; at: < http://www.lib.utexas.edu/maps/middle_east_and_asia/jordan_rel_2004.jpg>. This map is in the public domain.



dan there have been sharp increases in demand due to the sudden waves of immigrants, refugees, and returnees in the recent past. With the natural growth in demand this has severely reduced the available water from 3,600 m³/capita/year in 1946 to 906 m³/capita/year in 1955 (a scare water situation), to an absolute scarcity by 1990 (327 m³/capita/year) and to a much worse situation thereafter (150 m³/capita/year in 2004).³ To respond to this immediate water demand in the past few years, the ground water was over

pumped to a percentage reaching to 185 per cent of the safe yield. In parallel, in an effort to respond to the severe shortage during the very drought years, e.g. from 1998 to 2002, water consumption in agriculture was reduced to 68 per cent (of the annual water budget) as opposed to 75 per cent in the 1990 (Ministry of Water and Irrigation 2002: 6, 2002a, 2002b).

3 Al Rai Newspaper, 12 September 2005, issue: 12775; at: <<http://www.alrai.com/>>.

Based on the ‘water strategy’ of the Ministry of Water and Irrigation (2002: 9), the projected water demand is presented in table 45.1. It is estimated that in 2020 the population would reach 9.2 million and the total demand for water will be 1,647 MCM assuming that population growth will decline from 3.1 per cent in 2005 to 2.7 per cent by 2015. The then available resources are estimated at about 1,300 MCM, thus a deficit of about 347 MCM will still be experienced. Thus, water will be a prevailing problem and integration of efforts in the region is required to meet this challenge.

Table 45.1: Projected water demand per sector (million cubic metres, MCM). **Source:** Ministry of Water and Irrigation (2002: 9).

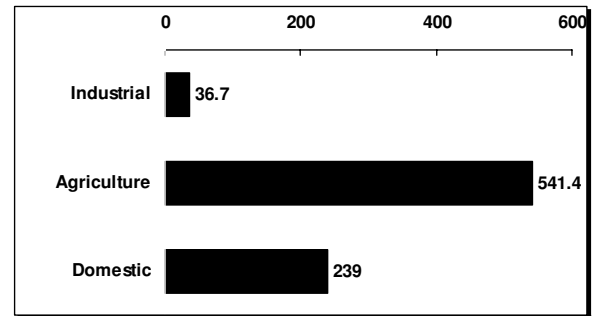
Use	2005	2010	2020
Municipal	382	434	611
Industrial	81	99	146
Agriculture	858	904	890
Total	1321	1436	1647

At present water is allocated in an asymmetric way with agriculture taking the largest portion (67 per cent). The contribution of this sector to the GDP is the lowest. The ‘National Agricultural Strategy’ has triggered plans to improve the productivity and water management in agriculture (Ministry of Agriculture 2002: III: 2). This strategy includes plans to enhance on-farm efficient water use and irrigation schemes, re-use of reclaimed water of safe quality, to plant low water intensive plants, investigate the saline water agriculture scheme where the brackish water can be a good option, to enhance water harvesting, concentrate on the high value products and on increasing the added value (figure 45.3).

On the other hand, this strategy also confirmed the role of the agricultural sector in the socio-economical dimension, as agriculture employs a large number of people in the Jordan Valley, in the western mountain range and in some areas of the eastern parts of Jordan. Land ownership and agriculture are generally seen as part of the cultural heritage and tradition. The local social dimension must be considered as an aspect of the culture and as a ‘soft security’ issue in local communities.

On ‘food security’ a survey by the *Islamic Network on Water Resources Development and Management* (INWRDAM) that was conducted in 21 Arab

Figure 45.3: Water use distribution among sectors (million cubic meters supplied), in 2000. **Source:** Ministry of Water and Irrigation (2002: 9).



countries found that 1205 m³/cap/year are needed for food production and domestic water consumption (Islamic Academy of Science 1995). If Jordan would be self-sufficient in food production and domestic water consumption, about 6.7 BCM of water would be needed annually. Jordan depends on food imports (‘virtual water’) to satisfy its needs. Al Nasser (2002: 8) estimated that Jordan annually imports about 6 BCM of virtual water as food. This amounts to approximately seven times of the annual Jordanian water budget, and about 10 times of the renewable resources. Certainly 100 per cent self-sufficiency in food is impossible in a water scarce country; but this figure demonstrates the level of vulnerability Jordanians may experience during food crises or due to the negative impacts of global environmental change. Together with the trend in the declining per capita water supply over the years this indicates social and economic threats Jordan may face and they require comprehensive remediation plans.

With global environmental change (due to climate change), food production may very well be negatively impacted by the rise in temperature. According to reports by UN organizations (UNFCCC 2003; IPCC 2007, 2007a, 2007b; Brauch 2007i, 2009; WBGU 2008), climate change may result in reducing food production efficiency by 1/3, and arid and semi arid areas would be the most sensitive areas to impacts of climate change. Being the largest water intensive sector and yet the lowest contributing to the GDP, the agricultural sector may thus become the most vulnerable sector and issues of ‘food security’ as well as ‘social security’ will become a greater concern than it is already today. How Jordan can cope with this challenge? Would it be more feasible to switch the amount of water used in agriculture to other sectors? How should Jordan respond?

45.4 Current Plans and Initiatives

Responding to the projected water shortage, since 1997 Jordan has formulated and implemented a comprehensive 'water strategy' at the national level that tackles several issues facing the water sector mainly in the following areas:

- Water resources development;
- Water resources management;
- Legislation and institutional set-up;
- Shared water resources;
- Public awareness;
- Performance efficiency;
- Public sector participation.

Based on the strategy several actions are successfully being implemented in the areas above. In the following, the attempt is to summarize key planned projects that concerns directly the water supply and use issues. This is intended to visualize the level of investment and work required to try to provide as much water as possible to reduce the gap between the supply and demand.

45.4.1 Water Supply

Several projects are being considered to enhance the water supply of Jordan during the coming decades: a) the *Disi water conveyance project* (46.4.1.1); b) the *Red Sea - Dead Sea Conduit* (46.4.1.2); and c) the *Wehdah or 'unity dam'* (46.4.1.3).

45.4.1.1 Disi Water Conveyance Project

It aims at supplying potable water to the Greater Amman to satisfy the growing demand. The project includes building a conveyor system to pump and transfer water (100 MCM/Y) from the Disi - Muddawwara area in the south of Jordan to the greater Amman (the capital), over a distance of about 325 km. The water is of a high quality non-renewable ground water (Disi Aquifer), and it is a shared aquifer with Saudi Arabia. Some quantities are presently being extracted to provide Aqaba, the major tourist, commercial and industrial city in the south of Jordan, and some private agricultural projects with water. In Saudi Arabia, relatively large quantities are also being extracted. The current use does not reflect the value of the resource, thus it is seen that the future use as potable water is a much more valid and sound option. The project is in the final tendering process, the implementation will start in 2008. The estimated capital cost of the project amounts to about 600 million US \$.

45.4.1.2 The Red Sea - Dead Sea Conduit

This project aims primarily to solve an environmental problem by reclaiming the level of the Dead Sea to its position in 1950 as well as providing desalinated water. The project, when implemented, can be regarded as one of the fruits of peace in the Middle East, as Jordan, Palestine and Israel will benefit from the project not only with regard to the supply of water, but as equally important in saving the Dead Sea, which is regarded as a historical and cultural treasure. Concerning the benefits in supplying water, the project will result in supplying about 600 MCM of fresh water for the three parties engaged in the activity, about 350 MCM will be the share of Jordan, and this will augment the future supply plans and efforts. The project is undergoing detailed feasibility studies in 2007–2008. The estimated cost for the feasibility and environmental studies is 15 million US \$. The initial estimates for the project cost would be in the order of 8 billion US \$.

45.4.1.3 The Wehdah (Unity Dam)

The project comprises the construction of a major dam structure on the Yarmouk River on the Jordanian border with Syria. Construction work has started. The project will be storing about 225 MCM per year from the flow of Yarmouk River with incremental yield of 108 MCM per year. The dam will contribute to supply water for municipal and agricultural demands and to produce electricity. The total cost of the project is estimated at about 200 million US \$.

In addition to the above three key investment projects, a number of water harvesting projects, brackish water desalination and conveyance, reclaiming water projects, refurbishment of the water supply network in different cities are either underway or in the process. Many of these projects are supported and financed by international institutions. The development of the sector is also supported by a number of programmes and initiatives for enhancing awareness and education on water management issues.

45.5 Discussion and Further Actions

Water and food are major challenges for Jordan's development. The government together with non-governmental and international organizations have been putting much effort in meeting this challenge by developing plans and executing large projects to augment the water supply and to satisfy the needs of the economic sectors including agriculture, industry and

tourism, as well as the domestic use. In terms of supply, it is evident that all efforts (national and international) should be joined to help in easing the problem of supply, this can be achieved by directing and fostering the financial aid programmes to Jordan to be able to implement high investment projects such as the *Red Sea - Dead Sea Conduit* and the *Disi - Amman Water Conveyance* projects.

On the demand side, as far as the agricultural sector is concerned (which has been the largest water consumer), it is seen that more efforts are needed to manage, administer and market the production of high value products. The farmers still lack the contacts, links and tools to market their products at a better price. This issue is crucial as selling agricultural products implies selling water ('virtual water'). Thus, the value of the precious water of Jordan should somehow be reflected in the price of the agricultural product. In addition, a continued effort in water efficiency management in the agricultural sector is also necessary.

This leads to an important topic of its relevance for the sustainability of the economic sectors and the environment, to environmental economics. It is vital to include both the cost of natural resources and the cost of environmental damages caused by the economic sectors. For agriculture the cost of water used in planting certain crops should be accounted and given its economic value; building awareness in this regard may enhance a shift to plant high value products for external markets. Moreover, if we consider the cost of the environmental damage, then the cost of reclaiming the land due to the use of chemicals, increasing soil salinity (due to fertilizers and if brackish water is used), plastic wastes and others must be accounted for to determine the eco-efficiency and feasibility of this sector. Although this is rather difficult or could be complex, however, it is essential to introduce certain acceptable assumptions to get a clear picture on the long term feasibility of the sector to strengthen the plans for sustainable practices. The social dimension is also a part of the equation; however, moving to a more sustainable practice implies a more productive sector in the long term, better local economies and thus a better quality of life and a more secure society.

Stressing the environmental economy of a sector should also to be accompanied by better water and product management. The introduction of environmental economics into planning for the agricultural sector could be most effective when it is accompanied by a well managed institutional structure and programmes to help farmers produce more valuable

products and yet use less water. The institutions should also assist in determining the environmental cost of the activities; the cost of the resources (water and land being utilized and in advancing the awareness among farmers and all concerned parties. For the agricultural sector to be economically viable, the net revenue taking into account the cost of water or price of water, cost of utilization of land and any associated impact costs should be positive; and this cannot be achieved unless farmers ration the use of water, introduce water management schemes, adopt planting high value products, apply appropriate practices for pesticides and chemicals, and have a suitable and adequate market chain and the natural resources are priced properly. Thus, here comes a call for international assistance to vitalize the agricultural sector and to make it valuable and economically and environmentally efficient.

The same argument applies to a certain extent also to the other sectors, for example to the industrial sector, where the intention is to advance this sector by promoting industrial investments in different parts of Jordan. So far, the cost of the natural resources and the environmental damage costs were not yet properly taken into account. Therefore, a major issue is to ensure that industrial enterprises are optimizing the use of natural resources and that the cost of the resources and of any associated environmental impacts cost on the environment are also covered by the price of the product. In this regard, it is required to have more intensive programmes to help industrial enterprises in minimizing the use of water; this can be achieved through a focussed programme for cleaner production and by helping industries to be more eco-efficient. One aspect of the eco-efficiency of the enterprises is the amount of water used per mass of product. It is so important for the industries and governmental institutions in Jordan to check the benchmarks for water consumption noting that a number of options or means of minimizing water consumption could be identified by undertaking an audit or cleaner production assessment, where the water balance can be revised and the real demand for water in certain industry can be determined and then optimal measures can be implemented.

If a complete cleaner production assessment is carried out, that covers the whole issues of materials and resources, the effluent quality of water discharges from the enterprises will also be improved by minimizing and avoiding sources of pollution. This will also influence efforts to preserve the quality of the resources. Less pollution in the industrial water efflu-

ents means less stress on the quality of the resources, and thus reduced costs of environmental damages. The textile production sector is a good case study, where garments are produced in Jordan and sold internationally. This process is very water intensive and thus wastewater is also a concern. Selling the garments means also selling water and the impacts on the environment. Thus, a proper pricing of the natural resources would be a good means to foster sustainable production (Pillet 2005).

A few additional important actions are considered as being necessary:

1. In vitalizing the agricultural sector and at the same time reducing its allocation of water, development of technology and know-how are key elements. Efforts are required to create the know-how and to implement programmes to produce high nutritional value products and yet at the optimum amount of water needed. International efforts should be directed at such programmes. This has become more and more urgent as the future allocation for the agricultural sector will remain steady at about 900 MCM (table 45.1). Vitalizing the agricultural sector will also respond to a social and cultural aspect, as many communities depend on agriculture for their living and the ownership of this way of living is appreciated. It is also noted that the agricultural sector employs about 9 per cent of the workforce in Jordan.
2. As the trade and services sector are the major contributor to the GDP in Jordan, it is wise to continue fostering efforts to promote Jordan as a country of business and services and in parallel to improve the level and quality of these services. This activity will earn the foreign currency to support the needed imports of fuel, food and other products.
3. Enhancing industrial development will only improve the value of the currency if and the exports are improved. Therefore, marketing Jordanian products globally is required. However, it is also important to ensure the long term sustainability of this sector by taking environmental economics into account.
4. Finally, there is a need for a maximum cooperation within the region and with international organization to help solving the water issue that is also a security issue that challenges the continued development and sustainability taking the growing population and the needs of the society for a better life into account. The water stress may also be more and even more urgent if the growing impact

of climate change is taken into account, which for Jordan implies higher temperature, even less precipitation, and lower food yields (Brauch 2007i, 2007j). International conventions that were adopted to respond to global environmental change should focus more on the most highly affected and thus most vulnerable countries like Jordan.

46 'New Security Thinking' in Israeli-Palestinian Water Relations

Jan Selby

46.1 Introduction

The post-Cold War era has witnessed a great deal of rethinking of the notion of security (Brauch/Oswald Spring/Mesjasz/Grin/Dunay/Behera Chadha/Chourou/Kameri-Mbote/Liotta 2007). This applies both to the objects of security (i.e. the goods that are to be secured, e.g. through 'energy security', 'food security', 'environmental security', etc.) as well as to the subjects for whom these objects are so desired (i.e. the individuals or groups who are claimed to be included in 'national security', 'human security', 'collective security', etc.). The extent and creativity of these numerous re-conceptualizations is beyond doubt. What is less certain, however, and is far from clear, is the extent to which these re-conceptualizations have impacted upon the actual practices of global politics. It is this more complex issue which the present chapter attempts to address, by focusing on one specific site of environmental conflict and insecurity - that of Israeli-Palestinian water issues.

In analyzing the impacts of new security thinking on Israeli-Palestinian water politics, two discrete sub-issues demand attention: firstly, the impacts of post-Cold War re-conceptualizations on the two main parties' approaches to water issues during the course of their peace process (46.3); and secondly, the impacts of these re-conceptualizations on external actors' approaches to and involvement in these water issues (46.4). This chapter considers these two issues in turn, in each case attempting to weigh up the extent and form of the influence, and to evaluate whether this influence has been largely positive or negative. Prior to that, however, the chapter considers the impacts of new security thinking within Israeli-Palestinian relations at large, this providing necessary context for analyzing the specificities of their water relations (46.2).

Theoretically, the chapter is informed by political Marxism (Wood 1981; Halliday 1994; Rosenberg 1994), and by historical materialist scholarship on the Middle East (Bromley 1994; Owen 2004; Shafir/Peled

2002). It thus assumes that material conflicts and compromises over production and distribution (rather than ideational or discursive variables) are the principal determinants of social structures and social change; that history is made by social structures and collectives, especially classes (rather than by individuals); that individual societies are shaped through their own unique histories of socio-economic struggle and accommodation, within the context of an uneven and expanding global capitalist system; that state forms, projects and interests are products of (even if they are not wholly reducible to) their social bases; and that new concepts, discourses and ideologies can only change the world when there exist material social structures and actors to nurture and promote them. While these assumptions are not developed to any great extent herein, they do provide a theoretical backdrop to the analysis.

By 'new security thinking', I refer to all those re-conceptualizations of and arguments surrounding security which do not rest upon traditionally 'realist' assumptions. In traditional security studies, the subject of security is the nation-state; the principal aim of security is to ensure the territorial integrity of that nation-state; and the main tool at that nation-state's disposal is military power - the threat of violence, and its use when necessary. In new security thinking, by contrast, the relevant subjects of security lie either above ('collective security') or below ('human security') the level of the state; the purpose of security ranges well beyond territorial integrity to include 'economic security', 'water security' and so on; and the tools of security range from economic development to international cooperation. 'New security thinking' varies widely from one field and one institution to the next. In the water arena, for instance, it includes and ranges between liberal functionalist, neo-Malthusian and neo-liberal perspectives, these being united as 'new security thinking' less by what they share than by their collective theoretical antithesis - traditionally state-centric security discourse. The key question with

which this chapter is concerned is whether, within the specific context of Israeli-Palestinian water relations, new security thinking has managed to challenge traditionally state-centric and militarist approaches to security, transforming the actual practices of inter-state politics.

The chapter's core contention is that the practical influence of new security thinking on Israeli-Palestinian relations and their water politics has been at best negligible, at worst politically regressive. In the case of Israel, the military establishment with its narrowly realist understanding of security has continued to dominate policy (including water policy) towards the Palestinians, while new security thinking has functioned above all as an ideological accessory to political realism and state power. In the case of the Palestinians, the struggle for national self-determination and statehood has stifled debate on non-traditional security issues, while security in the traditional sense has remained the preserve of Israelis only. Finally, in the case of the 'international community', the major impact of new security thinking has been to legitimize a politically insidious international aid programme that has done little to either combat the injustices of the peace process, or promote sustainable development. It is these arguments that are developed at greater length below.

46.2 New Security Thinking in the Oslo Process

Israeli-Palestinian relations over recent years have been dominated, indeed over-burdened, by the language and pursuit of security. The 1993 Oslo agreement between Israel and the Palestine Liberation Organization was above all a security accord, whereby Yasser Arafat's PLO-in-exile took over responsibility for policing and administering the Palestinian population of the Israeli-occupied West Bank and Gaza in return for a vague promise of negotiations on all major issues separating the two parties at some point in the future. Arafat returned from Tunis with his phalanx of Fatah cadres and Palestine Liberation Army officers, becoming responsible for governing and securing first most of Gaza, and later the major Palestinian population centres of the West Bank. As mandated by the terms of the agreements with Israel, the Palestinian Authority became 'Israel's enforcer' in the West Bank and Gaza (Said 1995: 10). It established a 'strong police force', such that the PA areas had the highest proportion of police in relation to population in the

world (Usher 1996: 34). It established, besides its regular civil police force, fourteen shadowy intelligence and security organizations.¹ And it developed a deplorable record of human rights violations that outdid Israel's (Amnesty International 2000). Israel for the most part raised few objections to these excesses.² To the contrary, Israel gave the PA unofficial licence to operate against the Palestinian opposition right across the West Bank and Gaza - even in areas that were officially under Israeli security control (Usher 1996: 27-28). There was extensive security coordination between the PA's security services and the Israeli Defence Forces and its internal intelligence agency, the Shabak; after 1998, there was also extensive coordination with the CIA.³

At the centre of these arrangements was the relationship between the Israeli state and Yasser Arafat; as Noam Chomsky has appropriately labelled it, Oslo was an "Israel-Arafat agreement" (Chomsky 1999). Israel and Israeli businesses pumped billions of shekels that were meant to be transferred to official PA coffers directly into personal bank accounts held by Arafat, in a bid to strengthen his powers of patronage and control amongst the local Palestinian population, whilst keeping his client administration in a situation of economic dependency.⁴ PA authority was heavily constrained by this economic and in turn political dependency, as well as by Israeli military orders and by a matrix of joint committees which effectively ensured that Israel maintained veto powers over many areas of government. Of course, following the renewal of Israeli-Palestinian violence in September 2000 this patron-client relationship was terminated. Arafat was no longer able or willing to do Israel's security bidding for it in the West Bank and Gaza, and it was for this reason that Arafat was declared 'irrelevant', first by Ariel Sharon and later by the Bush administration. Such, in a nutshell, was the security-insecurity structure of the now-collapsed Oslo 'peace process'.

1 Danny Rubinstein: "Protection-racket, PA-style", in: *Ha'aretz* (3 November 1999).

2 Yitzhak Rabin and Shimon Peres were particularly unconcerned about them; it was only under Binyamin Netanyahu that objections began to be raised, in a tactical attempt to stave off international criticism.

3 The CIA's role is set out in: Israel; PLO, *Wye River Memorandum* (23 October 1998).

4 See e.g. R. Bergman: "Israel deposited NIS1.5b' in Arafat's personal account", in: *Ha'aretz* (8 October 1999); Amira Hass: "Chairman Arafat straightens out his financial accounts", in: *Ha'aretz* (13 January 2000).

What were the aims and ambitions, and the concepts of security, that underlay these political arrangements? On the Israeli side - which, given its dominant position, was and still is by far the most important - two different security logics stood out. On the one hand was the security doctrine espoused by Prime Minister Yitzhak Rabin, a traditional Labour Zionist 'security hawk', and backed by Israel's socially hegemonic security establishment, which saw the Oslo process in traditional 'national security' terms. Rabin himself was candid about this security logic, noting that the

Palestinians will be better at it [enforcing order] than we were because they will allow no appeals to the Supreme Court and will prevent the Israeli Association of Civil Rights from criticizing the conditions there by denying it access to the area. They will rule by their own methods, freeing, and this is most important, the Israeli army soldiers from having to do what they will do.⁵

The subjects of Rabin's very traditional conception of security were (Jewish) Israelis and the Israeli state. The main objects to be secured were freedom from Palestinian resistance or 'terror' (alongside ongoing Israeli control and colonization of the territory and resources of the West Bank and Gaza). And the means by which these goods were to be secured consisted essentially of what the Israeli sociologist Baruch Kimmerling has termed a "subcontracting of occupation" (Kimmerling 2001).

Alongside though subordinate to this vision of Rabin's was a second and very different logic, associated above all with Foreign Minister Shimon Peres. In Peres' more radical vision, what was needed to consolidate regional peace was the general transformation of Middle Eastern political, economic and social structures. In publications such as *The New Middle East*, he envisioned a virtuous circle of democratization, domestic political stability, regional security structures and regional free trade eventually effecting regional integration and stability, much as has happened (at least according to mainstream liberal accounts) in post-war Western Europe (Peres 1993). In keeping with this liberal functionalist vision, Peres and the Ministry of Foreign Affairs promoted a welter of multilateral regional development projects: the construction of regional energy and transport infrastructures, regional projects for optimal water management, schemes for the integrated development of the Jordan Rift Valley, and so on. These proposals built

upon a very different conception of security from that espoused by Rabin and the IDF. Here, the subjects and objects as well as the means of engendering security were much more akin to those of new security thinking, than were those of the traditional national security establishment. The subjects were not simply Israelis, but the people of the Middle East as a whole; the purposes of security were not simply territory, nation and state, but in addition the positive provision of economic, social and political goods such as energy, water and freedom; and these goods were to be achieved not simply through the most cynical political realism, but instead through multilateral initiatives. Such was the Peres-led vision of the new Middle East: a Middle East rebuilt on the basis of new security thinking, even if this order was also one in which the Israeli economy and polity would be decisively at the helm.

These intellectually incommensurable strands of Israeli security discourse represented different (though in practice overlapping) structural tendencies within Israeli society. The national security establishment viewed the Oslo process in narrowly traditional terms as a security arrangement, in which its success or failure would be judged by the PA's success in 'fighting terror'. The liberalizing middle class and business class, by contrast (or in addition), saw Oslo as a route towards the construction of a new Middle East, and towards the normalization and globalization of Israel's economy and society (Shafir/Peled 2002; Nitzan/Bichler 2002). Within the Israeli society of the early 1990s, the two images co-existed in uneasy alliance - as evidenced, most obviously, by the fractious relations between 'Rabin people' and 'Peres people' within the then-Labour led administration. But, owing to the military's hegemonic position within Israeli society, and to the acceptance and indeed complicity of the middle class and business class in that military hegemony, it was Rabin's security logic which prevailed, and which above all structured Israel's relations with the Palestinians and the Arab world during the 1990s (Ben-Eliezer 1998; Peled 2004: 47-70). Thus, whereas the initial 1993 Oslo agreement represented a compromise between the two groupings, thereafter Peres and his team were relegated to the relatively insignificant multilateral negotiations, with Rabin and the Ministry of Defence taking charge of all further bilateral talks. And it was this latter grouping, with its traditionally militarist conception of security, that henceforth directed and determined the course of the 'subcontracting of occupation'.

5 See in: *Ha'aretz* (7 September 1993); quoted in Usher (1999: 74).

Given the prevailing international balance of forces, Palestinian security discourse and concerns were inevitably subordinate to these debates and differences internal to Israel. Arafat and his Tunis-based PLO had entered Oslo in a position of extreme political and financial weakness, in relation both to Israel and to Palestinian factions centred inside the Occupied Territories; and Israel had looked to Arafat for precisely this reason.⁶ Arafat well understood his allotted role, giving Palestinian negotiators, as Israeli negotiator Uri Savir recalls, specific instructions to accommodate the Israelis on 'every aspect' relating to security (Savir 1998: 14). 'Security', it appeared, remained the demand and expected preserve of Israelis only (Khalidi 1995: 1-18). Palestinian political discourse, by contrast, became and remained centred on ethical-political appeals to those national and indeed human 'rights' denied Palestinians by their uprooting and subsequent occupation. It should be of little surprise, given this, that when the Oslo accords were translated from abstract ideas to material practice, their operationalization of security ideas inevitably reflected Israeli priorities. As Shimon Peres tellingly observed just prior to the onset of the 1995 Oslo II negotiations, "in some ways we are negotiating with ourselves".⁷

Internally, the political omnipresence of the Israeli occupation and peace process had the additional effect of stifling debate on non-traditional security issues. Arafat's priorities during the peace process were to maximize the territory under the control of the PA, and to consolidate the PA's political, economic and coercive resources vis a vis Palestinian society. In the first case, the result was that issues such as health, water and even economic development were demoted down the Palestinians' agenda during negotiations with Israel. In the second case, meanwhile, the pressures of state formation and patronage-building within the context of a deeply iniquitous peace process led to growing corruption and lawlessness, while simultaneously repressing debate on these key 'human security' issues (Khan 2004). As Palestinian critics of the such as Haider Abdul Shafi and Edward Said rightly complained, the Oslo process was disastrous

for Palestinian society; while as radical political economists like Adel Samara have pointed out, debates on issues such as globalization have largely bi-passed Palestinian intellectual and policy circles (Samara 2000, 2001). Until recently, the demands of occupation and the peace process were such that there was little space for intra-Palestinian discussion of such non-traditional security issues.

46.3 New Security Thinking in Israeli-Palestinian Water Relations

It is within these quite specific and deeply unequal 'high political' contexts that Israeli and Palestinian water security and insecurity since Oslo need to be understood. Israeli society and the Israeli state have traditionally viewed water issues through a straightforwardly national security lens. From this perspective, predominant from the pre-state days onwards, the absolute scarcity of water in the Middle East was such that Israel would have to maximize its control over regional water resources. This was the view of Chaim Weizmann and the Zionist leadership as far back as 1919 - it is "of vital importance not only to secure all water resources feeding the country, but also to conserve and control them at their sources", Weizmann observed at the Paris peace conference - and it continued to be the predominant view until well into the 1990s (quoted in: Hurewitz 1956: 28).

Israel as a result has historically been very activist in exerting and extending control over regional water resources: by resorting to force to prevent the Arab League's attempted diversion of the Jordan River in the mid-1960s; by invading and settling the water-rich Golan Heights and West Bank, in part for hydro-political reasons; and by minimizing the Palestinians' consumption of water resources, both within 1948 Israel, and, after 1967, within the occupied West Bank, to name but the most conspicuous examples. Water policy was led by the Ministry of Agriculture, which, due to its ideological proximity to the kibbutz movement and agriculture's crucial role in extending Jewish territorial presence across the land of Palestine, very much reflected the views of the Labour Zionist national security establishment (Rouyer 2000; Selby 2003, chap. 2). The subjects of this traditional water security thinking were the Jewish citizens of Israel. Its object, water, was conceived in essentially zero-sum terms, as a scarce and finite good that would be securely in Israel's hands only to the extent that it wasn't controlled by Arabs. And the threat and use of force were the

6 Peres was "convinced that if Arafat was allowed to return and rule in Gaza and Jericho ... he would yield, for the time being, on virtually everything else". quoted in Connie Bruck: "The wounds of peace", in: *New Yorker* (14 October 1996).

7 See, in: *Ha'aretz* (14 November 1994); quoted in Murphy (1995: 36).

primary means by which this zero-sum good was to be secured.

If this was how water was traditionally viewed by Israel's national security establishment, however, from the early 1990s attitudes started to change. The liberalization, globalization and deepening commodification of both the Israeli and the global political economy led more and more Israeli experts and policy-makers to argue that water should be viewed as an essentially economic rather than national security good, one potential effect of this being that the water issue could thus be 'desecuritized' and the primacy of the logic of force reduced.

For many Israeli water experts, commentators and policy makers, it became obvious that in strictly economic terms water is simply not that valuable in the contemporary Middle East - in at least two different respects. In the first place, some of a liberal functionalist persuasion argued that economic and technological developments now made it possible to overcome the zero-sum logic of traditional water security thinking, for instance through the construction of desalination plants or through regional multilateral projects such as a peace canal from Turkey, both of which could, it was claimed, provide water for household consumption at readily affordable prices. Shimon Peres and the Israeli Ministry of Foreign Affairs were clearly of this view (Peres 1993). In addition, others of more neo-liberal views argued that, even within the current water budget, huge savings could be made if only water were consumed more efficiently and rationally. These neo-liberal commentators pointed out, for instance, that most of Israel's water was allocated at heavily subsidized prices to the economically insignificant agricultural sector (which accounted during the 1990s for only 3-4 per cent of GDP), arguing that, given the globalization of the trade in foodstuffs, such subsidization and over-allocation of water to agriculture was no longer defensible. As one Israeli commentator put it, "Israel can import oranges from Europe for less money than it costs to farm them here" if the farmers had to pay the real price for water (Baskin 1992: 9). The combined impact of these arguments was a significant softening of Israel's traditionally zero-sum water security thinking.

What is more, these discursive changes found clear reflection in the institutional make-up of the Israeli water sector. As the Israeli economy expanded and liberalized, and the economic significance of the agricultural sector dwindled, so the predominance of the Ministry of Agriculture in water policy making itself came under threat. For the first time in 1990 a Water

Commissioner was appointed who was not from the agricultural establishment (Feitelson 2002: 305). In 1996, the Water Commission itself was transferred from the Ministry of Agriculture into a new Ministry of National Infrastructure. Israel's major para-statal water institutions have been liberalized, with the Mekorot water supply company becoming an autonomous cost-centre operating without government subsidies, and Tahal, formerly responsible for water planning, having been completely privatized (Rouyer 2000: 150-151). Israeli water policy has moved from being dominated by agricultural and 'national security' thinking, to being strongly informed by economic thinking, and by neo-liberal doctrine in particular.

The policy results have been clear. Water tariffs have increased, especially in the agricultural sector; and Israel has commenced construction of a raft of desalination plants which will soon be supplying 400 million cubic metres of water per year, not far off what it currently takes from West Bank aquifers shared with the Palestinians.⁸ With regard to relations with the Palestinians, water was intentionally relegated within the framework of the Oslo peace process to one of the "other areas of common interest" to be resolved during permanent status negotiations, secondary to the more pressing subjects of "Jerusalem, refugees, settlements, security arrangements, borders, relations and cooperation with other neighbours".⁹ Within the final status talks conducted in 2000 and 2001 at Camp David and Taba, water was barely touched on at all, while in the negotiations for the track two Geneva Initiative during 2002-2003, water was deliberately not discussed, it being generally accepted that it was simply a "technical issue".¹⁰ To a large extent, water has effectively been both economized and downgraded within Israeli security thinking and policy-making. As in the Israeli economy and

8 Amiran Cohen: "Work commences on desalination plant", in: *Ha'aretz* (12 August 2003); Sharon Kedmi: "Ashkelon desalination plant finally opens for business", in: *Ha'aretz* (5 August 2005).

9 See: Israel and the PLO: *Declaration of Principles on Interim Self-Government Arrangements* (13 September 1993), article 5.

10 While there were final status talks on water issues during this period (interview with Shaddad Attili, PA Negotiations Affairs Department, 2 June 2002), these were not significant enough to merit inclusion in the 'Moratinos Document' (in: *Ha'aretz*, 14 February 2002), which is generally taken as an accurate account of the Taba negotiations. On the Geneva Initiative, I benefited from an interview with Yossi Beilin (1 September 2005).

society more broadly, there has been a clear link between liberalization and the potential for water peacemaking (Feitelson 2002).

And yet, this *potential* for water peacemaking with the Palestinians has not so far been translated into *actualities*, for, as in the high politics of the peace process, so too the water negotiations have continued to be dominated by Israel's national security establishment. Within the 1993 Oslo agreement, Peres' liberal-civilian team had implicitly recognized Palestinian water rights - this being to the consternation of Defence Ministry officials, who believed that this would but create problems for future negotiations. Yet come the more substantive negotiations that followed, Peres' men had been sidelined into the multilateral arena, with the bilateral water negotiations with the Palestinians being led by Noah Kinnarty of the Ministry of Defence, a hawkish military man in the style of Rabin.¹¹

The water provisions of the 1995 Oslo II agreement clearly reflected this change of personnel. For despite Israel's increasing wealth and economic capacity to produce and manage water effectively, and its consequent potential to treat water as other than a zero-sum security good, its concessions to the Palestinians were negligible. Under the terms of the deal, a mere additional 3.1 million cubic metres (mcm) of water per year were made available by Israel to West Bank Palestinians (compare this with the estimated yield of the West Bank aquifers, 679 mcm, and Palestinian West Bank consumption in 1995, 118 mcm).¹² Israel retained an effective decision-making veto over the management of West Bank water resources, infrastructure systems and supplies. And the only 'new resource' that was made available to the Palestinians was largely imagined into existence by Israeli negotiators (Selby 2003: chap. 5). The Oslo II water agreement - constituting the high point of Israeli-Palestinian water diplomacy - involved little more than a repackaging of ongoing Israeli control and domination under the banner of peace and cooperation (Selby 2003a: 21-38, 2003: chap. 4).

How profound has been the impact of new security thinking on Israeli and Palestinian bilateral water

relations? Our answer has to be: not particularly. Whatever the extent of new thinking about water issues in general within its NGOs, universities and ministries, Palestinian discourse on water relations with Israel is understandably dominated by a concern with the attainment of legitimate 'water rights' to the use of Jordan River and West Bank waters, leaving little space, or indeed desire, for discussions of 'water security'; 'security', as noted previously, seems to be the demand and terrain of Israelis only.

In any case, Israel has so dominated Israeli-Palestinian water relations since the onset of the peace process - the text of the 1995 Oslo II water agreements were largely presented to the Palestinians as a *fait accompli* - that it is really on Israeli policy that we must focus if we want to assess the impact of new security thinking on the Israeli-Palestinian water arena (Selby 2003, chap. 6). And what we find there is that, irrespective of Israel's economic liberalization and the consequent liberalization of Israeli water policy, the country's military-led national security establishment has continued to call the shots in water relations with the Palestinians, insisting on maximizing its control of regional resources, and on making as few compromises as possible with Palestinian demands. If anything, the liberalizers' calls for efficient management and the creation of new water supplies have primarily served as rhetorical cover for the pursuit of narrowly-conceived national water interests, and for the furtherance of Israeli water security at the Palestinians' expense. And as in the peace process more broadly, Israel's liberalizing but far from progressive elites and middle classes have been largely happy to accept the enduring hegemony of military institutions and thinking, and the ongoing oppression of the Palestinians.

46.4 New Security Thinking on Israeli-Palestinian Water Issues Amongst External Actors

Just as Israeli security (and water security) discourse during recent years has been characterized by the unequal juxtaposition of conflicting liberalizing and nationalist tendencies, so something similar can be discerned in the international water arena. During the last twenty years, water issues have attained a much higher profile within international and global policy fora than they generally enjoyed hitherto, this being on the back of the mainstreaming of environmental concerns within the global North, and also within the context of the post-Cold War coalescence of inter-

11 Interviews with Noah Kinnarty, Ministry of Defence, Israel, and Oslo II lead negotiator (28 July 1998); and Moshe Yizraeli, Consultant to the Water Commission (21 July 1998).

12 Figures from (or extrapolated from): Israel and the PLO: *Interim Agreement on the West Bank and Gaza Strip* (28 September 1995), Annex III, Article 40; and Annex III, Appendix 1, Schedule 10.

national 'security' and 'development' agendas (Duffield 2001). This heightened profile of global water issues has been prompted, at least at a rhetorical level, by a new wave of neo-Malthusian thinking about the global environment. With its modern roots above all in the Club of Rome's 1972 report - which evinced an inevitable clash between economic development and environmental sustainability - this thinking has seen a flowering of international programmes, institutions, networks and agreements committed to raising awareness of, and combating, one of the main crises of our age (Meadows/Meadows/Randers/Behrens 1972). And this pessimistic neo-Malthusian thinking has been translated directly into the discourse on Israeli-Palestinian and Middle Eastern water issues, with countless commentators - journalists and experts alike - forecasting increasing competition over scarce, finite water resources, with violent inter-state 'water wars' as the result (Starr/Stoll 1988; Bulloch/Darwish 1993; Selby 2005). As one leading commentator, Thomas Stauffer, bluntly stated it, 'the Malthusian spectre is real in the Middle East'.¹³

Though dominant within media and public discourse, this neo-Malthusianism has in practice been subordinate to a second tendency within recent global environmental and water discourse, that of neo-liberalism. For while the former has raised the clarion cry of ecological crisis - alarming publics and politicians to the cause - it is the latter which has most structured global discussion and decision-making about how to respond. Accordingly, the policies promoted by the World Bank, USAID, and epistemic communities of water experts such as the World Water Council have emphasized above all the importance of valuing water as an economic commodity; of ending subsidies; of allocating water between sectors in accordance with economic logic (and in the Middle East, of reducing allocations to the agricultural sector); of improving institutional efficiency; and of making increased use of the private sector through privatization or public-private partnerships. Curiously, while one face of the new thinking, neo-Malthusianism, has sought to 'securitize' water as an emerging threat to international security, neo-liberals have argued the exact reverse - that by commodifying and economizing water, it can be effectively negated as an object of inter-state conflict.

As discussed above, the impact of neo-liberal ideas on Israeli-Palestinian bilateral relations has been negli-

gible, despite the significant internal liberalization of Israel's economy, society and water policy. Beyond the two central parties to the conflict, however, there are three major impacts (or non-impacts) of this new neo-Malthusian and neo-liberal security thinking that demand attention.

Firstly, for all the increased attention on international environmental issues over the past twenty years, this has not led to significant international political interventions to resolve the Israeli-Palestinian water dispute. Bilateral Middle East negotiations have been accompanied by multilateral talks, which during the early- and mid-1990s brought together regional governments, outside powers and international organizations to discuss regional water issues. But the focus of these multilateral talks was technical rather than political, and in the water arena they made no progress of any consequence (Peters 1996). In terms of actual conflict resolution, the role of outside powers has been minimal. During the 1950s, the Eisenhower administration devoted considerable effort to prompting the Jordan basin riparians to agree a water sharing plan which, though it was eventually rejected at a high political level, has nonetheless remained a continual reference point in discussions and negotiations on regional water issues (Lowi 1995). By contrast, the Clinton Administration - supposedly devoted to addressing post-Cold war challenges such as environmental insecurity - made no such ambitious attempt to address, let alone resolve, the Middle East's inter-state water problems. No doubt this difference has a great deal to do with the fact that Israel and the U.S. are today much more closely aligned than they were during the 1950s. But it is also clear testimony to the limited impact of new security thinking on external official political intervention in the Israeli-Palestinian water conflict.

By contrast with this, secondly, the newfound recognition of the social, economic and political importance of water has generated a tremendous level of international support for the reconstruction and development of the Palestinian water sector. The World Bank and USAID both defined water as one of their three top priority funding areas in the West Bank and Gaza, and led by these two donors, over 10 per cent of all aid money to the Palestinians between 1993 and the collapse of the peace process in 2000 went to water and wastewater projects (Rouyer 2000: 229; Selby 2003: 4-5). This aid has funded the establishment of autonomous Palestinian water institutions, the construction of new water and wastewater infrastructures, and the rehabilitation of local networks

13 Quoted in S. Peterson: "What could float - or sink - peacemaking", in: *Christian Science Monitor* (14 July 1999).

long run down through Israeli under-investment. It led to marked improvements in the water supply situation in many Palestinian communities, at least up to the collapse of the peace process in 2000 (though these improvements were extremely uneven, centring on high profile urban centres such as Ramallah and Bethlehem, at the expense of rural areas). By stimulating such high investment in the Palestinian water sector, new security thinking did have a limited beneficial impact on Palestinian water security.

However, these positives also need to be considered within their broader political and economic contexts. The main purpose of the aid programme to the Palestinians since 1993 has been to support a deeply unequal and unjust 'peace process'. In the water sector, as elsewhere, the post-Oslo development effort was premised upon a transfer of the burdens and responsibilities of managing the Palestinian population from Israel to the international community. This transfer of burdens was initiated at a time when Israeli leaders remained set against Palestinian statehood, when they remained committed to the ongoing colonization of the West Bank through settlement building, and when they retained the right to enforce security closures around (and within) the Palestinian territories, with disastrous effects upon the Palestinian economy and society. This transfer of burdens remained in effect despite Israel's re-occupation of much of the West Bank and Gaza between 2000 and 2002, and still remains in effect despite Israel's new policy of 'unilateralism', and its consequent refusal to re-open political negotiations with the Palestinians. In the water arena, as in all others, the international aid programme has worked within, been dependent upon, and thus been complicit in the vagaries of a deeply unequal macro-political context, whilst maintaining the fiction of being "non-political" (Selby 2003: chap. 7).

As this illustrates, thirdly, new security thinking on water issues has been thoroughly insensitive to questions of politics, power, poverty and inequalities. Whether in its neo-liberal or neo-Malthusian variants, the new mainstream environmental discourse has been blind to these questions, the former viewing environmental problems as caused by economic and technical inefficiencies, and the latter seeing them as caused by over-population and the over-consumption of limited natural resources – with neither of them allowing much space for discussion of structures of power and inequality. Intellectually as well as in practice, international environmental agendas have as a result usually operated within the context of, and have

implicitly accepted, confirmed and even exacerbated, enduring political economic structures. In keeping with this, international expert discourse on the Israeli-Palestinian water conflict has consistently understated the extent of ongoing Israeli control of the Palestinian water sector, and consistently overstated the changes wrought by the Oslo 'peace process' (Selby 2003a).

Likewise, international expert discourse has had very little to say about the 'internal' dimensions of water security within Palestinian society – about internal water inequalities in water supply between Palestinian towns and villages; about the small-scale local violence that often accompanies these inequalities; about the local black markets in water; about the marginalization of rural Palestine within international donor programmes; or about the impacts of the internal political economy of water on Palestinian livelihoods, gender relations and poverty.

The impacts of these intellectual lacunae on aid policy to Palestine are too nebulous to be stated with any great precision. But what can be stated is that within a political configuration where the ultimate purpose of aid programmes has been to support the high politics of the peace process, expert discourse on Middle Eastern water issues has done little to direct attention either towards the inequities of that 'peace process', or towards combating poverty, promoting sustainable economic development, or furthering 'human security'.

46.5 Conclusions

From a historical materialist perspective, using new words is easy, but transforming material structures and practices very difficult. The last twenty years have witnessed a flourishing of new discursive formulations of 'security', most of which have sought to take the concept out of the hands of the nation and state, to make it instead the possession of human individuals across the world, and to focus attention on issues other than military capabilities. Certainly, this new thinking has had effects within international institutions and NGOs, within some middle class thinking, and where it has provided fresh opportunities for the aid and development industry. But in deeply contested geopolitical contexts such as that shared by Israel and the Palestinians, traditional security logics have continued to predominate.

The reasons for this are various, and are country-specific. In Israel, the longstanding political hegemony of the military and the existential insecurity of the

Zionist project, combined with the complicity of Israeli middle and capitalist classes in the occupation of the West Bank and Gaza, and in Israel's 'war economy', have effectively neutered challenges to traditional military-led national security thinking (Nitzan/Bichler 2002; Selby 2006).

Amongst the Palestinians, the Fatah leadership's central preoccupation with maximizing territorial gains and consolidating internal power, combined with the dependence of large sections of the Palestinian middle class on the peace process, and on the donor funds and NGO jobs that it generated (Hanafi/Tabar 2005), has resulted in a stifling of debate on internal social, political and economic insecurities (incidentally, these internal insecurities were the primary reason for Hamas' victory in the January 2006 Palestinian legislative elections).

Within the US, the power of the right-wing Israel lobby, and US big business' economic interests in the continuation of war and conflict in the Middle East, have resulted in the administration doing little to promote sustainable regional economic development or human security (Mearsheimer/Walt 2006; Nitzan/Bichler 2002). Finally amongst international donors, the apolitical discourse of development (Ferguson 1990) is such that donors have largely accepted - and thus been practically complicit in - the overall framework of a 'peace process' that has done little to advance either peace or development.

There is 'no more dangerous enemy', asserted Marx and Engels at the beginning of *The Holy Family*, 'than *spiritualism* or *speculative idealism* which substitutes "*self-consciousness*" or the "*spirit*" for the *real individual man*' (1956: 15). Rephrased in more contemporary and rather less bombastic terms, it can be said that the belief that individual consciousness and socio-political realities can be transformed by inventing new concepts and discourses, is not just mistaken but also potentially dangerous. No matter how imaginatively the concept of 'security' is re-thought and re-used, socio-political realities such as the Israeli-Palestinian conflict and the Palestinian water crisis will not be overcome unless there exist structural, material bases for so doing. In the absence of material change, 'new security thinking' can come to serve primarily as a rhetorical cover for enduring inequities and interests. The real challenge is not to re-imagine security, but to support and hopefully embolden actual social movements struggling for social transformation.

47 Functional Water Cooperation in the Jordan River Basin: Spillover or Spillback for Political Security?

Anders Jägerskog¹

47.1 Introduction

Ever increasing attention is given to the importance of the world's water resources and aquatic systems. The rising demand for water is due to a variety of factors, such as population growth and urbanization. The sustainable management of water resources is extremely important in the developing world, which is continually faced with a lack of the financial resources, infrastructure, and human resources needed to improve water management. Today, more than 45% of the world's population lives in internationally shared river basins. The increasing pressure on the limited freshwater resources in places such as the Jordan River Basin makes greater and deeper knowledge of how to manage trans-boundary waters essential.

In spite of fears of water-related violence and conflict, Israelis, Jordanians, and Palestinians have maintained a basic level of cooperation over their shared waters.² Even during the *Intifada* that started in September 2000 this is true. Between Israel and Jordan low-level cooperation dates back to the 1950's when, under the auspices of the UN, they collectively have chosen to co-ordinate water activities related to the Jordan River. The cooperation was later formalized as part of the Israeli-Jordanian Peace Agreement of 1994 that has created a Joint Water Committee. The Israeli-Palestinian water relations are regulated in a 1995 interim agreement. This is not a full agreement but covers only part of the water issues between the par-

ties, such as protection of water and sewage systems. A Joint Water Committee is also in place between Israelis and Palestinians. Given the political stalemate and ongoing violence, substantial negotiations on water or other matters are not likely to take place soon. Still, Israelis and Palestinians agree that cooperation on their shared water is indispensable.

The hydrological interdependence, i.e. the transnational nature of international river basins provides a rationale for cooperation (Elhance 1999). Indeed, an awareness of the positive prospects of basin-wide cooperation through the development of a water regime might spur an increased hydro solidarity and cooperation. A database compiled by Aaron Wolf's institution at Oregon State University, comprising all the water agreements on international watercourses (<http://www.transboundarywaters.orst.edu/>), shows that states tend to find ways to reach agreement rather than to engage in conflict over shared water resources. There is still a need, however, to understand *why* and under *what conditions* such cooperation occurs. In addition, it is of interest to analyse the *quality* of that cooperation. A key question in this chapter is if and if so how, the existing cooperation over transboundary waters can be used to promote cooperation in others spheres, thereby potentially functioning as a conflict prevention mechanism.³ Increased understanding of the relationship between the technical level (where most of the actual water coordination and cooperation takes place) and the political level needs to be analysed. Some questions that will be dwelled upon are; Is it reasonable to argue that there are, or can be, cooperative spillover ef-

1 This chapter is partly based on Jägerskog 2003.

2 For examples of the water war thesis see e.g. Starr 1991 and Bulloch/Darwish, 1993. These sources should, however, rather be seen as examples of how knowledge can be very misleadingly constructed. For example, they ignore the mitigating role that international food trade has had on the water conflict in the region and the fact that water has been more of a source of cooperation and coordination in the region than of conflict.

3 Conflicts can in this context mean, for example, conflicts with regard to a shared natural resource, a potentially violent conflict with roots in for example diverging political interests, dispute over land or borders etc.

fects as a result of the existing water cooperation on other political questions and issue-areas in the region? Can the existing cooperation over transboundary water in the Jordan River Basin be used to promote cooperation in other spheres between the parties? Is it indeed feasible to think that water may be a catalyst for increased security and eventually peace?

Among other things the chapter aims to analyse prospects and potential avenues for increased coherence between different issues, in this case predominantly between conflict prevention and security issues and the sustainable use of natural resources. In the wider perspective (benefit sharing perspective) it will also contribute to our understanding of the importance of water for the economy, trade, regional integration etc.

47.2 Theoretical Dimensions

In an effort to utilize cooperation between riparians over transboundary waters it has been argued that the states (or entities) engaged in the cooperation must be able to *perceive* the potential for a range of benefits that are not only to do with water management *per se*. Sadoff and Grey argue that there are four basic cooperative benefits. The first is *benefits to the river*, which entails a better management of the ecosystems. The second is *benefits from the river* such as increased food and energy production. The third is the *benefit of reduction costs because of the river* since the tensions between riparian states that inevitably will exist over a shared river will be lowered by cooperation in the management thereof. The reduction of tensions will also result in a reduction of costs. The fourth example are the *benefits beyond the river* which cover the positive results that cooperation over a shared river can have in terms of spillover effects such as increased economic integration between two or more countries. Seemingly the cooperation between states sharing a river is in some cases vast, while in other cases not so significant. The perception of potential benefits as well as the materialization of those from water cooperation seem in any case imperative to a better management of the world's rivers as well as to relations among the riparians sharing a watercourse (Sadoff/Grey 2002).

The economic framework developed by Sadoff and Grey for understanding cooperation and benefit sharing ought to be complemented by an account of the political aspects involved in the joint management of international rivers. Many international relations

scholars try to understand why international cooperation occurs in spite of the presumed anarchic nature of the international system. Some try to explain the cooperation through regime or institutional theory.⁴

These regimes or institutions are considered to exist in areas such as international trade, monetary policy, security and arms control, and the use of natural resources. Regimes may function as a vehicle for international learning and the converging of states' policies (Haas 1994). The social interaction, which takes place in a regime, fosters a convergence in value orientation and thereby creates incentives for a further institutionalization of cooperation (Mayer/Rittberger/Zürn 1993). Wendt has clarified the institutionalization of cooperation in the international arena. He argues that: "The process by which egoists learn to cooperate is at the same time a process of reconstructing their interests in terms of shared commitments to social norms. Over time, this will tend to transform a positive interdependence of outcomes into a positive interdependence of utilities or collective interest organized around the norm in question" (Wendt 1994: 87).

The regime approach, which is an inherently constructivist way of analysing the institutionalization of cooperation, focuses on how the expectations that are produced by behaviour affect interests and identities.⁵ This process of institutionalization is one in which actors internalize new understandings of self and other and, furthermore, move towards increasingly shared commitments to the norms of the regime. Whereas an international treaty is a legal document stipulating rights and obligations, a regime is a social institution in which the behaviour of its actors constitutes the regime or institution (List/Rittberger 1992).

Evidently, there are some contained mechanisms that guide the actions of the parties in a river basin. In the international relations literature these mechanisms are referred to as regimes or institutions. Within the literature that deals with international waters a concept that is receiving increased attention is that of *water regimes*. Waterbury argues that "the process of regime formation itself – legislating, data

4 Economists tend to use the term institutional theory while political scientists and international relations scholars use the term regime theory more often.

5 The regime theory approach stems from the functionalist approach within international relations, see: Groom (1975: 93-III) and Mitraný (1975: 53-78), have usefully discussed both the tenets of functionalism and spillover and spillback concepts.

gathering, formal institution-building, and negotiating – can provide momentum, the creation of new institutional interests and expertise, and, occasionally, ‘tipping’ moments that lead to formal cooperation” (Waterbury 2002: 35).

The majority of the studies that deal with international relations tend to treat every state or nation as an unproblematic singular unit. This is also the case in most analyses of water relations between states. However, this approach is a gross simplification. In order to understand why nations choose the policies they pursue in the international arena one needs to study thoroughly the domestic political context, since the policies pursued internationally are likely to be a reflection of the domestic discourse. Thus, the need for governments to be in line with their respective domestic discourses in their pursuit of international policies is key to understanding foreign policy. In the words of Stein, “analyses that ignore the context in which negotiations take place, ... the impact of cultural, social, institutional, political and psychological factors or processes of communication and choice, are inadequate as explanations of international negotiations” (Stein 1988: 230). Obviously this either creates room for cooperation and possibilities for spillover effects or effectively limits this possibility.

Discourses become either accepted or “sanctioned” or not accepted within a society. The sanctioned discourse sets limits within which policies have to be pursued, that is, it indicates what avenues may be politically feasible (Allan 2001). It represents what may be said, who may say it, and also how it is to be interpreted. It is helpful in explaining why people who are confronted with the same scenarios or events nevertheless describe their experience in quite different ways. The rationale for explaining events in one way or another is often a result of the surrounding social context and the particular discourse that has been sanctioned. In a related line of thinking, the sociologist Pierre Bourdieu argues that the dominant knowledge or view in a society is dominant not because it represents a “higher level” of knowledge but because it is formulated from a position of greater power in the social hierarchy. This position depends on economic, social, and cultural capital (Bourdieu 1986).

In the creation of the sanctioned discourse, various “discursive actors” have special interests or stakes. However, interests and power positions will determine the outcome of this “discursive battle”. While politicians, in both democratic and non-democratic regimes, are in a position to influence the dis-

course, they are not able to exercise full control over it. Discourse analysis is useful in explaining why they sometimes choose not to implement the water policies, which would seem to be the most rational from a scientific perspective. Allan argues that the role of politicians is mainly to legitimize “that which is determined by the discourse” (Allan 2001, 2003). While that is true it can be added that politicians have a stake in the discursive battle, as they possess certain economic, social, and cultural capital. A useful distinction when analysing how discourse affects policy is the one made by Hajer, who argues that actors in a given area (such as the water sector) create coalitions that subscribe to the same narratives. He calls these “discourse coalitions”. It is not necessary that these actors strategically choose the narratives they do in order to create a coalition. The coalitions need not be formalized but may be a result of various story lines made up by actors from a sometimes different logic but with a conclusion that are supportive of the conclusion of the other actor(s). These coalitions can consist of government officials, water professionals, journalists, and so on (Hajer 1995).

47.3 The Importance of Politics: The Role of Discourses

In this section the importance of politics in the creation of water policy is scrutinized. This is key to our understanding of the possibilities for spillover effects to other political issue areas. By analysing the discourse within the respective states or societies it is evident that other considerations than purely related to water play a pivotal role in determining water management decisions and also the potential effect that those might have on other areas. Strategic concerns and security considerations are key ingredients of this mixture. Since control over and access to fresh water in a river basin with limited supply is of strategic importance, states are likely to develop a *hydraulic mission*, which feeds in to a hydro-political ideology.⁶ Below follows an analysis of the various features of the sanctioned discourse or hydro-political ideology among the parties in the Jordan River Basin.⁷

6 Anthony Turton, 2002: “The political dynamics of institutional development in the water sector: South Africa and its international river basins” (unpublished).

7 When referring to the parties in the Jordan River Basin, Syria and Lebanon are not considered since they have not been part of the research for this chapter, although they are formal parts of the Jordan River Basin.

In Israel the discourse on water was largely determined by ideology (i.e. predominantly Zionism) from the 1940's up until the 1970's, which implies a strong emphasis on water allocations to agriculture since it represents a central feature in Zionism (Feitelson 2002). Even though there has been a shift in the discourse towards more economic reasoning, the ideological preference for farming is still reflected in the disproportionate political power the agricultural sector enjoys in Israel: the agricultural sector possesses the cultural capital needed to deploy that political power.

From a military angle it is perceived that giving up farming in the remote areas of Israel would constitute a strategic risk. Keeping agricultural settlements in the remote areas is important since they are seen as a "buffer zone" against potential enemies. However, there are arguments for saying that the policy of using agricultural settlements as a tool in the strategic defence of the state has proved counterproductive. The inadequacy of buffer zones was also effectively shown during the Gulf War in 1991 when Iraq sent missiles directly into the heart of Israel. It was also evident in earlier wars. In the 1973 war many Israeli soldiers were occupied evacuating agricultural settlers in the Golan Heights rather than fighting the Syrians. Hence, the policy of keeping agricultural settlements in strategic areas of the state seems to be based on a misguided perception of their strategic importance and is perhaps better explained by other political reasoning. First, Israel's (misguided) policy of keeping agricultural settlements in strategic areas has to be explained by other reasons than their true strategic importance. Its policy suits the argument of the farming community and there seems to exist a farming-military *discourse coalition* (Hajer 1995). This discourse coalition represents the dominant discourse on water in Israel. Second, Israel's main interest in the negotiations, from a water perspective, is to maintain the high levels of allocation since a negotiation will most likely be based on some measure of current use. Third, it is also possible to trace the root of the arguments of the farming community and the strategic establishment in the domestic structures of the state and Zionism. Fourth, this perspective does not exclude cooperation on water issues in the region, but it limits the room for compromise solutions. In the case of Israel it seems as though the potential for positive spillover effects from water coordination and cooperation to other political sectors is limited. Rather, water is used as a political tool in other spheres.

However, today it is possible to find challenges to the sanctioned discourse in Israel. It can be described as a "discursive battle".⁸ In this sense there is a *differentiation* between various experts and water professionals in Israel (as well as in Palestine). On the Israeli-Palestinian water issue, besides the military-farming coalition, there is also a strong group of Israelis (and Palestinians as well) who argue for extended joint management of the shared aquifers (Had-dad/ Feitelson/Arlosoroff/Nassereddin 1999). This group emphasizes the risk aspect when they argue that joint management is the only way to counter the risk of non-reversible decline in the water quality of the shared aquifers. The current Water Commissioner of Israel, Shimon Tal, argues along similar lines and advocates cuts in allocations to agriculture as a means of countering the water crisis.⁹ Furthermore, in a subgroup under the Multilateral Working Group on Water Resources a group, named Executive Action Team (EXACT) involving Israelis, Palestinians and Jordanians, has met to discuss common water challenges under U.S. auspices without interruption since 1992. This group has, by and large, focused on technical matters of importance for all parties and has refrained from discussing political issues. This has contributed to the building of trust between the parties.¹⁰ What we can see when analysing how Israel views positive impacts coming from water cooperation, which goes beyond the actual cooperation, the main positive result is mainly *benefits to the river* which entails an increased protection of the ecosystems.¹¹ Potential *benefits from the river* are also on the table, predominantly through the work of EXACT.

The Palestinians, on the other hand, seem to be somewhat stuck in the prevailing discourse that the starting point of any negotiation ought to be their water rights. Haddad (1997) points to the fact that the Palestinians have long been denied self-rule and the right to develop and manage their natural resources. One water negotiator, Amjad Aliewi, argues that it is possible to discuss other issues, such as pol-

8 An elaborate discussion on the various competing Israeli discourses can be found in Feitelson (2002).

9 Shimon Tal, 2001: "Water Commissioner Shimon Tal briefs foreign press", Israeli Ministry for Foreign Affairs, <<http://www.mfa.gov.il/mfa/go.asp?MFAH0k8s0>>, accessed on 28 February 2005; and Zafir Rinat: "Watered-down advice", *Ha'aretz*, English edition, 24 June 2001.

10 For more see: <http://exact-me.org/>

11 The protection that is happening could of course be extended much further.

lution, only after the water rights of the Palestinians have been clearly established.¹² This is iterated by another Palestinian water negotiator, Shaddad Attili, who maintains that the core of the Palestinian negotiating position has to do with securing water rights.¹³ The history of the conflict, in which the Palestinians have been subject to inequality and repression, and the strong tradition of farming among the Palestinians are integral parts of the domestic structure in Palestine. Hence the idea that water rights ought to be *the* starting point in any negotiation is deeply rooted in the history of the conflict. This very strong paradigm effectively sets the boundaries for what is feasible. Needless to say there are various discursive actors who reinforce this view and thus bolster the sanctioned discourse.

Inevitably, a negotiation in which water rights are discussed as a main principle must be based on figures of current allocation and use. Today the difference between the allocations to Israel and those to the Palestinian areas is considerable. Thus the water rights that the Palestinians may obtain in a negotiation runs the risk of being far too limited. A shift on the part of the Palestinians towards the principle of equitable utilization is likely to produce a better outcome.¹⁴ But this is not part of the dominant Palestinian water discourse and consequently not on the table, in spite of international advisers pushing for it. It may well be that the power of the sanctioned discourse prevents the Palestinians from obtaining the best agreement possible. However, the Palestinian position on this issue is also beginning to change. The Negotiation Support Unit under the PLO is increasingly emphasizing that the permanent status negotiations should seek to allocate water on an equal *per capita* basis in Palestine and Israel. This argument is based on the principle of equitable utilization (Phillips/Shaddad/Mc Caffrey/Murray 2004). Another dominant feature in the Palestinian discourse is their insistence that the Palestinians' water problems are almost exclusively the fault of Israel (Trottier 1999). This rhetoric is found among academics, water professionals, and in the media, as well as from government officials. This is, of course, also

a result of the Palestinians having been deprived of their rights and self-rule by Israel.

In Jordan, the argument is emphasized that the water scarcity in the country is man-made. It is estimated that the Hashemite Kingdom absorbed around 450,000 Palestinians after 1948. Irrigation was a crucial factor in accommodating them, thus putting pressure on Jordan's limited water resources (Haddadin 2000). Thus, Jordanians argue that Israel is partly responsible for Jordan's water shortage. Dureid Mahasneh, a former Jordanian negotiator, also argues that it is not fair that Palestinian refugees from the West Bank should get Jordanian water while the occupant (Israel) is getting their water.¹⁵ The dominant view among the discursive elite in Jordan was that peace would be beneficial since it would bring U.S. economic and military aid (Ryan 1998).

As in Israel and the Palestinian areas, the advocates of "virtual water" are not strong in Jordan. The commercial sectors involved in agro-business as well as the farming community in Jordan are not positive to further increase import of foodstuff from the international market since it threatens their interests. In particular if this would take the shape of government policy. This is, however, to be expected since Jordan, like the other entities, has a strong tradition of farming, even though the agricultural sector today contributes a fairly small part (3-5%) of gross domestic product (GDP). In addition, the food self-sufficiency argument, emphasizing a strong domestic base and subsequently not an emphasis on the importation of food, is strong in the Jordanian discourse.¹⁶

47.4 Regime Theory Considerations

A central question of this chapter is why and under what conditions cooperation has occurred between the parties in the Jordan River Basin. A way to investigate this is to analyse the actual implementation of the agreements (both final and interim) between the parties in the Jordan River Basin. The case of Israel and the Palestinians is different from the Israeli-Jordanian case in that the agreement to be implemented is an interim one, while Israel and Jordan are working with the implementation of a final agreement (Dombrowsky 2003).

12 Amjad Aliawi, personal communication, Amman, Jordan, 9 March 2002.

13 Shaddad Attili, personal communication, Amman, Jordan, 9 March 2002.

14 Tony Allan, personal communication, London, UK, 23 October 2001.

15 Dureid Mahasneh, personal communication, Amman, Jordan, 9 March 2002.

16 Hazim el-Nazer, personal communication, Amman, Jordan, 11 March 2002.

With regard to the actual implementation of the various parts of the agreements it is concluded that they are often being implemented somewhat painfully. It is also evident that in the Israeli-Palestinian case many parts of the interim agreement awaiting implementation are being delayed despite a general understanding on part of the professionals (among experts) that implementation should be carried out.¹⁷ Although various problems have hampered the implementation of the agreement, both parties acknowledge the importance of it being in place. Indeed, even in the midst of the latest tensions during the current Intifada, the work of the JWC continues. A joint statement of 31 January 2001 from the Israeli and the Palestinian heads of the JWC reaffirmed their commitment to continue their cooperation. In the declaration the head of the PWA, Nabil el-Sharif, and the head of the Israeli delegation to the JWC, Noach Kinarty, promised to take all necessary steps to keep water out of the conflict, and also appealed to their respective constituencies to refrain from damaging water infrastructure¹⁸ (Schiff 2001). Arguably this might be referred to as a “tipping moment” (at least on the technical side) between the parties in favour of cooperation.

It is clear that while the ambiguities that exist in the agreements are useful when trying to reach an agreement, they work as obstacles in the post-agreement phase when they are to be implemented. For example, the lack of provision for drought in the Israeli-Jordanian agreements has served to create tension between the parties and has thus tested the robustness of the agreement. It is concluded that the power asymmetry between the parties, which is particularly evident in the case of Israel and the Palestinians, effectively gives Israel the upper hand in the decisions with regard to the implementation of the agreements. An example that illustrates this is the work within the Israeli-Palestinian Joint Water Committee (JWC). According to the Palestinians taking part in the JWC and its subcommittees,¹⁹ there have been delays in decisions with regard to permits to drill wells, and so on.²⁰ While the Palestinians attribute many problems and delays in decisions regard-

ing Palestinian projects to Israeli unwillingness, the Israelis maintain that they have hydrological reasons for turning down Palestinian proposals.²¹ However, well-informed sources admit that Israel's refusals to agree on project proposals with the Palestinians are sometimes due to political rather than technical reasons.

Furthermore, it is noted that, in comparison, the Israeli-Jordanian cooperation and implementation of the agreement can be described as fairly smooth, while the Israeli-Palestinian cooperation and implementation of the Interim Agreement have encountered obstacles. These obstacles cannot be attributed to problems of cooperation on a professional level. They are rather the result of the surrounding political circumstances which are much more sensitive and problematic in the case of Israel and the Palestinians than in the case of Israel and Jordan. In that sense the possibilities for an extension of the water cooperation to other political sectors is confined.

Despite the problems in implementation there exists a kind of contained mechanism that guides the action of the parties. This can be called a water regime. While this does not imply that there are no problems in the sector, it is concluded that the evolving principles, norms, rules, and decision-making procedures resemble a water regime. In addition, during times of pressure on the regime, such as the drought in 1999, which resulted in strained relations between Israel and Jordan, or the Intifada between Israel and the Palestinians that started in September 2000, the water regime has showed robustness and resilience, as referred to above, although its effectiveness has been hampered.

In the work of the EXACT group referred to above (which consists of Israel, the Palestinians and Jordan) it is evident that a sense of shared commitments to shared norms of how to handle their shared waters has grown. Since the early 1990's, their work has led to an institutionalization of cooperation. The interaction that takes place between the parties in this setting shows that a shared vision is developing

17 Politically sensitive issues, such as the locations for the drilling of Palestinian wells in the West Bank, are generally blocked by Israel for hydrological reasons, but it seems that there are often political reasons for those decisions. This is also unofficially acknowledged by Israeli officials.

18 Zeev Schiff: “Unlikely cooperation”, in: *Ha'aretz* (English version), 13 February 2001.

19 The JWC has the right to form various subcommittees, which it has done, in order to work with specific issues such as technical matters. The decisions in these subcommittees are subject to approval of the JWC.

20 Ayman Jarrar, Personal communication, Delft, The Netherlands, 22 November 2002; and Ihab Barghouti, Personal communication, Ramallah, 27 November 2002.

21 Shmuel Cantour, Personal communication, Tel Aviv, Israel, 30 April 2001.

for how to manage their shared problems. Hence it is concluded that the international water regimes that exist might be seen as a conflict-mitigating factor since they promote basin-wide interstate cooperation and thereby increase water security. The analysis of the water cooperation in the Jordan River Basin through the prism of regime theory is helpful in explaining why cooperation has occurred in spite of the significant political conflict. When a convergence of values has occurred within a regime and the cooperation has been institutionalized, it is more difficult than one might think to reverse or end this cooperation. However, whether this will have the possibility to extend beyond the water cooperation is largely determined by other political considerations that are largely outside the water management arena. Nevertheless, it is clear that the cooperation that has been institutionalized contributes to an increased water security for the parties in the Jordan River Basin in that the benefits to the river are more evident and possible to have a reasonable account of. Increased coordination and notification between the parties makes it possible to avoid sub-optimal decisions. On the other hand, the possibility to avoid sub-optimal outcomes does not always mean that the necessary decisions for avoidance of sub-optimal outcomes are taken. It is also important to bear in mind that the benefits are not always evident for the people in the region. This is in particular the case for the Palestinians in the West Bank or Gaza whose daily water situation is also negatively affected by the Israeli occupation of those areas.

47.5 Benefits Beyond the River: The Case for Spill(-)over Effects of Water Cooperation in the Jordan River Basin – Wishful Thinking or Tangible Reality?

While regime theory contributes to our understanding of why cooperation on water *per se* is taking place and a system of more or less formal and informal norms, rules, and procedures has evolved over time between the parties in the Jordan River Basin, it is not very helpful when analysing the potentials for positive spillover effects. The regime approach leads us to think (correctly) that the parties are able to avoid sub-optimal outcomes in terms of the management of the resource itself and that this is enough for bringing about cooperation. For the analysis of the potentials for positive spillover effects of this cooper-

ation we need to reach for a combination of economic and sociological (in particular theories on discourses) theoretical tools. As outlined by Sadoff and Grey there are four major “benefits” that could be derived from cooperation over a shared watercourse. These are benefits: a) *to* the river, b) *from* the river, c) *as a reduction of costs* resulting from river cooperation and d) benefits that go *beyond* the river (Sadoff/Grey 2002). Are those benefits possible to discern in the case of Israel, and the Palestinians and Israel, and Jordan and Israel? And does it matter *who* sees the benefits?

In terms of benefits to the river it is argued that there are tangible benefits to the parties in terms of a better management of the river system. For example, the canal for storage of Yarmuk water from Jordan in Lake Tiberias that was built after the peace agreement between Israel and Jordan has led to a more sensible (although by no means perfect) way of utilizing the water of the Jordan. In the case of Israel and the Palestinians an example of cooperation with benefits *to* the river is the local cross-border cooperation that takes place between the Israeli city Emeq Hefer and Tulkarem on water, in spite of being separated by the “green line”. The cities have an ambitious programme to manage their shared water resources.²² In terms of benefits stemming *from* the river the result is more mixed. There are plans between the parties for increased energy production but not much has happened. While the Israeli-Jordanian arrangements for storing part of the Jordanian share of the River Jordan in the Israeli Lake Tiberias during wintertime and the subsequent release of the water to Jordan in summer time when they need it more is a benefit to the river, it could also be seen as a benefit from the river. As a result the Jordan is able to optimize the water allocation to its farmers and to its cities. In terms of *reduction of costs* and the related reduction of tension as an outcome of the cooperation the result is mixed. While in the case of Israel and Jordan the relations are relatively smooth, it is highly doubtful whether this has to any large extent to do with the functional water cooperation. Rather, there are strong political factors (such as U.S. pressure, Israeli interest of keeping good relations with Jordan, etc) acting as strong forces reinforcing this cooperation. In the case of Israel and the Palestinians it is not apparent that the basic cooperation that is taking

22 Nahum Itzkovitz, personal communication, Antalya, Turkey, 2 November 2002; Eran Feitelson, personal communication, Jerusalem, 24 May 2001.

place between the water professionals is resulting in cooperation in other political areas. In terms of benefits *beyond* the river (for example economic integration) it is not apparent yet. In the case of Israel and the Palestinians there is on the contrary a sort of disintegration that is taking place.

While visionary leaders such as Shimon Peres in his book *The New Middle East* (Peres 1993) pointed to a possible future of further economic integration and cross-border business parks in the Jordan Valley, this has not happened yet. If an economic integration should eventually take place it is furthermore not reasonable to argue that this would to any significant extent be a result of technical water cooperation between the parties, although it should not be neglected as a confidence building measure. Indeed, the confidence building has meant that there is a professional understanding across the borders, which have increased water security since the professional people involved have generally been helpful in providing assistance for reparation of water infrastructure even during the latest Intifada. In terms of donor thinking around the issue of potential spillover effects that goes beyond the river much analysis is still needed. Reasonable questions to be asked are: would increased conditionality (demanding or at least linking water cooperation projects to cooperative measures in other political spheres) from the donor side facilitate increased spillover effects?

For a further understanding of why spillover effects of cooperative behaviour are hard to find in this case it is indeed useful to draw on discourse theory. In order for benefits to be tangible and gain momentum to stir further cooperation in other areas the benefits must be apparent to a broader public. Otherwise it is hard for the policy-makers to take the necessary steps to capitalize on the cooperation that is tak-

ing place. While the water professionals and practitioners in the field see the potential benefits in all of the above-mentioned areas, their respective superior political system is not so attuned to that (and indeed have many other interests to weigh in against the water question). And the broader public is even less aware of the cooperation that is taking place and naturally neither aware of its actual and potential benefits. Thus the strong public discourses discussed above largely determine what spill(-)over of cooperative behaviour is possible.

47.6 Conclusion

The main focus of this chapter has been on analysing whether the actual water cooperation and co(-)ordination that takes place within the water sector (primarily on a technical level) could be further utilized as a conflict prevention and cooperation enhancement mechanism in other sectors. Drawing on functionalist theories the reasonable conclusion would be that it is possible for cooperation on water issues between the parties in the Jordan River Basin to also co(-)operate on issues "beyond the river" as a result stemming from the water cooperation.

While functionalism provides a sensible way of viewing the world it is still largely questionable if cooperation on water resources in the Jordan River Basin provides reason enough for increased cooperation in other spheres in this conflict-ridden region. While the cooperation on water is rather strong and robust it has not been shown to promote cooperation in other political sectors. Ending on a slightly negative note it is at the same time acknowledged that the cooperation that is taking place is an important process.

48 Water and Food Security in the River Nile Basin: Perspectives of the Government and NGOs in Egypt

Emad Adly and Tarek Ahmed

48.1 Introduction

Water is a scarce resource that should be equitably utilized and sustainably allocated and should take into account the social, economic and environmental conditions. Egypt, like any other arid country, faces the pressing challenge of closing the gap between its limited water resources and the increasing water demand. Egypt considers the River Nile its 'vein of life', being the sole source that covers nearly 95 per cent of the population requirements. The dependence of the other nine riparian countries (figure 48.1); Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, and Uganda, on the Nile water varies according to each country's precipitation and water use patterns. These countries, being mostly humid and/or less populated than Egypt, are less vulnerable to fluctuations of the Nile flows.¹

Despite the fact that declining Nile water availability with respect to growing populations and increasing requirements for development is an alarming issue, Egypt has not yet reached the stage of a crisis. Rigorous efforts by both the government and the civil society are carried out to avoid an unbalanced offer/demand ratio. Exploring and exploiting existing available resources will only balance the water demand and supply in the short-term. Demand-driven and participatory oriented solutions and remedies constitute the basis for longer-term solutions.

This chapter discusses the views in Egypt, the major downstream country, on water and food security challenges from both governmental and non-governmental perspectives. It presents their visions and plans for the future, analyses their strategies and policies and attempts to find means of reconciling traditionally opposed and diverging approaches. Prospects for collaboration and complementarity should shift from the traditional unilateral supply-driven centralized approach to more effective participatory, demand-driven and consultative policies and action in the framework of a continued regional dialogue. This complex and challenging relationship should be extended from the national to the regional level, allowing countries of the Nile Basin to share their concerns, responsibilities and visions.

48.2 Nile Basin Population Growth and Increasing Water Demands

The population in the Nile basin countries is characterized by high population growth rates (table 48.1). Estimations of the UN World Population Prospects - the 2006 Revision (2007) and the Population Reference Bureau (2005) up to 2050 highlight the increasing future water needs for all Nile Basin countries.

This rapid population increase, adding from 2005 to 2050 about 518 million 'consumers' to the current population of the Nile Basin, imposes a human pressure on water demand and underlines the necessity of rationalizing water use. It also emphasizes the importance of tapping the potential for exploiting non-conventional sources, such as desalinated brackish/sea water.

It is noted that Egypt's population grows each year by approximately 1.5 million people. The United Nations projections indicate that its population will grow from 62.3 million in 1995 to 95.6 million by

1 For detailed information on the River Nile see: Fahmi (1986); Evans (1990); Whittington/Mc Clelland (1992, 1992a); Saeed (1992); Said (1993); Al-Mahdi (2002); AOYE (2003); FAO (1997); Howell/Allan (1994); Shady/Adam/Mohamed (1994); Shady/Grover (1996); Hvidt (1997); World Bank/UNDP/CIDA 1998: Waterbury (1987, 2002); Allan (2001, 2003); ESCWA (2002); Peichert (2003); for a comprehensive bibliography, see at: <http://www.nilebasindiscourse.net/biblio_EN.php>.

Figure 48.1: The Nile River Basin. **Source:** NBI (2005). This map is in the public domain (<<http://www.nilebasin.org>>).



2025 and will reach 114.8 million before it stabilizes by the year 2065.

The anticipated per capita water consumption for Egypt in 2025 and 2050 is projected to continually decline from 936 m³/year in 1995 to 607 m³/year and 503 m³/year respectively. Table 48.2 shows the per capita share of water consumption in the Nile basin in 1995 and the anticipated consumptions in 2025 and 2050. The data shown reveal that some Nile basin countries have been below the water poverty line of

1000 m³/year since 1995, implying a disastrous impact on food production in the region.

48.3 Aspiration to Food Security in the Nile Basin

Securing the food supply is one of the key challenges in all Nile Basin countries. Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet

Table 48.1: Population Growth in the Nile Basin Countries. **Sources:** Data for 1950 and 2000 and projections for 2025 and 2050: UN (2007); at: <<http://esa.un.org/unpp>>. Compiled by H.G. Brauch, 23 January 2008; previous compilation: Brauch (2002).

Nile Basin Countries	1950	2000	2005	2025	2050	Population Growth	
						1950-2050	2005-2050
Burundi	2,456	6,668	7,859	15,040	28,315	25,859	20,456
D.R. Congo	12,184	50,689	58,741	107,481	186,837	174,653	128,096
Egypt	21,834	66,529	72,850	98,513	121,219	99,385	48,369
Eritrea	1,140	3,684	4,527	7,684	11,465	10,325	6,938
Ethiopia	18,434	69,388	78,986	124,996	183,404	164,970	104,418
Kenya	6,077	31,252	35,599	57,176	84,757	78,680	49,158
Rwanda	2,162	8,176	9,234	15,220	22,627	20,465	13,393
Sudan	9,190	33,349	36,900	54,267	73,029	63,839	36,129
Tanzania	7,650	33,849	38,478	59,989	85,077	77,427	46,599
Uganda	5,158	24,690	28,947	54,011	92,935	87,777	63,988
Total	86,285	328,724	372,121	594,377	889,665	803,380	517,544

Table 48.2: Per Capita Share of Water Consumption (m³/year) in Riparian Countries in 1995, and Anticipated Share in 2025 and 2050. **Source:** FAO, Natural Resources Management and Environment Department, 1997: Irrigation Potential in Africa: A Basin Approach (Rome: FAO); at: <www.fao.org/docrep/w4347E/w4347e0k.htm>.

Country	in 1995	in 2025	in 2050
Burundi	594	292	213
D.R. Congo	22419	9620	6189
Egypt	936	607	503
Eritrea	2775	1353	999
Ethiopia	1950	807	517
Kenya	1112	602	457
Rwanda	1215	485	372
Sudan	5766	3287	2569
Tanzania			
Uganda	3352	1467	995
Tanzania	2964	1425	1000

their dietary needs and food preferences for an active and healthy life (chap. 33 by Oswald and chap. 34 by Salih). The major challenge for a sustainable use of water resources in agriculture is to manage community expectations to meet social and environmental aspirations, while ensuring that food and fibre are produced competitively and profitably. Water is seen as a major element in food security programmes as

the water, food and trade nexus is increasingly figuring in the consciousness of decision makers in the region. The necessity of securing one thousand tonnes of water [1000 cubic meters] to obtain one tonne of wheat is a simple example of how food production is extensively water consuming. For most Nile Basin countries, agriculture is the major consumer of water resources. On the other hand, the presence of water embedded in food crops ('virtual water', Allan 2003, 2003c) emphasizes the role trade can play in securing the food supply within a broader policy framework that encompasses both food production and trade.

Because of the limited opportunities to rely on increased and regularized precipitation, irrigation is seen as the main alternative to provide the bulk of the additional food needed in the decades ahead for the increasing population of the Nile Basin. Reliance on irrigation, however, depends mainly on the ability to store water, promoting its availability to meet the anticipated increase in food requirements. Just as land productivity became the frontier to exploit during the second half of the twentieth century, water productivity - getting more crops per drop - is considered the new frontier for the twenty-first century.

This new challenge requires creative strategies that would mix food production and trade, making securing the food supply less resource-intensive and more information- and participation-intensive. Rising to the challenge, the Nile Basin countries aim, in planning and/or implementing I&D projects, to bridge the gap between population growth and urban over-population on one hand, and food production

and rural development on the other hand. Efforts carried out in this direction go hand in hand with determined attempts to ensure sufficient water supplies while protecting the environment and ensuring economic and financial support, which are all necessary elements for maintaining agricultural sustainability.

The above-described procedure implies an evident application of integrated water resources management. This is encompassed by complementary measures that include institutional strengthening, raising awareness and development of information systems, participation of concerned stakeholders, working with other countries or regions to successfully manage internationally shared resources, etc. However, since each Nile Basin country has a set of unique legal, institutional, economic, social, physical, and environmental conditions that influence its water management policies and strategies, the application of integrated water management depend on many factors, such as the size and political organization of the country, its hydrological conditions, its regional milieu, and the diversity of stakeholders.

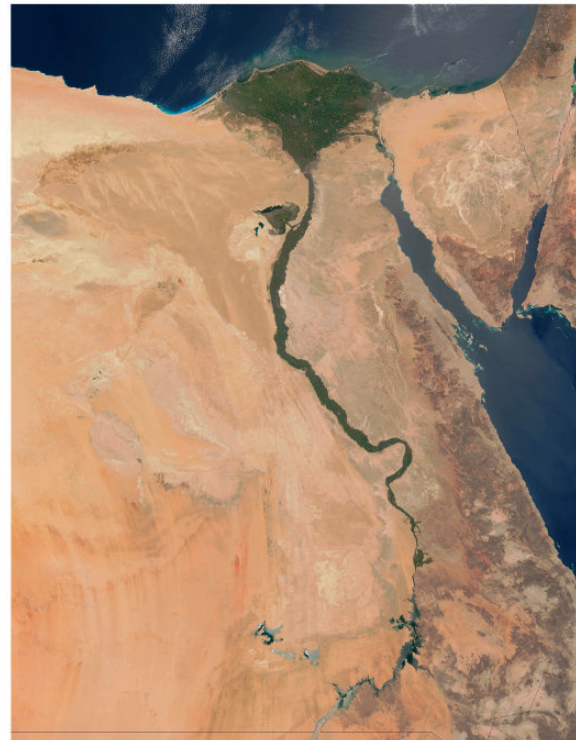
48.4 The Water Situation in Egypt with Respect to that in the Upper Nile Countries

The Nile River originates from the Ethiopian Highlands and the Equatorial Plateau, both located in humid areas representing the origins of the Blue and White Nile respectively (figure 48.2). On a national basis, Rwanda and Burundi and most of the Tanzanian part of the basin receive an average of 800 to 1000 mm of precipitation (figure 48.3). The eastern portion of the basin in Tanzania is dryer, with only 600 to 800 mm. Kenya, Uganda and the Democratic Republic of Congo fragment of the basin are quite well watered, with an average annual precipitation of 1200 to 1600 mm. Ethiopia has high rainfall, as the Blue Nile Basin includes a large area where the rainfall is over 1200 mm; but the Atbara Basin headwaters receive only 600 to 800 mm. The arid region starts in Sudan, which can be divided into three rainfall zones: the extreme south where rainfall ranges from 1200 to 1500 mm per year; the fertile clay plains where 400 to 800 mm of rain falls annually; and the desert northern third of the country where rainfall averages only 20 mm per year. Further north, in Egypt, precipitation falls to less than 20 mm per year.

The Nile and Lake Nasser are the only renewable sources of water supply for surface water in Egypt.

Most of Egypt's terrain is desert, divided into two unequal parts by the Nile River. Less than one-tenth of the land area of Egypt is settled or under cultivation. This territory consists of the valley and delta of the Nile, a number of desert oases, and lands along the Suez Canal, which connects the Mediterranean with the Gulf of Suez, an arm of the Red Sea. While more than 90 per cent of the country consists of desert areas, the Nile enters Egypt from Sudan and flows north for 1,545 km to the Mediterranean Sea, forming a narrow green valley lined by extended yellow cliffs.

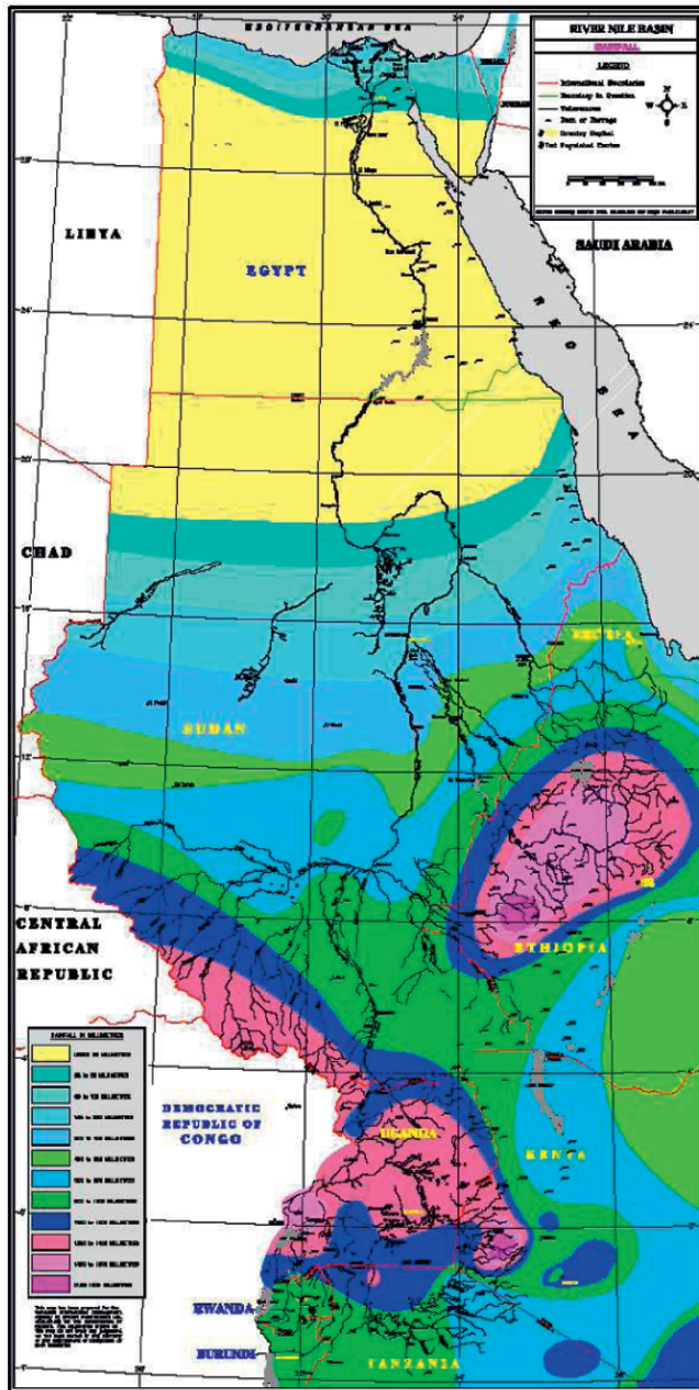
Figure 48.2: Satellite Image of the Nile River. **Source:** NASA, Visible World; Credit Jeff Schmaltz, MODIS Rapid Response Team, NASA/GSFC, Sensor Terra/MODIS, 27 August 2003; <<http://veimages.gsfc.nasa.gov/5724/Egypt.A2003235.0845.250m.jpg>>. This satellite image is in the public domain.



48.5 The Challenges Egypt Faces with Regard to Water, Agricultural Development and Food Security

The principal water management challenges in Egypt stem from the nature and quality of supply and demand management responses to water shortage. Table 48.3 shows the water demand in Egypt in 1997

Figure 48.3: Rainfall Patterns in the Nile Basin. **Source:** SPIDER International Ltd., 1994, 1997: *Water Resources Atlas of the River Nile Basin* (Ottawa: Canadian International Development Agency). This map is in the public domain.



and that projected for 2017, demonstrating how these requirements will be met through tapping non-conventional water resources, including water savings and possibilities of reuse.

Water conditions are, however, likely to straighten despite the giant water storage reservoir in Lake Nasser created after the construction of the High Aswan Dam in 1964. This is due to climatic fluctuations,

accelerating development activities, and high price of untraditional water abstractions. The role of the High Aswan Dam in reducing Egypt's vulnerability to the fluctuations of external and shared resources originating from upstream countries cannot, nonetheless, be denied.

Table 48.3: Estimated Water Balance of Egypt in 1997 and 2017 (in km³/year). **Source:** Egypt, Ministry of Water Resources and Irrigation (2002). This table is in the public domain.

	1997	2017
Water Resources:		
From Lake Nasser through High Aswan Dam	55.5	55.5
Rainfall	1.3	1.3
Shallow Groundwater	6.1	8.4
Drainage Reuse	7.5	11.4
Wastewater Reuse	1.4	2.4
Total	71.8	79.0
Industrial water flushed back to system	6.8	17.8
Agricultural water flushed back to system (Not including Reuse)	4.9	1.9
Domestic water flushed back to system (Not including Reuse)	2.4	2.6
Fishery water flushed back to system	0.9	0.4
Total Water Resources	86.8	101.7
Water Demand:		
Agriculture	57.8	63.6
Domestic	4.7	6.6
Industry	7.5	18.7
Navigation	0.2	0.2
Evaporation	2.4	2.5
Fishery	1.3	0.6
Total	73.9	92.2
Drainage to Sea	12.9	9.5
Total Water Demand	86.8	101.7

As use mounts, environmental problems emerge, including deterioration of water quality, salinization, and reduction of the yield of heavily exploited aquifers. The decline in water quality has in part been caused by problems related to the fast growth of cities: inefficient wastewater treatment, poor or non-existent solid waste management, and weak pollution control and abatement programmes. In addition, the truth that 'somebody has to pay for the quality water

services' has often been overlooked. Institutional structures have paid too little attention to the imperatives of financial sustainability. Both in irrigation and in water supply and sanitation, the quality of service delivery has too often been undermined by inadequate budgets, themselves in part resulting from inadequate cost recovery.

Increased urbanization, less homogeneous societies which reduce the effectiveness of traditional water management institutions, high levels of unemployment leading to reluctance to reduce water diverted to irrigated agriculture on which the poor often depend, increased climate variability, and increased pressure on agriculture from imports, are additional challenges that would reduce water availability. As a result, more than 50 per cent of the population food requirements are currently imported from abroad as reflected by the indicators on the state of food security shown in table 48.4. Available water resources can do little to close this 'food gap' – self sufficiency in food would require an extra quantity of water that amounts to more than the entire current water use. There is, however, scope for improving returns to water through greater use efficiency and through a move to higher value crops.

48.6 Governmental Efforts to Secure the Food Supply

The Government of Egypt recognizes the significant role of the agricultural sector, contributing to the food needs of the country and providing the domestic industry with agricultural raw materials. This sector also accounts for about 20 per cent of GDP and total exports, and about 34 per cent of total employment. It promotes industrial development through expanding the market for industrial goods such as pesticides, fertilizers, equipment and machines. Moreover, agriculture helps finance economic and social development through the net capital outflow from agriculture to other sectors of the economy. To meet the different water requirements, most importantly those of the agricultural sector, the Government of Egypt has adopted a strategy based on three main pillars:

1. Using the available water resources appropriately;
2. Protecting the water quality and combating pollution; and
3. Identifying new water resources in consultation and cooperation with Nile basin countries.

Table 48.4: Indicators Used to Report on the State of Food Security in Egypt. **Source:** Egypt, Ministry of Water Resources and Irrigation (2003). This table is in the public domain.

Indicator	Year of Evaluation	Indicator Value	Remarks
Net cereal imports and food aid as a per cent of total consumption	1998-2000	33.7%	
Food aid as a per cent of total imports	1998-2000	0.3%	
Average daily per capita calorie supply	1999	3323 kcal	compared to the global norm of 2808 kcal
Average daily per capita calories from animal products	1999	241 kcal	compared to the global norm of 460 kcal

This strategy has been put into action by the Ministry of Water Resources and Irrigation (MWRI 1997), the responsible body for appropriating and distributing water in Egypt, at three main levels. At the first level, water scarcity has been felt, but *supply side solutions* exist and scarcity has typically been addressed through supply management and engineering interventions to divert more water or reduce conveyance losses.

At the second level, where classic supply side solutions are no longer practical, investments have more focused on *non-conventional supply solutions* like wastewater recycling, and have begun to make water use more efficient through user *demand management interventions*. Demand side approaches have proven challenging as they rely on the development of appropriate instruments and institutions to ensure sustainable and high quality water services to farmers and the population, as the counterpart to managing demand to maximize income and growth.

At the third level, where institutional reforms have led to enhanced water management within each sub-sector, demand and the needs of a modern economy continue to press on scarce resources, necessitating improvements in *overall sector governance*. Typically, this stage includes integrated water resources management, decentralization of water service management to locally accountable institutions, and the involvement of users and of civil society in governance structures. Difficult political tradeoffs and institutional accountability are involved to achieve more value per each drop of water. However, experience has shown that overall integrated management can be achieved, provided that political will is backed up by effective capacity building programmes, awareness campaigns, applied research, and adoption of innovative technologies.

Virtual water and agricultural product trade add another dimension to the question of securing the food supply. Under the GATT '94/WTO multilateral agreements and the free trade agreements, the obliga-

tions of Egypt are an important determining factor for food security. The Government of Egypt has steadfastly maintained that it will comply with all obligations and commitments under the framework of rules and procedures of global trade. The most relevant and significant provisions of the agriculture agreement relate to market access, domestic support and export subsidies. However, developing countries are not obliged to reduce domestic support measures which are 'an integral part of their development programmes'. While Egypt operates under these obligations and shares the burden of implementing them, it strives to achieve domestic economic growth, jobs and an enhanced living standard through increased exports.

In the same context, the Association Agreement between the European Union and Egypt, within the Barcelona process, is to establish an appropriate framework for cooperation and partnership, which is to contribute to the economic and social development in Egypt.² The establishment of a bi-lateral Free Trade Agreement is based on reciprocal tariff liberalization for both agriculture and agro-industry. The EU has increased the tariff quotas granted for Egypt's main exports. Egypt equally reduces tariff duties for several agricultural imports from EU countries. Processed agricultural products equally enjoy reciprocal concessions, thereby improving market access for both parties. In the light of all these measures, Egypt plans to increase its agricultural exports to a level of US\$ 1 billion annually (<www.agri.gov.eg/future.htm>).

2 Source: <<http://www.eu-delegation.org.eg/en/eu>>.

48.7 Role of Civil Society and NGOs in Water Security

Non-governmental organizations may enhance transparency in presenting the facts on water issues. They may increase awareness on new techniques aiming to rationalize water use, whether for irrigation or drinking purposes, maintain water supply and combat pollution. They may expand the dialogue among different segments of society and involve more people with the executive officials to discuss water issues and forward constructive proposals. They may handle water issues in a comprehensive way, economically, socially, environmentally, legislatively, and geographically. They may also address the links between health problems of local communities with wrong attitudes and practices of citizens towards water streams. They may enhance the full cooperation of various activities of ministries concerned with water use in the active implementation of the Law on the Environment (Law No. 4 of 1994). Finally, NGOs may raise the awareness on water issues and promote national values and traditions that call for preserving water through various methods of regular and irregular education and various media channels.

NGOs operating in developing countries face, however, many obstacles and constraints that sometimes jeopardize their efforts, often due to a lack of recognition from various bodies of the government, and sometimes even from the society itself. In some other cases the reasons might be attributed to a lack of funding or capacities within the NGO itself. Some other reasons are more sector specific, i.e. related to the field in which the NGO is active. For example, there are only few NGOs working in the field of food security, many of which lack the necessary professional and technical capabilities. There is also a clear lack of interest in scientific research and a lack of data and information on voluntary-based activities dealing with food security. On the financial side and even on the technical one, the support of donors and the private sector is limited. Many NGOs depend on scattered and unsustainable financial sources, often leading to a discontinuity of their activities.

To overcome these problems, several actions and measures are proposed. The first involves organizing NGOs working on food security, and uniting them in a network of associations, unions, and institutions dealing with food security issues. Second, the integrated roles between government, civil society, academia and the private sector should be stressed. The NGOs should, thirdly, expand their capacities in

human resource development, knowledge and information, fundraising and strengthening of their structures. By highlighting success stories of NGOs working on food security, the media can also play an important role in combating hunger in Nile Basin countries. Expertise should finally be exchanged within the framework of international bodies working in related fields.

48.8 Successful Initiatives of NGOs in the Water Sector

48.8.1 Egyptian Water Partnership

The *Egyptian Water Partnership* (EWP) is an informal platform to discuss water issues and policies, exchange information and start joint activities among different stakeholders and water players. Its mission includes “promoting sustainable management of water resources at national and local levels, through partnerships.” Its objective is to identify critical water issues of local and national importance based on ongoing assessments of the state of water; disseminating information and facilitating sharing experience among users, policy makers, and planners on new developments, good practices and research findings and familiarize different water stakeholders with each others programmes. To achieve this objective, the EWP strategy is to coordinate the efforts of various water stakeholders to maximize the benefit from water; economically and socially without compromising the sustainability of water and its quality.

The partnership aims also to ensure a broader outreach and to co-operate with global and regional programmes and initiatives, and establish links with regional and international organizations such as GWP, GWP-Med, WWC, UNDP, CEDARE, UNESCO, etc. The EWP serves as a public instrument to solicit public opinion on water related projects at the local and national levels, to provide a platform for practical action by creating support for promising initiatives in the field of IWRM or lobbying for changes in water management practices.

The EWP will serve as an independent stakeholder platform, a vehicle to promote IWRM principles, build the capacity and raise awareness on IWRM in Egypt. The EWP will achieve this in a multi-disciplinary approach by bringing together organizations from many backgrounds to share knowledge and develop a common vision for facing water problems in a participatory approach. The EWP makes

water everybody's business in Egypt. The EWP work plan identified among its priorities the relevance of water security for Egypt's obligations towards the international and local community. The EWP has addressed Egypt's water scarcity as well as water rights and equity. The EWP is a strong advocate in supporting the government and society in Egypt to realize its Millennium Development Goals (MDG) for water.

48.8.2 The National Nile Basin Discourse Forum

The *Nile Basin Initiative* (NBI) emphasized the role of civil society in achieving its ultimate goal of co-operative development on the Nile and the need to engage the society to better represent the interests of the poor (Peichert 2003). This led to the Nile Basin Discourse (NBD) "to promote dialogue on sustainable and equitable development, peace and mutual understanding within the Nile River Basin"³, and to the establishment of National Civil Society Forums (NDFs) in each country in October 2003. The National Forum in Egypt (EgNDF) reflects the demographic distribution and selection of a representative sample of the Governorates overlooking the Nile in Upper Egypt and in the Delta. These national consultations resulted in many recommendations to raise the awareness of the general public, on the role of specialists (civil engineers, agronomists, medical doctors, media), on the need to enforce the regulation on Nile Protection and the Environment and to reconsider the traditional agricultural system to the economic value of water.⁴

These consultations resulted in a Declaration in which the members of the National Forum pledged to establish a democratic dialogue among all stakeholders at the national and regional levels on the shared responsibility of management and preservation of water resources. It also recommended to all concerned national, regional and international organizations, to civil society, the governments, academia and research centres to operationalize the recommendations of the Forum as a step to achieve the sustainable development goal for the River Nile.

48.9 Conclusions

This brief overview of the challenges facing Egypt with reference to water and food security, the development plans of the government, its implication for Egyptian civil society and non-governmental organizations offered a snapshot. The challenges facing all stakeholders led to recommendations based on manifold expertise and a willingness to start where others have ended. The cooperation within the Nile Basin Initiative offers a platform for partnership and a shared vision. There is a need to develop national integrated programmes for water resources management. Most Nile countries suffer food shortage and this needs more investments in new appropriate technologies to increase the crop productivity, and the promotion and wider use of such technologies. Financial sustainability can only be achieved if the private sector is attracted to water and food security projects.

Last but not least, the civil society has an important role to play especially in the areas of water conservation and sustainable livelihoods through food security. And it would be appropriate in this context to recall the goal of the Nile Basin Discourse "to promote dialogue on sustainable and equitable development, peace and mutual understanding within the Nile River Basin".

These data point out the need for coordination and effort unification among all Nile basin countries to reach unconventional solutions in facing the problem of the declining individual share of water supply, including improved water conservation, waste minimization and reuse of treated sewage water, besides a rationalization of the water demand.

3 Source: <http://www.iucn.org/themes/wetlands/pdf/NBD%20Newsletter%20_Dec.2003%20issue.pdf#search=NBI%20Discourse>.

4 Source: <http://www.aoye.org/arab/NBD_dec.htm>.

49 Water and Food Security in the Nile River Basin: Perspectives of Governments and NGOs of Upstream Countries

Patricia Kameri-Mbote and Kithure Kindiki

49.1 Introduction

Water is an important resource for sustaining life. The uses of water are manifold, and include domestic uses, industrial uses such as the production of hydro-electricity, irrigation and animal husbandry (Godana 1985: 1). Moving and stagnant water – such as rivers and lakes – serve as reservoirs for waste disposal (Okidi 1996: 1). Water and food security around the world continue to be threatened by population explosion and the rising standards of living, confirming that water is finite and cannot withstand all pressures to its quality, quantity and life-giving purposes. With the increasing demand on water and pressure on national water resources, states are increasingly turning to international watercourses.

This chapter is concerned with the perspectives of governments and NGOs of upstream countries regarding the consumptive utilization of the Nile River resources in the pursuit for water and food security within the basin states (49.2). It reviews the debate on the relationship between water scarcity in the Nile basin and inter-state armed conflict (Starr 1991, Wolf/Yoffe/Giordano 2003; 49.3); and on the status in international law of the bilateral treaties (49.4) on the consumptive uses of the Nile entered between Egypt, Britain and other powers before and during the colonial period (Garretson 1960; Teclaff 1967; Okidi 1982, 1994; Carrol 1999; Okoth Owiro 2004: 50).

The chapter argues that even if water and food security may not necessarily lead to violent inter-state conflict (Wolf 1998), water and food scarcity in the basin has, however, nurtured political tensions among basin states thus retarding the efforts towards sustainable development (49.5). Food security is used here to mean food production and availability at the macro level as well as access and distribution of available food. Since our aim is to look at the situation of upper riparian countries, we do not explore discourses concerning meeting food security needs through dis-

tribution of food produced in one part of the basin to all basin countries (figure 49.1).

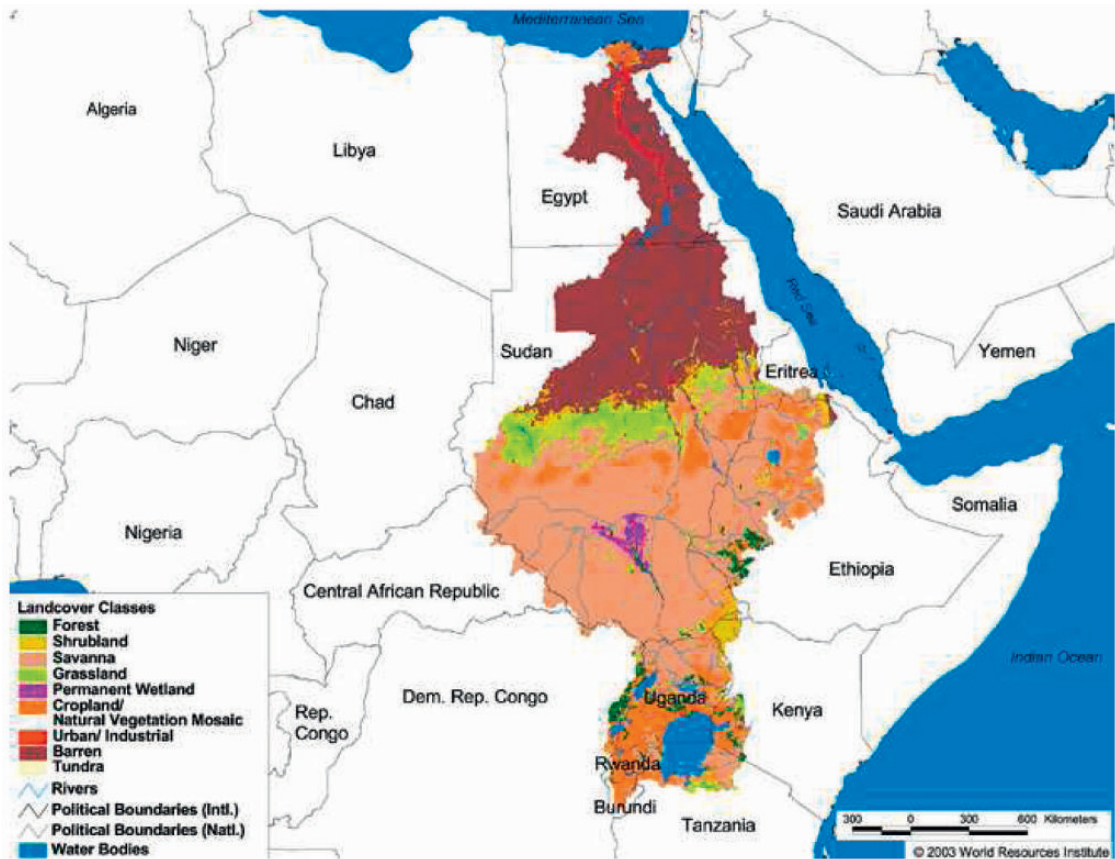
Further, it is contended that the current state of affairs whereby riparian states' interests in the Nile basin are diametrically opposed, coupled with the strong foundation in international law for the claims of upstream states, suggests that the traditional political methods of settling disputes like negotiation or conciliation are unlikely to yield results in the foreseeable future (49.6).

As a result, downstream states, notably Egypt, will continue to delay or complicate political dispute settlement mechanisms. The chapter recommends a change in diplomacy by upstream states to one of convincing downstream states to submit the Nile question to some international judicial process. This contribution is premised on the assumption that with the dilemma posed by water and food insecurity in the Nile basin, governments will choose to co-operate in the development of joint water management schemes for the benefit of all, based on the principle of equitable utilization of shared resources, rather than go to war as the finite limits of available water supplies are reached (49.7)

49.2 Reappraising the Hydrology of the Nile: Water and Food Security in the Basin

The Nile River, which is inextricably linked to Lake Victoria, as the only drainage outlet from the Lake is the second longest river in the world. Its length together with its tributaries is 3,030,300 kilometres (Kasimbazi 1998: 18). The entire Nile-Victoria basin is estimated at 2.9 million square kilometres, representing roughly one tenth of the African continent (Okidi 1994: 321). The Nile basin covers ten states, namely: Kenya, Uganda, Tanzania, Rwanda, Burundi, the

Figure 49.1: Landcover Classes in the Nile Basin. **Source:** IUCN: Water Resources E Atlas. Watersheds of the World; at: <http://www.iucn.org/themes/wani/eatlas/html/af15.html>; © World Resources Institute 2003. Permission has been obtained from the copyright holder.



Democratic Republic of Congo (DRC), Ethiopia, Eritrea, Sudan and Egypt (figure 48.1, table 48.1).

The Nile is made up of three main tributaries. These are the White Nile, the Blue Nile and the Atbara. The White Nile rises from its source in the highlands of Rwanda and Burundi and flows into Lake Victoria leaving its Northern shore near the town of Jinja, and heading north towards Lake Albert that receives much water from the Semliki River, which has its source in the DRC and empties first into Lake Edward, where it receives additional water from the tributaries coming from the Rwenzori Mountains in Uganda on its way to Lake Albert. From here, the White Nile flows into Sudan (Kasimbazi 1998).

Lakes Victoria, Edward and Albert are the natural reservoirs (figure 49.2), which collect and store great quantities of water from the high rainfall regions of Eastern Equatorial Africa and maintain a permanent flow down the White Nile with relatively small seasonal fluctuations (Beadle 1974: 124). In Sudan, near Khartoum, the White Nile meets the Blue Nile, which

drains Lake Tsana in the Ethiopian highlands. The two flow together to just north of Khartoum where some 108 kilometres downstream, they are joined by the Atbara, whose source is in Eritrea. The River then flows north through Lake Nasser and the Aswan High Dam before splitting into the Rosetta and Damietta distributaries just before flowing into the Mediterranean Sea (Okidi 1982).

The linkage between water and food security in the Nile basin is obvious, as water scarcity impacts negatively on agriculture and, therefore, on food security. Water scarcity is probably the single biggest threat to food security anywhere in the world. Water and food security in the Nile basin remains fragile. For instance, Egypt continues to strenuously defend its nearly 100 per cent dependence on the Nile waters to secure the livelihood of its ever-increasing population (figure 49.3; see chap. 48 by Adly/Ahmed; table 48.1). The situation in arid Sudan is no better. Ethiopia remains a country of perennial droughts and famine, despite the country contributing a substantial vol-

Figure 49.2: The Upper Nile Basin and Lake Victoria. **Source:** USDA, Production Estimates and Crop Assessment Division Foreign Agricultural Service: at: <http://www.fas.usda.gov/pecad/highlights/2005/09/uganda_26sep2005/images/nile_basin.htm>. Permission was obtained from the copyright holder.



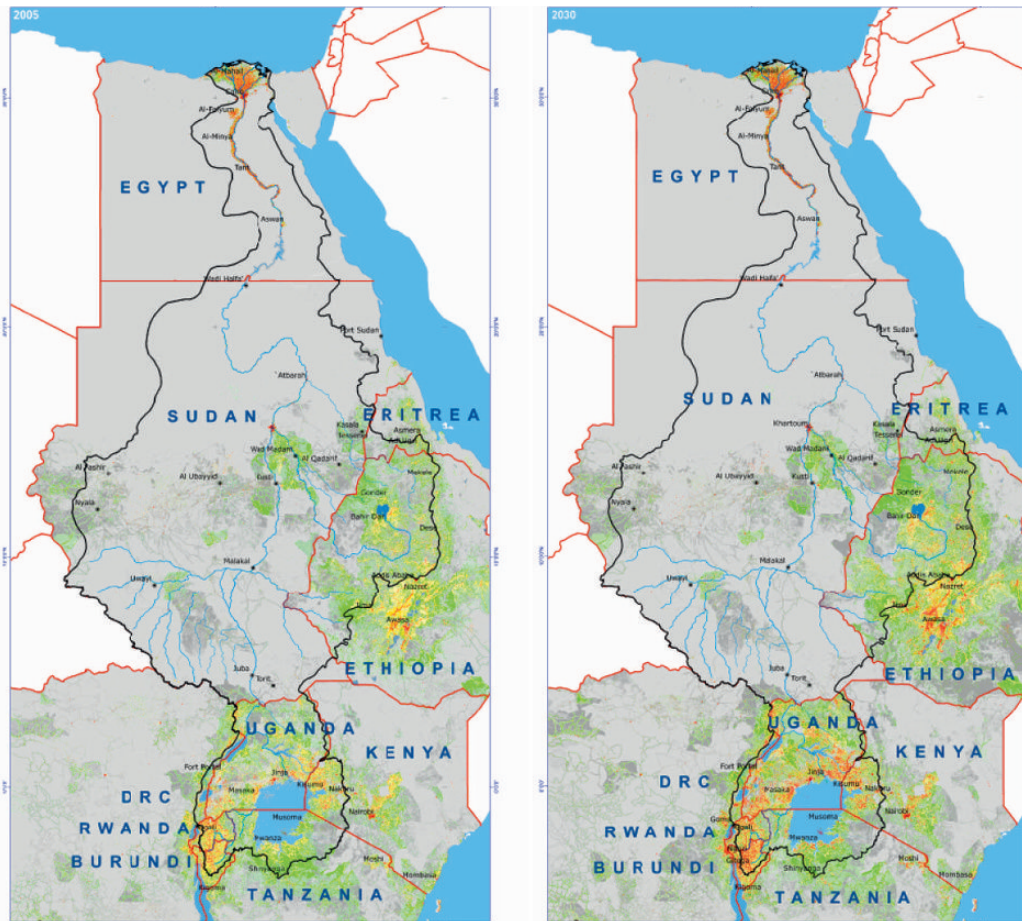
ume. Okidi (1982: 321) has explained the reason for this state of affairs as being the uneven monthly and geographical distribution of the Ethiopian rain.

Similarly in Kenya, another substantial contributor of water through six major rivers flowing into Lake Victoria, two thirds of the entire territory is classified as arid or semi-arid, where water and food remain scarce resources. Kenya has established the Lake Basin Development Authority to develop a master plan for the consumptive uses of its water for agricultural development, to the chagrin of Egypt. Tanzania, a contributor of approximately 25 per cent of the waters flowing into Lake Victoria, is grappling with its water and food scarcity by ambitious irrigation works under the aegis of the Kagera Basin Organization, despite Egyptian opposition to these works.

It is noted that one distracting factor in the quest for a basin-wide consensus on equitable utilization of the Nile waters emphasizes that upstream states contribute only 15 per cent of the water flowing into Egypt. According to Bard (1959), Godana (1985) and Okidi (1994), the average annual flow of the Nile measured at Aswan is 84 billion cubic metres. Of this total about 85 per cent originate from the Ethiopian plateau, whereas only 15 per cent come from sources in East Africa. However, these estimates over-simplify the statistics of the Nile which are complex (Garretson 1967; Godana 1985; Okidi 1994; Okoth Owiro 2004). At least three reasons debunk the claims based on these figures.

First, the flow of the White Nile is relatively regular throughout, while the Blue Nile-Atbara sub-system

Figure 49.3: Population Distribution on the Nile Basin in 2005 and 2030. **Source:** FAO < <http://www.fao.org/images/PopulationDistribution29Nov.png>>.



fluctuates seasonally. According to Godana (1985: 81) the Blue Nile swells to an enormous torrential flow and accounts for some 90 per cent of the water passing through Khartoum. But by April the water from both sources dwindles to one-fortieth of the flood discharge, to account for no more than 20 per cent of the water passing through Khartoum. This tallies with statistics by Garretson (1967), who argues that the Blue Nile alone supplies 90 per cent of the water passing through Khartoum during the high season from April to September; but this contribution reduces to 20 per cent during the low season from January – April.

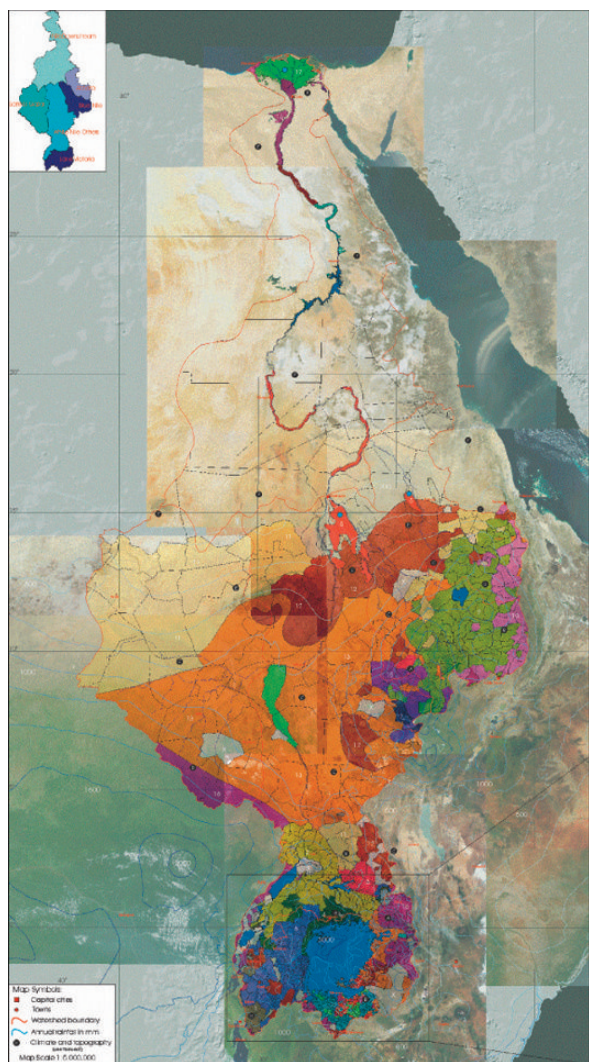
Second, it is incorrect to measure the flow of the Nile from Khartoum. A more realistic estimate of the White Nile's contribution could be obtained by measuring the amount of water leaving the Lake plateau of East Africa because of the estimated 24 billion cubic metres of water from the White Nile, half is lost

through intense evaporation and soakage in the Sod (Godana 1985: 83).

Third, estimating the flow of the Nile on the basis of how much water reaches the Sudan or Egypt appear to assume that the purpose of the Nile is to feed these two countries with water; thus only the water reaching its destination is worth accounting for (Okoth Owiro 2004: 3).

The worsening of water and food security in the Nile basin should enhance the need to comprehensively deal with the management of the quality and quantity of its water. The rapid population increase calls for equitable uses of the River to enhance basin-wide as opposed to single riparian food security (table 48.1; figure 49.4). By the year 2000, 280–300 million people lived in the ten basin countries. Of these, about 160 million depend on the Nile River and its tributaries (Kameri-Mbote 2004: 11). Within the next 25 years, the basin population may double to 594 million by 2025 (table 48.1), increasing the water demand

Figure 49.4: Dominant Crops in the Nile Basin Farming System. **Source:** FAONile; at: <<http://www.fao.org/images/dorminantcrops.png>>.



for agriculture and industry (table 48.2) with a possible increase in drought and famine (figure 48.3). There may be more erosion, soil degradation, pollution from chemical run-off from industry and agriculture and more water-borne diseases.

49.3 Riparian Interests

The economy of the entire Nile Basin heavily depends on agriculture. The water resources of the Nile are utilized for irrigation, hydroelectric production and fishing. The river is a source of water for domestic use and is also important for biodiversity and climate modulation as well as for tourism (Kasimbazi 1998:

19). To achieve these purposes, dams have been constructed by downstream and upstream states.

Egypt entirely depends on the Nile for its water needs (chap. 48 by Adly/Ahmed). In 1978, Egyptian President Anwar Sadat threatened to go to war were any country to tamper with the river's flow: "We depend upon the Nile 100 per cent in our life, so if any one, at any moment thinks of depriving us of our life, we shall never hesitate to go to war" (Kukk/Deese 1996: 46).

Egypt has never carried out this threat, despite the increasing interest in and in some cases abstraction of the water of the Nile Basin for various irrigation and other development projects. Egypt still holds the view that existing Nile Treaties are binding in perpetuity, and that the treaties grant Egypt natural and historic rights over the Nile (49.4).

Other co-riparians have expressed different views. Ethiopia adheres to the Harmon doctrine (49.4), arguing that it can do whatever it pleases with the waters in its territory despite any ramifications on co-riparian states (Kukk/Deese 1996). This position is similar to that of Tanzania, which does not recognize the Nile Agreements. Although Kenya does support the Egyptian position and opposes the Nile Agreements, its view is somewhat moderate, urging for a more equitable utilization of the water of the Nile and Victoria Basin in accordance with the principles of the United Nations Charter, and the modern principles of international watercourses law (Okoth Owiro 2004: 38-41). The position of Uganda, Burundi and Rwanda is the same, while the DRC has never stated its position (Okoth Owiro 2004: 41).

As a result of the positions taken by downstream states, in opposition to the radical Egyptian view, upstream states have increasingly viewed the Nile as a principal feature of their economies. Tanzania hopes to implement a plan to abstract the waters of Lake Victoria to irrigate the relatively low and dry steppes on central Tanzania. Kenya has begun treating more seriously the waters of Lake Victoria with the establishment of the Lake Basin Development Authority.

49.4 The Legal and Institutional Context

The Nile is an internationally shared river. With Lake Victoria the Nile forms an "international watercourse", defined in the UN Convention on the Non-navigational Uses of International Water (1997) as a

“watercourse, parts of which are situated in different states”.

According to Article 38 of the Statute of the International Court of Justice (ICJ) the basic sources of international law are treaties, customary international law and general legal principles, as well as judicial decisions and scholarly writings “as a subsidiary means for the determination of the rules of law” (Brownlie 1990: 10). While the Nile may be governed by the principles of both treaty and customary international fluvial law, the only treaty principles governing its water use are the bilateral treaties between Egypt, Britain and other powers between 1885 and 1959. Under these treaties upstream states committed themselves to Egypt and Britain that they would respect prior rights to and especially claims to natural and historic rights to the Nile waters, which Egypt asserted (Okoth Owiro 2004: 1).

All these treaties, except the 1959 Agreement, were adopted when all co-riparians of the Nile (except Ethiopia) were ruled by foreign colonial powers. After the independence of the states in the basin, the legal issue has remained whether or not the treaty commitments made by the predecessor states binds post-colonial states (O’Connell 1956: 16). As the lack of agreement on this question is responsible for the divergent positions adopted by upstream and downstream states, the legal status of these treaties is briefly discussed, before looking at the current general norms of international law on shared water resources such as the Nile.

49.4.1 The Legal Status of the Nile Treaties

Is the international legal regime established over the Nile through treaties concluded between Great Britain with other powers still operational or binding on the Nile Basin states? The answer to this question is fundamental to the issue of upstream and downstream riparian rights and obligations over the Nile water. If these treaties are valid and binding, they legitimize the legal order of the colonial period that gave Egypt pre-eminence in the control of the Nile and unimpeded use of the Nile for national development. This would pose a severe constraint on development efforts and opportunities of upper riparian states.

But if the Nile Agreements are not binding, then the control and utilization of its water are regulated by the general norms of international law discussed below (50.4.2). It would imply that the Nile needs a new legal regime in the form of a basin-wide treaty. This

would not only provide room for fresh negotiations amongst all basin states, but could also help develop a utilization regime that is more sustainable and equitable.

49.4.2 General Norms on International Watercourses

There are at least six principles of contemporary international law on the consumptive uses of international watercourses. Each of these, as well as their level of acceptance, is discussed from the perspective of upstream states. It will be seen that the first three principles are outdated while the last three seem fairly anchored in law.

The first one is the doctrine of absolute territorial sovereignty. In its absolute form, this doctrine, posits that states have absolute sovereignty over all water in their territory and may use it as they please including extracting as much of it as possible or altering its quality regardless of the consequences of the use on the supply of water on downstream or contiguous states (Birnie/Boyle 1992: 218).

This doctrine of absolute territorial sovereignty appears founded on the basic international law principle that there is absolute sovereignty for every nation as against all others within its territory (Kasimbazi 1998: 20). It is favoured by upstream states, as it is an extreme theory that completely ignores the rights of downstream states. However, the doctrine has remained unpopular, with the great majority of writers emphatically rejecting the doctrine (Godana 1985: 36). Even the U.S. itself quickly retracted from the full Harmon doctrine in subsequent treaties with Mexico and Canada.

Even if the Harmon doctrine were to be accepted by writers, it fails to appreciate that under international law, states not only have territorial sovereignty but ‘territorial duties’ as well. One such duty is encapsulated in the customary international law maxim *sic utere tuo ut alienam ad laedas* that creates an obligation for states not to conduct or permit activities within their territory that may be harmful to the territories of other states (Birnie/Boyle: 1992: 89). Reiterating this customary principle, the arbitral tribunal in the well-known *Trial Smelter Arbitration* (1938–1941) that involved transboundary pollution ruled that: No state has a right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or to the properties or persons therein.

The second theory is that of absolute territorial integrity. It espouses an old common law of water rights whereby a lower riparian state has the right to the full and uninterrupted flow of water of natural quality. The upper riparian may not interfere with the natural flow without the consent of downstream states. This principle, which is favoured by downstream states and has been the basis of the 1929 and 1959 Nile treaties, is curiously also based on the 'good neighbourliness' doctrine espoused in the *sic utere tuo* maxim.

A major criticism to the absolute territorial integrity theory is that just as its absolute sovereignty counterpart, it is an extreme doctrine that creates something akin to veto rights in favour of downstream states against upstream states (Biswas 1993: 172). Current law on international watercourses, as espoused in the 1997 UN Convention, reject the radical approach and endorses a legal scheme that balances between rights and duties for both upstream and downstream states. According to Godana (1985: 39), the theory of absolute territorial integrity may also be considered as discarded.

The third principle is that of prior appropriation rights or to use the words used in the Nile Treaties, 'natural and historic rights' to internationally shared rivers. The principle allows any riparian that puts the water of an internationally shared river to use first to establish prior and incontestable rights over the particular use. Although in theory this principle favours neither upstream nor downstream states and therefore appears equitable *prima facie*, it is restrictive and unworkable (Kasimbazi 1998: 21). The theory's weakness is to allow the state that puts the waters of an internationally shared river into use first, enjoys veto rights over others, an undesirable scenario that seems unsupported by the 1997 UN Convention and other sources of international fluvial law.

The fourth is the principle of limited territorial sovereignty and integrity (Kasimbazi 1998: 22). The theory advances qualified sovereign and territorial claims over international watercourses. By it, co-riparian states have reciprocal rights and duties in the use of the waters of a transboundary water river.

Fifth is the principle of equitable utilization, already hallowed in treaty and customary international law. It is the most widely endorsed theory that treats international watercourses as shared resources subject to equitable utilization by all riparian states (Birne/Boyle 1992: 219). The doctrine rests on the foundation of equality of rights and relative sovereignty but should not be confused with equal division.

It calls for accommodation of the interests of all riparian states.

Equitable utilization as a principle of international law has found support from case law, state practice, treaties and other codifications. In the *River Order Case* the Permanent International Court of Justice (PCIJ), which is the progenitor of the ICJ invoked the exigencies of justice and considerations of utility, favouring "a community of interest" in the utilization of an internationally shared river by all riparians based on equality of rights on the whole of the navigable part of the River Order. Although this case involved navigation, the same principle is applicable to the consumptive, non-navigational uses of international watercourses.

While the precise meaning of the term 'equitable utilization' is the subject of future judicial or arbitral interpretation, guidance may be sought from the Helsinki Rules as well as the codification of the International Law Commission (ILC) in its report to the UN General Assembly I 1994 during the drafting of the 1997 UN Convention. According to the Helsinki Rules, 'equitable utilization' is to be determined in all the relevant factors, which include geography, climate, hydrology, prior utilization of the waters, economic and social needs of each state, the availability of other resources, avoidance of waste in the utilization of the water, and the practicability of compensation to one or more riparian states as a means of adjusting conflicts among the needs and uses of each riparian state.

Sixthly and finally is the principle of common basin-wide management of international watercourses. Also well-grounded in international law, this theory presupposes that internationally shared rivers and lakes are most efficiently managed as an integral unit. The theory stems from the consideration that international watercourses do not respect national frontiers across which they flow. Thus, proponents of this doctrine insist on a community approach management that downplays political boundaries and one that regards an international watercourse as a single economic and geographic unit.

Treaties in which the common management doctrine has been incorporated include the *Agreement on the Action Plan for the Environmentally Sound Management of the Common Zambezi River System* (1988: 28 ILM 1109), the *Treaty on River Plate and its Maritime Limits* (1973: 13 ILM 242), and the *Treaty for Amazonian Cooperation* (1978: UNTS). Other international codifications that endorse the common management theory include the 1972 *Stockholm Dec-*

laration on the Human Environment (article 2(5)(a), and the 1977 *UN Mar del Plata Water Action Plan*. The principle forms article 24(1) of the 1997 UN Convention providing that:

Watercourse states shall ... enter into consultations concerning the management of an international watercourse, which may include the establishment of a joint management mechanism.

It is worth emphasizing that the rather omnibus common management doctrine generates an array of other more specific principles. These include the general duty for each state to cooperate with co-riparians, and the procedural requirements of prior notification of intended projects involving the water resources of an international watercourse, as well as the duty to consult other riparians and negotiate with them where objections to the intended utilization arises.

49.4.3 The Institutional Set-up for Cooperation on the Nile

Although this chapter is not concerned with appraising the existing cooperative framework regarding the Nile Basin, a brief mentioning of two initiatives is appropriate: the *Nile Basin Initiative* (NBI) and the *Nile Basin Discourse* (NBD). The NBI, involving all basin countries except Ethiopia, has the ambitious goal of establishing regional cooperation and mutually beneficial relationship between the basin states. The initiative, therefore, is to achieve sustainable socio-economic development through equitable utilization of, and benefit from, the common Nile Basin water resources.

On its part, the NBD was conceived to respond to the challenges of involving civil society within the NBI so as to bring in the voices of stakeholders other than government in the furtherance of the ideals of the NBI. To achieve this purpose, the NBD promotes dialogue and sharing of ideas with the aim of eradicating poverty, promoting sustainable and equitable development and ensuring peace and mutual understanding in the Nile Basin.

49.5 Unlocking the Impasse: New Solution to an Old Problem?

From the foregoing discussion neither the unilateral claims of Egypt on maintaining the *status quo* on the Nile, nor the threat by upstream states like Tanzania, Uganda and Kenya to abstract the waters of the Nile-Victoria system is supportable in law. The question

still remains what needs to be done to move the Nile debate forward.

Although the threat by Egyptian President Anwar Sadat was made nearly three decades ago, Egypt's hard-line stance has not changed much. The potential for conflict over the Nile has long been identified, yet as the clock ticks away no practical solution seems to be forthcoming. Instead, scholars, diplomats, politicians, civil society, the international community and other stakeholders continue to either recommend more cooperative arrangements or simply to downplay the potential conflict over the Nile. For instance, Wolf, Yoffe and Giordano (2003) believe that violent conflicts over the use of scarce water resources are more likely to be found on the sub-national rather than the international level.

Even if the 'water war' hypothesis should be considered as wrong, water and food scarcity in the Nile Basin may be a politically destabilizing factor that may impair not only sustainable development in the basin states, but also intra-African cooperation in other areas such as regional integration for trade. While the ongoing negotiations and cooperative initiatives remain key in addressing the water and food security question in the Nile Basin, an exit route out of the Nile impasse must be found. This chapter recommends two approaches that upstream states need to initiate as a matter of priority either simultaneously or one after the other: the negotiation and adoption of a new treaty binding all riparian states and the reference of the issue of the legality of the Nile treaties to a judicial or arbitral forum.

The first recommendation - negotiating a new treaty - seems to be in agreement with what happens around the world to give effect to the evolving international water law. Basin states are coming together to agree by treaty on how best to achieve equitable utilization of transboundary rivers and lakes, taking into consideration the concept of sustainable development as the bedrock on which international environmental law and policy is based (WCED 1987: 43). Given the history of the Nile where Egypt has remained hostile to any attempts to re-negotiate the treaty arrangements over the Nile water, it is unlikely that a new treaty will be successfully negotiated in good faith in the foreseeable future. That makes the second option - reference of the matter to an international judicial or arbitral tribunal probably the more viable option.

The current state of affairs whereby riparian interests in the Nile Basin are diametrically opposed, coupled with the strong foundation in international law for the claims by upstream states as against those by

Egypt, suggests that the traditional political methods of settling disputes like negotiation or conciliation are unlikely to yield results in the foreseeable future. Downstream states (notably Egypt) will continue to delay or complicate the political dispute settlement mechanisms. It is therefore recommended that upstream states should change their diplomacy, from convincing Egypt to relent on its position, to convincing both Egypt and other basin states to submit the Nile question to an international judicial process.

The ICJ currently enjoys a high degree of acceptability by African states as a forum of settling their disputes. The historical suspicions relating to the attitude of the Court toward the developing countries appear to be addressed over the years. The Court has been able to resolve some of the most protracted territorial and frontier as well as maritime delimitation disputes involving African disputes, recent examples being the *Land and Maritime Boundary Between Nigeria and Cameroon* relating to the question of sovereignty over the Bakassi Peninsula and the dispute between Botswana and Namibia over the Kasikili/Sedudu Island in River Cunene, and the legal status of the island.

The Nile issue could also be referred to an international arbitration tribunal. This may be more likely to achieve since arbitration allows parties some leeway in determining the principles on which the dispute is to be settled. Arbitrations may lead to building the necessary consensus for 'resolving' the dispute by producing a win-win situation, as opposed to judicial tribunals that end up 'settling' a dispute by producing a win-lose outcome.

49.6 The Role of Civil Society

The continuing dialogue on the Nile cannot be fully participatory without civil society involvement. While this has been agreed upon, there have been concerns that a few NGOs currently engaged do not fully represent the diversity of civil society (Kameri-Mbote 2004: 21–22). Given the open nature of the dialogue under the auspices of the existing cooperative arrangements, the challenge of meaningfully putting in place an agenda that is not captured by the interests of powerful groups remains.

Moreover, providing adequate resources for the dialogue continues to be a challenge. The initial phase of funding provided by CIDA and the NBD is currently struggling to survive. It is unlikely that governments will provide resources for the dialogue of civil society given the suspicion with which they have

viewed civil society engagement and the broader resource constraints facing most governments. Non-involvement of civil society actors threatens the sustainability of the collaborative management initiatives and makes it expensive for state actors to bring in these actors at a latter stage. Without NGO participation, the NBI will never fully realize its goals of a shared vision or regional cooperation. While projects may be initiated and completed, they will fail to fully disentangle the problems surrounding equitable consumptive utilization of the Nile among the basin states while causing political tensions that may weaken the state and frustrate sustainable development in the basin.

49.7 Conclusion

Emile Lodwig, the famous German historian and geographer, made the following remarks on the Nile when he visited Egypt and the Sudan in 1937: "every time I have written the history of man, there hovered before my minds eye the image of a river, but only once have I beheld in a river the image of man and his fate" (Mageed 1994: 156). He made these remarks during a global confrontation, on the eve of the Second World War, which brought the threat of war to the Nile Basin after Italian occupation of Ethiopia. At that time, the whole basin was under the domination and influence of European powers.

Today, the situation is equally uncertain not only in terms of possible future conflicts but also of other complexities of unprecedented dimensions. The population of the countries of the basin is expected to rise from the current 370,000 million (2005) to 890,000 million by the middle of the twenty-first century (table 48.1), while scientific speculations exist that the basin is among the areas most threatened by global warming and sea level rise, where one fifth of Egypt's most populated and productive lands may be subjected to flooding (Mageed 1994: 156).

The ecological integrity of the Nile Basin (and therefore the water and food security in the basin) is hinged on a new framework of co-operation espoused in a new treaty. If this cannot be negotiated in good faith, then the legal option left is to refer the dispute over the Nile on the Nile Agreements to an international judicial and arbitral tribunal. Governments, civil society, the international community and other stakeholders have a joint role to promote such approaches.

50 Water and Security in Sub-Saharan Africa: Emerging Concepts and their Implications for Effective Water Resource Management in the Southern African Region

Peter Ashton and Anthony Turton

50.1 Introduction

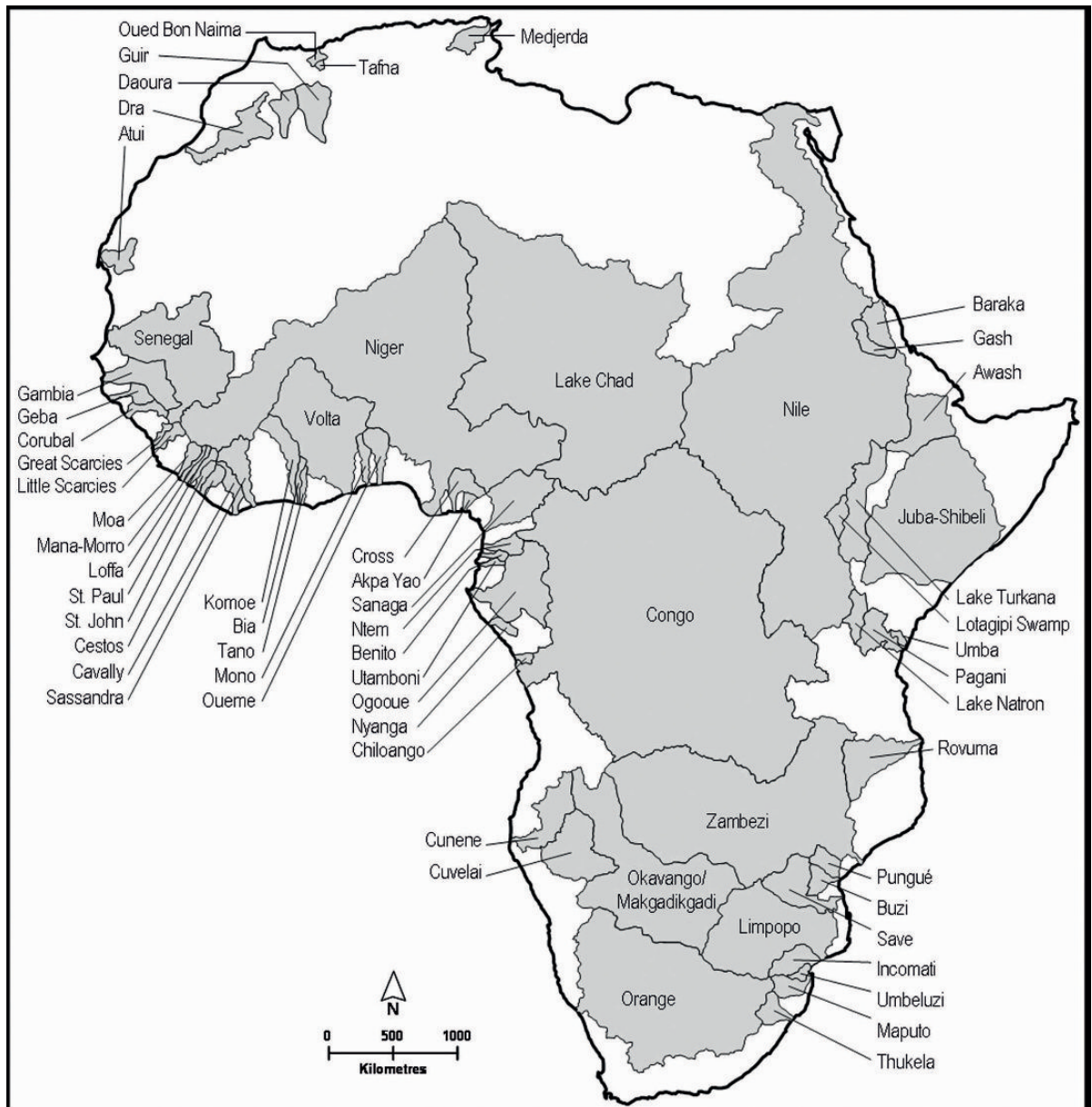
Africa has 63 river basins that cross the international political borders demarcating the 48 countries making up the African continent (Pakenham 1991: 15). Each of these river basins is shared by between two and ten states and this feature poses several strategic implications for the future economic development aspirations of the countries concerned. Significantly, large areas of Africa are arid or water scarce, where the spatial and temporal distribution of surface water is tightly controlled by the interplay between sparse and erratic rainfall and high evaporation rates. In these areas, the availability of surface water seldom matches the water needs of the respective countries and greater reliance is placed on water drawn from underground aquifers for domestic, agricultural, and industrial use (UNESCO-ISARM 2004: 4). In the extremely dry areas of North Africa, every country relies heavily on water drawn from the large shared aquifer systems that characterize this region. Here, the “Great Man-Made River Project” in Libya provides a classical example of this dependence, where the large volumes of water drawn from the Nubian Sandstone Aquifer (shared by Chad, Egypt, Libya, and Sudan) contribute over 90% of Libya’s national water budget (Kuwaiti 2004: 8).

The dilemma posed by the erratic availability of water in many African countries has prompted researchers to pose two inter-related questions. First, will governments go to war over scarce water resources as the finite limits of available supplies are approached? Or will they choose instead to cooperate in the development of joint water management schemes in order to optimize benefits to all? In the context of post Cold War Sub-Saharan Africa, more and more countries are engaging with their neighbours to share their common water resources (Tur-

ton 2003a: 32). Increasingly, this process is taking place through sets of negotiated water-sharing regimes that are most easily understood within the framework of a *Hydropolitical Complex*. The best example of this in sub-Saharan Africa is the Southern African Hydropolitical Complex, where water-sharing agreements between states are now a prominent feature of the international relations of the Southern African Development Community (SADC) region. Indeed, such is the importance of these agreements that water resource management is now widely considered as a driver of regional cooperation in its own right (Heyns 2002: 158, 176; Ramoeli 2002: 107; Turton 2003b: 281).

In this chapter, we argue that the answer to the dilemma posed above requires an understanding of two critical elements relating to the strategic access to water in the context of water and security in sub-Saharan Africa. The first element concerns security of supply (of water), with the hydraulic mission of the state being aimed at achieving this fundamental development objective as a foundation for economic growth, social wellbeing and political stability. The second element relates to the need for each state to choose an appropriate strategy or mix of strategies that will achieve and sustain a high level of security of supply. In our analysis, we explore the relevance of the Southern African Hydropolitical Complex, both as an analytical concept and as a possible mechanism for building and sustaining inter-state cooperation, and thereby avoiding possible conflicts over water.

Figure 50.1: Map of Africa showing the locations and names of the continent's 63 international (shared) river basins. **Source:** Map modified and redrawn from UNEP (2002: 27), plus own data.

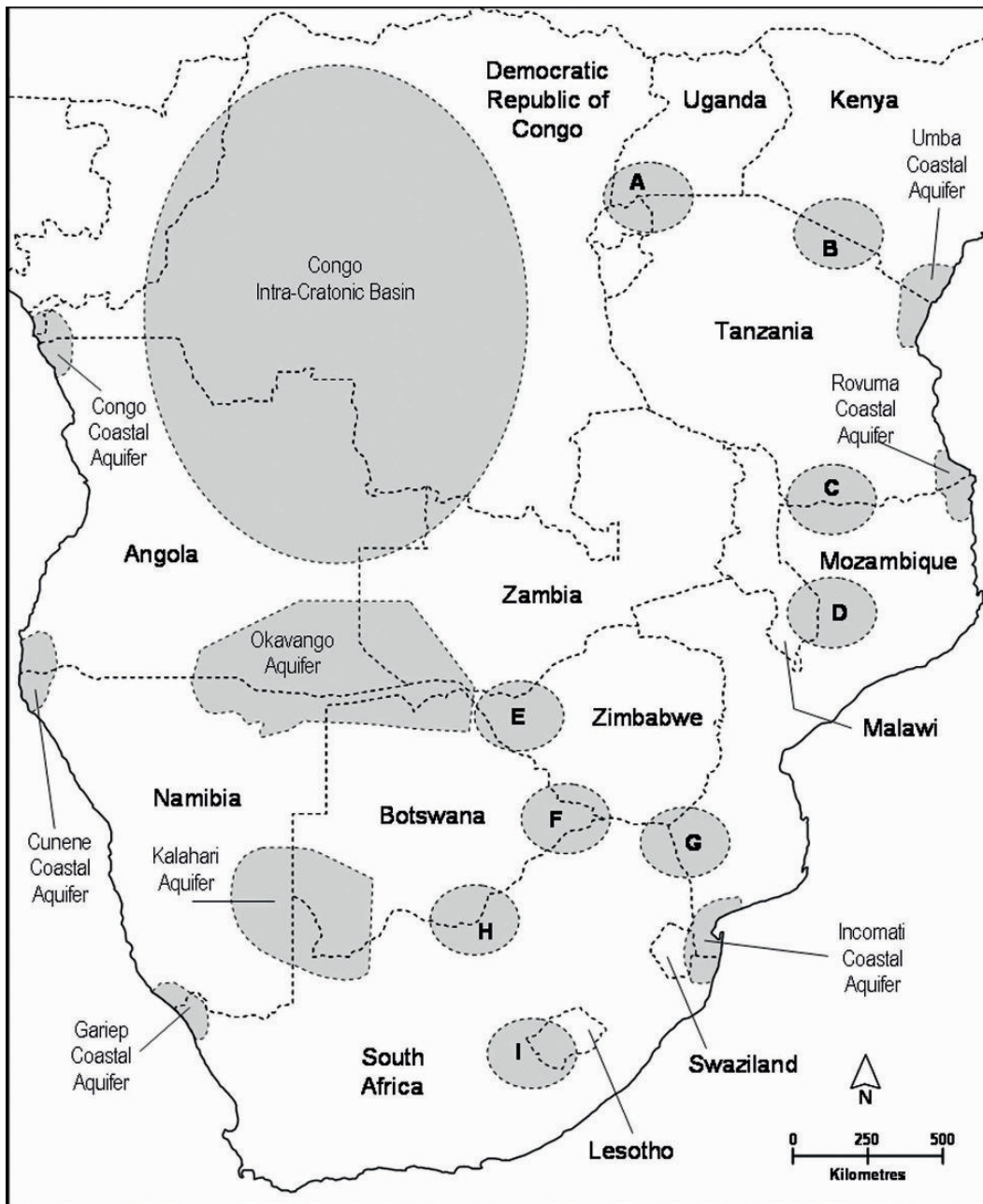


50.2 Water Dependencies and Interstate Behaviour: The Basis for Cooperation or Conflict

Africa's shared river basins (figure 54.1) cover approximately 63% of the surface area of the continent, contain 78% of the human population and, more significantly, hold over 90% of the continent's surface water resources (Ashton/Turton 2004: 5). While far

less information is available on the water contained in shared aquifer systems (figure 54.2), or the precise extent to which countries in the more arid regions of Africa rely on these systems, they represent critically important sources of water for the countries located in Africa's desert and semi-desert areas (Kuwairi 2004: 2). Similarly, many major cities and towns across Africa rely heavily on groundwater resources to meet the needs of domestic and industrial water users (UNESCO-ISARM 2004: 5). Clearly, a full un-

Figure 50.2: Map of Southern Africa, showing the international (shared) aquifer systems used by the SADC states. (A = Kagera Aquifer; B = Kilimanjaro Aquifer; C = Upper Rovuma Aquifer; D = Shire Valley Alluvial Aquifer; E = Nata-Gwaai Aquifer; F = Tuli-Shashe Aquifer; G = Pafuri Alluvial Aquifer; H = Ramotswa Dolomite Aquifer; I = Karoo Sedimentary Aquifer. **Source:** Map drawn from data in UNESCO-ISARM (2004: 7), plus own data.

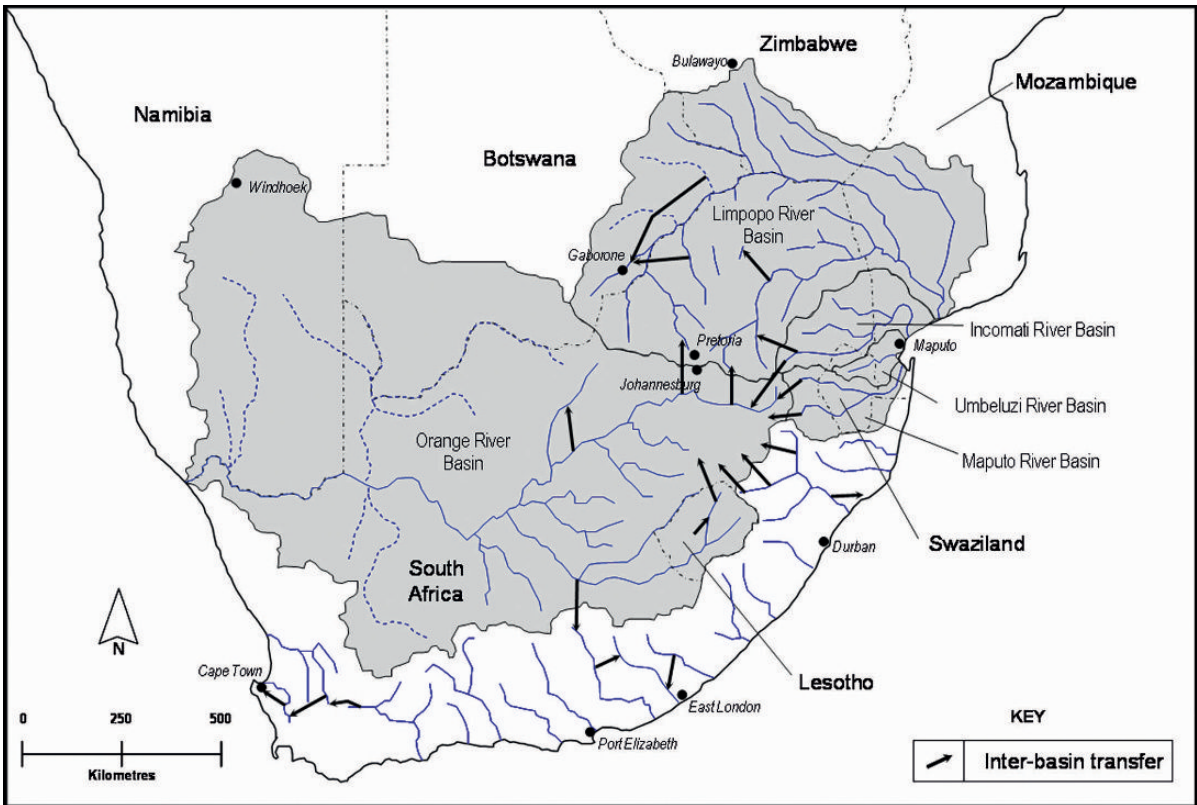


derstanding of the strategic nexus between water and security in sub-Saharan Africa requires a sound knowledge of the role of international river basins and shared aquifers in the current and future development plans of each country.

Several recent social and economic studies (Gleick 1998b: 45; Hirji/Johnson/Maro/Chiuta 2002:

45; Hoekstra 2004: 66; Ohlsson 1999: 250) have highlighted the pervasive poverty and low human development index (HDI) values of many countries in sub-Saharan Africa. In these countries, problems caused by a shortage of ‘first-order resources’ (water) are accentuated by the shortage of ‘second-order resources’ (infrastructure, institutions, money, and skills; Ohls-

Figure 50.4: Map of the Southern African Hydropolitical Complex, showing the locations of three pivotal basins (Orange, Limpopo, and Incomati) and two impacted basins (Umbeluzi and Maputo), together with the main centres of economic activity and/or capital cities of the four pivotal states (Botswana, Namibia, South Africa, and Zimbabwe), and the positions of major inter-basin water transfer schemes.



states can more easily deploy a wide variety of resources to resolve their water supply problems (Ashton 2004: 163; Ashton/Turton 2004: 9).

Given the extent and importance of shared water resources in Africa, purely inward-looking strategies offer few dependable prospects of long-term national water security and several countries would likely suffer considerable hardship were they to adopt such strategies (Ashton 2002: 240; 2004: 170). This is clearly illustrated by South Africa and Zimbabwe, where efforts were concentrated on national rather than regional priorities and supply-side options were used to meet the growing demands for water. The outcome of the so-called “hydraulic mission” of these states (Waterbury 1979: 270; Allan 2000: 28) is clearly visible in the numbers of large-scale water storage reservoirs and inter-basin transfer schemes (figures 50.3 and 50.4). Whilst these schemes provide sufficient water to meet national needs, they increase the pressure on shared water resources and emphasize disparities with neighbouring countries that cannot afford such options (Pallett 1997: 59; Ashton 2004: 167).

The extent to which African countries rely on shared surface and groundwater resources heightens the need for states to look beyond purely national priorities and harness the region’s collective social, economic, and technological resources to attain a common goal, that of assuring long-term water security. In strategic terms, this challenge presents African countries with the opportunity to shape and secure a variety of shared benefits with implications far beyond those of national and regional water security. Most notable amongst these are the promotion of political and economic stability across the continent (Ashton/Turton 2004: 16).

Earlier studies (UNEP 2002: 14; Wolf/Yoffe/Giordano 2003: 29) evaluated the number and types of agreements between countries that shared transboundary water resources. These authors concluded that the available evidence indicated low levels of inter-state collaboration and that this represented a potential “risk” of future conflict between the states concerned. However, more recent studies (Heyns 2002: 158; Ramoeli 2002: 105; Turton 2003a: 302–304; Tur-

ton and Ashton 2004: 16) have revealed a widespread preference amongst Southern African states to cooperate in the management of their shared water resources. This view has been strengthened by the interim results of a study on the scope and intent of international agreements that South Africa has entered into with its neighbours. This study revealed that South Africa has entered into 59 international water-related agreements with neighbouring (SADC) states and the international community (Ashton/Earle/Malzbender/Moloi/Patrick/Turton 2005: 14).

50.3 Emerging Concepts: The Southern African Hydropolitical Complex

The collapse of the bipolarity associated with the Cold War prompted considerable speculation that there would be widespread worsening of the international relations between states. However, with few exceptions, this rather pessimistic view was not realised and scholars were prompted to seek reasons to account for the relative absence of widespread conflict. An important outcome of this was the development of a new concept, the regional security complex, and several examples were cited for the developing world (Buzan/Rizvi 1986: 1; Buzan 1988: 16; 1991: 187; 1994: 1; Buzan/Wæver/de Wilde 1998: 201). A regional security complex has been defined as a group of states whose primary security concerns link together sufficiently closely that their national securities cannot realistically be considered apart from one another (Buzan 1991: 190). Typically, a security complex occurs where a set of security relationships stands out from the general background by virtue of its relatively strong, inward-looking character, as well as by its relatively weak outward security interactions with its neighbours. Significantly, the boundaries between regional security complexes are defined by relative indifference towards security perceptions and interactions (Buzan 1991: 193).

In southern Africa, a regional security complex comprising ten of the mainland SADC states – Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe – has been identified (Buzan 1991: 210). In this context, the term “security complex” emphasizes the interdependence of both shared and competing interests, and incorporates the shifting patterns of cooperation and competition over time (Buzan 1991: 190). But what of transboundary water resources as a stra-

tegic security interest for states in semi-arid areas, specifically where water scarcity constraints can undermine the future economic viability of the state? In this regard an important concept in security complex theory is that of a referent object, which has been defined as “things that are seen to be existentially threatened and that have a legitimate claim to survival such as state sovereignty, national identity, the environment and the economic stability of the state” (Buzan/Wæver/de Wilde 1998: 36). In the context of water, the economic viability of the state becomes the main referent object, because future economic growth plans cannot be implemented in the absence of a high level of assurance of water supply.

Where African states have a relatively low level of socio-political cohesion, it is difficult for an effective central authority to emerge over time and enforce statehood (Oyebande/Amani/Mahe/Niang-Diop 2002: 35). In such situations, challenges to the central authority erode the state from within, making it impossible to enforce laws and guarantee personal security. This factor is critical to an understanding of water and security in sub-Saharan Africa because the hydraulic mission of the state is a necessary (but insufficient) condition for the foundation of an economically viable state. Significantly, most of the politically unstable states in sub-Saharan Africa have yet to embark on the hydraulic mission phase of their national development, and appear unable to secure a high assurance of water supply through infrastructural development.

Schulz (1995: 97) extended the security complex theory of Buzan (1991: 190) and developed the concept of a “hydropolitical security complex” as a distinct form of regional security complex, which he defined as “... including those states that are geographically part ‘owners’ and technically ‘users’ of the [shared] rivers and, as a consequence, consider rivers as a major national security issue.” Importantly, Schulz’s work illustrates what can happen in the field of hydropolitics when water resource management becomes linked to national security concerns, or to other issues of a high politics nature (Turton 2003a: 86; Ashton/Turton 2004: 4).

Given that national security is a relational issue that is mitigated by geographic proximity, the role of international river basins provides an interesting, and largely unexplored, analytical variable. Within the twelve mainland SADC countries, a total of 15 river systems are shared by two or more SADC states, with two major river systems (the Nile and Congo rivers) also being shared with other states to the north (table 50.1). In addition, Tanzania shares three smaller

Table 50.1: Countries sharing the international river basins found in the SADC region (figure 50.1). The Nile and Congo River systems are also shared with countries to the north of the SADC region, while the Pagani, Umba, and Lake Natron basins are shared by Kenya and Tanzania.

River Basin	Riparian States	Basin Classification
Buzi	Mozambique, Zimbabwe.	Impacted Basin
Congo	Angola, Burundi, Cameroon, Central African Republic, Congo, Democratic Republic of Congo (formerly Zaire), Rwanda, Tanzania, Zambia	Impacted Basin (though SADC countries have relatively little impact)
Cuvelai	Angola, Namibia	Impacted Basin
Incomati	Mozambique, South Africa, Swaziland	Pivotal Basin
Cunene	Angola, Namibia	Impacted Basin
Lake Natron	Kenya, Tanzania	Impacted Basin
Limpopo	Botswana, Mozambique, South Africa, Zimbabwe	Pivotal Basin
Maputo	Mozambique, South Africa, Swaziland	Impacted Basin
Nile	Burundi, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda,	Pivotal and Impacted Basin (though SADC countries have relatively little impact)
Okavango / Makgadikgadi	Angola, Botswana, Namibia (Zimbabwe, shares the Nata River sub-basin and is a riparian state of the Makgadikgadi basin, though not the Okavango sub-basin)	Impacted Basin
Orange	Botswana, Lesotho, Namibia, South Africa	Pivotal Basin
Pagani	Kenya, Tanzania	Impacted Basin
Pungué	Mozambique, Zimbabwe	Impacted Basin
Rovuma	Malawi, Mozambique, Tanzania	Impacted Basin
Save-Runde	Mozambique, Zimbabwe	Impacted Basin
Thukela	Lesotho, South Africa	Impacted Basin
Umba	Kenya, Tanzania	Impacted Basin
Umbeluzi	Mozambique, Swaziland	Impacted Basin
Zambezi	Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia, Zimbabwe	Impacted Basin

basins (the Pagani, Umba and Lake Natron basins) with Kenya to the north (figure 50.1). Clearly, sovereign control over these shared river basins has to be shared between the riparian states when a given basin is managed as a hydrological unit in keeping with the norms of Integrated Water Resource Management (IWRM).

Potential threats to economic security often become a national security issue because relative economic growth is a major determinant of the power of states in a given system (Buzan 1991: 127). Here, the perception of threat drives decision-making, thereby becoming an independent variable in the international relations of a water scarce state (Turton 2003: 89). This issue is particularly pertinent to international river basins that are approaching the point of closure, where the available supplies of water have

largely been exploited or allocated. When a shared river approaches closure, competition for water intensifies, with a concomitant increase in the potential for conflict between riparian states. This can become an issue of high politics when looming water scarcity is perceived to pose the threat of reduced economic growth potential (Turton 2003a: 86; 2003d: 78; 2003e: 85), and hence a threat to the economic viability and sovereign integrity of the state.

Because the availability of water supplies at a high level of assurance is a fundamental determinant of the economic growth potential of all states, reliable and sustained access to water supplies is a strategic issue for developing countries situated in arid and semi-arid regions (Ashton/Turton 2004: 2). The significant role played by water in Southern Africa is illustrated by the fact that the first cooperation proto-

col that was signed within the SADC region was the Protocol on Shared Watercourse Systems (Ramoeli 2002: 105). Heyns (2002: 158) notes that one of the major development challenges facing the SADC region in the near future is the need to implement large, regional water-sharing and transfer schemes that can alleviate the economic limitations imposed by looming water scarcity in some countries. This represents a strong call to launch a substantial regional hydraulic mission that will develop the infrastructure needed to provide a high assurance of supply on which future economic growth can be planned with confidence.

Whilst the SADC region contains a large number of international river basins, four of the economically most developed states in the region – Botswana, Namibia, South Africa, and Zimbabwe – are water scarce. These four states are approaching the limits of their readily available surface water resources and looming water scarcity is likely to impose limitations to their economic growth potential in the near future (Ashton/Turton, 2004: 4). This could become particularly acute if the dire predictions of global climate change result in a decrease in the quantity of water available. Significantly, these four states are also linked together through their co-riparian status in the transboundary Orange and Limpopo basins.

Using the work of Buzan (1991: 1; 1994: 1), Buzan/Wæver/de Wilde (1998: 1), and Schulz (1995: 91), Turton (2003a: 294) developed a conceptual model that factors in the hydropolitical dimension of international relations within the SADC region where water scarcity has not yet been intimately linked to national survival. The rationale for this is based on the fact that co-riparian status on the region's many international rivers (table 50.1) provides permanent linkages between different states within the Southern African security complex as originally defined by Buzan (1991: 187), but has not yet become a driver of securitization in its own right. The original typology proposed by Turton (2003a: 293) and refined here, distinguishes two types of riparian state (pivotal state and impacted state), and two categories of international river basin (pivotal basin and impacted basin). Each of these concepts is defined below.

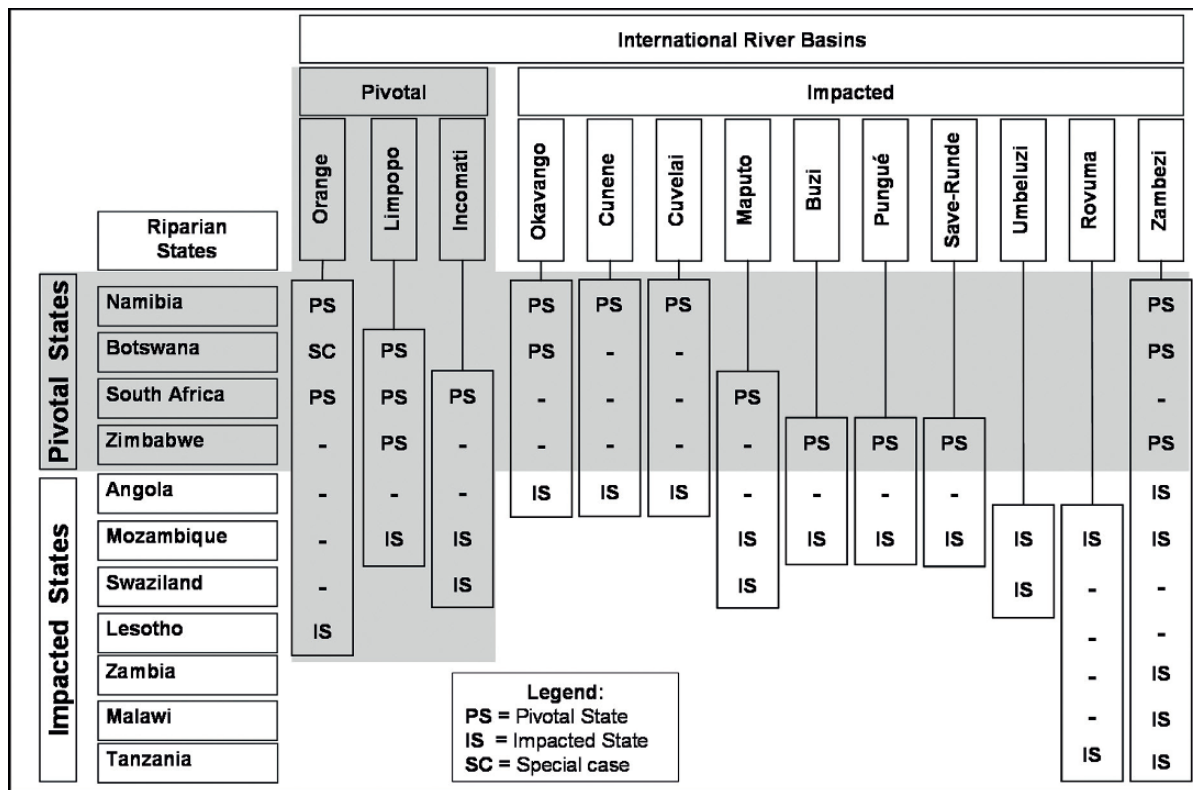
- *Pivotal States* are riparian states with a high level of economic development and a high degree of reliance on shared river basins for strategic sources of water supply. Four Southern African

states are in this category, namely: Botswana, Namibia, South Africa, and Zimbabwe.

- *Impacted States* are riparian states that have a critical need for access to water from an international river basin that they share with a pivotal state, but appear to be unable to negotiate what they consider to be an equitable allocation of water. As a consequence, their future developmental aspirations are impeded by their asymmetric power relations with the pivotal states to which they are co-riparian. In Southern Africa, seven states are seen to be in this category: Angola, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, and Zambia.
- *Pivotal Basins* are international river basins that face closure, but are also strategically important to any one (or all) of the pivotal states by virtue of the range and magnitude of economic activity that they support. In Southern Africa, three basins are regarded as being pivotal basins (Orange, Incomati, and Limpopo).
- *Impacted Basins* are those international river basins that are not yet approaching a point of closure, and which are strategically important for at least one of the riparian states. An impacted basin has at least one of the pivotal states as riparian, so that there appears to be less freedom of choice for an impacted (riparian) state to develop its water resources in a manner that it deems to be fair and equitable. Often, this would appear to be due to perceptions about the asymmetric power relations that exist between the riparian states, where the pivotal state may view any unallocated water as a strategic reserve. Seven impacted basins occur in Southern Africa: Cunene, Maputo, Okavango, Cuvelai, Pungué, Save-Runde, and Zambezi.

Based on these concepts, Turton's original conceptual model (Turton 2003a: 294) has been expanded to display the patterns of cooperation and competition within international river basins (figure 50.5), as a critical component of the Southern African Regional Security Complex defined by Buzan (1991: 210). The Southern African Hydropolitical Complex can thus be understood as being a set of political interactions nested within the Southern African Regional Security Complex, across various levels and between different units, centred on patterns of amity and enmity in the broadest sense, but amplified specifically with respect to water resource management in transboundary river basins. It differs from the Hydropolitical Security Complex defined by Schultz (1995: 97), because water has not yet been elevated to

Figure 50.5: Schematic diagram illustrating the relationships between shared river basins within the SADC region and countries comprising the Southern African Hydropolitical Complex; pivotal basins and pivotal states are shaded. **Source:** Amended and redrawn from Turton (2003a: 294); Ashton/Turton (2004: 7).



become a major driver of threat perception in Southern Africa, or to the extent that national survival might be equated with direct control over the resource by military means. Within the SADC region, water has a long history of politicization (rather than securitization), having played a prominent but subtle role during the liberation conflict years of the last three decades (Turton 2003a: 203; Turton/Earle 2005: 155). The overt nature of Southern African water politics has changed somewhat in the post-Apartheid era, but the underlying drivers remain largely unchanged. The four economically most developed states in the region are also those facing the greatest scarcity of water; they all share international river basins with other states; and they all face significant limitations to their future economic growth prospects as a result of looming water shortages (table 50.2).

The population statistics shown in table 50.2 reveal two important points. Firstly, three SADC countries (Botswana, Lesotho, and Swaziland) are expected to have negative population growth rates during the period 2000 to 2025, with South Africa being expected to show a very modest increase in population numbers (UNPD 2005). This can be as-

cribed to the devastating effects of the HIV/AIDS pandemic in Southern Africa, with these four countries having the highest adult prevalence of HIV/AIDS of any African country (Ashton/Ramasar 2002: 219). Secondly, the other SADC countries are expected to have relatively high population growth rates of between 14.6% and 106.2% for the same period. Similar high population growth rates are also expected to occur in the other sub-Saharan countries, while slightly lower growth rates are anticipated in North Africa (UN 2005; table 50.2). Clearly, population growth rates of the magnitude shown in table 50.2 will exacerbate the existing problems associated with water shortages in these countries, making it even more difficult for the respective governments and water resource management authorities to provide their citizens with appropriate services.

Clearly not all international river basins are equal in strategic importance or in terms of their inherent conflict potential. The Orange, Limpopo, and Incomati basins in the SADC region have been classified as pivotal basins, based on three critical criteria: a significant portion of the basin falls within one or more of the pivotal states; at least one of those piv-

Table 50.2: Projected Population Growth in SADC Countries, (2000 – 2025 – medium estimate), Compared With Other African Regions.

Country	2000 Population (m.)	2025 Population (m.)	Increase (2000 – 2025)	
			(m.)	(%)
Angola	13.841	26.829	12.988	+93.8
Botswana	1.754	1.655	-0.099	-5.6
Dem. Rep. of Congo	50.052	103.224	53.172	106.2
Lesotho	1.788	1.690	-0.098	-5.5
Malawi	11.512	19.737	8.225	71.5
Mozambique	17.911	27.556	9.645	53.9
Namibia	1.894	2.519	0.625	33.0
South Africa	45.610	48.297	2.687	5.9
Swaziland	1.023	0.975	-0.048	-4.7
Tanzania	34.763	52.807	18.044	51.9
Zambia	10.702	16.419	5.717	53.4
Zimbabwe	12.595	14.430	1.835	14.6
SADC	203.445	316.138	112.693	55.4
Southern Africa ^a	118.630	160.107	41.477	35.0
Central Africa ^b	73.844	140.088	66.244	89.7
East Africa ^c	216.983	387.413	170.430	78.6
West Africa ^d	241.386	417.814	176.428	73.1
North Africa ^e	142.148	204.927	62.779	44.2
Sub-Saharan Africa ^f	650.843	1 105.422	454.579	69.8
Africa ^g	792.991	1 310.349	517.358	65.2

- Southern Africa = Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, Zimbabwe.
- Central Africa = Cameroon, Central African Republic, Republic of Congo, Democratic Republic of Congo (DRC), Equatorial Guinea, Gabon.
- East Africa = Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, Sudan, Tanzania, Uganda.
- West Africa = Benin, Burkina Faso, Chad, Cte d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo.
- North Africa = Algeria, Egypt, Libya, Morocco, Tunisia, Western Sahara.
- Sub-Saharan Africa = Southern Africa + Central Africa + East Africa + West Africa (as listed above).
- Africa = Southern Africa + Central Africa + East Africa + West Africa + North Africa (as listed above).

otal states has a high reliance on the water from these basins; and each basin is approaching the point of closure. A deeper analysis of these three pivotal basins raises a number of subtle but important facts that are not immediately visible. For example, the Orange River is the largest of the three basins in terms of its volume of flow (Basson/van Niekerk/van Rooyen 1997: 44; Turton 2003c: 137) and it is arguably the most strategically important river to which South Africa has access. Whilst Botswana is a co-riparian state, the portion of the basin within the boundaries of Botswana is part of the Kalahari Desert, containing ephemeral watercourses that contribute no stream flow to the main channel of the river. Botswana is therefore listed as being a special case, because it occupies its position as co-riparian in all deliberations over the Orange River, but currently makes no use of the surface water in the basin (although it does use water from the transboundary Kalahari Aquifer).

50.4 Implications

While Africa's many states display varying levels of socio-political cohesion and different levels of economic development, their prospects for future development are linked to three key features: (1) the spatial and temporal variability of water across the continent; (2) the degree to which available water resources are shared by different states; and (3) the highly uneven levels of access to water supply infrastructure. Many of the less developed countries in Africa have low levels of water supply infrastructure and concomitant low assurance of water supply; this contrasts with regional hegemonic states that generally display a higher level of infrastructural development and enjoy a greater assurance of water supply.

The Southern African Hydropolitical Complex provides a potentially useful analytical tool with which to consider the water and security nexus in Southern Africa (Ashton/Turton 2004: 6). This approach offers a more nuanced understanding of two specific aspects – issues that are pertinent to the security of water supply, and issues that are important for the selection of a national strategy to achieve higher assurance of supply levels. Both are explored below.

50.4.1 Security of Supply

Assurance of supply lies at the heart of economic growth and development, because sustainable social

and economic development is impossible where a low assurance of supply prevails (Postel 1999: 25). In essence, a country is only able to develop once appropriate hydraulic (and other) infrastructure is in place and the quest to achieve a high assurance of supply - the so-called "hydraulic mission" (Waterbury 1979: 270; Allan 2000: 28) - has been initiated.

To date, the hydraulic mission of the Southern African Hydropolitical Complex can be segmented into two distinct phases, with a probable third phase that will likely occur in the future. The first phase saw South Africa as the regional hegemon develop massive hydraulic infrastructure, and lay the foundation for rapid and sustained economic growth centred on the mining sector and irrigated agriculture (Turton/Meissner/Mampane/Seremo 2004: 398). Simultaneously, a comparable sequence of events occurred in Namibia (which was being run as a *de facto* province of South Africa), whilst Zimbabwe initiated a strong hydraulic mission centred on the development of the Kariba Dam and numerous widespread irrigated agriculture systems. The start of the second phase occurred when the other pivotal states (Botswana, Namibia, and Zimbabwe) attained independence and launched their own hydraulic mission to underpin their economic growth. It is anticipated that the third (future) phase will begin when the other impacted states in the region launch their own hydraulic missions in pursuit of social development objectives consistent with the Millennium Development Goals (MDGs), and which will enable their economies to engage more fully with the globalization trend. Based on current trends of increasing inter-state cooperation in Southern Africa, this third phase is likely to be characterized by cooperative partnerships between the underdeveloped states and their more technologically advanced neighbours, the pivotal states.

Present water use patterns in the pivotal states are characterized by constraints found in two distinct categories. First-order, or hydrological, constraints are represented by the regional patterns of rainfall and runoff, with each of the four pivotal states generally receiving far lower rainfalls than they require to meet their development objectives (Pallett 1997: 14). Second-order, or infrastructural, constraints are represented by dams and inter-basin transfer schemes that capture and store the runoff and channel it to where it is required for use. Significantly, each of the four pivotal states in Southern Africa has amongst the lowest ratios of mean annual rainfall to runoff in the world, averaging less than 8% (O'Keeffe/Uys/Bruton 1992: 281). In South Africa, over 60% of the total an-

nual runoff is captured and stored in dams - this large fraction appears to be close to the limits of economic viability and sustainable ecological integrity (Rabie/Day 1992: 647). Significantly, both South Africa (ranked 11) and Zimbabwe (ranked 20) have been singled out amongst African states by virtue of the number of large dams that have been built in these countries (figure 50.3; WCD 2000: 370).

Another important characteristic of the Southern African Hydropolitical Complex is the high degree of dependence of the four pivotal states on flows in shared rivers that arise beyond their borders. In this regard, approximately 90% of the surface water within Botswana is derived from upstream countries, with Namibia (76%), Zimbabwe (58%) and South Africa (12%) also relying on inflows from neighbouring states (FAO 2004c: 2). This feature makes the pivotal states particularly vulnerable to the actions of other states, and requires them to cooperate with neighbouring countries to solve their assurance of supply problems. Compounding this problem is the fact that the centres of major economic development in each of the four pivotal states lie on or close to major watersheds (figure 50.4). The implications of this are that each country has a high degree of reliance on inter-basin transfers and major hydraulic infrastructure, and these infrastructure elements will always be a strategic feature of the economic and political vulnerability of the SADC region.

The countries comprising the Southern African Hydropolitical Complex share a total of eighteen transboundary aquifer systems (13 shared within the SADC countries, and a further five with countries to the north; figure 50.2; UNESCO-ISARM 2005: 7). Extensive exploitation of an aquifer in one country could lower the regional water table and exert adverse effects on the communities in neighbouring states who also depend on the system. Consequently, joint management of these groundwater resources is essential to ensure that the strategic interests of each state are not adversely affected.

One of the major implications of pervasive water scarcity for the future economic growth potential of the SADC region lies in the need to develop inter-basin transfer schemes (Heyns 2002: 176). Given the asymmetric distribution of rainfall patterns and river flows, many of the planned transfer schemes will have to cross international borders. This will require close cooperation between states and each pipeline or canal that crosses a border will entrench the co-dependency of the respective states on their shared water resources. The most developed state in the South-

ern African Hydropolitical Complex (South Africa) is already deeply dependent on inter-basin transfer schemes. For example, eight of the nine provinces in South Africa are already dependent for more than 50% of their gross geographic product (GGP) on water provided from outside their borders, with six of these provinces having a dependency in excess of 70% (Basson/van Niekerk/van Rooyen 1997: 55). Gauteng Province, the economic heartland of South Africa, generating 10% of the economic output of the entire African continent, is already totally dependent on inter-basin transfer schemes for its survival (Turton 2004: 12).

50.4.2 Strategies to Achieve Higher Assurance of Supply Levels

Since regional water scarcity has the potential to limit the future economic growth and prosperity of states in the SADC region, and every state also relies to varying degrees on transboundary surface and groundwater resources, it is important to understand the implications of possible cooperative strategies that could improve assurance of water supply throughout the region. In this regard, significant advances have been made to establish a body of international law and regimes for the management of transboundary river systems. Here, three elements are particularly important.

Firstly, the body of international water law codified in the *Helsinki Rules on the Uses of the Waters of International Rivers* and the *United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses* has been supported by every state in the Southern African Hydropolitical Complex. Key elements from both of these international legal instruments have been incorporated into the *SADC Protocol on Shared Watercourse Systems* and its 2000 Amendment, the *Revised SADC Protocol on Shared Watercourses*, which form the legal and institutional foundation for the management of transboundary rivers in all SADC Member States (Ramoeli 2002: 106). This is highly significant, because there is no correlation between the ratification of these two pieces of international law by the respective riparian states, and their actual use of the principles embodied therein (Eckstein 2002: 88; Boisson de Shazournes 2003: 217). Therefore, even if an individual SADC state has not ratified the two international conventions described above, it is still bound by the core principles enshrined in them by virtue of their ratification of the *SADC Water Protocol* and

the 2000 revision. Further evidence for increasing cooperation is the emergence of a trend that shows African governments to be spearheading the notion of an ecosystem approach to the development of international environmental law (McIntyre 2004).

Secondly, contrary to earlier assertions (UNEP 2002: 14; Wolf/Yoffe/Giordano 2003: 29), there is increasing evidence for a high level of sophistication to the development of international water-sharing and cooperation agreements between riparian states in sub-Saharan Africa. A recent study (Ashton/Earle/Malzbender/Moloi/Patrick/Turton 2005: 14) indicates that South Africa alone is a signatory to 59 water-related agreements, and there is sufficient evidence to show that the corpus of international water agreements to which South Africa is a signatory, is more robust than originally shown by Turton/Meissner/Mampane/Seremo (2004: 392).

Thirdly, evidence has been presented to show that even during the height of the Cold War, when many of the local wars of liberation in Africa were being fought as proxy wars for the respective Superpowers (Turner 1998), water resource managers were able to negotiate peaceful water-sharing agreements (often between belligerent powers) (Turton 2003a: 300; Turton/Meissner/Mampane/Seremo 2004: 392; Turton/Ashton 2004: 13; Turton/Earle 2005: 162). These agreements demonstrate that shared concerns over scarce water resources provide a strong reason for countries to collaborate with each other for mutual benefit. In addition, these agreements provide strong support for regional economic integration efforts that accompany reconstruction and peace building in Southern Africa.

50.5 Conclusions

In answer to the worrisome question about the best options available to African states confronted by water scarcity limitations to their future economic growth potential, the balance of evidence suggests that cooperation will be favoured rather than conflict. In this regard, the African continent has seen the development of many water-sharing agreements for the management of its transboundary river basins. In sub-Saharan Africa, the best example of this can be found in the Southern African Hydropolitical Complex. Clustered on the strategic water needs of the four most economically developed states in the SADC region (Botswana, Namibia, South Africa, and Zimbabwe), the Southern African Hydropolitical

Complex shows that a variety of linkages exist between the sovereign states of the Southern African Regional Security Complex originally defined by Buzan (1991: 210).

In this regard, the referent object is the economic stability of the country, and consequently the sovereign integrity of the state in question, making water scarcity a strategic concern. Given the high reliance on transboundary rivers, combined with the historic evidence of cooperation in the development and utilization of those resources, the Southern African Hydropolitical Complex is unlike the Hydropolitical Security Complex mooted by Schultz (1995: 97) to exist in

the Tigris and Euphrates case. As such the Southern African Hydropolitical Complex is not a security complex in its own right, but rather a distinct component of the Southern African Regional Security Complex defined by Buzan (1991: 210). The implications of these conclusions are that, in terms of water security in sub-Saharan Africa, the future trajectory of the various states in the Southern African Hydropolitical Complex will most likely be based on mutual cooperation, where the management of transboundary water resources will become a driver of regional integration in its own right.

Box 50.1: "Protocol on Shared Watercourses in the Southern African Development Community (SADC)" signed in 2000. This text is in the public domain.

(Two key Articles have been taken from this important regional treaty. Article 2 describes the objectives of the revised Protocol while Article 3 list the details of the General Principles embodied in the revised Protocol. Together, these two articles convey both the spirit and intent of the Protocol and therefore provide a useful overview of the main features of this agreement).

Article 2

Objective

The overall objective of this Protocol is to foster closer cooperation for judicious, sustainable and co-ordinated management, protection and utilization of shared watercourses and advance the SADC agenda of regional integration and poverty alleviation. In order to achieve this objective, this Protocol seeks to:

- a.) Promote and facilitate the establishment of shared watercourse agreements and Shared Watercourse Institutions for the management of shared watercourses;
- b.) Advance the sustainable, equitable and reasonable utilization of the shared watercourses;
- c.) Promote a co-ordinated and integrated environmentally sound development and management of shared watercourses;
- d.) Promote the harmonization and monitoring of legislation and policies for planning, development, conservation, protection of shared watercourses, and allocation of the resources thereof; and
- e.) Promote research and technology development, information exchange, capacity building, and the application of appropriate technologies in shared watercourses management."

Article 3

General Principles

For the purposes of this Protocol the following general principles shall apply:

1. The State Parties recognize the principle of the unity and coherence of each shared watercourse and in accordance with this principle, undertake to harmonize the water uses in the shared watercourses and to ensure that all necessary interventions are consistent with the sustainable development of all Watercourse States and observe the objectives of regional integration and harmonization of their socio-economic policies and plans.
2. The utilization of shared watercourses within the SADC Region shall be open to each Watercourse State, in respect of the watercourses within its territory and without prejudice to its sovereign rights, in accordance with the principles contained in this Protocol. The utilization of the resources of the watercourses shall include agricultural, domestic, industrial, navigational and environmental uses.
3. State Parties undertake to respect the existing rules of customary or general international law relating to the utilization and management of the resources of shared watercourses.
4. State Parties shall maintain a proper balance between resource development for a higher standard of living for their people and conservation and enhancement of the environment to promote sustainable development.
5. State Parties undertake to pursue and establish close co-operation with regard to the study and execution

- of all projects likely to have an effect on the regime of the shared watercourse.
6. State Parties shall exchange available information and data regarding the hydrological, hydro geological, water quality, meteorological and environmental condition of shared watercourses.
 7. a.) Watercourse States shall in their respective territories utilize a shared watercourse in an equitable and reasonable manner. In particular, a shared watercourse shall be used and developed by Watercourse States with a view to attain optimal and sustainable utilization thereof and benefits therefrom, taking into account the interests of the Watercourse States concerned, consistent with adequate protection of the watercourse for the benefit of current and future generations.
 - b.) Watercourse States shall participate in the use, development and protection of a shared watercourse in an equitable and reasonable manner. Such participation includes both the right to utilize the watercourse and the duty to co-operate in the protection and development thereof, as provided in this Protocol.
 8. a.) Utilization of a shared watercourse in an equitable and reasonable manner within the meaning of Article 7 (a) and (b) requires taking into account all relevant factors and circumstances including:
 - (i) geographical, hydrographical, hydrological, climatic, ecological and other factors of a natural character;
 - (ii) the social, economic and environmental needs of the Watercourse States concerned;
 - (iii) the population dependent on the shared watercourse in each Watercourse State;
 - (iv) the effects of the use or uses of a shared watercourse in one Watercourse State on other Watercourse States;
 - (v) existing and potential uses of the watercourse;
 - (vi) conservation, protection, development and economy of use of the water resources of the shared watercourse and the costs of measures taken to that effect; and
 - (vii) the availability of alternatives, of comparable value, to a particular planned or existing use.
 - b.) The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is an equitable and reasonable use, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.
 9. State Parties shall deal with planned measures in conformity with the procedure set out in Article 4 (1).
 10. a.) State Parties shall, in utilizing a shared watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other Watercourse States.
 - b.) Where significant harm is nevertheless caused to another Watercourse State, the State whose use causes such harm shall, in the absence of agreement to such use, take all appropriate measures, having due regard for the provisions of paragraph (a) above in consultation with the affected States, to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation.
 - c.) Unless the Watercourse States concerned have agreed otherwise for the protection of the interests of persons, natural or juridical, who have suffered or are under a serious threat of suffering significant transboundary harm as a result of activities related to a shared watercourse, a Watercourse State shall not discriminate on the basis of nationality or residence or place where the injury occurred, in granting to such persons, in accordance with its legal system, access to judicial or other procedures, or a right to claim compensation or other relief in respect of significant harm caused by such activities carried on in its territory.

Signed at Windhoek, Namibia, on the 7th of August 2000 in three original texts in the English, French and Portuguese languages, all texts being equally authentic.

(The Protocol was signed by Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe; not signed by DR Congo.)

A copy of the full document can be obtained from: http://www.sadc.int/index.php?action=ar001&page_id=protocols_shared_watercourse_revised

51 Water Security in the Senegal River Basin: Water Cooperation and Water Conflicts

Martin Kipping

51.1 Introduction: Water War and Water Peace

The English noun ‘rival’ derives from the Latin ‘rivalis’, which in turn comes from ‘rivus’, i.e. river, stream (Onions 1966: 769). Sharing the same source of water thus seems to have been a sensitive issue already in ancient times. However, it is only after the end of the Cold War that ‘water conflicts’ have gained prominence within the social sciences in general and International Relations in particular. Demography, increased water consumption due to economic growth, worrying scenarios of climate change, and the growing ecological consciousness have contributed to this development. While the social and economic consequences of water scarcity and pollution have been discussed under the label of ‘environmental security’ (Brauch 2003; Kahl 2003; Dalby 2008), research on ‘environmental conflicts’ (Diehl/Gleditsch 2001; Gleditsch 2003) has investigated armed violence induced by water conflicts.

Three schools of thought can be distinguished in relation to ‘water security’, understood as security from water-related violence:¹ the Neo-Malthusian, the Cornucopian and the political approach (Gleditsch 2003; Selby 2003). The *Neo-Malthusian approach* derives its name from Thomas Malthus’s *Essay on the Principle of Population* (1798), which drew a gloomy picture of demography-induced resource scarcity, necessarily leading to either famine or war. With regard to water conflicts, Neo-Malthusians point out the conflictive consequences of growing water stress, defined as a shortage of renewable water resources per capita (Falkenmark 1989).

1 Although it does not deny the implications of water availability for human security, this chapter focuses on more conventional security aspects. In the present context, “water security” means the absence of violence induced by competition over freshwater.

Cornucopians, in contrast, adopt a more optimistic perspective: They underline the potentials of technical progress, market mechanisms, trade, and substitutes to avoid conflict-generating resource scarcities (Gleditsch 2001, 2003). Normative, sometimes technocratic concepts of rational water management, such as ‘Integrated Water Resources Management’ (IWRM), or the mathematical modelling of basin management are usually inspired by Cornucopian thoughts.

The *political approach* is more pessimist vis-à-vis these technical solutions, emphasizing distributional problems related to international watercourses. Transboundary rivers² cause upstream-downstream conflicts that cannot be solved within the established political institutions of individual riparian states. Instead, the opportunity for upstream countries to externalize the negative consequences of their water use (such as polluted or decreased water flow) creates constellations where ‘beggar your neighbour’ policies seem to pay off.

These insights, in combination with the dominant Neo-Malthusian discourse, have led to a kind of ‘water war hype’ in the 1990’s, when water was sometimes conceived as the renewable resource most likely to cause international wars.³ These propositions have somehow been muted, however, by the results of Aaron Wolf’s quantitative research, which found that no undoubted water war has ever been fought in modern times.⁴ Thus, attention has progressively shifted towards inter-state water *cooperation*, which

2 There are more than 260 international river basins worldwide.

3 A representative, and possibly the most cited article of the water war type is Starr 1991.

4 The last clear inter-state war over water occurred between the Mesopotamian city-states of Lagash and Umma around 2,500 B.C. (Wolf/Yoffe/Giordano 2003: 30).

has reached impressive levels in the industrialized world. Nevertheless, water is still discussed as a cause of *intra-state* resource conflicts: Indeed, it seems that “geographic scale and intensity of conflict are inversely related” (Wolf 1998: 6). Research programmes led by Thomas Homer-Dixon (University of Toronto) and Günther Baechler (ENCOP: University of Zurich and Swisspeace) have investigated these intra-state water conflicts from a Neo-Malthusian perspective, scrutinizing how and under which conditions different forms of resource scarcity may cause violent conflicts.⁵

Despite this intensive research on water conflicts and water cooperation, methodological shortcomings raise some scepticism vis-à-vis its results: Studies on intra-state water conflicts have suffered from biased case selection, favouring cases where both water scarcity and violent conflicts occurred. In addition, research on international water cooperation has focused on the industrialized world, not allowing generalizations for developing regions, where water problems are most acute. Finally, the Neo-Malthusian perspective appears to be overly pessimistic and one-sided, since it is as justified to expect reactions to common problems of resource scarcity to be cooperative as to suppose them to be confrontational.

The present chapter aims at refining the debate on water conflicts and water cooperation by investigating a case that constitutes a puzzle for the Neo-Malthusian discourse: the Senegal River in West Africa.⁶ Thereby, it intends to identify causal mechanisms that will help generating better hypotheses for future comparative analyses and large-N studies.

51.2 Case Selection: Why the Senegal River?

The Senegal River (figure 51.1) is an ideal object for a case study on water cooperation and water conflicts for two reasons: First, both cooperation and conflict over water have been extreme in the Senegal Basin. On the one hand, the three downstream states Senegal, Mauritania, and Mali have reached an extraordinary degree of integration in managing their shared river (Andersen/Rangeley 1993: 144; Rangeley/Thiam/Andersen/Lyle 1994: 33; Tangara 1998: 553;

GWP 2000: 17; GCI 2000: 37; Dombrowsky/Grey 2002: 91; WWAP 2003: 313).

Within the *Organisation pour la Mise en Valeur du Fleuve Sénégal* (OMVS or Organization for the Development of the Senegal River), they realized an ambitious infrastructure programme for irrigation, power-generation, and navigation purposes, including the construction of two major dams in common property. On the other hand, one of the most violent conflicts over water occurred in the Mauritanian part of the Senegal Valley in 1989/90, when the Moorish elite expelled the non-Moorish, ‘black’ farmers of the valley in order to gain control over their irrigated land (Magistro 1993: 203; Baechler 1999a: 94). The bloody deportation resulted in more than 200 dead and 70,000 refugees (Libiszewski 1999: 136).

Second, in addition to the occurrence of these extreme events, which permit the investigation of both cooperation and conflict over water, their correlation with the overall water availability in the Senegal Basin is of utmost interest, as it is decisively ‘Anti-Malthusian’. The decisions on the joint infrastructure programme were taken at the beginning of the 1970’s (Reichhold 1978: 148–159; Maiga 1995: 80–81; Meublat/Ingles 1997: 182–183). Thus, they coincided with the first devastating Sahelian drought, which started in 1968. The Mauritanian ‘events’⁷, in contrast, occurred after water availability in the Senegal Valley had risen, thanks to the dams constructed within the infrastructure programme. This means that, in the Senegal Basin, growing water scarcity correlated with more intense cooperation between riparian states, less water scarcity with a violent conflict within one of these states.

For these two reasons, it can be expected that the Senegal case provides interesting insights on causal mechanisms of water cooperation and water conflict that have not received adequate attention up to now.

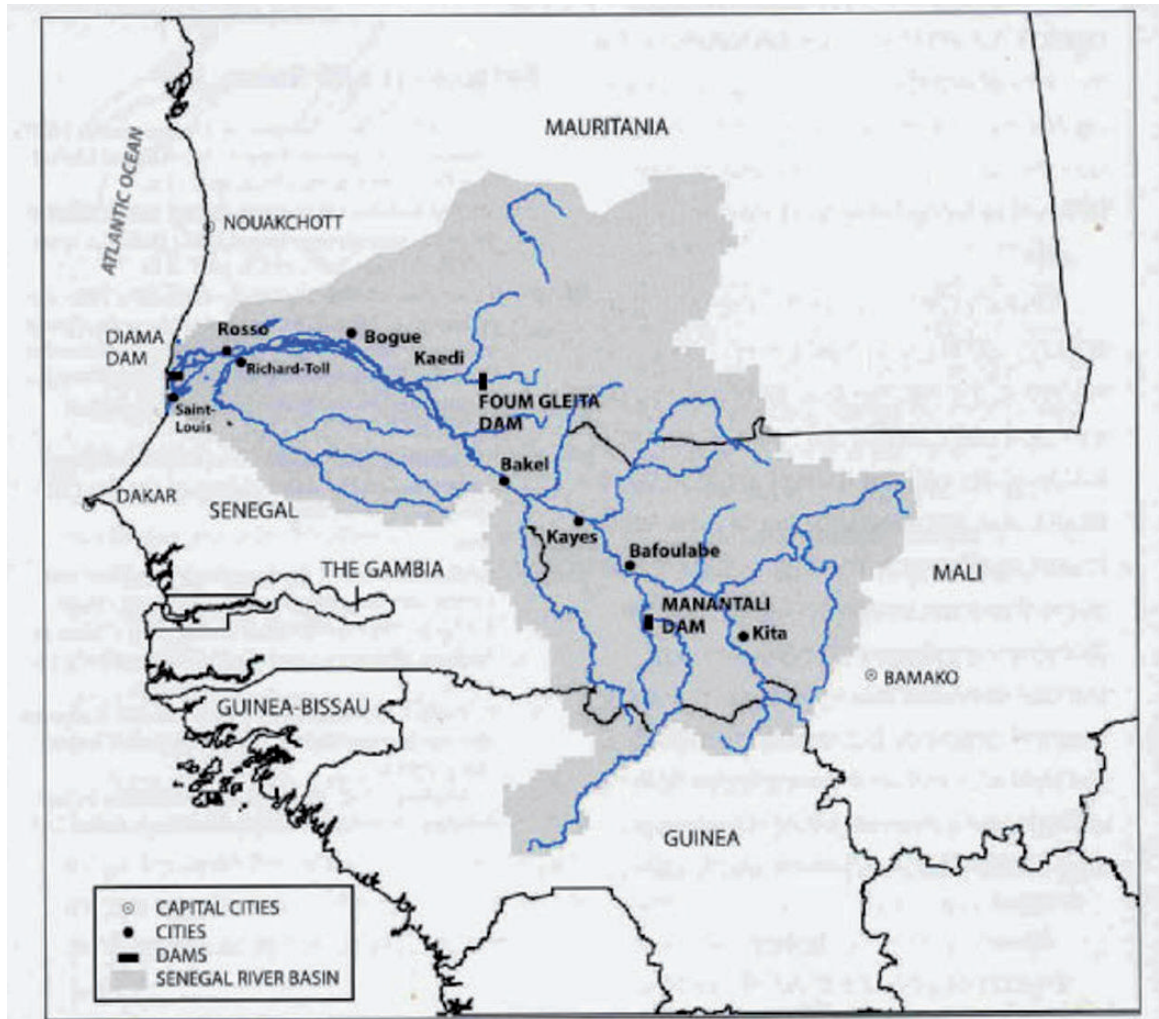
51.3 Hypotheses for the Puzzle of ‘Anti-Malthusian’ Correlation

How could the ‘Anti-Malthusian’ conjuncture of cooperation and conflict over the Senegal River be explained? In order to assure the case study’s connectedness to the theoretical debate, hypotheses on scarcity-driven water cooperation will be derived from the classic schools of International Relations

5 Homer-Dixon has objected to be classified as a Neo-Malthusian, see Brauch 2003: 75; Homer-Dixon 1999.

6 The chapter is a summary of an in-depth study written in 2004 (Kipping 2005).

7 In the region, the violence is euphemistically referred to as ‘les Événements’.

Figure 51.1: The Senegal River Basin. **Source:** Brantly/Ramsey (1998: 108). Printed with permission

(Realism, Institutionalism, Liberalism), while the debate on resource conflicts will provide possible explanations of the Mauritanian events.

51.3.1 Intensified International Cooperation in Times of Growing Water Scarcity

A priori, international cooperation is an anomaly for *Realism*, as the latter conceives anarchy and survival as the key determinants of the international system. This is even more the case for water cooperation in times of water scarcity, as realist approaches to ‘hydropolitics’ (Elhance 2000) normally adopt a Neo-Malthusian perspective. Nevertheless, the concept of ‘hegemonic stability’ can account for ‘untrue’ cooperation in cases where a dominant power coerces dependent states into agreements which are tailored to the hegemonic state’s advantage. Quantitative re-

search provides some support for this concept with regard to international water cooperation. Bertram Spector, for instance, finds that disparities between riparian states in the share of water used for industrial purposes, in access to safe drinking water, in the Human Development Index (HDI) and in economic power correlate positively with water cooperation. He concludes that “in the inequality among riparians, the seeds for cooperation may be found” (Spector 2000: 233).⁸ Miriam Lowi also employs the concept of hegemonic stability in her research on the Jordan Basin: “[I]f the dominant power in the basin will benefit from regional cooperation in water utilization, it will take the lead in creating and maintaining a re-

⁸ A book example for such an agreement is the 1944 Water Convention between Mexico and the United States (personal communication from Ursula Oswald).

gime, and will enforce compliance with its rules” (Lowi 1993: 10). Under this perspective, water cooperation can only be expected if the hegemonic state is located downstream, whereas upstream states will not voluntarily enter into water-sharing agreements that tend to limit their freedom of action.

How can the concept of hegemonic stability explain intensified water cooperation in times of growing water scarcity? The dominant power might get interested in assuring that upstream states refrain from increasing their water abstraction or in redistributing the river’s water to its own favour in order to offset the negative climatic impact. Due to growing problem pressure, the dominant state’s interest in jointly developing the shared river could increase as well.

In contrast to Realism, where cooperation is dictated by the dominant power, *Institutionalism* perceives cooperation as the product of a shared demand. Collective problems – such as floods or the underdevelopment of common watercourses – are best for the prospect of water cooperation (Marty 2001: 38). Asymmetries of interest, reflected in upstream-downstream ‘Rambo’ situations (Haftendorn 2000: 64–65),⁹ in contrast, need to be balanced by additional, external incentives provided by packet deals or development assistance, for instance. The latter may also be needed to enable poor countries to implement agreed-upon cooperation projects (Marty 2001: 345). In addition to a common demand for cooperation, the transaction costs for reaching an agreement need to be sufficiently low. They can be minimized by a high degree of regional integration (Durth 1996) and by the institutionalization of water cooperation (Wolf 2001: 10).

How can growing water scarcity influence these factors? First, a drought is likely to increase riparians’ interest in developing their watercourse in order to alleviate problems of water supply (Sadoff/Grey 2002: 402).¹⁰ Second, a drought might induce international donors to provide additional incentives and means to realize transboundary water projects in the affected regions.

9 Game theory defines ‘Rambo’ situations as conflicts where one party completely lacks incentives for reaching an agreement with the other(s), as it can only lose out from a consensual settlement of the conflict. This distinguishes a ‘Rambo’ situation from a dilemma situation, where all parties may – theoretically – gain from an agreement if they succeed in overcoming the barriers to cooperation, such as lacking transparency, distrust or missing compensation mechanisms.

In contrast to Realism and Institutionalism, which perceive states as black boxes, *Liberalism* focuses on the domestic factors of foreign policy and international relations. Two strands of Liberalism are of particular relevance in relation to hydropolitics: First, polity features influence decisions on water cooperation. Notably in political systems characterized by “belly politics” (Bayart 1989), rent-seeking opportunities associated with water projects are extremely important: “[T]he main beneficiaries of dams are construction companies, consulting engineers, corrupt politicians and government officials, who work in tandem to promote them” (Biswas 2004: 4). Economic and other interest groups like agribusiness, consumers of hydro-energy or indigenous groups might also influence decisions on water cooperation. Second, ideational factors may play key roles for water policies, since national water resources and large infrastructure projects tend to be highly symbolic.¹¹

While water scarcity does not affect rent-seeking opportunities, it can boost influential pressure groups’ interest in international water cooperation. In addition, the symbolic value of cooperation projects is likely to rise, thus increasing the riparian states’ incentives to enter into such agreements.

51.3.2 Intra-State Violent Conflict in Times of Growing Water Availability

Whereas classic International Relations theory does not offer hypotheses for explaining the inner-Mauritanian conflict, the recent debate on natural resources as a cause of civil war suggests some promising arguments. This debate, however, rather dichotomously conceives either the *abundance* of *non-renewable* resources (diamonds, oil, coltan, etc.) or the *scarcity* of *renewable* resources (fertile land, vegetation, water, etc.) as causes of conflict. Most interesting about the Mauritanian case is that it combines a *renewable* re-

10 “The increasing scarcity of fresh water in the developing countries may by itself now encourage the basin countries to cooperate to achieve optimal benefits” (Swain 1997: 414). “[I]f all countries involved perceive a shortage, the stakes for developing the common resource by co-operation become very high” (Ohlsson 1995a: 24).

11 “[D]am construction projects are frequently prestige projects, symbolic for national development aspirations” (Libiszewski 1999: 123). “Water resources and projects are frequently highly symbolic to policy makers and publics both within the nation and outside” (Frey 1993: 64). See also Okidi (1988).

source (water) and its dam-induced *abundance* as a possible reason for the events of 1989 and 1990. Thus, both lines of argument might provide hypotheses for explaining this case.

The ‘resource curse’ argument is based on the ‘structural transformation of war’ observed during the 1990’s. According to this reasoning, globalization and the end of the Cold War have caused the progressive commercialization of war, leading to ‘war economies’ where rebel and governmental troops – which are increasingly difficult to distinguish – compete for the access to and the exploitation of highly valued non-renewable resources. Lacking economic alternatives for young men make countries particularly vulnerable to ‘greed’-driven rebellions (Collier/Hoeffler 1998).

Yet, for several reasons, this line of thought is difficult to adapt to the Mauritanian context. First, the economic outputs of freshwater use (cash crops, hydro-energy, etc.), unlike alluvial diamonds or gold, can hardly be produced and sold under conditions of civil war: “Water is not a lootable resource” (Gleditsch 2004). Second, the prices for these products are rarely high enough to finance war economies or to provide sufficient incentives for going to war. Third, the abundance argument is static in essence: There *is* too much gold for peace to be maintained. What is needed for the Mauritanian case, however, is a hypothesis that links the *increase* of resource availability to the outbreak of conflict.

Better fitting hypotheses might however be derived from the debate on scarcity conflicts, which is heavily influenced by Homer-Dixon’s and ENCOP’s research. Homer-Dixon has developed a full-fledged causal model of scarcity conflicts. According to this model, demand-induced, supply-induced, and structural (i.e. distribution-induced) scarcity can indirectly cause intra-state violent conflict via decreased agricultural productivity, economic decline, a sharper segmentation of society, migration movements, and the weakening of institutions like the state. Demand-induced, supply-induced, and structural scarcity reinforce each other in processes of *ecological marginalization*, where weaker groups of society move to ecologically fragile areas, and *resource capture*, where powerful groups modify resource distribution in their favour (Homer-Dixon 1999: 73–79).

Resource capture appears to be of particular interest for the Mauritanian events, since Homer-Dixon makes explicit use of the latter in order to exemplify his concept (Homer-Dixon 1994: 11–13, 1999: 76–77). Labelling the Mauritanian events “resource capture”,

Homer-Dixon however confounds his model’s independent and dependent variables, since the concept of resource capture only refers to factors of resource scarcity that may ultimately lead to the outbreak of violence, not to the violence itself. Thus, this concept is not well suited for explaining the Mauritanian conflict.

In contrast to Homer-Dixon, ENCOP considers intra-state violent conflict also as a *direct* result of resource scarcity (Baechler/Böge/Klötzli/Libiszewski/Spillmann 1996: 318–321). Most interesting is ENCOP’s concept of *socioecological heterogeneity*, inspired by structuralist development theory. According to this concept, discrepancies in the endowments of renewable resources, reinforced by inequality in economic and political power, motivate underprivileged groups to rise up (Baechler/Böge/Klötzli/Libiszewski/Spillmann 1996: 37, 308). This focus on discrepancies, as opposed to scarcity as such, makes ENCOP’s approach useful for the Mauritanian case. While ENCOP conceives the congruence of resource discrepancies with power discrepancies as conflict-generating, it however seems to be equally justified to suppose the *incongruence* of both as a cause of violent conflict: In societies where renewable natural resources constitute the main economic assets, politically dominant groups might resort to violence in order to assure control over these resources, if the distribution of the latter does not already correspond to the distribution of power in society. This mechanism could explain the Mauritanian events, since it was precisely the Mauritanian elite that initiated the expulsions of 1989 and 1990.

51.4 Process-Tracing: Causal Mechanisms of Cooperation and Conflict on the Senegal River

The hypotheses generated in the last section will now be used for tracing the processes of 1) the decisions on the OMVS infrastructure programme and 2) the violent conflict in Mauritania. Testing the *realist*, *institutionalist* and *liberal* hypotheses for the international cooperation, on the one hand, and the hypothesis of a conflict-generating incongruence of resource and power distribution for the intra-state conflict, on the other hand, will reveal in how far the ‘Anti-Malthusian’ correlation of water availability and conflict or cooperation in the Senegal Basin is backed by causal linkages.

51.4.1 Intense Cooperation: Infrastructure Projects of the Organization for the Development of the Senegal River (OMVS)

Plans for the development of the Senegal River date back to colonial times. In 1822, the French Government established a first experimental plantation in the lower Senegal Valley (Reichhold 1978: 110–119; Tangara 1998: 110–128). With increasing technological capacities, projects for the regulation of the Senegal River for irrigation, navigation, and hydropower purposes surfaced in the 1920's, and numerous studies on development options were commissioned by the French administration. However, due to the shift of colonial interest from the Senegal Valley towards the Senegalese Peanut Basin and the projects' doubtful economic profitability, none of these plans was realized under French rule (Maïga 1995: 18–21).

At the beginning of the 1960's, the newly independent riparian states took up the colonial plans. With the help of the United Nations, the preparatory work continued, and a first inter-governmental organization for the development of the Senegal River, the *Comité Inter-Etats*, (CIE), was founded in 1963. In 1968, the CIE was superseded by the *Organisation des Etats Riverains du fleuve Sénégal* (OERS), which aimed at the political and economic integration of the riparian states beyond the mere development of their common river. Due to political frictions between Léopold Sédar Senghor's pro-French Senegal and Sekou Touré's decisively anti-colonial Guinea, the three downstream states replaced the OERS with the OMVS in 1972 in order to pursue the agreed-upon development projects without Guinea (Maïga 1995: 63–76).

In 1974, the three OMVS member states adopted a *schéma directeur* for their infrastructure programme, encompassing a main regulatory reservoir in the upstream Malian part of the river, and a downstream anti-salt barrier to prevent the intrusion of marine water during the annual low-water period. The upstream Manantali dam was designed to guarantee a minimum water flow for the all-year irrigation of 255,000 ha in the middle and lower valley as well as uninterrupted navigation between the Atlantic Ocean and the Malian town of Kayes. In addition, the Manantali dam was supposed to be equipped with a hydropower station, producing 800 GWh annually (Reichhold 1978: 148–159; Maïga 1995: 80–81; Meublât/Ingles 1997: 182–183).

While the main pillars of this infrastructure scheme had already been conceived by the French, the internationalization of the river due to decolonization led to the disappearance of their sovereign, unitary control over the whole river basin. According to the *realist* hypothesis, Senegal – as the basin's most advanced and most powerful state¹² – could have taken over the colonial heritage and pushed forward the infrastructure programme. Indeed, it seems that Senegal was particularly active in this regard (LeMarquand 1982: 234–235, 1986: 14–15). However, the potential successor of the French did not really act like a hegemonic power. During the negotiations on the infrastructure programme, Senegal adopted a more than benevolent attitude towards its neighbours, eager to satisfy their demands. In addition, the two leading positions of the OMVS – the posts of its Secretary General and High Commissioner – were reserved for Mauritania and Mali (Tangara 1998: 138). Finally, Senegal proved to be unable to integrate Guinea, although the latter's upstream position makes it strategically important (Kane 1994: 174).¹³ Thus, the *realist* hypothesis of a hegemonic power unilaterally pushing through the water cooperation over the Senegal River can be rejected.

This is even more true, as the *institutionalist* perspective reveals that there was not even a need for a hegemonic power that would have forced its neighbours to cooperate: “The Senegal River is a case in which there is not only a common interest among the three lower riparian countries, but, in addition, the interest is complementary” (Fox/LeMarquand 1979: 16). Where did this “rare harmony of objectives among the participating States” (Godana 1985: 230) come from? Senegal and Mauritania were mainly interested in expanding irrigated agriculture in the Senegal Valley, necessitating the regulation of the river through an upstream reservoir. Mali, in contrast, was in desperate need of a direct connection to the sea to alleviate its land-locked situation. In addition, cheap hydro-energy was supposed to boost its industrial development (Niasse 2004: 8). Manantali thus constituted a “win-win-win” project, as this “key component” (Platon 1981: 1084) of the infrastructure pro-

12 At least for the first 20 years after independence, Mali and Mauritania nearly completely depended on Senegalese infrastructure for access to the sea (Stewart 1989: 163).

13 Due to the political frictions mentioned above, Guinea even threatened Senegal with diverting the river with Chinese assistance (Tangara 1998: 135, footnote 22).

gramme – accounting for ¾ of the investment costs – was designed as a multipurpose dam, satisfying all three objectives of irrigation, navigation and energy generation. In order to account for differences in benefit, the contribution of each participating state to the costs of the infrastructure programme was calculated according to a complicated formula, based on econometric estimates of the relative gains (Godana 1985: 224–228).

In addition to this win-win-win constellation, the cooperation between Mali, Mauritania and Senegal was eased by relatively low transaction costs. The three OMVS member states share the same official language, their juridical and political systems are similar, and the common colonial history and religion (Islam) act as unifying factors. Furthermore, the considerable amount of data on the Senegal Basin collected by the French and the institutionalization of the cooperation within the CIE and the OERS certainly facilitated agreements.

If the *institutionalist* explanation of the cooperation over the Senegal River thus appears to be plausible, what role did growing water scarcity play for the realization of the common infrastructure programme? Although the riparian states' interest in jointly developing their river was already substantial, the onset of the severe Sahelian drought of 1968–1973 made it even more pressing. Food deficits and food imports sky-rocked, increasing dependence on external aid and undermining development plans (LeMarquand 1982: 53, 1986: 8–9). Thus, Senegal and Mauritania in particular accelerated their efforts to realize the agricultural potential of the Senegal Valley, which offered good conditions for the cultivation of rice, the basic food crop of urban inhabitants (White 2000: 50; Park 1993: XV; Seck 1991a: 17).

While the interest in the infrastructure programme was already there before the drought, the financial means to realize it, however, were not. The investment costs had to be almost completely¹⁴ borne by international donors. Arab oil states, the Federal Republic of Germany, and the French Government together provided the lion's share of funds (Maïga 1995: 91). Although these donors had their specific interests in supporting the OMVS plans as well,¹⁵ their final consent cannot be understood without the context of the Sahelian drought. The resulting famine with approximately 100,000 dead caused growing awareness of the region's poverty and a real "donors' run" on the Sahel (Brantly/Ramsey 1998: 108; GWP

2000: 4). The OMVS member states succeeded in exploiting this increased openness to support Sahelian countries. With continued reference to the drought (Reichhold 1978: 291, 300, 307), the national leaders were able to convince the donors to support the OMVS programme with sums that were far above normal country quotas¹⁶ – despite growing doubts regarding the economic profitability of the planned infrastructure (LeMarquand 1982: 75–80, 214–216; 1990: 227). This is why the growing water scarcity after 1968 clearly was a necessary condition for the intensified water cooperation in the Senegal Basin.

Although the water cooperation within the OMVS can satisfactorily be explained by the *institutionalist* approach, the *Liberal* hypotheses might still provide some refinements. Both domestic politics and the discourse on the infrastructure programme are relevant in this regard. In addition to the agribusiness in the Senegal Valley and to urban consumers of electricity and rice, the interest groups that benefited most from the infrastructure programme were the bureaucracies of the public extension services operating in the Senegal Valley. The drought provided the Senegalese SAED (*Société nationale d'Aménagement et d'Exploitation des terres du Delta du fleuve Sénégal et des vallées du fleuve Sénégal et de la Falémé*) and the Mauritanian SONADER (*Société nationale pour le développement rural*) with strong arguments for the continued modernization of farming practices: It "offered new opportunities for development planners, allowing them to suggest with some plausibility that the farming and livestock-rearing systems by which [sic!] the Valley's inhabitants lived, belonged to the past, and that the future lay with irrigated farming alone" (Adams undated: 1). Nevertheless, it seems that the riparian states' leaders acted rather independently from such particularistic interests, but in

15 The Arab oil states aimed at increasing their influence in Muslim Sub-Saharan Africa, the French had economic interests in the Senegal delta, and the German Government seems to have been interested in opening up iron ore reserves in the upper parts of the river. In addition, most tenders – and thus Arab funds – went to construction firms from the European donor countries (LeMarquand 1986: 43; 1990: 226).

16 Cf.: "In general the OMVS plans to 'push back the desert' struck the right political chord with western and Arab sources of finance" (LeMarquand 1982: 175; 1986: 31). "Politically, the major selling points of the plan [of the OMVS, MK] were that it would lessen the impact of future droughts and help close the food gap that was emerging" (Brantly/Ramsey 1998: 109).

14 At 96% (Tangara 1998: 511).

what they perceived as the “national interest” (Le-Marquand 1982: 134–135, 253). Their perception, however, was heavily influenced by the symbolic significance of the large-scale infrastructure programme. In fact, the OMVS disposed of a considerable “‘modernist’ legitimacy” (Meublat 2001: 444), which was further boosted by the hope of a “‘re-greening’ of the Sahel” (Meublat/Ingles 1997: 163) since the beginning of the drought.

51.4.2 Violent Conflict: The Mauritanian “Events” of 1989/1990

While the degree of water cooperation between the OMVS member states was extraordinary high, the expulsion of non-Moorish farmers from the Mauritanian part of the Senegal Valley was exceptionally violent. It occurred as the third in a row of three violent conflicts (Wegemund 1991: 90–101; Leservoiser 1994: 219–221): First, a deadly struggle between Senegalese farmers and Mauritanian herders near the Senegalese village of Diawara in the upper Senegal Valley led to mutual pogroms in Mauritanian and Senegalese towns against the (alleged) citizens of the other state in April 1989. Second, these pogroms, which motivated an airlift to exchange populations between Nouakchott and Dakar, caused inter-state tensions between Mauritania and Senegal, which deployed military forces on the common border along the Senegal River and occasionally exchanged fire. Third, in the context of these Mauritanian-Senegalese tensions, Mauritanian security forces and state-supported militia systematically deported about 70,000 non-Moorish inhabitants of the Mauritanian part of the river valley in two campaigns in the summer of 1989 and the spring of 1990 (Amnesty International 1990; Magistro 1993: 203–204). While only these last events are the object of our case study, they need to be analysed in relation to the preceding developments.

The media and some analysts have called the events “ethnic riots” or “ethnic cleansing” (Leservoiser 1994: 234, Wegemund 1996: 284, Libiszewski 1999: 137). Although this study intends to assess the role of growing water availability for the expulsion, it is unquestioned that the violence escalated along ethnic lines, between Moorish and non-Moorish segments of the Mauritanian population. Thus, this cleavage will be explained first.

The Moorish, i.e. Arab-speaking population of Mauritania can be divided into two groups: the (usually light-skinned) *Beydan* ‘masters’, on the one hand, and their former *Haratin* ‘slaves’ of black origin, on

the other hand. While the *Beydan* had traditionally lived from herding, trade and *razzias* against sedentary farmers, the *Haratin* took care of their masters’ herds and cultivated oasis land. Culturally assimilated and economically dependent, the *Haratin* remained in a patron-client relationship with their former masters even after their (repeated) official liberation as slaves. The non-Moorish, or “black-African”¹⁷ farmers – having fled the Moorish emirates to the left side of the Senegal River – returned to the Mauritanian shore only after the French ‘pacification’ of the valley. The *Halpulaar* constituted the majority of black Africans in Mauritania, which also comprised significant numbers of *Wolof* and *Soninké* (Wegemund 1991: 104–111).

Since independence, Mauritanian politics were heavily influenced by the power struggle between Moorish and *Halpulaar* groups. While the better-educated, French-speaking black Africans originally dominated the public administration, the Moors took over control of the state from the French (Baduel 1989: 26). Promoting the Arab language in school and public life, the *Beydan* succeeded in stabilizing their “monopoly of politics” (Leservoiser 1994: 192). The increasing black resistance peaked in an unsuccessful coup attempt of *Halpulaar* officers in 1987, leading to a purge of the security forces, thereafter completely controlled by the Moors (Park/Baro/Ngaido 1993: 97).

Moreover, the economic base of the *Halpulaar* was increasingly put into question: Due to pressing demands from the overwhelmingly poor and landless *Haratin*, on the one hand (Ould Bouboutt 1989: 137; Bâ 1991: 261; Ruf 1995: 37), and to the plans of irrigated farming in the Senegal Valley, on the other hand (Park/Baro/Ngaido 1993: 109; Leservoiser 1994: 166–167; Wegemund 1996: 292), the Mauritanian Government adopted a new land code in 1983, abolishing the traditional system of land tenure, which had organized flood-recession farming in the Senegal Valley before. Control over land was transferred from the *Halpulaar* land aristocracy to the Mauritanian State, which was supposed to distribute the land among the farmers who actually cultivated it.

After a slow start to the land redistribution, however, the *Beydan* elite itself seems to have gained interest in irrigated farming in the Senegal Valley. Thus, the Government accelerated the land redistribution by issuing *circulaires* permitting a simplified

17 Their usual self-designation is “négro-africain” (Stewart 1989: 168).

procedure for land concessions (Park/Baro/Ngaido 1993: 109–110). The *Beydan* dominance in the public administration made sure that land concessions were almost exclusively granted to Moors (Leservoisier 1994: 184). As *Beydan* investors from Nouakchott rushed into the valley, land prices exploded (Homer-Dixon 1994: 12; Libiszewski 1999: 136), and more and more Mauritanian *Halpulaar* and cross-border farmers from Senegal¹⁸ were expropriated. This led to increasing tensions between Senegal and Mauritania, creating an enabling environment for the pogroms in the cities and the military skirmishes, which in turn provided a *window of opportunity* for the deportation of non-Moorish farmers from Mauritania in order to “free” their land for Moors (Magistro 1993: 203; Dessler 1994: 105; Homer-Dixon 1999: 74).

How can this “land grab” (Horowitz 1991: 172) be explained? The Mauritanian Government had invested considerable sums into SONADER’s irrigation perimeters since the end of the 1970’s. After only 10 per cent of overall public investment in 1976–1980, the respective proportion increased to 18 per cent in 1981–1985 and 26 per cent in 1985–1988 (Leservoisier 1994: 143–144). This “capital transfer from the core to the periphery” (Magistro 1993: 214) increased the value of the *Halpulaar* economic assets, contributing to the growing discrepancy between the distribution of political power, on the one hand, and the control of valuable economic resources, on the other hand. Finally, “[t]he Mauritanian elite, too impatient to await the legal process of eviction, has begun more forcibly to remove people from the land” (Horowitz 1989: 5).

If it seems to be clear that control over land was the driving force behind the deportation, what role did the growing water availability thanks to the OMVS dams play? Traditional flood-recession farming in the Senegal Valley was commercially uninteresting, producing no more than 400–800 kg of grain per harvest. Land under controlled irrigation, however, could yield much higher results. Whereas revenues from flood-recession farming did not exceed 29,000 FCFA/ha per harvest, gains from irrigated rice cropping could bring up to 209,000 FCFA/ha per harvest (Horowitz 1991: 173). Nevertheless, due to high capital and operation costs, irrigated agriculture still was not sufficiently profitable in the absence of a regulation of the river: “These perimeters have

been costly to prepare, maintain, and operate, in part because the river often does not contain enough water for efficient irrigation; as river levels go down, the cost of pumping water to the fields increases markedly” (Horowitz 1989: 4). Thanks to the OMVS dams, however, water for irrigation became available all year, enabling farmers to bring in up to three harvests. Thus, return on capital increased three-fold, and irrigated farming became economically highly interesting, even more so considering the lack of economic alternatives in Mauritania. Therefore, many authors identify the surplus of water provided by the dams as a main cause of the Mauritanian ‘events’ (Nikolaj 1990: 473; Horowitz 1991: 172; Leservoisier 1998: 130). Others go even further, considering the ‘events’ primarily as “a conflict triggered by dam-induced pressure on land” (Adams undated: 27; Bosshard 1999; WEC 2002).

In the end, however, it is not clear if the increased water availability was a truly necessary condition of the Mauritanian conflict. The historical struggle for influence between Moorish and non-Moorish segments of the Mauritanian society already provided incentives for the deportation, and the public investment in the Senegal Valley created valuable objects of ‘greed’. Nevertheless, the dam-induced growing water availability surely was a reinforcing factor of the conflict, considerably deepening the incongruence between the control of political power and the distribution of economic assets, which was finally rebalanced by the expropriation and expulsion of the politically under-privileged black Africans.

51.5 Conclusion: Strengthening the Water Peace

The process analyses have shown that the ‘Anti-Malthusian’ correlation of water availability and conflict or cooperation in the Senegal Basin can indeed be explained by causal linkages: Without the Sahelian drought of 1968–1973, the OMVS member states would not have been able to realize their plans for developing the economic potential of the Senegal River. International donors would have been much more reluctant to fund the controversial dams. For this reason alone, growing water scarcity was a necessary condition for the intensification of international cooperation on the Senegal River. In addition, in absence of the drought, the OMVS member countries’ interest in developing their common river would have been less pressing. This would have diminished the

18 Before the events, approximately 30,000 Senegalese cultivated land in the Mauritanian part of the valley, according to traditional land use patterns from colonial times (Seck 1991b: 305).

riparians' efforts to overcome their controversies and to mobilize the needed funds.

Regarding the Mauritanian conflict, it was demonstrated that the dam-induced increase in water availability was at least a reinforcing factor, if not surely a necessary condition. The rise of land prices due to improved opportunities for highly profitable irrigated farming partly motivated the expropriation of the valley's black farmers and their bloody expulsion. This 'land grab' by the Moorish elite was eased by the historical conflict between Moorish and *Halpulaar* segments of the Mauritanian society, which had led to the total control of the security forces by the Moors and polarized the Mauritanian society. In addition, the escalating conflict between Mauritania and Senegal provided the 'fog' needed for the realization of the expulsion plan.

What do these results imply in *political terms*? The study has shown that external actors – here: donors – can indeed be crucial for intensified international water cooperation. It seems that bilateral development agencies and multilateral lending institutions may strengthen the 'water peace' and falsify Neo-Malthusian determinisms in developing regions. However, their involvement in favour of water cooperation is not positive *per se*.¹⁹ Indirectly, donor support for the OMVS infrastructure programme contributed to the Mauritanian conflict of 1989 and 1990. Although it is unclear if this consequence could have been foreseen 15 years in advance, this insight underlines the need not to consider international water cooperation as a purely technical affair. Effects on domestic politics can be considerable,²⁰ and respective impact assessments are needed to ascertain that support for specific cooperation projects is globally beneficial to riparian societies. Where political risks are significant, support for the water cooperation in question should be reconsidered if no adequate counter-measures – such as tough political conditionalities – can be taken.

Regarding *consequences for future research* on water security, the Senegal River case study has illus-

trated the need for a more precise operationalization of variables in comparative qualitative and large-N quantitative studies. While Aaron Wolf states vis-à-vis conflict and cooperation over the Senegal River that "it is clearly an exceptional example of political tensions following the climatic trend" (Wolf/Stahl/Macomber 2003: 6), our research has shown the exact opposite. Wolf's erroneous judgement can be explained by the fact that he counts the ambitious, but basically empty political declarations on regional integration between the riparian states adopted in the 1960's, but does not consider the concrete decisions on the infrastructure programme taken *after* the onset of the Sahelian drought.

For assessing the causes of conflict and cooperation between riparians of international watercourses, there is a need not only to consider the respective degrees of water scarcity and upstream-downstream constellations, but also to specify the interests in water use and the technical as well as financial capacities of riparian states. A country like Mali, for instance, which lacks both the interest in the consumptive use of the Senegal River's water and the financial capacities to realize large-scale water abstraction from the river, is unlikely to struggle for water distribution with its downstream neighbours.

Furthermore, the role of external actors in regional water cooperation has not received sufficient attention up to now. Although several authors make allusions to the importance of external incentives like rents from development assistance (e.g. Perritt 1989: 205; Andersen/Rangeley 1993: 151), systematic research on this issue is lacking. However, respective studies might give indications on the degree of riparian states' ownership of cooperation projects and thus on the prospects for their sustainability.

Finally, the nature of the state needs to be taken seriously in order to understand hydropolitics. Research on water cooperation and water conflicts mostly adopts a biased "European" perception of the state. In many developing countries, however, (pre-) colonial legacies such as the land aristocracy of the *Halpulaar* or the patron-client relationship between *Beydan* and *Haratin* are key to most political processes.

In short, research on hydropolitics must get more precise in order to produce more reliable results. If better research is to improve life for people in the world's river basins, however, we cannot do without a strong political will to make 'water peace' more stable.

19 The Green Cross seems to suggest exactly this, when it states that "all movement towards collaboration must be taken as a step in the right direction" (Gorbachev/Masire/Carlsson/Ramos 2000: 14).

20 See: "The economic benefits and costs that every water-related policy or project can and does create bring into existence new interest groups and constituencies that can seriously undermine or threaten the power and privileges of the established stakeholders" (Elhance 2000: 209).

52 The Centrality of Water Regime Formation for Water Security in West Africa: An Analysis of the Volta Basin

Maëlis Borghese

52.1 International Rivers in Africa: Imperative for Co-operation

Because water is so essential for physical survival and no human activity can be sustained without water, and because of the growing water scarcity in many regions of the world, transboundary water has often been regarded as a potential source of insecurity, tension or even violent discords among riparian states (Falkenmark 1986; Cans 2001; Larbi Bouguerra 2003). The *Economist* argued in 2000 that “water shortages will grow even more serious, the stuff of future wars. ... With 3,5 billion people affected by water shortage by 2050, conditions are ripe for a century of water conflicts” (Dinar/Dinar 2000: 193).

The freshwater dispute database (Wolf 1999b; Wolf 1998, Wolf/Stahl/Macomber 2003; Wolf/Yoffe/Giordano 2003) challenged this view, arguing that shared water was a powerful incentive for international co-operation. Wolf and his colleagues registered 261 international river basins shared by two or more riparian nations. Only few basins are characterized by inter-state conflicts: the Aral Sea Basin, the Nile Basin and the Okavango Basin in Southern Africa. Their analysis argues, seeking water security definitely leads states with shared international water resources to co-operate rather than to enter into conflict. Although their thesis is empirically based, it does not analyse its roots, the co-operation mechanisms. Their analysis remains legalistic, stating that co-operation exists because countries sharing transboundary lakes or rivers sign agreements. They do not explore the genesis of these agreements and omit answering the following question: What leads the countries sharing freshwater resources to co-operate?

Addressing this problem is particularly crucial for Africa and vital for human beings and in their energy and food production. Freshwater is an indispensable resource for economic development. Given the high demographic and economic growth rate and the pro-

jected climate change, a considerable part of Africa will soon face freshwater scarcity or stress, according to forecasts by United Nations agencies.¹ It is therefore becoming increasingly clear that key goals of the international community – sustainable economic development, environmental well-being and security, peaceful co-existence, human security, and human rights – cannot be achieved in Africa, until bilateral and multilateral agreements can be negotiated and implemented to manage the water resources of international river basins in co-operative, sustainable and equitable ways (Elhance 2000: 202). In Africa transboundary international waters cover 62 per cent of the continent. In West Africa² tensions on water resources often have geopolitical impacts. Transboundary water resources tie up all states in a river basin into a highly complex web of environmental, economic, political, and security interdependencies. Any manipulation of water flow of a shared river by a riparian state has economic, environmental and security impacts on other riparian countries. A sustainable management of shared water resources implies international co-operation (Marty 1997, 2000).

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- 1 According to the definition of the United Nations Development and Environmental Programmes (UNDP; UNEP), an area is experiencing *water stress* when annual water supplies drop below 1,700 m³ per person. When annual water supplies drop below 1,000 m³ per person, the population faces *water scarcity*.
 - 2 Although it covers only a quarter of the African continent, West Africa has 25 international river basins, nearly half of African international rivers. Among these basins are the Niger basin (11 countries), the Chad Basin (8 countries), the Volta Basin (6 countries) and the Senegal Basin (4 countries). West African countries have water resource dependence (part of renewable water resources produced outside the country) of 40 per cent, but for Mauritania and Niger the dependence is 90 per cent (Niasse 2004: 5).

Africa has a long history of transboundary water management based on its own water laws regulating at least partially the use of many basins (IUCN 2004). While an understanding of the scope and nature of African transboundary water law supplies an important tool to improve the management of its shared basins, there is a need to understand why and under what condition co-operation occurs. The literature on international water co-operation in Africa is often technical and based on descriptive monographs. Although studies exist on trends in international water management and international development (Hajer 1996) and on conditions in Africa's transboundary waters³, only few offer political analyses of African international co-operation processes on shared basin (Niasse 2004; Borghese/Giordano/Lautze 2005). This chapter will partially fill this knowledge gap with a focus on the Volta River Basin.⁴ An examination of the factors accounting for the formation of transboundary water treaties in this shared basin can be used to contextualize the developments in African transboundary water law, to understand better the environmental co-operation mechanisms, and thus enhance incentives for future co-operation in transboundary basins.

The Volta River Basin is the 9th largest in sub-Saharan Africa covering an estimated area of 400,000 km² in six West African countries: Benin, Burkina Faso, Ivory Coast, Ghana, Mali and Togo. The area coverage ranges from 1 per cent in Mali to almost 70 per cent in Ghana. The 6.5 per cent of the total basin in Togo represents over 40 per cent of its land. In Mali (UNEP 2002a) the area within the basin holds an abundance of natural resources for the entire country. Whereas its resources are a determinant for the riparian states' economy and development, the Volta Basin remains one of few basins in Africa without any regional management authority. Although no serious conflict on its shared waters has been recorded, since the 1990's riparian countries have initiated a co-operation process that should lead to a regional authority for the integrated management of the Volta Basin by end of 2006. This co-operation dynamic on the Volta river basin offers an opportunity to analyse some explanatory factors of international environmental co-

operation in African transboundary basins⁵ to address this question: What realities, actors and mechanisms do encourage states to co-operate on international basins? Backing on the regime formation theory (52.2), this chapter explores the drivers for international co-operation looking at the specific case of the one-going negotiation process in the Volta River Basin in West Africa (52.3).

52.2 Regime Theory as the Research Framework

Co-operation has been a major research field for international relations. In the late 1970's, the concept of 'international regime' has emerged and has become a structural concept of international co-operation (Keohane/Nye 1977). Viewing international politics with sceptic optimism, it denies neither the state's egotism that they are motivated by their own interests, nor their violence potential. Given the growing interdependence of states this model believes in the possibility to control international violence through institutionalized international co-operation. Defined as "sets of principles, norms, rules and decision-making procedures around which actors' expectations converge in a given area of international relations" (Krasner 1983: 22), the concept of international regimes offers an analytical tool to comprehend the reality of international co-operation and the importance of international institutions. Combining the neo-liberal and *cognitivistic* approaches of regime theory (Hasenclever/Mayer/Rittberger 2000)⁶, and analyzing the co-operation on the Volta Basin as an environmental regime formation dynamic, this chapter intends to check the model of regime formation against an on-going empirical West African reality.

3 See for details: Godana (1985a); Rangeley/Thiam Bocar/Andersen/Lyle (1994); Hirji/Grey (1998); Okaru-Bisant (1998); Ilomaki (1999); UNECA (2000); Sadoff/Whittington/Grey (2002); IUCN (2004).

4 This chapter summarizes a comprehensive study of the author (Borghese 2005).

5 The co-operation process in the Volta Basin has barely been documented in the academic literature. Information was therefore collected in the field from September to November 2004. 25 interviews were conducted with Ghanaian and Burkinabe representatives from national authorities, international organizations, NGOs and research institutes and expatriate representatives of multilateral and bilateral donor organizations involved in the Volta basin co-operation process (Borghese 2005). This added personal testimonies and data, including project reports, figures and unpublished research or project documents.

52.2.1 State Interests as Determinants of Regime Formation

According to the realist hypothesis, a homogenous interest constellation among the states sharing a common problem is the key determinant for launching international co-operation and regime formation (Zürn 1998). Different ideal type models can explain this particular interdependence and related outcomes in terms of regime formation probabilities, such as game theory or the theory of public goods. While the first model focuses on existing power distribution between negotiators, the second insists on the nature of the common problem to determine the probability of co-operation. Backed on empirical studies, the international relations specialists at Tübingen University have elaborated a theory of regime formation, which partly integrates both explanatory dimensions in a single model (Mayer/Rittberger 1993). They concluded that the existing combination of the 'situation structure' (constellation of states interests determining the 'games' they play) and the 'problem structure' (nature of the common problem confronting them) must be analysed case by case, in order to assess the scope of possibilities for regime formation in a specific problem area.

For the case of international river basins, some general trends can be identified regarding the determinants of previously defined 'situation' and 'problem' structures. For instance, the geography of the basin, understood in its wide meaning of physical, economic and human geography, is crucial for assessing riparian states' interest or lack of interest in co-operation. It determines their national dependence on the water resources (freshwater supply), as well as the international level of their mutual dependence. The

up- and downstream morphology of transboundary basins creates asymmetric interests and bargaining power structures, which reduce the chances for regime formation (Niasse 2004).⁷

Many other factors determine the 'situation structure' of the riparian states of international river basins. In West Africa, the strong demographic growth and industrialization have increased the pressure on natural resources and have a direct influence on water stress and scarcity, often creating an urgent need for concerted efforts among states sharing these resources. Specific social, cultural, historical, political, and other circumstances may equally play a role but their relative weight on national preferences differs.

On the 'problem structures', two main problems should be distinguished, whose respective influence on the interests and incentive structures of riparian states and thus on co-operation in the basin is strictly opposite (Marty 2001: 35–38). While collective problems (water scarcity, floods, untapped opportunities for river development and poor river navigability), create symmetric incentive structures and homogenous interests easily lead to co-operative solutions, negative or positive transboundary externalities (transboundary pollution or the unilateral construction of a dam) correspond with an asymmetric incentive structure and a heterogeneous interest constellation, which may hamper cooperation.

The realist-oriented liberal school analyses international co-operation in shared river basins mainly as the result of a win-win interest constellation among riparian states, relying on the given 'situation' and 'problem structure' (see figure 52.1).

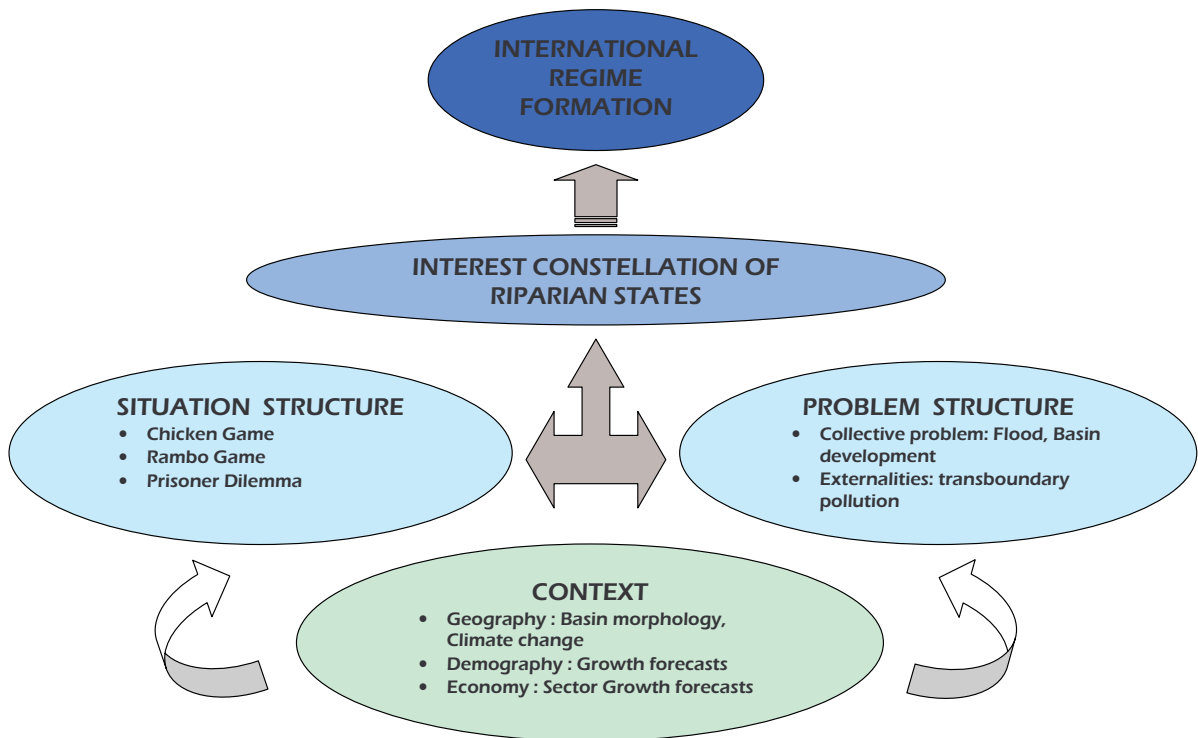
52.2.2 The Influence of Process Factors

Given the complex reality in international relations, the simple and rational regime formation scheme should be nuanced: A positive interest constellation does not represent a sufficient condition for regime formation (Osherenko/Young 1993: 11). Even if the 'problem' and 'situation structures' influence the probabilities for regime formation, it cannot be auto-

6 The author deliberately chose to set the purely realist-oriented vision of regimes aside, since its central hypothesis is not compatible with the Volta Basin riparian states. According to this school, regime formation and resilience relies on the involvement of a strong leader among the states confronted with one common problem. Such a 'hegemon' does not exist in the Volta region whose countries have largely weak economies: The region is one of the poorest in Africa, with average annual income estimated at US\$ 800 (UNEP 2002a). However, a co-operation process has been initiated in the Volta region. Considering the inadequacy of the realist model for the African reality, the chapter focuses primarily on neo-liberal (which is based on some realist hypothesis but does not consider power as the only driver of international relations) and cognitivist explanations.

7 Observing the Niger Basin Organization's great difficulties in implementing effective co-operation in comparison to the success of the Senegal River Development Organization in the Senegal River Basin (see: chap. 51 by Kipping), Niasse argues that co-operation is easier to implement in international boundary basins such as the Senegal River Basin than in international boundary-crossing basins.

Figure 52.1: Scheme: Realist-Oriented Regime Formation Process in Transboundary Basins. **Source:** Developed by the author based on Borghese (2005).



matically expressed in a clear and deadlocked preferences constellation. The success of regime creation results from a progressive process that lightens and transforms states' preferences to, finally, let appear "win-win" agreement opportunities (Müller 1993: 35-37).

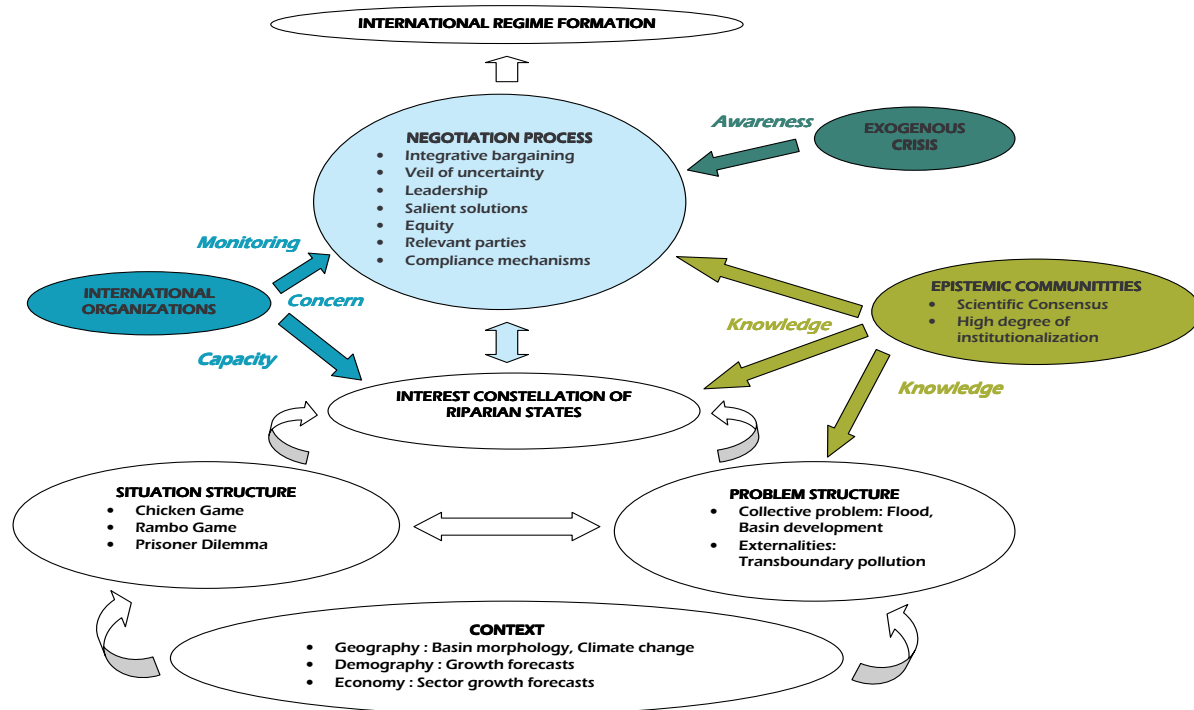
Young⁸ has developed a model of regime formation focusing on the determinant role of negotiations, which he refers to as "institutional bargaining" (Young 1989b, 1994, 1998). His key argument is that a so-called "veil of uncertainty" covers the negotiation process. This concept designates "all factors that make it difficult for individual participants to foresee how the operation of institutional arrangements will affect their interest over time" (Osherenko/Young 1993: 13). Referring to Rawls's philosophical concept of "veil of ignorance", this "veil of uncertainty" encourages negotiating parties to formulate institutional agreements that are acceptable to all, inducing the actors to engage in "integrative" rather than "distributive" bargaining. Together with this central hypothesis, from various case studies he drew these factors

influencing the course of the bargaining process: the equity of the negotiations, the definition of salient solutions, the participation of relevant parties, the formulation of accurate compliance mechanisms, as well as the role of political leadership during discussions. The particular combination of these elements strongly determines the success or failure of any regime formation process (Osherenko/Young 1993).

The *cognitivist school* gives a more substantial criticism of the neo-liberal explanation of regime formation. It stresses the limits of considering state interests as exogenously given and only dependant on determined situational factors (Haas 1992: 1-2; Hasenclever/Mayer/Rittberger 2000). Emphasizing the limits of an analysis that omits to grasp the origin and dynamics of states' common understanding (Goldstein/Keohane 1993)⁹, it proposes to fill this gap by providing an explanatory theory for states' changing perception of their common interest. They point to the role of ideas and knowledge in shaping states' preferences and therefore influencing the demand for international co-operation. Regarding the growing influence of specialists in today's complex and uncertain world,¹⁰ the role of "epistemic communities", defined as "a network of professionals with recognized expertise and competence in a particular domain and

8 Oran Young is "one of the pioneers of regime analysis" and "one of the most innovative and productive scholars in that field" (Hasenclever/Mayer/Rittberger 1997: 68).

Figure 52.2: Scheme: Integrated Model of Regime Formation. **Source:** Developed by the author based on Borghese (2005).



an authoritative claim to policy-relevant knowledge within that domain or issue-area” (Haas 1992: 3) appears crucial. Epistemic communities are likely to convey their common understanding of a problem and the related political solutions to decision-makers. As a result, their influence on the political process increases the chances for building an international consensus and, in turn, an international regime.

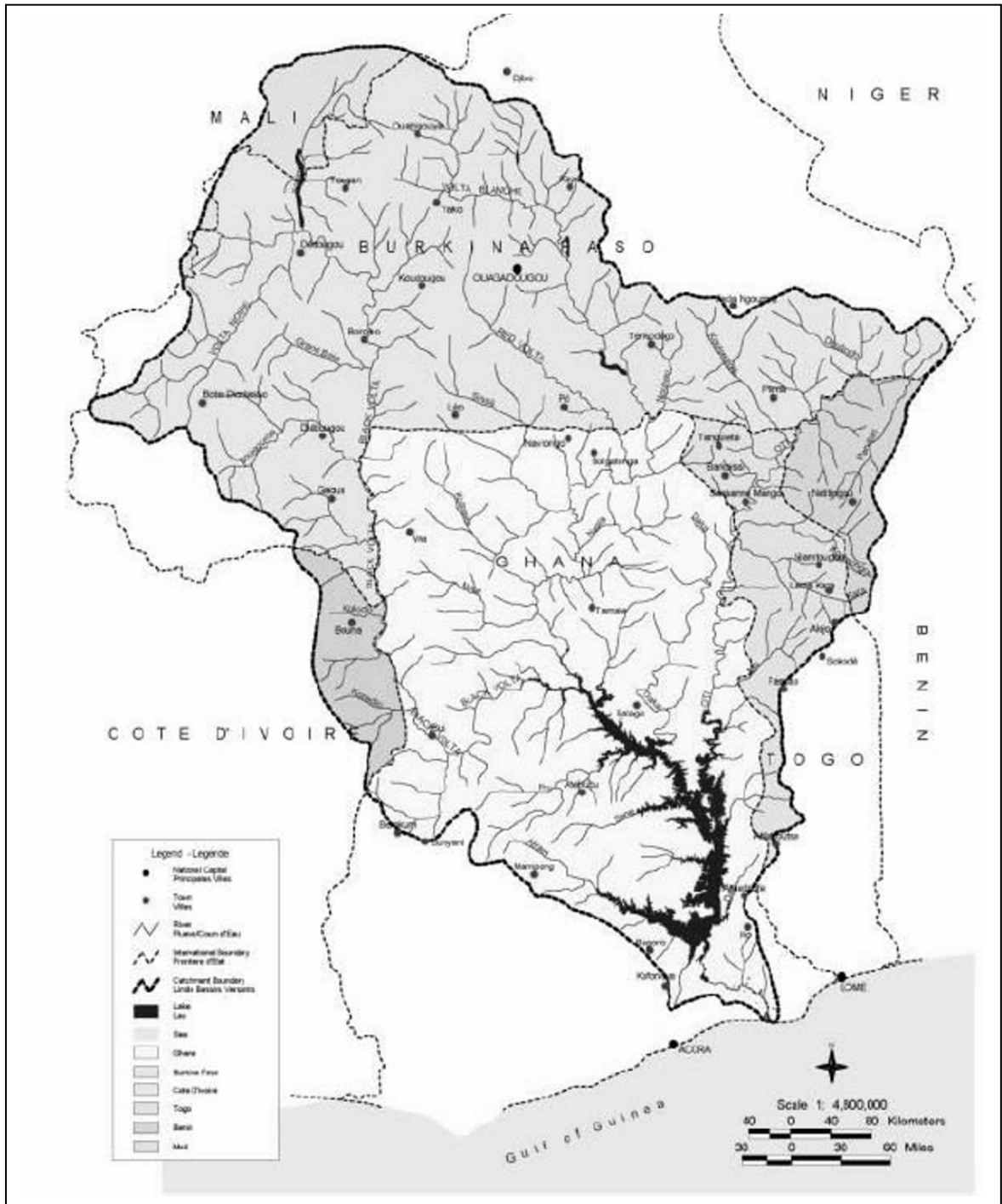
9 The impact of ideas on international policy has been analysed by Goldstein and Keohane who explained various evolutions in international relations history, such as the construction of an open world economy in the 1950’s and the abolition of colonialism after the recognition of the norm of people self-determination, under the hypothesis that the actions described can be understood on the basis of egoistic interests in the context of power realities: that variation of interests are not accounted for by variations in the character of the ideas that people have (Goldstein/Keohane 1993: 26). They concluded that interest-based theories of international co-operation cannot provide complete explanations of changes in states’ preferences.

10 Peter Haas argues that the increasing complexities of problems of global concern and the expansion of the administrative spectrum of modern states and their political intervention since World War II has increased the demands for scientific information and expertise (Haas 1992: 7-16).

Finally, international organizations – both international non-governmental organizations (NGOs) and international multilateral organizations – are another type of influential non-state actors in the environmental regime formation processes. The *United Nations Environmental Programme* (UNEP) aims at identifying new environmental problems, assessing their density and their causes, and developing guidelines to enhance the problem awareness among concerned states and can therefore be described as “an organization dedicated to regime production”¹¹ (Müller 1993: 96). But also the impact of Greenpeace on developing international North Sea, Wales or Ozone layer protection, illustrates the ability of NGOs to enhance the states mobilization for international environmental protection (Müller 1993: 95-98). Three major influence patterns of international organizations on international co-operation processes can be identified: Increasing governmental *concern* by creating, collecting and disseminating scientific knowledge among others; enhancing the *contractual environment* by providing a bargaining forum such as the UN-conferences; increasing national *capacity* by transferring financial as-

11 Translation by the author of the German term: regimeerzeugende Organisation (Müller 1993: 96).

Figure 52.3: Map: Representation of the Volta River Basin Showing Political Boundaries. **Source:** UNEP (2002: 2). The permission to use this map was obtained from the copyright holder.



sistance, especially in developing countries (Haas/Keohane/Levy 1995: 399-408).

Figure 52.2 illustrates the complex interaction of process, context and knowledge mechanisms at the roots of international co-operation. It offers an inte-

grated model of regime formation combining existing theories on the issue into one single causal network.

52.3 Why Do States Co-operate in the Volta Basin?

The process of international co-operation among riparian states in the Volta River Basin in West Africa gives the opportunity to empirically test this theoretical model.

52.3.1 Geographic, Demographic and Economic Trends in the Volta Basin

The total basin is spread over six West African countries (figures 52.3 and 52.4). The relative proportion of the basin area found within a country does not necessarily reflect the relative importance of that part of the basin in that country. While a country may only have a small percentage of the total basin within its borders, as in the case of Togo, this area might comprise a significant proportion of the entire country. Additionally, the area of the country within the basin might hold an abundance of natural resources with respect to the entire country, such as in the case of Mali, Burkina Faso, Ghana and Togo.

Table 52.1: Distribution of the Basin in the Six Riparian Countries. Sources: Data for the Volta River Basin are from respective UNEP National Reports (UNEP 2001a, 2001b, 2001c, 2001d, 2001e, 2001f).

Country	Area of Volta River Basin (km ²)	% of Basin	% of Country in the basin
Benin	17,098	4.10	15.2
Burkina Faso	178,000	42.65	63.0
Cte d'Ivoire	12,500	2.99	3.9
Mali	15,392	3.69	1.2
Togo	26,700	6.40	47.3
Ghana	167,692	40.18	70.0
Total	417,382	100.00	

The climate in the Volta Basin is characterized by high temperatures and high evaporation rates, especially in the Sahel zone with an average of 2,334 mm per annum in the North of Burkina Faso (table 52.2). The area is drought prone: Any time rainfall is below average, rivers dry up. During the last decade rainfalls decreased, and the river run-off declines. Given global climate change forecasts, this trend may be confirmed in the coming decades: Climate scenarios showed a 15.8 per cent and 37.0 per cent reduction in the run-

off of the White Volta Basin¹² for the years 2020 and 2050, respectively (Opoku-Ankomah 2000). The high average population growth rate (2.54 per cent) will lead to a major increase of the population in the basin from about 18,600,000 in 2000 to approximately 33,900,000 in 2025, or of 80 per cent within 25 years (Barry/Obuobie/Andreini/Andah/Pluquet 2004: 18-24; table 52.3).

The riparian countries of the Volta Basin are among the poorest in the world with underdeveloped economies concentrated in the service (42 per cent) and agricultural (37 per cent) sectors in 1999. These countries are projecting major improvements in their development plans. Given the vital role of water, these will lead to an increasing use of the Volta River's resources. Agricultural water requirements may increase considerably: Burkina Faso, Cte d'Ivoire and Mali presently irrigate only a little over 10 per cent of their irrigable land area.¹³ Urbanization and the development of the industrial and service sectors will also increase water demand. In the basin, dams and reservoirs have increased to mobilize water for agricultural, industrial, and electricity generation: The largest dam was built at Akosombo in Ghana in the early 1960's primarily to generate electricity that created the Volta Lake (8,500 km²). In Burkina Faso, there are now approximately 600 dams and lakes with a total storage capacity of 4.7 billion m³ (UNEP 2002a: 3). Large and small dams have continued to expand in the basin with increasing population pressure and economic development.

12 The Volta basin encompasses four main tributaries, forming four sub-basins, which converge in Ghana to feed the Volta Lake: the Oti River, the Red, Black and White Voltas. The latter spreads over Northern Ghana and Togo and the South of Burkina Faso.

13 The realization of the Ghanaian development plan *Ghana's Vision 2020* would require to enlarge the agricultural area under irrigation from 10,000 to 100,000 hectares by 2020. This would imply a future water consumption of up to 4,114 million cubic meters (MCM) (Ghana, Ministry of Works and Housing 1998b: 14). At the same time, the industry's share of GDP is expected to increase to 37 per cent and therefore the demand for industrial and urban water is projected to rise from 63 MCM in 2000 to 272 MCM in 2020 (Van Edig/Engel/Laube 2002: 34, Ghana, Ministry of Works and Housing 1998c: 3). With regard to other riparians, the consumptive demand for Cte d'Ivoire in 2025 is projected as 9,400 MCM. For Burkina in 2010 the demand is estimated at 860 MCM. No projection could be obtained for Togo and Benin (Ghana, Ministry of Works and Housing 1998a: 7)

Table 52.2: Annual Rainfall and Evaporation in the Riparian Countries of the Volta Basin. Source: Barry/Obuobie/Andrein/Andah/Pluquet (2004: 13). Permission to use this table has been granted by the copyright holder.

Riparian Country	River	Area of the Volta Basin km ²	Upstream Riparian Countries	Average Annual Rainfall (mm)	Average Annual Evaporation (mm)
Ghana	Volta	165,830	Burkina Faso, Mali, Togo, Cte d'Ivoire, Benin	1320	1415
Cte D'Ivoire	Volta	9,890	Burkina Faso, Mali	1358	1486
Togo	Volta	25,545	Burkina Faso, Benin	1305	1697
Burkina Faso	Volta	171,105	Mali	950	2130
Benin	Volta	13,590	Burkina Faso, Togo	1294	1400
Mali	Volta	12,430	None	685	3015

Table 52.3: Population projection in the Volta River basin. Source: UN, cited from: Barry/Obuobie/Andrein/Andah/Pluquet (2004: 22).

Country	2005	2020	2025	2050	Growth Rate (2000)	Urban	Rural
	Projections of UN Populations Division					in per cent	
Benin	8,439,000	12,717,000	14,254,000	22,123,000	2.27	36	64
Burkina Faso	13,228,000	20,305,000	23,162,000	39,093,000	2.38	22.6	77.4
Cte d'Ivoire	18,154,000	23,339,000	25,114,000	33,959,000	2.53	23	77
Ghana	22,113,000	28,789,000	30,964,000	40,573,000	2.5	16	84
Mali	13,518,000	20,904,000	24,031,000	41,976,000	2.78	12.2	87.8
Togo	6,145,000	8,731,000	9,613,000	13,544,000	2.80	30	70
Total	81,597,000	114,785,000	127,138,000	191,268,000			
Average					2.54	23.30	76.70

52.3.2 Common Interests of Riparian States in Integrated Water Management - Analysis of Problem and Situation Structures

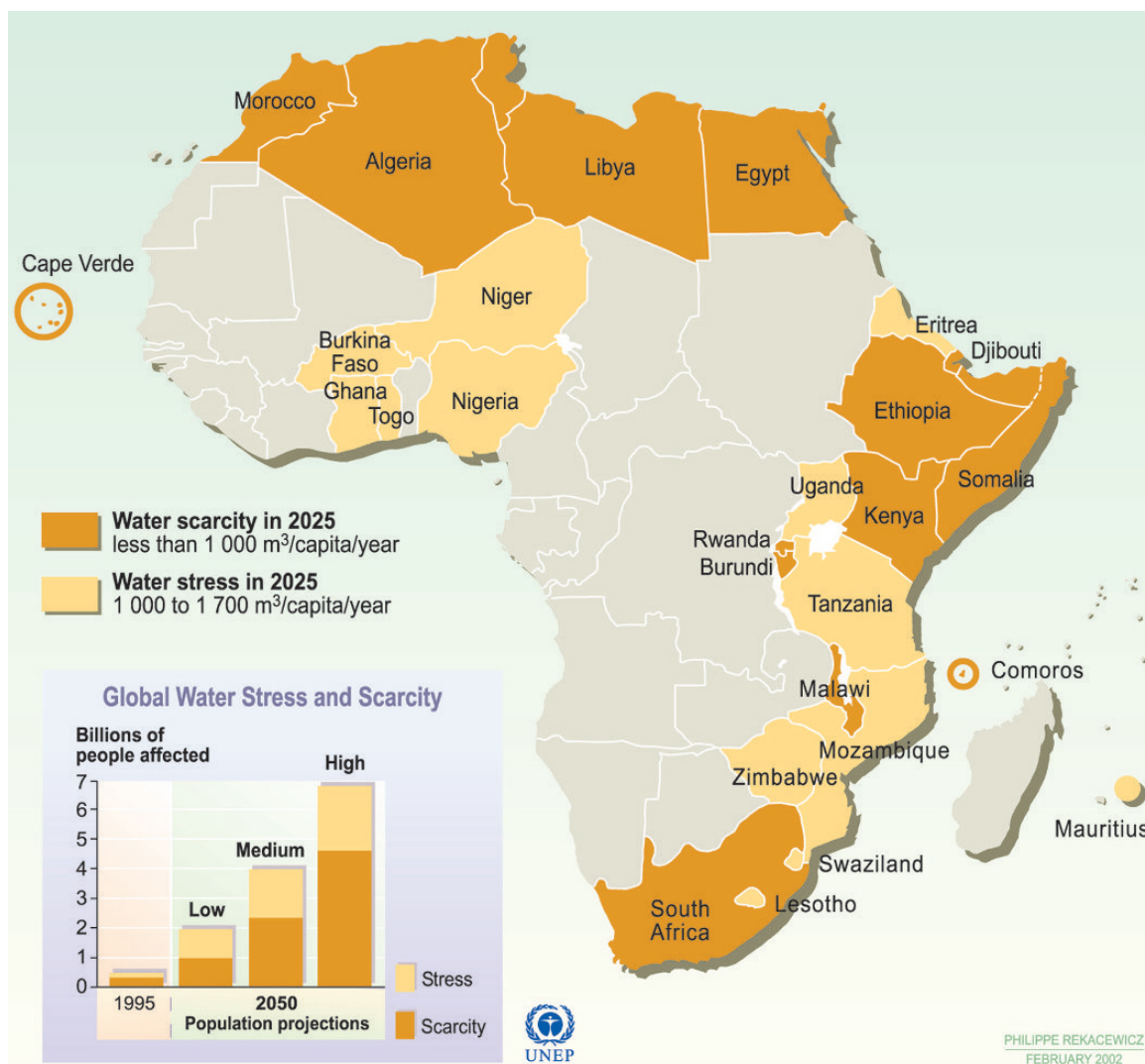
The combination of geographic, demographic and economic features leads to a higher pressure on the Volta Basin's water resources and therefore to problems of water scarcity in each country: The water demand for domestic and industrial activities is projected to increase by about 300 per cent by 2025, and Burkina Faso, Ghana and Togo will be subjected to freshwater stress by 2025 (UNEP 2002a: 3-4, figure 52.4).

Several environmental problems are already raging in the Volta Basin: the proliferation of invasive aquatic weeds affecting water quality, the prevalence of water-borne diseases such as Bilharziasis and Onchocerciasis, bush fire destructions, regular flooding, forest and land degradation leading to soil erosion and affecting

the water quality, transboundary pollution from industrial and agricultural wastes, as well as biodiversity losses are interrelated causing serious environmental, economic and social damages.

These matters are 'collective' problems (Marty 2001: 35-38) that create symmetric interests among the riparian countries and foster their motivation for co-operation. To avoid the tragic over-exploitation of the Volta Basin's scarce resources (resulting from uncoordinated and egoistic interest-oriented national policies) an integrated management policy must be drawn up and its implementation must be monitored by a multilateral regional international organization. A closer study of the Volta basin shows that co-operation has seldom been considered by riparian states as a priority and exclusive solution. Some problems such as water stress are only forecasts and will be felt only in the long term. Thus, they may not be high enough on the political agenda to lead governments to the difficult process of regime formation. Most of interview

Figure 52.4: Freshwater Stress and Scarcity in Africa by 2025. **Source:** UNECA (2000); UNEP (1999g). The permission to use this map was obtained from the copyright holder.



partners underlined that the short-term political strategy does not adapt well to the long-term imperative of a sustainable management of the Volta basin.¹⁴ The national administrations in charge of water management have often tried to get funds from international donors to support projects of transboundary co-operation but they had difficulties to obtain endorsements from their ministers¹⁵. Apart from environmental degradations spreading over the borders through the ri-

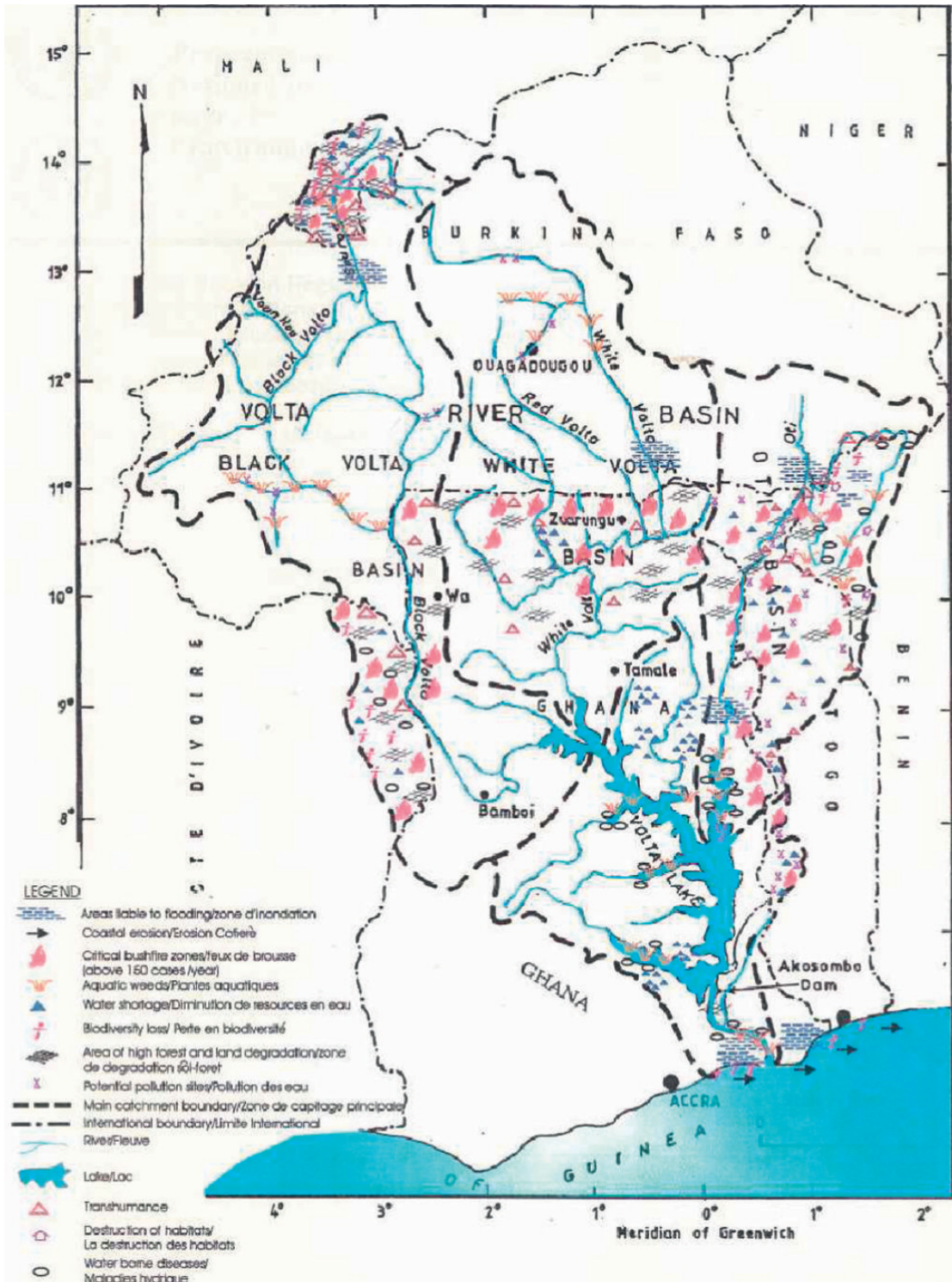
ver flow, other environmental problems do not necessarily require co-operation in a first stage. Negative international externalities (pollution) have created asymmetric interests and do favour international co-operation, since upstream countries rather prefer to keep the status quo than constrain themselves to find sustainable solutions.

But the up/downstream geo-morphology of the Volta basin reduces further the probabilities of co-operation since riparians are developing incompatible uses of the basin's resources. While Burkina Faso (upstream) bases its development on irrigated agriculture, Ghana (downstream) has based its economic development on its industrial and mining sectors, which need the hydropower from the Akosombo dam. According to the realist-oriented view of international re-

14 Interviews with Dr. Charles Biney, Mr. Minta Aboagye, Mr. Charles Bougare and Ms. Veronika Fuest 2004 (Borghese 2005: 95–98)

15 Interview with Dr. Opoku-Ankomah from the Ghanaian Water Research Institute 2004 (Borghese 2005: 97); Opoku-Ankomah (2000).

Figure 52.5: Map: Environmental Critical Areas in the Volta Basin. **Source:** UNEP (2001g), RCN 2/4. The permission to use this map was obtained from the copyright holder.



lations, this asymmetric ‘game structure’ should strongly shrink Burkina Faso’s incentives for co-oper-

ation (Andreini/Van de Geisen/Van Edig/Vlek 2001; Odame-Ababio 2004).

In spite of this unfavourable constellation of preferences, first steps have recently been taken to create an integrated management organization for the Volta Basin. In April 2004 the governments of Ghana and Burkina Faso signed the *Ghana-Burkina Faso Joint Declaration* that acknowledged common water and environmental issues and stated a desire to collaborate on the management of shared water resources in a *Volta Basin Technical Committee* (VBTC) involving all riparian countries. These first commitments were followed by a conference in Ouagadougou in July 2004, attended by the Ministers in charge of water issues in Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali, and Togo. They approved a series of agreements acknowledging the need for a transboundary management institution, defining a timeframe for its creation and creating the *Direction Gnrle de l'Inventaire des Ressources Hydrauliques* (DGIRH 2004). This body brings together experts and high officials from the national water management administrations of all six riparian countries with the task to set up the political, legal, institutional and financial framework of the future international organization of the Volta Basin.¹⁶ An international organization for the sustainable management with a permanent secretariat should subsequently be established by end of 2006.¹⁷

Since the study of 'situation' and 'problem factors' is not conclusive enough to explain this regime genesis, an understanding of the recently initiated co-operation developments in the Volta Basin calls for an analysis of the previously defined 'process factors'.

52.3.3 Process Factors on Volta Basin's Co-operation Trend

According to Young's theoretical model of "institutional bargaining", exogenous shock or crisis are considered as decisive process triggers for the initiation of a co-operation process: They contribute to reveal the nature and scope of shared problems to the concerned states and their public opinions and may also increase their sense of urgency. In the case of the Volta Basin, the 1998 crisis on the Akosombo dam has definitely played this role. During the dry season of 1998, the Volta sub-region suffered a severe drought. An acute fall in the level of the Volta Lake in Ghana

made it impossible for the Volta River Authority¹⁸ to generate enough electric power from the Akosombo hydroelectric plant to meet Ghana's growing demand. The 1998 crisis was so severe that it provoked a chaotic situation in the economy and living conditions of the society not only in Ghana, but also in neighbouring Benin and Togo, whose electricity resources are mainly imported from the Akosombo dam¹⁹.

The crisis not only underlined the common problem of water scarcity but also the existing conflict potentials on the Volta basin's water resources between the agricultural users of Burkina Faso and North Ghana and the industry of the coastal region. Due to the lack of information the President of Ghana, Jerry Rawlings, claimed the unilateral dam development policy of Burkina Faso caused the water shortages observed at the Akosombo reservoir²⁰. But a few days later, scientific analyses revealed that the low level of Volta Lake was mainly due to the drought and that water retention infrastructures in Burkina Faso had a negligible impact on downstream inflows in Ghana, compared with small variations in rainfall. This diplomatic incident stressed even more the need for improved scientific communication among riparian states, in order to enable the authorities to identify the sources of transboundary problems. In this crisis, the imperative for co-operation became clear to the water administrations in all riparian countries:²¹ High officials expressed a strong political will for enhanced co-operation:

There must exist, especially in developing countries, adequate structures, institutions and organizations for dealing with these urgent matters in order to achieve inter-state regulation and control of international water resources (Ghana, Ministry of Works and Housing 1998a: 22).

Burkina Faso shows solidarity with Ghanaian, Beninese and Togolese people in a situation which concerns all of us. The truth is that the whole sub-region has to cope with [water] deficits, especially the White Volta sub-basin. Since we encounter common water-related problems, we must seek for common solutions.²² (Salif Diallo, Burkinabe Minister of Water and

16 Interviews with Mr. Biney and Mr. Aboagye 2004 (Borghese 2005: 95-98).

17 Interviews with Mr. Biney, Mr. Aboagye, Mr. Bougare and Mr. Saintraint 2004 (Borghese 2005: 95-98).

18 The *Volta River Authority* is a public company in Ghana in charge of Akosombo dam's power production and distribution.

19 Panne de courant Akosombo, in: *Le Monde*, 10 April 1998: 5.

20 Panne sur le barrage d'Akosombo", in: *Agence France Presse*, 17 March 2005.

21 Interviews with M. Francois Baudry, M. Charles Biney, M. William Bouffard 2004 (Borghese 2005: 95-98).

Environment, Interviewed by the Burkinabe newspaper l'Observateur Paalga, 25 March 1998: 5)

Beyond this event, the role of ideas, as stressed by the *cognitivist school*, has also been a long-term determining factor for enhancing the states' perception of their common interest and political will to co-operate in the Volta Basin. Since the mid-1990's, *Integrated Water Resource Management* (IWRM) has become a concept in the international scientific community. According to this approach, the basin should be considered as a systemic unit composed of several sub-units such as the hydrologic system and the ecologic system. As an integrated ecosystem, the basin should therefore be addressed and managed holistically, irrespective of whether it is domestic or international (Marty 1997: 22-25). Considering the basin as the only effective geographic management scale, this approach therefore prompts the riparian states of international river basins to co-ordinate and to integrate their water management policies, ideally by forming a separate international basin organization (Burton 2001).

This concept and its implementation modalities were developed during international workshops and conferences in developed and developing countries. Several policy and research networks have been established, such as the *International Network of Basin Organizations*, the *Global Water Partnership* etc. After this phase of scientific diffusion, the concept was adopted by the international community as the key international reference for river and international basin management at a UN conference in Dublin in 1992 (Burton 2001). The IWRM approach has been widely endorsed by African public administrations and research centres in the water sector. Most experience with the implementation of IWRM in international basins was gained on river basins in Sub-Saharan Africa. Several institutions have been formed in this region such as the *Organisation de Mise en Valeur du Fleuve Sngal* (OMVS) on the Senegal River, the *Niger Basin Organization* etc. Many African governments have also initiated reforms of their water administration to better implement IWRM principles. The two main riparian countries of the Volta Basin, Ghana and Burkina Faso underwent an IWRM-oriented restructuring of their water institutions during the 1990's (Lautze 2004).²³

The development and diffusion of the IWRM concept confirms the crucial role of ideas and epistemic

communities in the process of regime formation: Ideas can change policy-makers' preferences and perception of their national interest, especially when they are supported and spread by scientific international networks and national advisory bodies.

However, both the restructuring of the water institutions of the Volta Basin's riparian countries and the subsequent initiation of a co-operation process effectively result from the massive financial and technical support provided by international organizations and donors. The spectre of increasing water scarcity and the related threats to the international peace order has increased the awareness of the international community. A large spectrum of international organizations involved in environmental protection, international solidarity and development have consequently identified access to drinking water and the sustainable management of water resources as policy priorities. The *Millennium Development Goals* and the action plan adopted at the UN summit in Johannesburg in 2002 have committed the international community to implement a sustainable water resources management plan in each country by 2005 and by 2015 to reduce by half the population without access to drinking water and sanitation.

As a direct consequence of this international mobilization, many initiatives have been undertaken by multilateral organizations, bilateral development agencies, international research centres or international NGOs to support the sustainable management of water resources in the Volta River Basin. Both Ghana and Burkina Faso the majority of the author's interview partners²⁴ mentioned that they had no exhaustive overview of the scope of actors. Regional and international organizations and initiatives that are concerned with sustainable water resources management in the Volta Basin seem to have mushroomed.

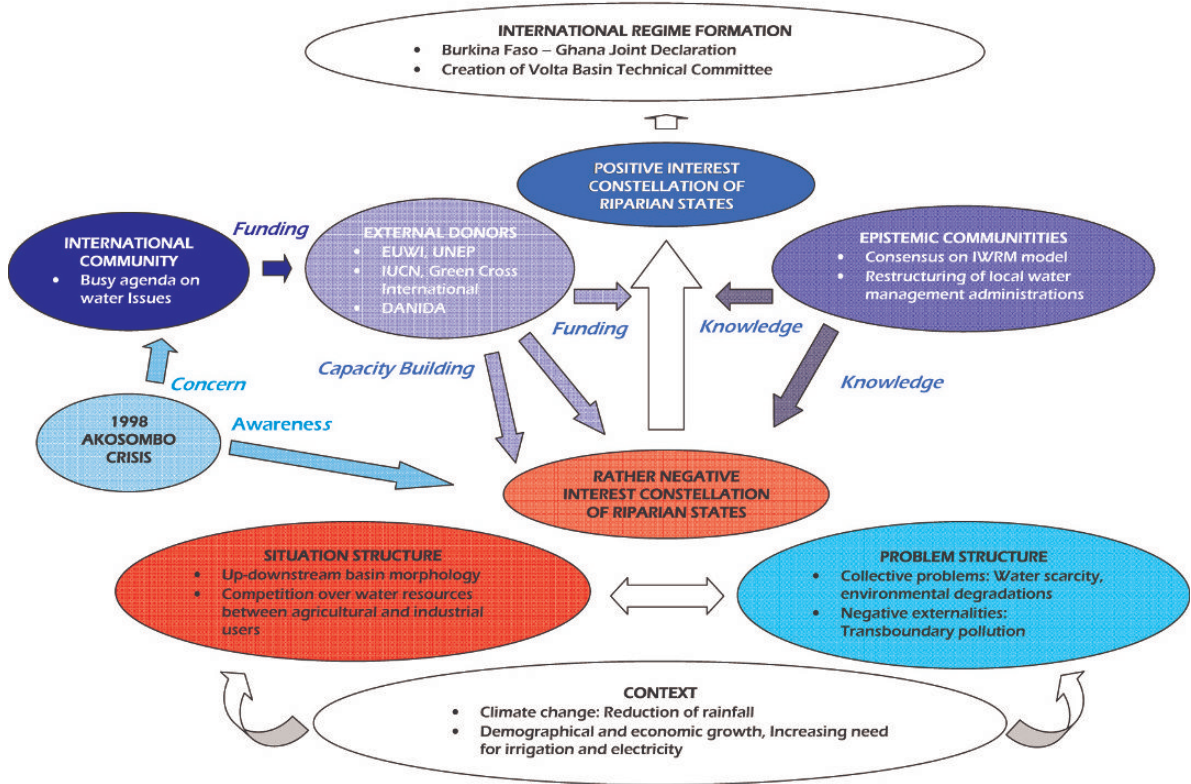
The actors listed below are not exhaustive, but they illustrate the strong involvement of the international community in support of the integrated man-

24 Interviews with Mr. Lorenzo Suarez-Pose Minta Abo-ge, Mr. Marc Andreini, Dr. Charles Biney, Dr. Pay Drechsel, Ms. Veronika Fuest, Mr. Niels Henrik Ipsen, Mr. Sven Jacobi, Mr. Jonathan Lautze, Mr. Mogens Mehta, Dr. Opoku Ampomah, Mr. Olivier Robinet, Mr. Steven Sandiford, Mr. Saintraint 2004, Mr. Bougare, Mr. Niasse and Mr. Diallo (Borghese 2005: 95-98). Most of the persons interviewed were very experienced with respect to water research/policy and all of them were working either in one of riparian countries' national authorities in charge of water resources or for one of the projects mentioned further.

22 Translation by the author.

23 Interview with Mr. Lautze 2004, in: Borghese (2005: 98)

Figure 52.6: Volta Basin Regime Genesis. Source: Developed by the author based on Borghese (2005).



agement of the Volta Basin and for creation of a regional basin management organization. Bilateral donors such as the *Danish International Development Agency* (DANIDA) and the *French Global Environmental Fund*²⁵, as well as *multilateral organizations like the New Economic Partnership for African Development* (NEPAD), the *World Bank* and the *European Union*, international NGOs such *International Union for the Conservation of Nature* and *Greencross*, and research centres such as the *German Centre for Development Research*²⁶, the *International Management Institute* or the *French Development Research Institute*²⁷ are currently preparing or funding the implementation of many projects on the Volta Basin. All these projects try to identify the existing transboundary problems of the Basin, to formulate technical solutions and set subsequent programmes of actions, and/or to strengthen the institutional dialogue, cooperation and data-sharing for the sustaina-

ble management of the Volta Basin. These initiatives and significant funding have obviously widely contributed to the genesis of an integrated management regime in the Volta Basin. Mr Ampomah, an economist at the *Ghanaian Water Resources Commission* (WRC) explains that:

The quest for an agreement to provide for a joint management structure on the Volta was largely driven by donors' involvement in the national water strategies of the riparian countries from the 1990's to satisfy lending conditions.²⁸

Through a proliferation of more or less co-ordinated projects, international organizations and donors have thus been strongly supporting the spreading of the IWRM model and the current process of regime formation in the Volta Basin with financial and technical²⁹ means. Their role has been absolutely essential to raising awareness about the advantages of co-operation and to effectively initiating the first steps of a co-operation process in the Volta Basin. Figure 52.6 summarizes the complex network of interest and process factors, which have led to the initiation of a

25 Fonds Franais pour l'Environnement Mondial (own translation).

26 Zentrum fr Entwicklungsforschung (own translation).

27 Institut de Recherche sur le Dveloppement (own translation).

28 Interview with Mr. Ampomah 2004 (Borghese 2005: 97).

negotiation process for the establishment of a Volta Basin management regime.

52.4 Key Role of International Organizations for Preventing Water Insecurity in Developing Countries

The study of the Volta River underlines the predominance of process over interest explanatory factors for international co-operation efforts in this transboundary basin. Although a thorough analysis of the geographic, economic and demographic context in the Volta Basin reveals co-operation-prone collective problems such as environmental degradation and water scarcity threats, the geo-morphology of the Volta Basin and the low ranking of environmental issues in the political agendas of riparian states' governments constitute a rather negative constellation of interest for international collaboration. From a realist point of view, upstream riparian states, such as Burkina Faso, which can arbitrarily control and use the water flow, should have only reduced incentives to constrain themselves to solve problems such as transboundary pollution or transboundary competition over basin's water resources.

However, the current co-operation process initiated by the six Volta River's riparian states proves that political will for the formation of a regional management regime exists and that other explanation factors must therefore be taken into account to comprehend this regime genesis. Although there was a local desire to collectively manage these shared water resources, particularly after the 1998 energy crisis, the fact that both agreements for the creation of a regional basin organization were signed during the period when numerous international actors arrived, and more generally that these agreements were signed when the international community paid attention to concerns of transboundary water management and to environmental issues, leads to the conclusion that external drivers have played the dominant role in the Volta Ba-

sin's regime formation. The close connection between epistemic communities, supporting the IWRM model, and the projects funded by the international donors' community, promoting a sustainable management of water resources at basin-scale, has transformed the perception of riparian states of their interest. Spreading of knowledge on IWRM concepts through the formation of local water institutions', capacity building through the provision of technical assistance and funding supporting international dialogue have convinced governments of the advantages of co-operation.

This conclusion reconciles the *cognitivist* with *neo-liberal* views of co-operation theories. The role of ideas and knowledge is essential to comprehend the realities of the formation of environmental co-operation in developing countries. But their impact depends on their linkage with funding enabling them to effectively spread and shape states' preferences.

For research on environmental security, these results stress the crucial role that the international community should play to prevent conflict and to enhance co-operation among states sharing a common resource in poor countries. Although the analysis of a single case does not allow systematic generalizations for the regime formation process, the impact of international actors appears to have been a key determinant for the creation of transboundary basin management regimes in developing regions, since they can offer sensitivity for environmental problems in countries that usually conduct short-term development policies and usually have a low environmental awareness. They can also provide technical and financial capacities to cope with these problems. Through significant financial means (compared with budgets of poor countries) international donors can give ideas (such as the IWRM model), concrete diffusion and implementation opportunities that subsequently shape the preferences of developing states and support their willingness for environmental co-operation.

29 Most of the mentioned projects bring technical assistance and funding for capacity building. For instance, DANIDA's support to the implementation of IWRM in Ghana includes the work of two permanent and three rotating technical assistants within the office of the main Ghanaian public organization in charge of water resources management: the *Water Resources Commission* and the *Water Directorate* (Interviews with Mr. Jacoby and Mr. Jensen 2004, Borghese 2005: 95–98).

53 Success and Failure in International River Basin Management – The Case of Southern Africa

Stefan Lindemann

53.1 The Challenge of International River Basin Management¹

Almost all of the world's largest rivers cross national borders. According to recent estimates, there are 263 international river basins² that account for 60 per cent of the global freshwater resources, cover 45,3 per cent of the world's land area and host 40 per cent of the global population (Klaphake/Scheumann 2001: 7). The use of these international river basins leads to numerous problems and conflicts among riparian countries that include disputes over water quantity, pollution, dam schemes, flood protection or navigational issues. The great majority of these conflicts derive from the upstream-downstream structure of international rivers. While most water-related conflicts arise upstream where abstractions or pollution compromise the availability of water downstream, activities downstream can also lead to conflict since they may create an obstacle of upstream actors' access to the sea (Bernauer 1997: 162).

One can generally identify two approaches in resolving water-related conflicts in international river basins. On the one hand, there are general principles of international water law through which victims of water conflicts might seek remedy. Unfortunately, this 'vertical' water law remains essentially a 'soft law' that has provided little guidance in resolving transboundary water conflicts (Birnie/Boyle 2002).³ Against this background, this chapter focuses on 'horizontal' initiatives for international river management between two or more riparian states at the river basin level, which seem to hold more potential for the resolution of transboundary water conflicts. Horizontal coopera-

tion along international waterways is omnipresent. The FAO has counted 3.600 international water treaties for the period between 805 AD and 1984 (Wolf 1997). If one excludes the numerous treaties on navigational issues, there are still more than 400 different treaties on international rivers (Wolf/Yoffe/Giordano 2003: 32).

These treaties vary substantially according to both the subject and the extent of the agreed cooperation (Hartje 2002: 22). The great majority is functional in scope, which means that the adopted approach focuses on the resolution of specific problems in the river basin (Marty 2001: 22). Functional forms of cooperation include (1) agreements on the development of joint projects such as dam schemes or flood protection – a type of cooperation that is still dominant as it reflects the traditional, infrastructure-oriented development paradigm (e.g. Rio Grande, Senegal). Furthermore, there are (2) agreements on the allocation of water, comprising the allocation of specific water quantities between riparians in mostly semi-arid or

1 This article builds on and summarizes the detailed findings in Lindemann (2005).

2 River basins or catchment areas are defined by a common mouth, which is either the point where the river flows into the sea or into an inland delta.

3 The UN Convention on the Law of the Non-Navigational Uses of International Watercourses, which took 27 (!) years to develop, establishes a series of principles for international water cooperation but has neither entered into force nor does it provide clear guidance in resolving transboundary water conflicts (Beach/Hammer/Hewitt/Kaufman/Kurki/Oppenheimer/Wolf 2000: 9). Among many problems, it institutionalizes the inherent upstream/downstream conflict by calling for both "reasonable and equitable use" and an "obligation not to cause appreciable harm." These two principles are in implicit conflict in the setting of an international waterway: up-stream riparians have advocated that the emphasis between the two principles be on "reasonable and equitable use," since this gives the needs of the present the same weight as those of the past. In contrast, down-stream riparians have pushed for emphasis on "no significant harm," which effectively protects the pre-existing uses generally found in the lower reaches of most major streams (Wolf 1998: 1).

arid regions (e.g. Aral Sea, Incomati). Functional forms of cooperation finally also include (3) agreements on water pollution problems, which have been growing in number since the late 1960's (e.g. Rhine, Tijuana). Beyond functional cooperation there are also (4) integrated approaches to international river basin management that focus on the river basin as a whole and try to resolve the existing hydrologic, ecologic and socio-economic problems through holistic policies. The integrated approach has been widely endorsed and promoted by international organizations, NGOs and scientists (Teclaff 1996: 384) but suffers from a so far very limited practical application (Hartje 2002: 23).

Southern Africa is certainly among the world's most interesting regions in the field of international water since few regions offer as much contrast. Due to the region's relative water scarcity⁴, the 15 international basins in the *Southern African Development Community* (SADC) are regularly included among the world's hydropolitical hot spots, second only to the arid and hostile Middle East (Wolf 2003: 1). Water scarcity in Southern Africa is firstly a problem of inadequate supply since levels of water availability are highly volatile due to climate and weather extremes.⁵ But water scarcity is also demand-induced since – *ceteris paribus* – the water available per capita tends to

4 Recent calculations for Southern Africa reveal that water is already scarce in a number of local basins, reaching availability levels of 1000 m³ or less per capita per annum (see Ashton/Turton in this volume). "By 2025, based on renewable supplies and demographic data, it is expected that Malawi and South Africa will face absolute water scarcity, and Lesotho, Mauritius, Tanzania and Zimbabwe will be water stressed; while Angola, Botswana, DRC, Mozambique, Swaziland and Zambia are likely to experience water quality and availability problems in the dry season" (Hirji/Mackay/Maro 2002: 7). Despite undeniable deficits – the designation of entire countries as water scarce is methodologically problematic since water scarcity is a complex and regionally varying phenomenon (Schiffer 2001: 4) – the indicators give an impression of Southern Africa's current and coming water crisis.

5 The climate in the region is characterized by staggering evaporation rates, extreme variations in precipitation over the year and recurrent floods and droughts (Chenje/Johnson 1996). These extremes – that are expected to worsen in the context of global climate change – make that the North and the East of the region are relatively wet (Democratic Republic of Congo, Angola and Zambia), while the South and the West receive very little rainfall (Namibia, Botswana, South Africa, Zimbabwe).

diminish due to both increasing industrial/agricultural development and average annual population growth of more than 3 per cent (Mohamed 2003: 213). Lastly, there is also a structural aspect to the problem of water scarcity in Southern Africa: Due to colonial and postcolonial settlement policies, the available water resources are extremely unequally distributed and mostly located far outside the urban areas (Swatuk 2002). Altogether, water resources are relatively scarce, extremely volatile and mostly located in international river basins – a fact that makes the international river basins crucial for the development of the entire region (Granit 2000: 2).

On the other hand, Southern Africa now has more experience in negotiating water treaties and implementing joint management bodies than any other region on earth, save the European Union (Wolf 2003: 1). While some of the management schemes in Southern Africa's international river basins date back to colonial times, most of the 24 international water treaties in the region have been negotiated since the mid 1980's. In the light of the Southern African water crisis, the existing efforts for international river management are of great importance. This is why I ask *if and how* these initiatives have provided guidance for the resolution of transboundary problems along international waterways. To what extent have the existing international river basin management schemes been successful in resolving the problems that prompted their creation? And what are the pathways to success and failure in the managing of international rivers?

53.2 Theoretical and Methodological Framework

Problems of international river basin management have so far been discussed in a mostly descriptive and unsystematic way (Bernauer 2002). Below a research framework is developed for a more systematic and theoretically guided comparison (54.2.1). This is followed by methodological considerations on how to apply this framework to regional case studies (54.2.2).

53.2.1 The Research Framework

In order to explain success and failure in international river basin management, I make use of international regime theory⁶. Treaties on international rivers are conceptualized as *water regimes* defined as norm- and rule based cooperation for the political resolution of problems and conflicts in the field of international

river basin management. Asking for the conditions for success of these international water regimes involves two interrelated, but analytically separated questions: (1) Under which conditions are the riparian states prepared to form institutions to address transboundary problems? (2) And what are the determinants of the effectiveness of those institutions? The focus is therefore on the determinants of (water) regime formation and (water) regime effectiveness – the two dependent variables.

The concept of regime formation is almost self-evident. A water regime is formed when riparian countries engage upon norm- and rule-based cooperation for the political resolution of problems and conflicts in the field of international river basin management. The concept of regime effectiveness, on the other hand, is more problematic. The most intuitively appealing sense of effectiveness centres on the degree to which a regime eliminates or alleviates the problem that prompts its creation (Young 1999: 4). However, this ‘problem-solving approach’ is misleading since it is usually very difficult to establish a causal relation between the effects of a regime and the state of a given problem.⁷ Against this background, I complement the ‘problem-solving approach’ with a political interpretation of regime effectiveness that focuses on behavioural change (e.g. Keohane/Levy 1996; Young 1999): Regime effectiveness becomes the extent to which the water regime prompts behavioural change on the part of the relevant actors leading to an improved management of the respective problem.

But what are the determinants – the independent variables – of water regime formation and effectiveness? Drawing on regime theory – especially the work by Frank Marty (2001) who, from a social sciences perspective, has contributed one of the very few theoretically guided analyses of international river basin management – five groups of independent variables are distinguished: problem factors (53.2.1.1); process factors (53.2.1.2); institutional factors (53.2.1.3); country-specific factors (53.2.1.4); and (5) factors of international context (53.2.1.5).

53.2.1.1 Problem Factors

It is intuitive to assume that problems of international river basin management are not equally easy to resolve. In general, one can distinguish between problems related to transboundary externalities and collective problems (Marty 2001: 35–36). Most problems are related to *transboundary externalities* due to the ‘upstream-downstream structure’ of international rivers. Negative externalities arise when the upstream country imposes costs on the downstream country without compensating it for the inflicted harm (e.g. in the case of water abstraction or pollution upstream). Positive externalities, on the other hand, are less frequent and exist when one riparian country produces a public good without receiving full compensation for its efforts (e.g. the provision for flood control upstream). Other problems in international river basins are of a *collective nature* (e.g. floods or common development projects). These problems are collective in that they impose (more or less equal) costs on all affected riparian countries – direct costs in the case of transboundary floods, opportunity costs in the case of under-utilized river development potentials. Problems related to transboundary externalities and collective problems differ fundamentally with respect to the underlying incentive structure of the relevant actors: In the case of collective problems, incentives tend to be symmetrical, while transboundary externalities are usually characterized by asymmetric incentive structures. This is why there is reason to believe that problems related to transboundary externalities are more difficult to resolve than collective problems (Marty 2001: 37).

Beyond incentive structures, problems in international river basin management vary according to the amount of *problem pressure* involved – that is, the perceived visibility of a given problem (Jänicke 1999: 77). Recurrent floods, for example, involve more problem pressure than the threat of water scarcity in the year 2025 and should therefore lead to more political pressure to tackle the given problem.

Hypothesis 1: Problem factors – the underlying incentive structures and problem pressure – influence the prospects of water regime formation: While collective problems facilitate the formation of water regimes, the latter are more difficult to achieve in the case of transboundary externalities. The higher the problem pressure involved, the better the prospects for the creation of effective water regimes.

6 “International regimes are sets of implicit or explicit principles, norms, rules and decision-making procedures around which actor’s expectations converge in a given area of international relations” (Krasner 1983: 2).

7 Environmental problems typically lead to a multitude of initiatives, which have an impact on the problem but are not necessarily linked to the existence of a related environmental regime (Young 1999: 5).

53.2.1.2 Process Factors

Moving beyond the purely functional logic of the early 1980's (e.g. Keohane 1984), regime analysis has come to realize that incentive structures do not entirely determine the prospects of regime formation – a “turn to process in regime analysis” (Schramm Stokke 1997: 58). This is why there is reason to focus on political tools that help to transform the given constellation of interests and thereby promote international water cooperation. These “process factors” can be divided into mechanisms to balance incentive structures and instruments to reduce the transaction costs of regime formation (Marty 2001: 38ff.).

Mechanisms to balance incentive structures facilitate the resolution of problems related to transboundary externalities. Balancing incentive structures involves the provision of new or additional incentives: A party which has an incentive to externalize cost, for example, must be given the expectation that it would not be rewarding for her to continue that behaviour. The provision of new incentives usually happens in form of direct or indirect costs. While direct cost incentives comprise the benefits a party expects to gain from a proposed arrangement in the specific issue area (e.g. side-payments), indirect cost incentives refer to all forms of issue linkages, that is the promise of costs or benefits in an issue-area other than the one at stake (e.g. sanctions). Secondly, the formation of water regimes generally requires the development of *instruments to reduce the perceived transaction costs of regime formation*. Here, one can distinguish between information costs and negotiation costs. Information costs are related to uncertainty about (a) the nature of the respective problem; and (2) the behaviour of the other parties and/or third actors. Negotiation costs, on the other hand, derive from communication problems, fragmented decision-making procedures or a high number of involved actors. Political tools to minimize both information and negotiation costs are manifold and can include confidence-building meetings at the technical level, the exchange of data or the implication of independent experts.

Hypothesis 2: Asymmetric incentives and transaction costs are important obstacles to regime formation. The creation of international water regimes therefore requires the development of political tools that (1) balance asymmetric interests through direct or indirect cost incentives; and (2) minimize the underlying information and negotiation costs.

53.2.1.3 Institutional Factors

Problem and process factors determine the prospects of regime formation. But what determines the effectiveness of international water regimes? Most authors assume a causal relationship between the institutional design of a regime and its effectiveness (Brown-Weiss/Jacobson 1998; Victor/Raustiala/Skolnikoff 1998; Mitchell 2001) – institutional design matters. Again drawing on Marty (2001: 45ff.), I assume that successful water regimes need to be specific, feasible, flexible, open and equipped with a centralized organization structure.

Specific regimes are problem oriented and incorporate precise rules and procedures that structure the relevant actors' behaviour with a view to a better management of the problem at hand. If these precise rules and procedures are missing, there is scope for interpretation and rule avoidance and the effectiveness of the regime is bound to suffer. Feasible regimes choose their goals according to the available financial and personal resources: If the respective goals do not take account of the resources at hand, the regime effectiveness can be expected to decrease. Given the fact that resources to solve problems related to international river basin management are usually limited, there is reason to assume that water regimes tend to be more effective if their goals are of limited scope (Marty 2001: 47). Flexible regimes include institutional mechanisms that allow adapting to changes in the problem structure. A lack of flexibility is likely to lead to reduced regime effectiveness since the existing problem solving strategy may prove inadequate to cope with changing circumstances. Furthermore, effective water regimes need a centralized organization structure. In such a case, one central actor exercises the regime functions – usually an international organization. This should facilitate coordination, communication and monitoring and lead to more regime effectiveness. Open regimes allow for a high degree of public participation. If non-state actors are involved in the decision-making process, this should increase the available knowledge as well as the legitimacy of the respective regime and foster its effectiveness.

Hypothesis 3: The effectiveness of a water regime varies with its institutional design: The more specific, feasible, flexible and open and the more centralized its organization structure, the higher the effectiveness of the water regime.

53.2.1.4 Country-specific Factors

Determinants of international regime effectiveness are not restricted to institutional regime design but also include country-specific characteristics (Mitchell 2001: 13). The latter comprise all those specific features of regime member countries that influence the implementation and thereby the success of the respective regime (Brown-Weiss/Jacobson 1998: 7). Despite the obvious difficulty to integrate country-specific factors into an analytical framework – they range from cognitive-informational capacities, political-institutional attributes and economic-technological context to aspects of political culture and individual leadership – I make an attempt to consider and systematize their influence.

Of central importance is the concept of capacity (Jänicke 2002): Regime member countries have very different capacities to implement the agreed standards and/or to impose behavioural change on relevant national actors. Against this background, deficits in the effectiveness of environmental regimes can to a considerable extent be attributed to insufficient implementation capacities (Haas/Keohane/Levy 1993; Brown-Weiss/Jacobson 1998). But what exactly are the capacities that determine water regime effectiveness?

First, I consider the *economic-technological capacities* of regime members as an important influencing factor. It is an intuitive assumption that the socio-economic situation of a member country will affect the prospects of a regime: Levels of economic development vary a lot between countries and lead to very different scopes of action, especially between developed and developing countries. More specifically, I look at the economic-technological capacities of the national water sectors. If the latter do not possess sufficient (1) financial and administrative resources to plan and administer international water projects; and (2) technical capacities for data generation and project implementation, water regime effectiveness is likely to suffer. Secondly, there is reason to take into account the impact of *political-institutional capacities*. Given the impossibility to consider the influence of different political systems and regime types in this paper, I limit my analysis to the role of political stability. If the regime member countries are characterized by high levels of political stability, there are good prospects for high water regime effectiveness.

Hypothesis 4: The effectiveness of water regimes varies with country-specific factors: The higher the (1) economic-technological; and (2) political-institutional

capacities of the member countries, the more effective is the water regime.

53.2.1.5 Factors of International Context

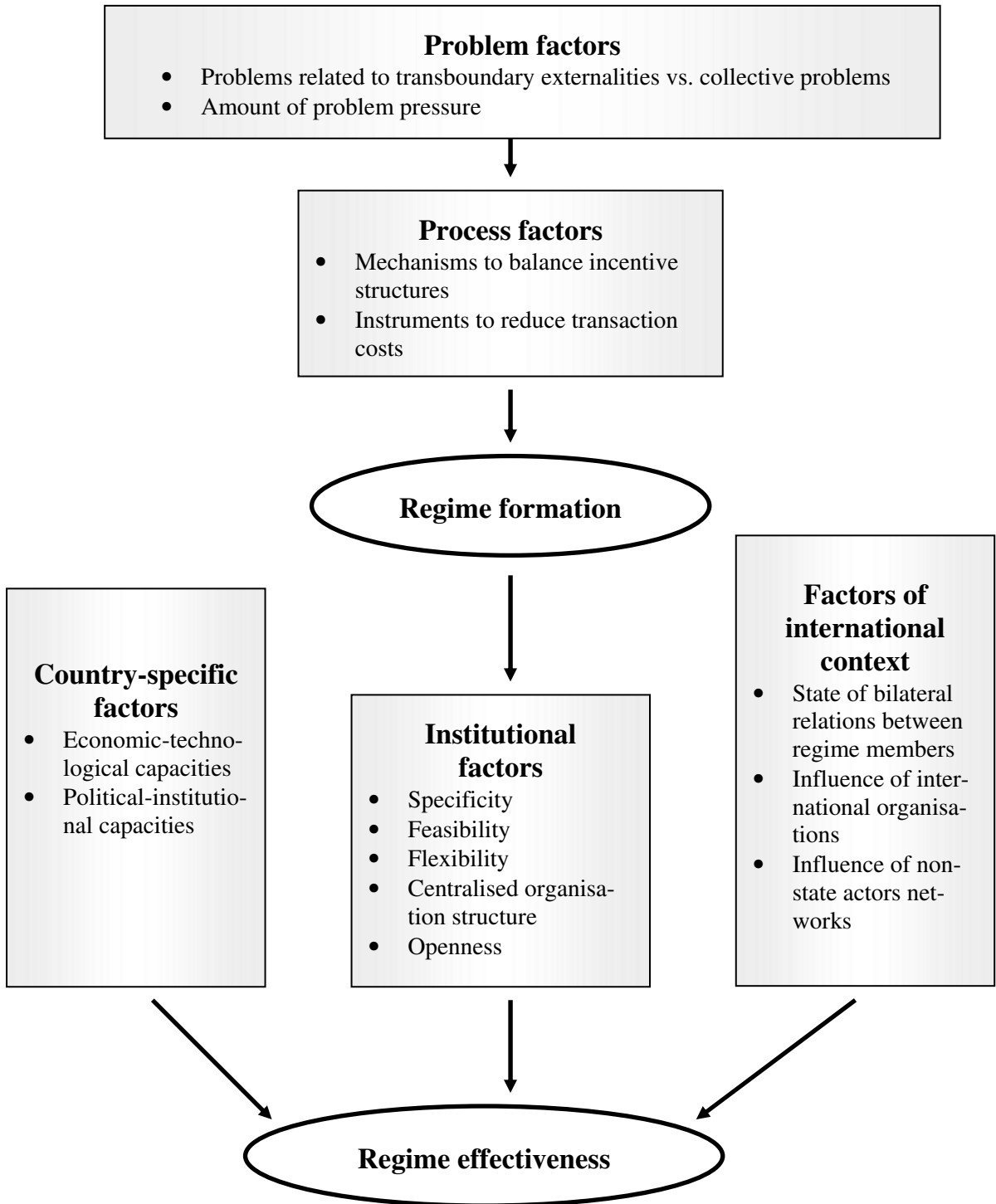
Beyond country-specific factors, the effectiveness of international regimes is influenced by factors related to international context (Mitchell 2001: 12). Here, I first need to take into account the *state of the bilateral relations between regime member countries*, which results from historical and current interactions and conditions, the patterns of communication, and the level of trust. The state of bilateral relations is judged by the existence or non-existence of foreign policy conflicts between member countries. If bilateral relations are strained by historical or current foreign policy conflicts, there is no trust basis for the implementation and/or further development of the water regime and its effectiveness is bound to suffer.

Furthermore, the effectiveness of international regimes varies with the *influence of international organizations* (Breitmeier 1997; Brown-Weiss/Jacobson 1998). This influence is exercised through multiple channels: International organizations provide financial resources, offer their technical and cognitive expertise and act as ‘independent’ mediators between conflict parties. Even though these activities are not per se positive, there is reason to assume that the support of international organizations promotes water regime effectiveness, especially in the developing world where financial, technical and cognitive resources are particularly scarce. In analogy, the effectiveness of international regimes is influenced by the *activities of non-state actors’ networks* that comprise international NGOs, local interest groups, journalists, policy experts or academics (Brown-Weiss/Jacobson 1998: 7; Mitchell 2001: 13). These networks mobilize and transfer knowledge about the problem at hand, initiate political campaigns and thereby contribute to a public debate that impacts on the evolution of the respective regime and should usually enhance its effectiveness.

Hypothesis 5: A water regime depends on its international context. Water regime effectiveness increases (1) the better the state of bilateral relations between regime members; and the higher the support by (2) international organizations; and (3) non-state actors’ networks.

Figure 53.1 summarizes the different components of the outlined research framework.

Figure 53.1: Political determinants of water regime formation and water regime effectiveness. **Source:** The author.



53.2.2 Methodological Considerations

In order to test my research framework, I conduct qualitative case studies based on a “structured and fo-

cused comparison” (George/McKeown 1985) defining and standardizing the data requirements for each case study according to the theoretically deduced variables. Afterwards, I engage in process tracing, that is,

I focus “on whether the intervening variables between a hypothesized cause and an observed effect move as predicted by the theories under investigation” (Bennett 2004: 22). Due to the indeterminacy of the research design – I have more inferences to make than implications observed (King/Keohane/Verba 1994: 119) – I cannot identify causal effects. However, this apparent shortcoming stems from a conscious decision: I think of the developed research framework as a means to systematize the most important determinants of water regime effectiveness – not as an empirical generalization.

With respect to the selection of cases, it is necessary to ensure variation in the explanatory variables, while allowing for the possibility of at least some variation on the dependent variable (King/Keohane/Verba 1994: 140ff.). On the basis of these criteria, I select four cases of Southern African water regimes: (1) The Permanent Water Commission on the *Okavango River Basin* (OKACOM); (2) the *Zambezi Action Plan* (ZACPLAN); (3) the *Zambezi River Authority* (ZRA); and (4) the *Lesotho Highlands Water Project* (LHWP).

The findings of these four case studies are based on the examination of primary and secondary sources. Where necessary and possible, additional data were generated through telephone interviews and email exchange with selected water experts in the region.

53.3 Empirical Findings

In this section, I first assess the effectiveness of the four water regimes (53.3.1) and then go on to identify the political determinants of water regime formation and effectiveness (53.3.2).

53.3.1 Assessing Water Regime Effectiveness

The first water regime under investigation is the *Permanent Water Commission on the Okavango River Basin* (OKACOM). The Okavango River originates in Angola, crosses Namibia and then discharges into the Okavango Delta in Botswana. While so far little Okavango water has been used, growing water needs since the early 1990's have led to plans for an increased water use and provoked tensions between the three riparian countries (Ashton 2003: 170). Thus, the riparian countries created OKACOM in 1994 for the conservation, development and utilization of common water resources (OKACOM Treaty 1994). Since then,

OKACOM has successfully institutionalized conflict potential, generated continuous dialogue at the political level and conducted a transboundary diagnostic analysis. While some behavioural change can be observed, the three riparian countries remain mainly concerned with national interests and sovereignty (Swatuk 2003: 129) and a river basin wide political perspective is far from being achieved (GEF 2002: 12). Despite some achievements and undeniable potential for improvement, OKACOM's effectiveness remains therefore rather limited.

The situation along the Zambezi River is even more difficult. Shared by Angola, Zambia, Zimbabwe, Namibia, Botswana, Malawi, Tanzania and Mozambique, the Zambezi is the region's largest river basin and “a veritable artery of life and development” (Söderbaum 2002: 118) for the eight riparian countries. While the Zambezi is generally rich in water, both weather extremes and population growth have put increasing pressure on the available water resources. As early as in 1987, the Zambezi riparian countries agreed on a *Zambezi Action Plan* (ZACPLAN) aiming at an environmentally sound management of the *Zambezi River basin* (ZACPLAN Treaty 1987). The comprehensive action plan consists of 19 sub-projects and envisages, among others, the development of a regional water law, the creation of a common monitoring system and the elaboration of an integrated management plan for the entire basin. However, the “ZACPLAN has not functioned as a powerful locomotive to promote environmentally sound management of the Zambezi river basin with participation of riparian countries, to the extent it was originally supposed to do” (Nakayama 1999: 398): The implementation of the ambitious water regime has been considerably delayed and only two of the sub-projects have led to visible results. Almost 20 years after the creation of the ZACPLAN, an integrated basin wide management is still a distant vision and the basin remains an “arena of different national interest in which the various riparian states are developing diverging policies and plans that are usually not compatible” (Chiuta 2000: 153). Since no behavioural change can be observed, the ZACPLAN can be qualified as ineffective.

While the ZACPLAN has so far been a failure, bilateral attempts for an international management of the Zambezi stretch between Zambia and Zimbabwe have proved more successful. Faced with electricity shortages after World War II, North and South Rhodesia felt the urgent need for a coordinated development of the common water resources – a need that led to the construction of the huge Kariba Dam be-

tween 1955 and 1976 (Tumbare 2002: 107). After the end of the federation in 1963, the two countries established the *Central African Power Corporation* (CAPCO) to allow for the continued operation of the Kariba Dam. In 1987, Zambia and Zimbabwe decided to replace the CAPCO with the *Zambezi River Authority* (ZRA) “to obtain for the economic, industrial, and social development of the two countries, the greatest possible benefit from the natural advantages offered by the waters of the Zambezi River and to improve and intensify the utilization of the waters for the production of energy and for any other purpose beneficial to the two countries” (ZRA Treaty 1987). The focus of the ZRA remains on the operation of the Kariba Dam but is extended to additional river development projects and environmental measures to combat the increasing water pollution. Within its limited mandate, the water regime can be regarded as relatively effective. The ZRA is “well established in its role as an operation and maintenance organization” (Rangeley/Thiam/Ander-sen/Lyle 1994: 42) and has recently done environmental capacity-building through the elaboration of an *Environmental Monitoring Programme* (EMP). On the downside, the water regime has failed to plan and implement additional river development projects, which indicates that the ZRA “could be perceived as a single task regime with little scope for spill over into broader co-operation” (Mutembwa 1998).

The *Lesotho Highlands Water Project* (LHWP) is situated in the Orange River basin shared by Lesotho, South Africa, Botswana and Namibia. The upstream part of the river basin features two fundamentally different riparian states: The mountainous Kingdom of Lesotho, a least developed country but relatively rich in water, and South Africa, the region’s political and economic giant suffering from mounting water scarcity – especially in the Gauteng Area that hosts 40 per cent of the country’s population and produces half of its wealth (Turton 2004a: 272–273). In this context, South Africa has since the late 1950’s pursued plans to transfer water from the water rich Senqu River in the Lesotho Highlands to the Vaal River in the Gauteng Area – a project that materialized with the signing of the LHWP between South Africa and Lesotho in 1986. The LHWP aims to enhance the use of the Senqu River by transferring – in four phases until 2020 – 70 m³/s of water to South Africa and by utilizing the transferred water to generate hydro-electric power in Lesotho, which also receives financial compensation in the form of royalties (LHWP Treaty 1986). Phases 1a and 1b of the LHWP have been successfully imple-

mented establishing a complex delivery system of dams and tunnels that currently diverts 29 m³/s of Senqu water to South Africa (Colombani 2003: 93). The LHWP can be considered as highly effective in the sense that it creates a ‘win-win situation’ for both countries “which would both be losers otherwise” (Conley/van Niekerk 2000: 137): While South Africa receives cost effective water to back up its economic growth, Lesotho benefits from both royalties and hydro-electricity to accelerate the development process of the country.

53.3.2 Political Determinants of Water Regime Formation and Effectiveness

How can one explain these different levels of water regime effectiveness? First of all, the case studies show that the underlying incentive structures do indeed influence the prospects of water regime formation. In the cases of OKACOM and ZACPLAN – both characterized by the threat of transboundary externalities – the initial constellation of interests proved an obstacle for cooperation, while the relatively symmetric incentive structure in the case of the ZRA – a collective problem – clearly facilitated the establishment of a water regime around the Kariba dam. However, one should not exaggerate the importance of incentive structures, which do not entirely determine the prospects of regime formation but rather serve as an indicator of a given initial situation that can be transformed during the negotiation process: As seen in the case of the LHWP, initially asymmetric incentives can be transformed into ‘win-win situations’. Also, taking a closer look at the ZRA case, one realizes that the incentives of cooperation partners are almost never fully symmetric. Even if two riparian states are affected by the same problem – electricity shortages in the case of the ZRA – the degree of their affectedness or their preferred solutions may differ and thus hinder water regime formation.

Furthermore, the empirical findings confirm the amount of problem pressure as a relevant influencing factor. As the case of ZACPLAN clearly illustrates, a lack of problem pressure may prevent far-reaching water cooperation:

[T]here is not a real issue on the Zambezi. The Zambezi has got so much water and so little is used, and there is no real threat. You can manufacture threats if you want, but nobody is interested in that (Piet Heyns, Interview 17 August 2004).

In the ZRA and LHW cases, on the other hand, high problem pressure linked to the visible problems of

electricity or water shortages facilitated the creation of more comprehensive problem solving mechanisms. These findings indicate that purely proactive initiatives for international river basin management that are not linked to clearly identified problems may lead to half-hearted solutions and implementation deficits.

With respect to the role of process factors, I had expected that asymmetric incentive structures were to be balanced by direct or indirect cost incentives to pave the way for water regime formation. This assumption was only confirmed in the case of the LHWP where Lesotho agreed to arrange for a water transfer when South Africa offered the payment of royalties and the provision of hydroelectricity in return. In the cases of OKACOM and ZACPLAN the riparian states created rather weak problem solving mechanisms that do not touch upon incentive structures. This is due to low problem pressure (as for ZACPLAN) as well as to high transaction costs resulting from a lack of hydrological data (especially for OKACOM). Also, one has to take into account the time perspective since it took several decades to balance incentive structures in the case of the LHWP.

Secondly, I had assumed that the establishment of water regimes required the use of political tools to reduce the transaction costs of the regime formation process – an assumption that was confirmed by all cases under investigation. Information costs are usually reduced through shared (feasibility) studies that generate new information and establish a common knowledge basis, while preferred strategies to reduce negotiation costs include the implication of ‘independent’ experts as well as confidence-building meetings at the technical level. Nevertheless, it is striking to note that the formation of all four water regimes under investigation was to an important extent facilitated by ‘situative’ political events: The ‘post-apartheid democratic moment’ in the case of OKACOM, the first *African Ministerial Conference on the Environment* (AMCEN) in the case of the ZACPLAN, the establishment of the federation between Rhodesia and Nyasaland in the case of the ZRA and the regime change in Lesotho in the case of the LHWP. This indicates that the formation of international water regimes is not entirely in the hands of the riparian countries, but also requires favourable situative events that can hardly be integrated in explanatory frameworks.

With view to explaining the effectiveness of the four water regimes, I first need to emphasize that regime formation and effectiveness are closely interrelated in the sense that problem and process factors do not only determine the prospects of regime formation

but also impact on the effectiveness of the problem solving mechanisms: While the balancing of incentives in the case of the LHWP leads to a mutual interest in implementation and thereby promotes regime effectiveness, asymmetric interests and the absence of problem pressure in the ZACPLAN case lay the foundation for the ineffectiveness of the water regime.

As regards to the hypothesized importance of institutional regime design, the empirical findings firstly confirm that specificity is advantageous: While the LHWP and the ZRA are problem-oriented and contain specific rules and procedures that effectively guide the actors’ behaviour, the ZACPLAN is little more than a series of vague projects that do not include any concrete rules and procedures. Furthermore, especially in light of the region’s limited resources for international river basin management, it is not advisable to burden a water regime with the multiple and highly complex goals of the integrated management approach since this may endanger the feasibility of the undertaking (as seen in the case of the ZACPLAN). This does not affect the desirability of integrated river basin management but raises questions concerning its feasibility. The case of the LHWP demonstrates that it may be more promising to start with limited but problem-oriented regimes that can then be extended over time.

Also, the case studies indicate that water regimes should contain elements of flexibility. The strictly ‘output-oriented’ ZACPLAN with its 19 subprojects proved overly rigid and little conducive to implementation (Granit 2000: 7–8). The advantages of a flexible approach are further illustrated by the LHWP that allows for a continuous monitoring and adjustment of regime provisions: In light of changing circumstances – the water needs in South Africa had initially been overestimated – the project phases two to four were put on hold in a problem-oriented manner. Furthermore, the empirical findings confirm the hypothesized importance of a centralized organization structure. As seen in the OKACOM and ZACPLAN cases, the lack of a centralized institution for project planning and coordination – for example in form of a river basin secretariat – has a clearly negative impact on water regime effectiveness. This is confirmed by the LHWP experience where the initially decentralized organization structure proved ineffective and had to be centralized. With respect to assumed need for regime openness, the case study findings are less clear. While the ZACPLAN is the only water regime that provides for public participation, openness has not been a characteristic of the decision making process of the

regime and decisions have been taken in groups of limited representation (Lamoree/Nilsson 2001: 35). Even though recent attempts to increase public participation in OKACOM and the LHWP have proved beneficial, the findings do not allow definite conclusions on the relevance of regime openness.

Assessing the relevance of country-specific factors, I find that water regime effectiveness indeed varies with economic-technological capacities. The OKACOM and ZACPLAN case studies unveil striking capacities deficits in the national water sectors, which lack the financial, technical and administrative capacities to plan and implement projects of international river basin management. The high capacities of the South African *Department of Water Affairs* (DWAF), on the other hand, have proved crucial for the success of the LHWP. With regard to the influence of political-institutional capacities, one can observe a striking lack of political stability: Almost all countries in the region having suffered from protracted civil war and violent conflict throughout the past decades, political instability is a major obstacle to effective water cooperation. The case of Angola in the context of OKACOM is exemplary: Due to decades of civil war that only ended in 2002, the Okavango Basin in Angola is still littered with landmines and hardly accessible – a situation that prevents project preparation, in particular the generation of hydrological data (Porto/Clover 2003: 78), and thereby limits OKACOM's effectiveness.

Finally, the case studies reveal the importance of factors of international context. The region is characterized by a history of political tensions, which go back to the anti-colonial liberation wars, the conflict with the Apartheid state in South Africa and the dynamics of the Cold War. Even though tensions have eased since the early 1990's, bilateral relations are still strained by historically rooted conflicts and distrust. This problem has exercised a very negative impact on the water regimes under investigation. In the case of the ZRA, for example, the historical debate about the benefits of the federation between North and South Rhodesia – now Zambia and Zimbabwe – created the perception of historically disadvantaged states and communities, issues that still inform debate about the ZRA and prevent more far-reaching water cooperation (Mutembwa 1998). Lastly the empirical findings underline the relevance of third actor support. In a region suffering from considerable development deficits, the activities of international (donor) organizations are of great importance: The GEF in the case of OKACOM, the World Bank in the case of the LHWP

as well as UNEP in the case of the ZACPLAN all play an important role with respect to the mobilization of financial resources and/or national capacity building. Despite the undeniable benefits of these activities, one should not overlook their negative side-effects, for instance, problems related to slow and overly bureaucratic project implementation (GEF in the OKACOM case) or a lack of ownership (UNEP in the case of ZACPLAN). Beyond international organizations, the cases of the LHWP and especially of OKACOM illustrate that the activities of non-state actors can significantly contribute to capacity-building and to the launch of an informed public debate.

I think that the activities of organizations that are working together with OKACOM (...) are complementing the activities of OKACOM in areas where OKACOM would not have been effective. OKACOM is a government organization but it is much better for an NGO to work with people on the ground than for government officials to do it. So it is a huge advantage to have this complementarity in the activities of these other organizations (Piet Heyns, Interview 17 August 2004).

53.4 Conclusions

The findings of the four case studies can be summarized as follows:

- The characteristics of a given problem in international river basin management influence the chances of water regime formation: If the underlying cooperation incentives are largely symmetric and the involved problem pressure is high, there are good prospects for the creation of effective water regimes.
- To reduce the transaction costs of water regime formation, countries typically rely on common studies for data generation and project preparation, the mediation of international experts and trust-building meetings at the technical level. If in addition asymmetric interests are balanced through cost incentives, one can expect far-reaching and effective water regimes.
- Effective water regimes need adequate institutional design: Water regime effectiveness is enhanced by problem-oriented and flexible management approaches that take account of the available resources and are equipped with a centralized organization structure.
- The effectiveness of international water regimes varies with country-specific capacities: Sufficient economic-technological capacities in the national

water sectors and political stability lay the foundation of water regime effectiveness.

- The successful management of international river basins requires a favourable international context: If the bilateral relations between regime members are characterized by mutual trust and cooperation and third actors – international organizations and/or non-state actors – support capacity building and civil society participation, there are good prospects for water regime effectiveness.

How can one judge the relevance of these findings? As already mentioned, I am unable to draw causal conclusions since the developed research framework does not allow for the identification of single effects. This means that I do not know to what extent the failure of the ZACPLAN can be attributed to asymmetric incentives, the lack of problem pressure, inadequate regime design or national capacity deficits. Also, I face a typical dilemma of multi-case comparisons: As the nature, scope and context of the water regimes under investigation are quite different; one might question the comparability of the four cases:

Regimes are specific and embedded in history, geography and culture. There is no one size fits all. They are needs driven. This is where many commentators make a mistake in my view by comparing apples to eggs... (Anthony Turton, Email 30 July 2004).

Nevertheless, this is no reason to abandon multi-case comparisons. When understood as a systemization of the most important driving forces and not as an empirical generalization, the findings do offer some valuable insight into the conditions for success of international river basin management. Here, it is especially the integration of country specific and contextual factors – so far largely neglected in the literature on international river basin management – that is of particular interest: The high relevance of national capacity deficits, political instabilities and strained bilateral relations illustrates that success and failure in international river basin management need to be discussed beyond the traditional ‘institutional design matters’ approach. Of course, one may object that capacity deficits and instabilities are unusually developed in the Southern African region. But since large parts of Asia, Latin America and Eastern Europe face at least similar problems, there are good reasons to pay greater and more systematic attention to these influencing factors.

With view to giving practical policy advice, it may seem unattractive to recommend the build-up of national capacities or the creation of a favourable politi-

cal context since this is less feasible than the adoption of a certain institutional design – at least in the short term. Nevertheless, there is reason to believe that national capacity building and the creation of a favourable political context both at the national and international level is the key to success in international river basin management – in Southern Africa but also in the developing world as a whole. This means that ‘neutral’ third parties (international organizations and non-state actors) need to intensify their efforts for capacity building and mediation between conflict parties (Turton 2003: 98). Finally, the findings of the Southern African case studies should lead to caution with respect to the today omnipresent claims for integrated river basin management – especially in the context of developing countries. This does not mean that one needs to question the general practicability of the integrated approach as done by Marty (2001: 398). But against the background of the experiences with the ZACPLAN, it seems more promising to first bundle the scarce resources and capacities in a problem-oriented and functional manner before considering extending and integrating the management approach over time.

54 Can 'Integrated Water Resources Management' Silence Malthusian Concerns? The Case of Central Asia

Martin Kipping

54.1 Introduction^{1, 2}

The debate on international water problems is largely dichotomous. It is split between the more analytical perspective of *International Relations* (IR) and related social sciences, on the one hand, and rather prescriptive, problem-solving contributions, on the other hand. While the IR discourse focuses on resource conflicts, the prospects of water wars, and opportunities or problems of international water regimes, the prescriptive discourse concentrates on normative concepts like the 'Dublin Principles'³, international water law, or '*Integrated Water Resources Management*' (IWRM)⁴.

This chapter will explore how these rather separate spheres can link up productively to ease solving international water problems. Therefore, it demonstrates the complementary character of Malthusian analyses⁵ of resource conflicts and the concept of IWRM by scrutinizing a regional example of severe water-related problems.

Central Asia – and the Aral Sea basin in particular – clearly constitutes a water 'hot spot'. Malthusian analysts highlight international upstream-downstream conflicts over relative water distribution (hydropower generation in upstream countries vs. irrigation in downstream countries), growing transboundary conflicts over absolute water distribution (notably caused by ambitious Turkmen development projects and the expected recovery of Afghan agriculture), as well as regular intra-state violence motivated by competition over scarce water resources.

This chapter shows how most of these problems could effectively be handled by adopting IWRM principles for water management: Basin-wide inter-sectoral integration would create opportunities for win-win solutions; demand-management could largely reduce overall pressure on water resources; and decentralized management structures would mitigate local water conflicts.

However, neither Malthusian analyses nor the concept of IWRM contain receipts for effectively implementing these potential solutions. On the contrary, a perspective of political economy – the liberal strand of IR – reveals how vested interests prevent reforms within downstream cotton-growing agriculture, which are prerequisites to inter-sectoral flexibility, a shift towards demand-management and the decentralization and democratization of local water management. In consequence, both Malthusian IR approaches and prescriptive concepts like IWRM need to be complemented by a profound knowledge of domestic politics within affected states if they are to identify realistic ways for solving water scarcity problems. In the context of global environmental change in general and cli-

1 An earlier version of this chapter has been accepted for publication in *Water International*. The author would like to thank WI's editor for granting him the right of pre-publishing it within this volume.

2 This chapter expresses the author's personal opinion and cannot be attributed to the German Federal Government.

3 These four key principles of good water management have been enshrined at the 1992 International Conference on Water and the Environment in Dublin. They highlight environmental concerns, stakeholder participation, gender considerations as well as the need to manage water as an economic good. Cf. <<http://www.gwpforum.org/servlet/PSP?iNodeID=1345>> (24 August 2007).

4 See section 55.4 for a discussion of this broadly accepted concept of good water management. Argawal/det al. 1999 provide a comprehensive, authoritative introduction to IWRM.

5 See box 54.1 for a description of the Malthusian discourse. Since 'Malthusianism' as such does not provide a full-fledged analytical framework or theory, the term 'Malthusian analysis' should be read as 'analysis informed by the Malthusian philosophy'.

Box 54.1: The Malthusian Discourse. The text was written by the author.

The (Neo-)Malthusian approach derives its name from Thomas Malthus' *Essay on the Principle of Population* (1798), which draws a gloomy picture of demography-induced resource scarcity, necessarily leading to either famine or war. Generally speaking, Malthusians are concerned with conflicts induced by a mismatch of (increasing) demand and insufficient offer of natural resources, due to demography, changing consumption and production patterns, combined with a shrinking resource base caused by overexploitation or global phenomena such as climate change, or the infinity of natural resources in general. With regard to water conflicts, (Neo-)Malthusians

point out the conflictive consequences of growing water scarcity. While both Malthusians and Neo-Malthusians share this general conviction, classic Malthusians perceive water conflicts as a direct consequence of increased competition over water (cf. Starr 1991), whereas Neo-Malthusians stress that water scarcity rather indirectly leads to conflicts via its socio-economic consequences like decreasing agricultural productivity or overall economic decline (cf. Homer-Dixon 1999). For a critique of Malthusian approaches to 'hydropolitics', see Kipping (2005, chap. 51).

mate change in particular, respective problem-solving capacities are becoming even more urgent to develop.

The next section lays out the overall structure of the chapter after a more detailed explanation of the problem at hand.

54.2 Analytical vs. Prescriptive Views on International Water Problems

If problems related to freshwater have grown in past decades due to demography, economic development and the internationalization of river basins, so has the number of concepts aiming to explain and alleviate these problems. On the one hand, analytical concepts like 'water stress' (Falkenmark 1989), 'adaptive capacity' (Turton/Ohlsson 1999), 'virtual water' (Allan 2003b) or 'environmental security' (Brauch 2003, 2003b, 2008a) have been developed in the realm of social sciences, including IR. Many of these contributions were to clarify in how far Malthusian assumptions about scarcity-induced water conflicts are justified. On the other hand, rather prescriptive concepts such as the 'reasonable and equitable utilization' of transboundary waters, the minimum ecological flow requirement, the 'Dublin Principles' or the 'Bonn Keys'⁶ have resulted from diverse political fora, where policy-makers and practitioners have formulated recommendations, guidelines and norms for better water management. Based on these principles, IWRM has emerged as the state-of-the-art model of ideal water management.

One has to note, however, that the water discourse's analytical and prescriptive layer remain disconnected. Despite first efforts to bridge the gap

(Merrett 2005), both constitute largely separate spheres, although they should ideally be complementary and build on each other: Analytical approaches are meant to identify, forecast and render intelligible water problems. Based on their analyses, prescriptive guidelines and practical tools can be developed or chosen in order to solve these problems. In practice, however, this complementary relationship rarely materializes. Most work on water problems either concentrates on empirical analysis or focuses on principles of 'good' water management. Although this dichotomy is not surprising considering the different origins of the analytical and prescriptive concepts, it certainly constitutes a missed opportunity.

This chapter explores ways for overcoming the dichotomy by scrutinizing a well-known regional example of severe water-related problems: Central Asia (chap. 55 by Raket; chap. 56 by Wunderer; chap. 57 by Martius/Froeblich/Nuppenau). This region – with its highly symbolic Aral Sea (partly) turned into Aral Desert – is a 'hot spot' for Malthusian analysts, who highlight serious inter- and inner-state water conflicts (Klötzli 1996, Giese/Sehring 2007: 10–20). In addition, Central Asia is probably the region where international donors have deployed most efforts to improve water management. Among others, programmes under the label of IWRM are implemented in the Ferghana Valley (Swiss Development Cooperation; IWMI/SIC 2005) and in the Chu and Talas River basins (TACIS). Transboundary water cooperation is also meant to play a prominent role within the European Union's 2007 Central Asia Strategy (<<http://register.consilium.europa.eu/pdf/en/07/st10/st10113.en07.pdf>>, 16 February 2008). Linking the water discourse's analytical and prescriptive layer, this chapter investigates in how far IWRM actually offers adequate answers to Malthusian concerns vis-à-vis Central Asian water problems.

6 See: <http://www.water-2001.de/outcome/BonnKeys/Bonn_Keys.pdf> (24 August 2007).

Figure 54.1: The Aral Sea Basin's Main Watercourses. **Source:** McKinney (2003: 189); reprinted with permission of the copyright holder.



The text proceeds as follows: First, water conflicts in Central Asia are analysed under a Malthusian perspective (55.3). Second, components of IWRM are discussed as potential solutions to these conflicts (55.4). The question then arises what impedes the implementation of IWRM-inspired solutions. Respective obstacles are identified third (55.5). The chapter concludes with a recommendation for future research on 'hydropolitics' (55.6).

54.3 Malthusian Concerns Regarding Central Asia

Central Asia in general and the Aral Sea basin in particular might be the region where humankind has most consequently realized its 'hydraulic mission'. While the Syr Darya and the Amu Darya have seen ir-

rigated agriculture for more than 2,000 years (Glazovsky 1995), it is not until Soviet times, however, that development planners have fundamentally changed the basin's ecological balance. Responding to the Soviet Union's striving for autarky in cotton production, irrigation expanded from about 2.5 million hectares to 7.5 million hectares of irrigated area (O'Hara 1998: 4). In consequence, the river water inflow into the Aral Sea decreased from about 56 km³/year prior to 1960 to 43 km³/year in the 1960's, 17 km³/year in the 1970's, and it almost ceased in the 1980's (O'Hara 1998: 4). The resulting desiccation of the Sea and the complete halt to its fishing industry did not come as a surprise but were deliberately taken into account as negative side-effects of the ambitious irrigation programmes.

Despite its enormous ecological costs, this development scheme did work until the end of the 1980's.

Table 54.1: Socio-economic Indicators of the Aral Sea Basin's Riparian Countries (2005). **Source:** CIA Factbook (2005).

	GDP (PPP) billion \$	Population thousands	GDP/capita \$ (PPP)	Surface area km ²	Irrigated area km ² (est.)
Afghanistan	21.5	29,930	800	647,500	23,860 km ²
Kazakhstan	132.7	15,190	8,700	2,717,300	23,320 km ²
Kyrgyzstan	9.3	5,150	1,800	198,500	10,740 km ²
Tajikistan	8.8	7,160	1,200	143,100	7,200 km ²
Turkmenistan	29.4	4,950	5,900	488,100	17,500 km ²
Uzbekistan	52.2	26,850	1,900	447,400	42,810 km ²

With the split-up of the Soviet Union in 1991, however, the Moscow-led overall management of the basin's resources disappeared and competing interests stopped being balanced by cross-Union compensations. The Amu Darya basin had been international even before, with Afghanistan and Iran as non-Soviet riparians. Nevertheless, this had had only minor consequences if compared to the independence of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. The dismantling of the Soviet Union led to a constellation where the Syr Darya, for instance, crosses four international borders before reaching the Aral Sea (figure 54.1). Towards the end of the Soviet Union, regional water management had already turned increasingly conflictive, leading to the establishment of two basin management organizations – one for the Syr Darya and one for the Amu Darya –, both based in Uzbekistan (Sehring 2002: 11). Yet, the main directives were still received from Moscow, quotas being set by the Ministry of Land Reclamation and Water Management in close coordination with the Ministry of Energy (ICG 2002: 6). In addition to the full-fledged internationalization of the Aral Sea basin in 1991, demography and the post-Soviet economic crisis led to increased pressure on agriculture, accompanied by a sharp deterioration due to lacking maintenance and repair of irrigation infrastructure. In this context, diverse inter- and intra-state water conflicts got apparent, which will be discussed in the following sections.

54.3.1 International Conflicts over Relative Water Distribution

The key conflict regarding the Syr Darya is over seasonal flow regulation, as the latter commands the availability of water for hydropower generation in upstream countries and irrigation in downstream countries. The ENCOP environmental conflicts research group has termed the distribution of water over time

“relative water distribution” (Libiszewski 1996a: 128–131). Hence, the Syr Darya's waters are cause of a relative distribution conflict. How did this conflict develop?

In Soviet times, numerous reservoirs were built in the two upstream Soviet Republics of Kyrgyzstan and Tajikistan in order to guarantee sufficient irrigation water downstream in late summer, when the natural water flow from snow and glacier melt decreases. Hydropower generation only came as an additional gain from the reservoirs, while priority was clearly given to irrigation needs in Uzbekistan, Kazakhstan and Turkmenistan. This perspective changed when the former Soviet Republics gained independence (Wegerich 2004): As supply of energy resources from downstream countries (electric power and coal from Kazakhstan, fuel oil and gas from Uzbekistan) switched to world market prices and the two comparatively less developed upstream countries started to feel the financial burden of maintaining the large dams on their territory, their interest in changing river management priorities towards hydropower generation increased. In this context, the newly independent riparian states adopted a provisional agreement in 1992 to uphold the Soviet-time management scheme, fearing the unexpected consequences of uncoordinated water use. Since 1995, bilateral barter deals were concluded on an annual basis, rewarding river regulation services by Kyrgyz dams with the free delivery of energy resources from downstream states and a purchase guarantee for surplus Kyrgyz electricity in summer months. In March 1998, this cooperation scheme was renewed within the framework of the *Central Asian Economic Community* (CAEC), when the Prime Ministers of Kazakhstan, Kyrgyzstan, and Uzbekistan signed a treaty on the use of water and energy resources of the Syr Darya basin. They were joined by Tajikistan in 1999 (Antipova/Zyryanov/McKinney/Savitsky 2002).

However, these agreements proved unreliable (De Martino et al. 2005: 22). Kyrgyz authorities responded

to unmet promises of energy supply from downstream states by prioritizing hydropower generation in the regulation of the main Toktogul reservoir (Giese/Sehring 2007: 16). Consequently, the share of Toktogul releases for irrigation needs decreased from 69 per cent to 34 per cent since 1993, while winter releases for hydropower generation increased from 31 per cent to 66 per cent (Giese/Sehring/Trouchine 2004: 8). This led to downstream flooding in winter months – due to the frozen and dammed river bed – and to downstream water shortages in the crop-growing season.

The lack of compliance with regional agreements can be explained by the prisoners' dilemma in which the riparian states are trapped (cf. Haftendorn 2000 and Marty 2001 as prominent examples for the institutionalist perspective on international water conflicts). In absence of an overall authority compliance with agreed-upon rules becomes a rather risky undertaking. If Kyrgyzstan reduces hydropower production in winter, for instance, it nevertheless cannot be sure that subsequent compensations materialize in case that the following summer's irrigation needs are below average thanks to above-average rainfall. Consequently, the riparian states lack trust in each other, thus increasing the unreliability of their common agreements.

This upstream-downstream conflict over relative water distribution is a good illustration of Aaron Wolf's argument on the importance of institutions for the successful management of international water conflicts (Wolf 2001: 10): The pace of change (i.e. the internationalization of the river basin) exceeds the institutional capacity to absorb that change. The two river basin organizations created in Soviet times are not recognized by riparians other than Uzbekistan and factually operate only on Uzbek territory. With the *International Fund for the Aral Sea* (IFAS) and the *Interstate Council for the Aral Sea Basin* (ICAB), international donors have set up externally-driven institutions without real capacity to influence regional water policies (Sehring 2002: 16–18). The *Interstate Commission for Water Coordination* (ICWC) performs better in this regard, but is also lacking substantial authority (Giese/Sehring 2007: 18). It seems that only the old Soviet network of water experts prevents an escalation of the water conflict (Dukhovny 2004: 103). Bilateral negotiations take place annually at the level of (vice) prime ministers, where seasonal water distribution and the delivery of energy resources are decided upon.

Correlating with Malthusian theses, the relative distribution conflict got virulent with the river water's increase in importance for the riparian states in general and for Kyrgyzstan in particular. As industry almost completely collapsed after independence and other natural resources – with the exception of some limited gold reserves – are scarce in this largely mountainous country, water is perceived as Kyrgyzstan's only wealth. A growing nationalist discourse in Kyrgyz politics demands payments for the water from downstream users just like Kyrgyzstan has to pay for fuel imports. In 1997, the Kyrgyz parliament even adopted a law postulating this principle for regional water cooperation (O'Hara 1998: 6).

54.3.2 International Conflicts over Absolute Water Distribution

While the relative distribution conflict between upstream hydropower generation and downstream irrigation clearly is at the centre of the region's water problems, issues of absolute water distribution progressively gain importance. Together with the management regime of the big reservoirs, the quotas for water abstraction from Soviet times were confirmed in 1992 (table 54.2).

The quotas potentially restrict water use mostly in agriculture, as irrigation accounts for over 90 per cent of regional water consumption (defined as the amount of water abstracted and not returned to the original water body). Currently, however, not all riparian states make full use of their quota, since the deterioration of irrigation infrastructure limits their capacities for water abstraction. Kyrgyzstan, for instance, leaves more than 2 km³ of its water share to downstream neighbours. Yet, this does not lead to additional water reaching the Aral Sea, as most water unused by upstream regions is consumed by irrigated agriculture in the Sea's delta area, where canal tail ends already suffer from regular water scarcity in dry years.⁷ In addition, water consumption upstream is supposed to rebound in the future, as the Kyrgyz and the Tajik economy recover from post-independence economic crisis, respective civil war. What is more, the recovery of Afghanistan from civil war and Taliban rule raises some additional concerns.

7 Even hydropower-driven winter releases from Toktogul do not necessarily reach the Aral Sea, as large volumes of water need to be directed to the Arnasaj-depression in order to lessen flooding problems in Uzbekistan (Giese/Sehring 2007: 16)

Table 54.2: Origin of River Flow and Water Allocation in the Aral Sea Basin. **Source:** Adapted from McKinney (2003: 193).

Country	Amu Darya		Syr Darya	
	Originating river flow (km ³ /year)	Quota (km ³ /year)	Originating river flow (km ³ /year)	Quota (km ³ /year)
Afghanistan	11,6	0	0	0
Kazakhstan	0	0	2,4	12,3
Kyrgyzstan	1,6	0,2	27,6	4,0
Tajikistan	59,9	9,1	1,0	2,5
Turkmenistan	1,5	22,0	0	0
Uzbekistan	4,7	33,9	6,2	19,7
Total	79,4	65,2	37,2	38,5

It is expected that Afghan water consumption will increase soon, as its rural population has few economic alternatives to irrigated agriculture besides poppy cropping. This will significantly reduce the flow of the Amu Darya, where competition over absolute water distribution is already intense. International development agencies accelerate this trend by assisting with the rehabilitation of Afghan irrigation infrastructure, aiming at stabilizing the war-torn country (Giese/Sehring/Trouchine 2004: 20–23).

Further pressure on the Amu Darya results from ambitious development projects in Turkmenistan. First, the Turkmen government is currently extending the Karakum Canal, the world's longest canal (1,300 km), which accounts for 19 per cent of total water abstraction from the Amu Darya. As the canal is not lined with cement, just dug into the desert sand, water losses through infiltration are enormous (Giese/Sehring/Trouchine 2004: 13–16). Second, the former Turkmen president Niyazov has announced the creation of an artificial 'Lake of the Golden Century' in the Karakum desert, which is planned to provide additional opportunities for irrigation, but also for recreational activities until 2010. Although the Turkmen side affirms that the Lake will be alimented solely by drainage water, this does not seem to be realistic. In order to guarantee a minimum quality of the Lake's water – if possible at all – additional water will have to come from the Amu Darya (Giese/Sehring/Trouchine 2004: 17–19).

Increasing Turkmen water abstraction from the Amu Darya risks escalating already existing conflicts with Uzbek farmers in the river's delta. Near the Tuyamuyun Hydroengineering Complex, where irrigation canals routinely cross the Uzbek-Turkmen border, competition over irrigation water has already motivated Turkmen authorities to construct an additional – highly inefficient – primary canal, located

exclusively on Turkmen territory, intended to decrease dependence on Uzbek water delivery (Giese/Sehring/Trouchine 2004: 17). As Turkmen and Uzbek farmers in these downstream regions are increasingly insecure of getting sufficient irrigation water, they sometimes deliberately block drainage canals in order to assure at least a minimum of soil moisture for the following year, though being aware of the fact that this significantly accelerates the salinization of their soil (personal communication, Elke Herrfahrtdt).

Although transboundary skirmishes between local communities have already been reported, competition over scarce irrigation water has not led to inter-state violence up to date. However, the foreseeable sharp increase of water scarcity in downstream regions augments the prospects of further deteriorating relations between Turkmenistan and Uzbekistan: "There have ... been continued problems in shared irrigation zones. Confronted with water shortages, Uzbeks and Turkmen in the lower Amu Darya region have sent raiding parties across the border to destroy pumping stations and irrigation canals" (O'Hara 1998: 7). It is not necessary to adhere to water-war scenarios to suppose that conflicts over absolute water distribution will contribute to regional instability and create enormous challenges for international cooperation. The realist school of IR in particular predicts harsh reactions by downstream Uzbekistan – the region's dominant power – in case its national water security is seriously threatened by upstream states (cf. Lowi 1993; Waterbury 1997).

54.3.3 Intra-state Scarcity Conflicts

Research has revealed that water conflicts tend to be more intense the lower their geographical scale. While no international water war has ever occurred in

modern times⁸, local water conflicts can turn extremely violent (Wolf 1998).

This also shows to be true for Central Asia (ICG 2002: 5), where violent conflicts over water are already reported from ancient times (O'Hara 1998: 3). In areas where overall river flow, storage capacities and distribution networks cannot guarantee sufficient irrigation water for all farmers, water distribution gets a highly conflictive issue. Water-stealing among farmers and village communities is a usual phenomenon, and distribution points frequently need to be guarded during the irrigational season. Similar to the Turkmen-Uzbek case referred to above, it is not uncommon to see physical solutions to water-stealing problems: Water users suffering from water stealing dig alternative canals in order to better control water delivery to their fields. Although these non-lined and uncovered canals lead to enormous water losses (usually up to 80 per cent), their beneficiaries still regard them as the only and thus rational way for solving their problems with water stealing (Herrfahrdt/Kipping/Pickardt/Polak/Rohrer/Wolff 2006). The inability to reach consensual and viable agreements between competing water users illustrates the severity of local water conflicts. Inter-personal violence occurs when guards confront water thieves or in cases individual farmers or whole village communities resort to violence against competing water users: Conflicts over local water distribution frequently end up in brawls (Giese/Sehring 2007: 17). Casualties are not exceptional, although these conflicts normally stop short of becoming deadly. As rivers and canals frequently cross international borders - most visibly in the Ferghana Valley - these essentially local conflicts often contain a transnational dimension, what makes them even more difficult to resolve. Polarization and escalation along ethnic lines occurs as well (De Martino et al. 2005: 28), although these cleavages seem to be overstated in the media.

In addition, competition over water indirectly leads to conflicts via migration, a causal mechanism stressed by Thomas Homer-Dixon (1999: 93-96). Competition over water is often concealed by competition over land, as agricultural land in Central Asia normally means irrigated land due to the semiarid and arid climate. Pressure on cultivable land is highest

in the densely populated Ferghana Valley, sometimes aggravated by soil degradation such as water-logging and salinization. In combination with lacking economic alternatives, people either look for work abroad (Russia and Kazakhstan are frequent destinations) or move to less densely populated areas like the Kyrgyz Batken Oblast. However, there is hardly any unused but usable land left over. Thus, these scarcity-induced migration movements result in increased competition over resources in the places of destination, sometimes causing violent conflicts, too. This occurred in Kok-Tash and Shorsu as well as in the Arka and Kistakuz regions of south-west Kyrgyzstan, for instance (De Martino et al. 2005: 18-19, 25-28). The well-known Osh clashes between ethnic Kyrgyz and ethnic Uzbek in 1990 also appear to have been motivated by competition over irrigated land. These (intra-state) riots, in which over 300 people perished and more than a 1,000 were injured, occurred after a Kyrgyz co-operative was given permission to use irrigated lands on an Uzbek Kolkhoz to construct residential buildings (O'Hara 1998: 6).

54.4 IWRM as a Possible Answer to Malthusian Concerns?

As explained above, serious water conflicts - international relative and absolute distribution conflicts as well as intra-state scarcity conflicts - do exist in Central Asia, and several factors make us believe that their intensity is likely to increase in the future. How could regional water (and related) policies prevent or mitigate these conflicts in order to contribute to a more peaceful and cooperative development of the region?

IWRM figures as the 'mantra' (Waterbury 1997: 279) of ideal water management and is promoted as such in Central Asia. What options does the concept offer for handling the water conflicts described above? In order to answer this question, the concept of IWRM will be shortly presented in the following paragraphs before its applicability to the different types of Central Asian water conflicts will be discussed.

IWRM developed in response to the traditional 'engineering', supply-side approach to water management: Traditional water policies mostly focussed on technical solutions for increasing quantitative water supply (i.e. by building barrages), without caring much about social aspects, efficiency or environmental concerns. IWRM instead pursues a holistic, integrated approach to water management. The *Global*

8 This does not imply that there are no inter-state armed skirmishes over water (see i.e. Gleick 1993). However, no scholar has yet convincingly shown that an international war (according to any of the established definitions) has been fought primarily over water.

Water Partnership (GWP) defines IWRM as “a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” (Argawal et al. 1999: 22; cf. also WWAP 2003: 299; GWP 2005). But what does this mean in practical terms? Following the understanding of IWRM put forward by Herrfahrdt, Kipping, Pickardt, Polak, Rohrer and Wolff (2006), IWRM requires three-fold integration: ecological, sectoral and regulatory integration.

Ecological integration demands that water management adopts an eco-system approach, systematically taking into consideration ecological interdependencies. In consequence, water should be managed according to hydrological boundaries, i.e. within catchment and sub-catchment areas, not along artificial administrative delimitations (Argawal et al. 1999: 24). Managing hydrological units as a whole eases the internalization of positive and negative externalities arising downstream, such as reduced water flow, pollution, but also flood protection by upstream dams. Furthermore, questions of water quantity should not be isolated from aspects of water quality (Argawal et al. 1999: 25), as both are important, and they are inter-linked: Available water might be sufficient in quantity but of insufficient quality for household consumption or even for irrigation. Water users might also compensate poor water quality by increasing their quantitative demand. If irrigation water is saline, for instance, the risk augments that fields salinize. In this case, considerable amounts of water are needed for leaching the fields. In the past, water quantity issues have dominated water policies, whereas problems of pollution, changes in temperature, or eutrophication have received much less attention. Ecological integration also demands that development planners consider the impacts of land use on the water cycle and the consequences of water use for land areas (Argawal et al. 1999: 24). Key issues of water-land interaction include altered flow regimes due to modified land cover (most acute in the case of deforestation or over-grassing), erosion, the siltation of reservoirs and canals as well as water-logging and the salinization of irrigated land.

Sectoral integration, reframing the objectives of water management, signifies that ecological, economic and social externalities of water use are internalized in order to maximize the overall, societal benefit of water use. While the conventional engineering approach to water management did not think of na-

ture as a legitimate water user, IWRM does. In periods of water scarcity, for example, minimum ‘ecological flows’ are to be guaranteed in order to sustain vital functions of the ecosystem. In relation to the economic sphere, sectoral integration demands that the benefits of water use be weighted against the costs of water supply and sewage treatment. In general, full-cost pricing should be aimed at. This principle enhances overall economic efficiency and reduces public financial burdens, thus guaranteeing financial sustainability of water services (Argawal et al. 1999, 41–42). In addition, all water-using activities (such as agriculture, fishing, power generation, manufacturing, household provision with drinking water, transport, tourism, etc.) should be jointly taken into account. By this means, water allocation can be oriented towards the most beneficial economic uses. In practice, scarce water resources have often been directed to economically less productive, but politically powerful actors, most often agriculture. Finally, sectoral integration requires that the social consequences of water management are not lost out of view. These include effects on poverty, gender relations or public health, which should all be taken into account by water managers.

Regulatory integration in turn concentrates on the managerial aspects of water governance. In contrast to the conventional top-down, centralized approach to water management, IWRM states that decision-making structures should be organized according to the principle of subsidiarity. Decisions should thus be taken at the lowest appropriate level (Argawal et al. 1999: 15–17). Participation of water end users is to be increased in order to limit transaction costs, to boost the ‘user-friendliness’ of management institutions, and to improve communication between water managers and water users. In addition, decisions need to be based on adequate data. As IWRM is holistic in its ambition, data requirements for its realization are considerable (Argawal et al. 1999: 51–54). Even in cases where ecological data are available and used, socio-economic variables – such as the amount and timing of water demand by different economic sectors, the elasticity of demand in function of water prices, reactions of water users to rationing, water use efficiency, etc. – continue to be widely ignored. The integration of these two types of data constitutes a particular challenge, as the ‘human factor’ still does not receive sufficient attention in water management (Kluge 2005: 36–37). Finally, water management should combine supply-side measures with demand-management, which aims at enhancing efficiency of water use and at prioritizing demands. Respective instruments in-

clude reducing water losses by rehabilitating infrastructure, adapting irrigation norms, and providing incentives for water saving. Economic tools like cost-effective, volumetric water fees and water markets are possible means for encouraging water-saving and selecting between competing demands.

IWRM cannot provide a detailed blueprint of ideal water management, as the broad framework of IWRM always needs to be operationalized in function of the affected society's specific preferences and conditions. However, the concept offers a whole set of broadly applicable tools for improving water management. Hence, it can assist societies with overcoming second-order - or 'structurally induced' (Turton/Ohlsson 1999) - water scarcity. In how far IWRM can consequently contribute to solving the Central Asian water conflicts will be analysed in the following sections.

54.4.1 Contributions of IWRM to Solve Conflicts over Relative Water Distribution

The relative distribution conflict in Central Asia is a problem of inter-sectoral integration, in essence: between hydropower generation upstream and irrigation needs downstream. This conflict remained latent in Soviet times: The unified sovereignty over most of the Aral Sea basin assured final arbitration, generally in favour of irrigation needs. At the same time, overall Soviet planning provided a satisfactory level of compensatory transfers to the upstream Soviet Republics. The relative distribution conflict only got acute when this overall sovereignty and planning disappeared in 1991 and gave way to the political fragmentation of the Aral Sea basin. This made the inter-sectoral cleavage largely coincide with international borders, turning *Kyrgyz* hydropower interests against *Uzbek* and *Kazakh* agricultural interests. In consequence, inter-sectoral externalities became international externalities, diminishing the interest in internalizing these externalities in order to maximize the overall benefit of water use: Upstream users lack incentives to reduce the negative externalities of hydropower generation, while downstream users have little interest to reward positive externalities from flow regulation upstream as long as they cannot effectively control dam management in the flow-generating countries.

A typical upstream-downstream conflict thus arose due to the predominance of artificial international boundaries over hydrological units. The promotion of *river basins as the adequate level of water management* - a key component of IWRM - is the logical an-

swer to this problem. Basin-wide integration would ease the *integration of all water-using economic activities* (in this case, mainly hydropower generation and irrigated agriculture), a further key element of IWRM. The consideration of these two principles would increase the economic rationality of water use and thus augment the total economic "benefits from the river" (Sadoff/Grey 2002: 393p). This in turn means that win-win solutions for solving the relative distribution conflict would become possible. The Toktogul and other dams' flow regimes could be turned towards generating the highest absolute gains, independently of the economic sector and nation-state where these profits accrue. Thanks to the resulting upwards move of the 'Pareto frontier'⁹ - speaking in economic terms - all basin countries could improve their position compared to the current situation. For this to become feasible, an adequate rule and trustworthy mechanisms for distributing the surplus gains would need to be found. Furthermore, a type of basin-wide authority would have to enforce the agreed-upon rules, solving the current prisoners' dilemma.

While this appears to be a rather idealistic and theoretical solution, some progress in this direction has already been made: Under the heading of IWRM, two water-energy consortia have been established for managing the Talas and Chu River basins, which cross the *Kyrgyz-Kazakh* border. Thanks to *Kazakh* funds invested in hydropower projects on *Kyrgyz* territory, *Kazakhstan* will gain partial control over upstream flow management. Joint decision-making structures in turn will ease a holistic management of these two rivers. Although the latter are of minor importance if compared to the *Amu* or *Syr Darya*, their cooperation schemes could still serve as examples for the whole *Aral Sea* basin. Despite IWRM-inspired declarations by IFAS or ICWC, basin-wide integration along the two major streams remains limited to the inherited quota system from Soviet times and the barter agreements mentioned above. *Uzbekistan* has recently begun to contribute in kind to the maintenance of the Toktogul reservoir. However, this might result more from fear of an ill-maintained dam upstream than

9 The 'Pareto Frontier' is a concept broadly used in economics. It describes a society's state in which nobody's resource endowment can be increased without at the same time decreasing the resource endowment of somebody else, i.e. without redistributing the available wealth. Hence, aggregate wealth is at a maximum when a given society is on its 'Pareto Frontier'. 'Moving up the Pareto Frontier' thus means increasing the (potential) maximum wealth of a society.

from a genuine recognition of the flow regulation services provided by Kyrgyz infrastructure.

54.4.2 Contributions of IWRM to Solve Conflicts over Absolute Water Distribution

If IWRM can defuse international conflicts over relative water distribution in the Aral Sea basin, what can it contribute to settling the international conflicts over absolute water distribution? In order to answer this question, one needs to recall the origin of these most 'Malthusian' conflicts. Examining water use patterns in Central Asia, the extremely high per capita consumption can hardly be overlooked. High dependence on irrigated agriculture (> 90 per cent of regional water consumption) together with highly inefficient irrigation practices account for one of the highest per capita water consumptions in the world. In Uzbekistan, for example, 8,000–10,000 m³ of irrigation water (water used for leaching not included) are abstracted for one hectare of cotton – compared to 1,500 m³ physiologically needed by the plants. With the same amount of water, 6 times as much as cotton can be produced. Only this enormous waste of water is able explain the absolute distribution conflicts described above, which persist in spite of an overall water availability that can be deemed satisfactory. Although Uzbekistan and Turkmenistan suffer from 'absolute' respective 'chronic' scarcity of *internal* water resources (according to Falkenmark's Water Stress Index), *external* inflows from Tajikistan and Kyrgyzstan would be largely sufficient to satisfy average water needs (ICG 2002: 4; Mason/Bichsel/Hagmann 2003: 10; De Martino et al. 2005: 21).

Considering the fact that the region's renewable water resources are already overused (hence the fate of the Aral Sea), conventional supply-side measures – intended to increase overall water availability – offer no solution to this problem. Better suited is the *demand-side approach* IWRM promotes. Potential for water saving is enormous in Central Asia, since more than half of the abstracted irrigation water is lost through infiltration and evaporation from irrigation canals before reaching the fields. The predominant but highly inefficient surface or furrow irrigation leads to additional losses. Deliberate over-watering, induced by outdated irrigation norms, is a frequent phenomenon as well. On average, the Central Asian countries use 1.5 times more water on the fields than recommended by water experts (ICG 2002: 12).

Introducing hard – i.e. physical – and soft – i.e. regulatory and institutional – measures of demand-management might significantly reduce rivalry over absolute water distribution. Initial investments into water-saving technology and infrastructure (lined and covered canals, sprinkler or drip irrigation) can be provided by public authorities, assisted by donor agencies if necessary. The main efforts, however, would have to come from the water users themselves. Consequently, appropriate incentives for water-saving must be created. They would include the introduction of water fees, covering at least operation and maintenance costs of irrigation infrastructure – ideally also capital costs and ecological externalities. Currently, water fees are either inexistent or largely symbolic in Central Asia. The fees should be calculated according to actual water use (volumetric or quasi volumetric fees) rather than in function of the number of irrigated hectares. Theoretically, water markets would most efficiently provide incentives for water saving, but they are ambitious to establish. Adapting irrigation norms to crops' real water needs would also significantly contribute to decreasing water demand.

In addition to demand-management, two further components of IWRM would help solving the problems behind the absolute distribution conflicts: First, a better *integration of water quality aspects* could moderate quantity problems. At the moment, huge amounts of drainage water cannot be re-used for irrigation because of their high salinity levels and pollution by fertilizer and pesticides. This water is directed into desert depressions where it feeds ecologically dead lakes. If irrigation norms and techniques as well as the application of agro-chemicals are adapted to quality concerns, drainage water might constitute additional irrigation water. Second, a better *consideration of water-land interaction* would decrease water needs as well. The current patterns of over-watering create a vicious circle of water-logging, salinization and the need of annually leaching the fields before the crop-growing season. Up to 30 per cent of total water abstracted from the rivers are used for leaching. These volumes could be saved for irrigation needs or ecological flows if irrigation practices improve.

54.4.3 IWRM Contributions to Solve Intra-state Scarcity Conflicts

The causes of the absolute distribution conflicts between the riparian states are usually similar to the causes of intra-state conflicts over absolute water distribution: The bad state of irrigation infrastructure,

highly inefficient irrigation practices and inadequate irrigation norms lead to water scarcity amid globally sufficient water. Again, measures of *demand-management* are the adequate response within the context of ongoing irrigation management reforms (cf. Malano/Van Hofwegen 1999 for a general discussion of irrigation management).

In comparison to primary canals of national importance, infrastructures at the secondary and tertiary level are in even worse conditions, however. Insufficient maintenance and repair lead to frequent breakdowns of conveyance and distribution systems, leaving whole communities without water. While a minimum funding of primary infrastructure is normally secured by the state, water end users are usually left on their own. This means that the principle of *cost-recovery* – a key component of IWRM – gains particular significance at the local level. More adequate pricing of irrigation services at the secondary and tertiary level can halt the decay of irrigation infrastructure and enable water managers to improve service quality. In consequence, the economic sustainability of water management promoted by IWRM can reduce local grievances and rivalry caused by water scarcity.

However, as economizing water and irrigation service improvements cannot be realized ad hoc and overall water availability might remain insufficient in some places, distribution conflicts between end users will continue to arise. Adequate mechanisms for conflict management are needed for these cases. It is generally agreed that the responsiveness of water management to users' grievances and needs is best where management decisions are taken at the lowest appropriate level – corresponding to the *principle of subsidiarity*, another feature of IWRM. While water management was extremely centralized in Soviet times, district water administrations are increasingly overburdened by dealing with the growing number of private farmers. This is particularly acute in Kazakhstan and Kyrgyzstan, where the land privatization process is well advanced. In these cases, local distribution conflicts are most likely to be solved if allocation decisions are made by decentralized management structures and based on broadened users' participation.

One possible – and widely used – instrument to facilitate users' participation is the creation of *Water User Associations* (WUAs): Irrigation farmers are encouraged to unite within these organizations to manage their own water supply at the local level (Svendsen/Trava/Johnson III 1997; Vermillon/Sagar-doy 1999). They are expected to decide on water distribution themselves and to care and pay for infra-

structure operation and maintenance. Similar to other forms of decentralization, this direct implication of end users in service provision is supposed to improve the quality and promptness of water management through the strengthening of bottom-up communication and control (Wegerich 2000; Mott MacDonald 2003). The WUA model promoted by international donors (e.g. World Bank and Asian Development Bank) also foresees the establishment of a specific conflict resolution committee within each WUA, composed of several elected WUA members. Due to the recent establishment of most Central Asian WUAs, it is too early to judge on the success of these bodies. But if they gain strength and ownership – building on existing traditions and inherited institutions (cf. O'Hara 2000: 373) – these participatory arbitration mechanisms could significantly contribute to preventing local scarcity conflicts.

54.5 Barriers to the Implementation of IWRM-Solutions to Malthusian Concerns

The analysis above has shown that IWRM generally has the potential to enhance 'second order resources' and thus the adaptive capacity riparians need to de-escalate and constructively manage their water conflicts. IWRM-inspired reforms offer substantial gains to all water users and could decrease tensions over water in Central Asia.

However, progress into this direction has been limited up to date. Official declarations routinely make reference to IWRM, but concrete action is lacking. Thus, the question arises how this gap between the conceptual appeal of IWRM on the one hand and the lack of governmental action towards its (in theory mutually beneficial) implementation on the other hand can be explained.

Simply put, IWRM is politically blind (Swatuk 2005), although it has been developed in explicit response to technocratic, 'engineers' water management. With regard to the prospects of international basin-wide management, creating 'win-win' solutions by re-allocating water presupposes that property rights are defined in advance (Van der Zaag/Seyam/Savenije 2002: 20). If the initial distribution of water use rights is already controversial, it remains unclear how benefits from joint management will be distributed and individual losses compensated. Overcoming cooperation problems for realizing win-win solutions also presupposes a minimum of mutual trust and confi-

dence as well as a strong arbitrating authority, as the institutionalist perspective of IR emphasizes. IWRM neither provides answers to asymmetries of power – the realist IR scholars' main concern: Uzbekistan as the regional hegemonic power is much less dependent on the other riparians' cooperation than vice versa.

However, these typical problems of international cooperation – highlighted by the institutionalist and realist schools of IR – do not seem to constitute the core of the problem in Central Asia. Property rights are more or less formally defined by the Soviet quota system and subsequent agreements (Ryabtsev 2003: 1). The principle of win-win exchanges of irrigation water against energy resources has been accepted and partly implemented. Uzbekistan's military and economic power is balanced by Kyrgyzstan's control over the Toktogul dam, illustrated by the fact that the Kyrgyz did already change its flow regime in Uzbekistan's disfavour. Personal networks from Soviet times make sure that the international conflicts do not escalate, and the Central Asian states display impressive solidarity in applying for funds from international donors for the generalized 'conferencitis' and 'workshopitis' of IFAS and ICWC (Sehring 2002: 13–15, 18; Mason/Bichsel/Hagmann 2003: 21).

By far more challenging is the implementation of demand-management as a means for mitigating absolute distribution conflicts, which represent a much acuter danger than the international conflicts over relative water distribution. Besides public investment into better infrastructure, incentives for water-saving are key in this regard. These incentives are however difficult to implement in the economic context of Tajikistan, Turkmenistan and, most importantly, Uzbekistan. In contrast to Kazakhstan and Kyrgyzstan, land privatization has remained superficial or virtually non-existent (Turkmenistan) in these three countries. The lack of secure and long-term land rights diminishes farmers' interest to invest into better, water-saving infrastructure, which would prevent water-logging and salinization of the soils.

In addition, agricultural markets are strictly regulated, if not to say repressive. Farmers are not free to choose what they plant, and production targets are maintained until today. Most importantly, farmers are ordered to grow a high percentage of cotton, a rather water-intensive crop. The cotton market in turn is controlled by official (Turkmenistan) or unofficial (Uzbekistan, Tajikistan) monopolies, which buy the produce at prices far below the world market and thus pick up significant rents. Forced labour – mostly

school children and students – is widely used by authorities for the cotton harvest in order to further reduce production costs (ICG 2005: 17–25). In the end, the miserable prices paid to farmers¹⁰ do not allow introducing or raising water fees, a crucial element for increasing water use efficiency.

Consequently, significant advances in demand-management presuppose more liberal land and agricultural markets in Tajikistan, Turkmenistan and Uzbekistan (ICG 2002: 2). Substantial liberalization is however unlikely to occur, since the cotton business plays a key role in the countries' political economy (ICG 2005: 12–16; Mason/Bichsel/Hagmann 2003: 21). In Uzbekistan, for example, half of the national hard currency revenues come from cotton exports. National elites monopolize the rents from this lucrative business. At the same time, farmers are increasingly trapped in debt, as they are less and less able to pay back loans for agricultural inputs provided by the same cotton companies. Due to this increasing dependence, national and local elites successfully control the rural population, whose economic situation has significantly worsened since Soviet times while their Kolkhozes and Sovkhozes have not changed much more than their legal form.

This political economy of the cotton industry also provides explanations for the fact that the decentralization of irrigation management hardly advances in Uzbekistan and Turkmenistan. Even where the political context is more liberal – in Kazakhstan and Kyrgyzstan – and numerous WUAs have been created, they face serious difficulties. Similar to most decentralization efforts, WUAs are appealing in theory but more difficult to make work in practice. Local power asymmetries do not disappear with the simple establishment of these associations, and their conflict-preventing potential thus struggles to materialize (Herrfahrdt/Kipping/Pickardt/Polak/Rohrer/Wolff 2006).

The realist and institutionalist school of IR cannot account for these intra-state factors of political economy, as they tend to regard states as black boxes. In order to identify blockages and ways how to implement IWRM at the transboundary level, analyses need to take a closer look at national politics. This is what Andrew Moravcsik (1997) has promoted under the label 'republican liberalism': taking seriously how governments' specific preferences are shaped.

10 The average monthly income of those working in the cotton field is US\$ 2 (information kindly provided by one of the anonymous reviewers).

54.6 Conclusion: How to Advance?

The Malthus-inspired, social science discourse on resource conflicts is able to adequately describe Central Asia's main water conflicts: the international upstream-downstream conflict over relative water distribution, the international upstream-downstream conflicts over absolute water distribution as well as the diverse local scarcity conflicts. As we have seen, the prescriptive concept of IWRM is complementary to the social science analyses in general and IR analyses in particular: It suggests promising ways for managing the conflicts in question: Basin-wide integrated management and resulting inter-sectoral re-allocation of water resources would create win-win-solutions to the relative distribution conflict. The integration of quality aspects, a better consideration of water-land interaction and, above all, demand-management could mitigate the causes of absolute distribution conflicts. Finally, decentralization of and user participation in water management would support conflict management at the local level.

However, a third element - in addition to the conflict analyses and IWRM - is lacking up to date: strategies how to implement the proposed solutions. While IWRM in theory creates opportunities for compensating short-term losers of water management reforms, illegitimate, vested interests in maintaining the status quo can hardly hope to gain from it. In our example, the national elites benefiting from the political economy of cotton will not be willing to accept far-reaching, IWRM-inspired reforms, however beneficial they would be for their respective societies and Central Asia as a whole.

If social science analyses of water problems in conjunction with prescriptive concepts like IWRM are meant to have impact 'in the real world', efforts need to be intensified in the area of implementation strategies (cf. GWP-TEC 2004 as a positive example). Based on an adequate problem analysis, IWRM indicates the direction to take, but it cannot tell how to make decision-makers choose this direction. If the gap between analytical tools and prescriptive concepts can indeed be bridged, as demonstrated in this chapter, the gap between theory and action is a more challenging one. Conventional IR approaches and prescriptive concepts like IWRM need to be complemented by a profound knowledge of domestic politics and power structures within the societies in questions - as proposed by Moravcsik's 'republican liberalism' - if they are to identify realistic ways for solving water problems. Both analytical and prescriptive thinking in hyd-

ropolitics should keep this in mind in order to improve prospects for seeing possible solutions materialize in action. Due to the pressure global environmental change is increasingly exerting on human livelihoods worldwide¹¹ - and especially in developing regions - solving water problems in practice will indeed be key to alleviate human suffering and enhancing social and economic development.

11 For Central Asia cf. Giese/Sehring 2007.

55 Environmental Security in Central Asia and the Caspian Region: Aral and Caspian Seas

Eva Rakel

55.1 Introduction¹

This chapter identifies the main environmental risks in Central Asia (CA) for the five former Soviet republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, as well as for the Caspian Region (CR) of Azerbaijan, Kazakhstan, Iran, Russia, and Turkmenistan, addressing potential or existing areas of conflict. The main question is: Will Central Asia and the Caspian Region be areas of conflict or of cooperation in the near future, and what are the prospects for joint environmental management?

Regional cooperation among states in Central Asia and in the Caspian region is necessary both to reduce environmental pressure and the related security risks. Inter-state cooperation particularly on water allocation has been the subject of various regional and bilateral negotiation processes in recent years, often resulting in formal agreements, joint commissions, and the development of policies and measures for joint water management. Yet, agreements are not enough if they are not efficiently implemented.

During the Cold War 'security' was a military-dominated concept closely related to national security based on the (neo)realist school of international relations (Morgenthau 1948; Thompson 1960; Carr 1939; Waltz 1959, 1979). National security meant the construction of identities 'under threat' and how to contain such threats to 'political order'. In the (neo)realist school the main subject of analysis is the state. According to this theory international relations is the space where states struggle with one another to enlarge their power by increasing their control of territory. These theories do not offer any framework to better understand different societies and groups of people that are unevenly threatened by the forces of

environmental degradation in a world that is increasingly interdependent, but highly asymmetrical.

Efforts to reconceptualize security include new 'critical geopolitics' (Agnew/Corbridge 1995; Ó Tuathail 1996; Amineh/Houweling 2004/2005) and discourses by political scientists, sociologists, political geographers, peace researchers, and strategic studies experts where security is conceived as a contested concept that involves not only military, but also socio-economic and environmental components (figure 55.1).

Contrary to the neorealist school, critical geopolitics does not take only the state, but also non-state actors (transnational corporations, human rights activists, environmental organizations, terrorist groups), as referents. Environmental insecurity is the result of a growing number of ecological problems such as global warming, resource depletion and trans-boundary pollution. Simon Dalby (1992, 2002, 2006) relates environmental security to social and political practices of dominance in local, national, and international politics. He argues that knowledge and presentation of economic degradation is neither scientifically neutral nor politically innocent. Thus, a new understanding of the relationship between human economic activity, ecosystems, and our perception of human 'progress' is needed beyond the state-centric discourse on 'national security' that is often limited to the military security dimension.

The regions of CA and CR are confronted with many serious environmental problems, most of which come from the Soviet period. Among these environmental problems are the desiccation of the Aral Sea, as a result of wasteful irrigation procedures for the cotton monoculture, as well as the extraction of petroleum and related pollution in the Caspian Sea, the pollution of drinking water, salinization of the soil, soil erosion, and consequences of nuclear weapons testing at Azgzyr, Lira, Aral, Say-Utes, and Semipalatinsk-Kurchatov in Kazakhstan.

1 I thank Mehdi Parvizi Amineh for providing me with material, criticism, and comments.

Figure 55.1: Map of Central Asian Countries. **Source:** Everett-Heath, Tom (Ed.): *Central Asia-Aspects of Transition* (London – New York: Routledge Curzon 2003). Permission was granted by the publisher.



These environmental problems were already serious political issues during the Soviet period, and their solution is now crucial for political and economic development and stability in the region. Environmental risks may become security risks when there is a lack of access to resources for basic needs (water, soil, air, and energy), when widespread negative impacts on public health become evident, and when agricultural productivity, energy security, and economic development are prevented. They do not necessarily trigger violent conflict, but tension could increase drastically when the environmental pressures accumulate and coincide with unfavourable social, economic, and political conditions such as an overall lack of democratic political culture, a weak governance structure, poverty, mass migration, high unemployment, demographic pressure, terrorism, and ongoing border disputes (Brauch 2003).

Regional cooperation among the CA and CR states and non-governmental organizations (NGOs) is

necessary to reduce environmental pressure and resulting risks. Inter-state cooperation particularly on water allocation has been subject to various regional and bilateral negotiation processes, often resulting in formal agreements, joint commissions, and the development of policies and measures for joint water management.

This chapter offers an overview of the social, political, and economic developments in the eight post-Soviet Republics of Central Eurasia (CE: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) (55.2). Then environmental risks (55.3) are identified; national, regional, and transnational policy measures to counter these risks are discussed (55.4); and the prospects for joint environmental management of environmental problems by the CE countries are reviewed (55.5), with a special focus on the Aral Sea and the Caspian Sea as two main ecological systems at risk. While the role of NGOs in CE is acknowl-

edged, the main focus will be on the governments and their role in environmental management.

55.2 Post-Soviet Central Eurasia

Since the fall of the Soviet Union several Eastern European countries have embarked on a transition to market economy and democracy. But this process has not yet reached CE. In 1991 the eight CE republics² for the first time in history became independent nation states. Although it was expected by some that independence would automatically lead to democracy, in all eight states authoritarian regimes have emerged.³ The causes for the rise of such 'strong presidentialism' were a fragmented and weak society, related social forces, and backward economic structures, in contrast to most of the Eastern European countries (Amineh 1999).

Independence came almost overnight and confronted these newly independent states with a complex rapid economic and social transition, and the establishment of a new political order. Their response to these challenges is similar, due to their common experience of more than 70 years of Soviet rule. The challenges of dismantling the Soviet power structure and launching a socio-economic development programme is complemented with the struggle for survival of various social forces. The top priority on their political agenda has been the prevention of ethnic and social conflicts rather than the introduction of Western-style democratic procedures or the management of environmental risks. This has several reasons:

- the challenge to create nation states while preserving the multiethnic character of the countries;
- the dismantling of the Soviet power structure while being confronted with social upheavals and rising radical Islamic forces;
- the economic imbalances between urban and rural oriented areas;
- becoming politically and economically independent from Russia⁴;
- the existence of weak legal structures preventing the needed large scale Foreign Direct Investment (FDI), especially in the energy sector, as well as the implementation of agreements of management of environmental risks.

While there has been movement in the transition to a market economy, the years since 1991 have also been a period of social and moral disaster. The problems

of transition attract much international attention due to the region's huge energy resources. Transnational Oil Corporations (TNOCs) already have made large-scale investments. Competing export pipeline projects create tensions among various state actors interested in the region (the United States, the European Union, China, Japan, Turkey, and transit countries such as Georgia and Armenia). Whether it will be possible to attract FDI to fully exploit the region's economic

2 *Kazakhstan* is the largest CE country, with an area of 2.7 million km² but a population of less than 15 million, of which about half is ethnically Kazakh. In the north lives a strong Russian minority. Other ethnic minorities include Ukrainians, Uzbeks, and Germans. Kazakhstan is rich in oil, gas, and mineral resources. It comprises a large diversity in landscapes and ecosystems. Kazakhstan's geographic destiny is primarily shaped by China and Russia as well as the Caspian Sea. *Kyrgyzstan* is mountainous and inaccessible. The majority of its population lives in the peripheral areas of the country. Kyrgyzstan has a complex ethnic composition, apart from ethnic Kyrgyz, are Uzbeks, Russians, and others. Kyrgyzstan has only limited natural resources. The country shares borders with China, Kazakhstan, Tajikistan, and Uzbekistan. *Tajikistan* has emerged from a civil war during 1992–97. Tajikistan has a population of 6.2 million people of which about 64 per cent are Tajik, and a large Uzbek minority of 25 per cent. The country borders Afghanistan, China, Kyrgyzstan, and Uzbekistan. *Turkmenistan* covers an area of 488,100 km². The country has large reservoirs of gas and substantial oil reserves. The country has the smallest and ethnically most homogenous population of the CA republics. Turkmenistan has borders with Afghanistan, Iran, Kazakhstan, and Uzbekistan. *Uzbekistan*, has the highest population density. The majority of the population is Uzbek, with ethnic minorities of Russians, Tajiks, and Kazakhs. Uzbekistan has a variety of resources; including natural gas, oil, gold, and silver. Both the Aral Sea and the Ferghana Valley—two of the main areas of conflict in CA—lie in Uzbekistan (Amineh 2003: 39–43, OSCE/UNDP/UNEP 2003). Only in Georgia and Armenia does the Muslim population amount to less than 50 per cent of the total population. Compared to its neighbours, Armenia had an advantage in its effort of nation building because of its homogeneous society. It also had no legacies of autonomous and regional separatist movements like in other CE countries, a fact which promoted political consensus and mobilization. Furthermore, religion serves as a unifying national force. More than 94 per cent of its population are Christians, most being Armenian Orthodox. Linguistically and culturally Azerbaijan has a long Turkic and Persian tradition. Almost 94 per cent of Azerbaijanis are Muslim, most of whom are Shi'i Muslim. Georgia is an important link and transit country between Asia and Europe.

potential will largely depend on the political stability in these countries. Economic growth is not necessarily a reliable indicator for economic or social health, because it is often based on a sharp rise in inequality and an explosive growth of intense misery and poverty. The experience of the past 15 years has often been discouraging. The people in CA and the CR have paid a high price with the rapid rise in unemployment and fall in real wages and pensions that have plunged millions into poverty. Today there is a wide income gap between rich and poor (Amineh 2003: 29–55; Kaser 2004/2005: 145–159). This situation might worsen if environmental problems such as the desiccation of the Aral Sea as well as the pollution of the Caspian Sea, are not solved.

55.3 The Aral Sea crisis

The most visible environmental disaster in CA is the desiccation of the Aral Sea, once the world's fourth largest brackish inland water reservoir. Now, it is one of its most devastating environmental problems, with an almost collapsed ecosystem. Within 30 years (1960–1990) the surface of the Aral Sea shrank to a half of its original size from 66,900 km² to 36,500 km². Its volume shrank by two thirds from 1,090 to 310 km³. By 2010 the Aral Sea's size may decline to 21,058 km² and its volume to 124 km³ (Spoor/Krutov 2004/2005: table 55.1).

During the Soviet period great amounts of water were diverted from the Amu Darya and Syr Darya rivers for the expansion of cotton production. The Amu Darya (Oxus) and Syr Darya (Jaxartes) originate in the eastern mountains and then cross the Kara Kum and Kyzyl Kum deserts before reaching the Aral Sea. With a length of 2,212 km the Syr Darya is the longer river, but it carries less water than the Amu Darya. It

flows from the Tyan Shan Mountains in northern Pamir then crosses Tajik and Uzbek territory, turning northwest through Kazakhstan to the Aral Sea (Micklin 2000: 7).

In the Aral Sea Basin (consisting of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Afghanistan, and Iran) the five CA countries are confronted with an environmental and human catastrophe. In the short-term, damage control rather than a reconstruction of the Basin's original ecosystem will be on the agenda. This can only be reached if all five CA countries cooperate. The strategically most important countries in the Aral Sea Basin are Tajikistan, whose complete territory lies within the Aral Sea Basin, and Kyrgyzstan, that controls the flow of the Syr Darya.

Prior to the Soviet period 75 per cent of Central Asia's population lived from the Aral Sea, which contained almost 90 per cent of its surface water. The Aral Sea Basin was a cultural, economic, and geographical centre for the region (Allison/Jonson 2001: 70), the Amu Darya and Syr Darya were living space for numerous flora and fauna, and the magnitude of the Aral Sea balanced the climate which was relatively mild in the Aral Sea region compared to other areas in CA (Engelman/Pavlakovic 2001: 149; figure 55.2).

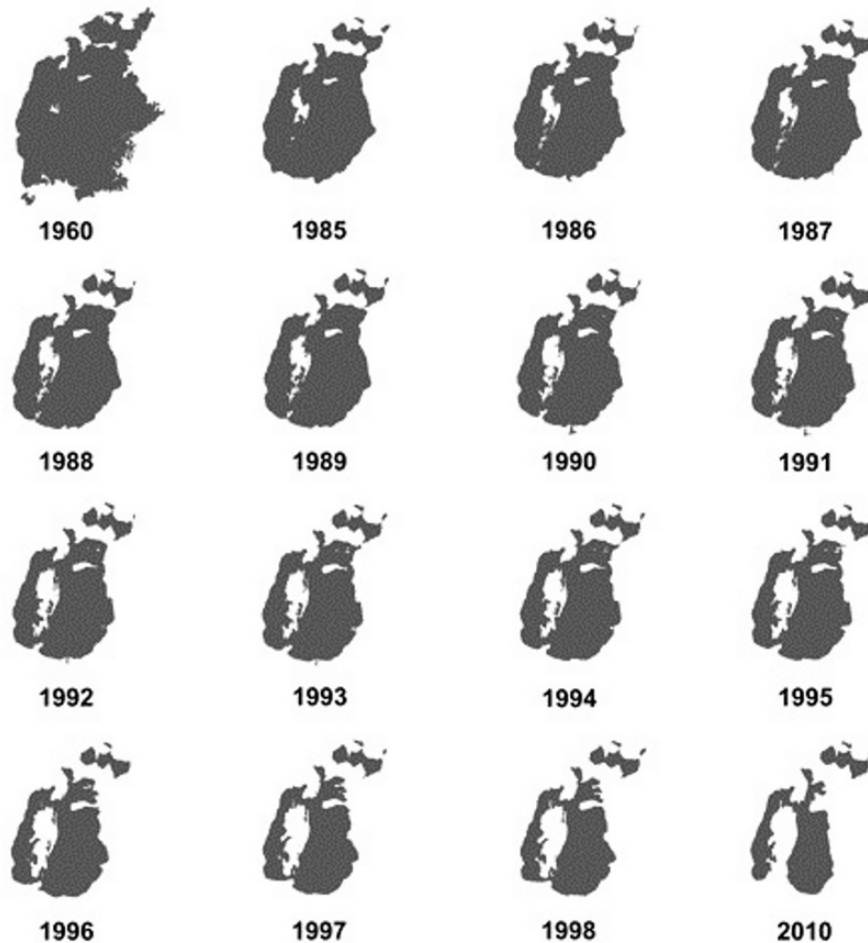
When the Soviets started the massive cultivation of cotton crops in the upstream regions of the Amu Darya and the Syr Darya, this harmonious balance was disturbed. While the immediate disaster of the Aral Sea is the result of inefficient irrigation, the roots of the problem can be found in the inappropriate strategy of economic development in CA during the Soviet period, when the Soviet planners stressed the production of agricultural primary products (mainly cotton, that needed most of the irrigation) instead of finished products or other traditional crops (Levintanus 1992; Rumer 1989). Between the 1950's and 1980, cotton production in CA rose from 2.6 million tonnes annually to 5.6 million tonnes (Gleason 1990). In Uzbekistan alone the tonnage of cotton per hectare rose from 1913 via 1960 to 1980 from 1.2 via 2.0 to 2.7 respectively (Spoor 1993: 19).

In 1980, 84 per cent of the water for irrigation in CA came from the Amu Darya and the Syr Darya rivers, of which 62 per cent was lost to evaporation and irrigation, and only 38 per cent returned to the rivers (Micklin 1991: 13). Consequently, the Aral Sea received less than 1,000 cubic kilometres of river water in the last 35 years, the sea level declined and the Aral Sea's volume of water was reduced (Engelman/Pavlakovic 2001: 149). Although in 1927 Soviet scientists

3 The recent popular events in some of the former Soviet countries, first the Rose Revolution in Georgia in November 2003, then the Orange Revolution in the Ukraine in November 2004, and finally in Kyrgyzstan in March 2005, have swept away the old Soviet and post-Soviet order. How far these events have been a clear step towards democracy in these countries remains to be seen. The brutal suppression of protests in the Andijan province of Uzbekistan in May 2005 by Uzbek President Islam Karimov has shown us that, in contrast to the other leaders, he is not willing to yield to the people's will (see various articles on: <<http://www.eurasianet.org>>).

4 The CE states still depend on Russia for economic development and military assistance.

Figure 55.2: Imagess of a Shrinking Aral Sea (1960-2010). **Source:** Spoor, Max; Krutov; Anatoly: "The Power of Water in a Divided Central Asia", in: Amineh, Mehdi Parvizi; Houweling, Henk (Eds.): *Central Eurasia in Global Politics: Conflict, Security and Development* (Leiden, Boston: Brill Academic Publishers, 2004/2005): 285.



were aware already of the environmental consequences of these irrigation practices, the USSR continued to emphasize short-term production over long-term sustainable development (Glantz 1999: 3). Thus, disastrous Soviet planning led to serious environmental, economic, and social consequences. Six environmental risks resulting from these practices can be identified in the Aral Sea Basin:

1. Lowering of the sea level of the Aral Sea by an average of 17 metres and reduction in the volume of water in the sea by two thirds.
2. Disruption of the climatic balance with temperatures in January 1980 to 1988 being 3 to 3½ °C lower than the previous annual average, and in July during the same period 1-4 °C higher. Simultaneously the frequency of dry and hot seasons has significantly increased, while the vegetative season has decreased to 170 days.
3. Increase of dust storms and a higher amount of dust on glacial surfaces resulting in the melting of glaciers.
4. Damage of the biological diversity in the Aral Sea Basin. Before 1960 the Aral Sea Basin was home to over 70 kinds of mammals and 319 types of birds. Now only 32 kinds of mammals and 160 types of birds exist in the Aral Sea Basin.
5. The changes in the Basin affect mainly the disadvantaged poor of 3-4 million of 44 million in an area of 440,000 square kilometres, mainly in the Ferghana Valley. However, consequences are worst near the shores of the lake, like in Karakalpakstan.
6. An increase in dust storms containing toxic salt residue. People who inhale these carcinogens have

a higher risk of experiencing infant mortality, respiratory illnesses, esophageal cancers, typhoid, and hepatitis (Peachery 2004: 4–6).

Additionally, the salinization of the soil makes the land in the Aral Sea area unusable for agricultural production. As Spoor and Krutov note: “The drying out of the Aral Sea is having far reaching consequences for the climate and biodiversity of the surrounding regions, while desert winds are transporting sand and salt over long distances, depositing millions of tonnes of (often polluted) salts on agricultural land all over the Basin area. Due to inadequate and badly maintained drainage systems, water logging is widespread and soil salinity is an increasing environmental problem. The worsening ecology of the region makes living in many areas – such as Karakalpakstan in Uzbekistan and Kyzlorda in Kazakhstan, where poverty and environmental degradation are linked in a vicious downward spiral—quite inhospitable” (Spoor/Krutov 2004/2005: 595).

The economy of Karakalpakstan used to depend on fishery in the Aral Sea. The withdrawal of water for irrigation led to a rapid increase in salinity of the Aral Sea, an effect to which many of the native fish could not adapt. By the 1980’s commercial fishing came almost to a halt. In 1959 the fishermen fished 50,000 tonnes of fish (mainly carp, bream, and pike-perch). In 1994 those few fishermen that still fished there retrieved 5000 tonnes of carp alone (IFSAS/UNDP/World Bank 1997: 23–24).

In Uzbekistan the agricultural heritage of the monoculture of cotton production makes land deterioration and contamination its second largest problem for human security. The deterioration of the Aral Sea leads to severe health problems, and the lack of employment to migration from the Aral Sea to other regions in the country, which now have to cope with an immense increase in population density (OSCE/UNDP/UNEP 2003: 25). This could lead to violent confrontations on the intra and inter-state level.

55.3.1 Possible Areas of Conflict due to the Aral Sea Crisis

When the Soviet Union collapsed domestic water crisis became an international problem for the countries of CA. The two rivers that constitute the Aral Sea Basin became international waters comprising five countries. The Amu Darya affects Tajikistan, Uzbekistan, Turkmenistan, and Afghanistan, while the Syr Darya affects Kyrgyzstan, Uzbekistan, Tajikistan, and Kazakhstan as well as Afghanistan. Physically the rivers

unite these countries, but since 1991 they demarcate borders. These political borders between the five republics had direct socio-economic and political consequences for the 35 million people in the Aral Sea Basin. In the downstream areas, e.g. in Karakalpak, it became unclear who would be responsible for the environmental crisis in the Aral Sea Basin. Would it be Russia that – in accordance with earlier Soviet agreements – would help the Central Asian republics restore the Aral Sea, or would the five CA states have to find a solution to the water crisis by themselves (Weinthal 2002: 6)?

The demarcation of boundaries, a significant population increase, limited water resources, and poverty are important factors that could lead to intra and inter-state conflicts. Since the independence of the CA states, over 50 per cent of the water supplies for Uzbekistan and the Kazakhstani ‘oblasti’ (provinces) of Kyzi-Orda and Shymkent and 98 per cent of Turkmenistan’s water supplies, come from foreign resources, namely Tajikistan and Kyrgyzstan. Kazakhstan, Uzbekistan, and Turkmenistan are the three downstream states of the Aral Sea Basin and they rely on water from Kyrgyzstan and Tajikistan where 90 per cent of the Basin’s water resources are located (Allison/Jonson 2001: 70–71).

The *Syr Darya River* comes from the mountainous region of Kyrgyzstan; it flows through Uzbekistan and Kazakhstan before it reaches the Aral Sea. *Kyrgyzstan* is the region’s main supplier of water for irrigation. Having a great amount of water it lacks coal, oil, and gas. In exchange for providing the other CA countries with water Kyrgyzstan receives natural gas, coal, and oil from Kazakhstan and Uzbekistan (Toursonof 2004).

Since the disintegration of the Soviet Union Kazakhstan and Uzbekistan charge Kyrgyzstan for supplying gas and oil, and Kyrgyzstan runs the Toktogul dam for power generation in the winter to satisfy its energy shortages because Kazakhstan and Uzbekistan do not fulfil the delivery of heating resources according to the agreement mentioned above. As a result, Kazakhstan started to contain the water behind the Chardana dam. When the capacity of its reservoir was exceeded the water broke through into the Arnsai depression in Uzbekistan. This depression filled up creating lakes out of the former lowland marshes of Aidar and Tuzkon. Now, every year these lakes fill up with water, flooding the surrounding countryside, villages, pasture lands, and infrastructure (power and communication lines, roads, and gas pipelines).

In Uzbekistan the costs of flooding in 2001 were estimated at US\$ 3.8 million (Lange 2001). In early 2004 the Chardara dam almost broke, due to extremely high water flows from Kyrgyzstan.⁵ Kyrgyzstan has been accused several times, in 1993, 1998 and 2001, for releasing too much water from the Toktogul dam down to the Syr Darya in the winter and releasing not enough during the summer. As a consequence many cotton fields in Uzbekistan and Kazakhstan were flooded in the winter and died out in the summer (Allouche 2004: 99).

Like Kyrgyzstan, Tajikistan has only limited oil, gas, and coal resources, and relies on its neighbouring countries for these resources. Thus, Tajikistan wants to develop its hydropower potential and is confronted with the problem that sufficient water has to be ensured for irrigation in Uzbekistan and Kazakhstan in spring and summer. In recent years access to contested water supplies have led to tensions and violence between Kyrgyz and Tajik villagers on the borders of the two countries (ICG 2002a: 5, 7).

The *Amu Darya River* is of great importance for the irrigation systems of Turkmenistan and Uzbekistan. In Turkmenistan 80 per cent of the land is desert. All but one province in Uzbekistan depend from 71 to 100 per cent on external water supply (Bushkov 1990: 4-5, 7-9). Although gas is the main export product in Turkmenistan, the amount that cotton exports contribute to the state budget has continued to rise since 1991 (IMF 1994: 125). Because of its great reliance on agriculture, irrigation is a main security issue for Turkmenistan (ICG 2002a: 2).

Intensive cotton farming in the last decades has drained freshwater reserves and caused the salinization of the Amu Darya River, soil erosion, water and soil pollution by pesticides, and the building of dams. This has led to the pollution of drinking water and has affected agriculture in Turkmenistan. The Amu Darya River provided drinking water for Dashoguz province. According to Arslan Berdiyev, project officer of the United Nations Children's Fund in Ashgabat, only about 20 per cent of the population living in the Dashoguz province (1.2 million people in total) have access to clean drinking water. It is estimated that about 40 per cent of the people living in the region of the Aral Sea have kidney problems due to salinated drinking water (Blua 2004).

Turkmenistan and Uzbekistan have experienced tensions on water allocation from the Amu Darya.

For example, the Dashhowuz province (Turkmenistan), Khorazm province (Uzbekistan), and the Autonomous Republic of Karakalpakstan (Uzbekistan) depend for their water supply on the lower Amu Darya. Here, tensions arose when Turkmenistan after independence in 1991 built a canal away from the Tuyamuyun Reservoir to improve water delivery for the oasis in the lower reaches of the Amu Darya, and also to improve its control over the water supply within Turkmenistan (Kloetzli 1994; Smith 1995).

In Uzbekistan the relation between ethnicity and territory is the most accentuated and the most fragile to conflict in CA. Uzbekistan has only little control of its water supply and has a large Tajik population that dominates its source. Two out of four areas with the highest water vulnerability in Uzbekistan are located in the Ferghana Valley (Smith 1995: 361-62) where the interrelation between resource issues, ethnicity, economic development, and state formation in the post-Soviet context becomes obvious. The fertile Ferghana Valley covers only 5 per cent of the territory in post-Soviet CA but is home to 20 per cent of the region's population, including large minorities of ethnic Kyrgyz, Tajiks, and Russians. It is split among three countries: Uzbekistan, Kyrgyzstan and Tajikistan (figures 55.3, 55.4).

The Ferghana Valley produces a major share of the country's cotton and grain, and contains numerous manufacturing plants as well as natural gas and oil fields (Amineh 2003: 163). Forty-five per cent of the irrigated area of the Syr Darya Basin lies in the Ferghana Valley. The Ferghana Valley contains several of the most vital and productive irrigated areas, e.g. Jalal-Abad and Osh in Kyrgyzstan; Andijan; Namanagan, and Ferghana in Uzbekistan, as well as Leninalbad (Khujand) in Tajikistan. All these areas rely on the Syr Darya for irrigation. In June 1990, clashes over access to land and water broke out between Kyrgyz and Uzbeks in the Osh province, leaving 300 people dead (Spoor 1998: 425) and 1,000 people wounded. As a result of these clashes the Uzbek minority in Kyrgyzstan claimed an independent status for the Osh region (O'Hara 1998).

When the USSR disintegrated, the territorial borders that had only been created during the Soviet period gained in significance and became particularly sensitive between the three countries that share the Ferghana Valley (ICG 2002a). This valley, which is one of the poorest areas in CA with high unemployment rates, is also a breeding ground for radical Islamist groups, such as the Islamic Movement of

5 Interview in July 2004 with Jenniver Sehring, PhD student at Giessen University, Germany.

Figure 55.3: Water Issues in the Ferghana Valley. **Source:** Victor Novikov/Philippe Rekacewicz, UNEP/GRID-ARENDAL, April 2005, see at: <<http://www.relief-web.int/rw/RWB.NSF/db900LargeMaps/AHAA-6CYLV7?OpenDocument>>.



Uzbekistan and the *Hizb-ut Tabrir al-Islami* (Party of Islamic Liberation).

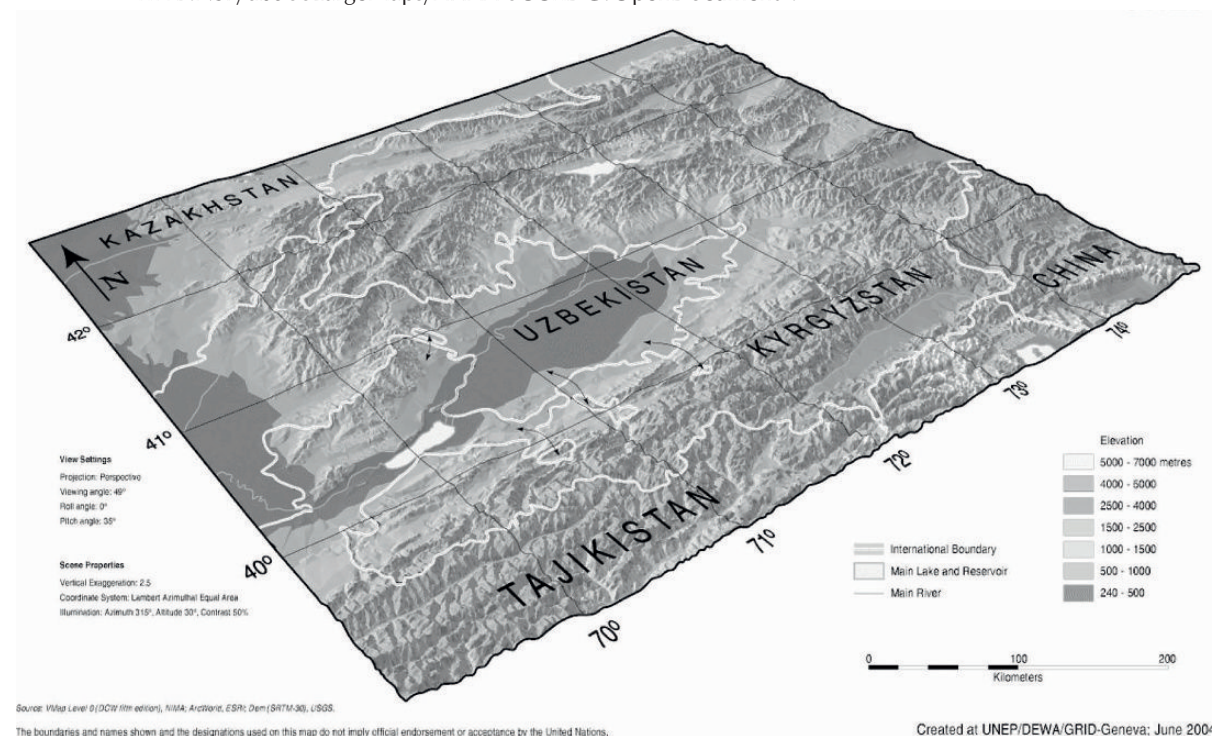
The competition for scarce resources between the different ethnic groups in the Ferghana Valley could have great effects on inter-state relations. Particularly, the predominance of Uzbeks (three-fourths of the population) in the Ferghana Valley contributes to tensions among different ethnic groups. Water from Kyrgyzstan flows through the Ferghana Valley. A reduction of the water flow by Kyrgyzstan could exacerbate

tensions between ethnic Uzbeks and ethnic Kyrgyz (Weinthal 2002: 121–22).

55.4 Caspian Sea Crisis

The Caspian Sea is the largest inland sea in the world. It has a length of more than 1,100 km and a width of about 200 to 400 km. It covers an area of 386,000 km². The environmental risks in the Caspian Sea are different in nature but equally severe as in the

Figure 55.4: Three Dimensional View of the Ferghana Valley Region. Source: UNEP and: <<http://www.reliefweb.int/rw/RWB.NSF/db900LargeMaps/AHAA-6CCRDG?OpenDocument>>.



Aral Sea. The deterioration of the Caspian Sea is another environmental risk to human security for the five littoral states of Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan. In the region around the Caspian Sea live about 14.7 million people thereof 6 million in Iran, 4.1 million in Azerbaijan, 3.5 million in Russia, 0.8 million in Kazakhstan, and 0.4 million in Turkmenistan (CEP 2002: 5). Most of these people live directly from the sea, especially from fishing.

The Caspian Sea has a low salinity, about one-third of the salinity of seawater. Due to this low salinity it has developed an extraordinary but also very vulnerable ecological system. The various types of fish that live in the Caspian Sea are among others the sturgeon, herring, mullet, carp, bream, pikeperch, roach, and salmon. It is inhabited by one of two species of freshwater seal and has great bird life of different species. The sturgeon is used for the production of caviar. In the past, 80 per cent of the world's caviar originated from the sturgeon in the Caspian Sea. Due to the overexploitation of the sturgeon since the fall of the Soviet Union, the annual catches have fallen from over 30,000 tonnes in the 1980's to less than 5,000 tonnes by 2000 (ITOPF 2003).

The Caspian Sea is also believed to have huge oil and gas resources. British Petroleum (BP 2004) esti-

mates the Caspian littoral states' proven oil reserves to be 216.3 billion barrels of oil (18.8 per cent of the world's total). Proven natural gas reserves are estimated at 2819.2 trillion cubic feet (44.6 per cent of the world's total).

Oil production started in Russian Azerbaijan more than 100 years ago, but it is only since the dissolution of the Soviet Union in 1991 that the Caspian region gained significantly more international interest, particularly among TNOCs which previously had been excluded from activities there. With the great attention paid to Caspian oil and gas resources since the dissolution of the Soviet Union, what became obvious also to a large public was the appalling state of the environment in and around the Caspian Sea. The petrochemical and refining complexes on the Absheron Peninsula in Azerbaijan have caused heavy land-based pollution. Spills from oil and gas drilling both onshore and in the sea itself have caused serious environmental problems. Untreated waste from half of the Russian population and most heavy industry in the Volga River empties directly into the Caspian Sea. Pesticides and chemicals used in the agriculture are threats to the Caspian Sea's flora and fauna. The existing and planned extraction of the Caspian hydrocarbon resources - heavily promoted by TNOCs - is a

direct as well as indirect source of environmental problems in CA and the Caspian region. Environmental risks include: fluctuations in the sea level, surge effects, the increasing salinity of groundwater, industrial pollution, loss of biodiversity, spills caused by transport of oil through the Caspian Sea by undersea pipelines and/or tankers. Little regional cooperation exists due to the unsettled dispute around the legal status of the Caspian Sea. Weak environmental laws and regulations or the unwillingness by local government to enforce them have great effects on the environment of the Caspian Sea. As industrial production declined in the first half of the 1990's due to economic decline there was also a reduction in the flow of industrial waste into the Aral Sea. Since the economic upturn from the mid 1990's pollution has risen again. The pollution of beaches and coastlines makes swimming almost impossible, and toxic waste threatens to contaminate drinking water. In the area close to the Caspian Sea a higher rate than average of cancer has been noted, and a decline in sturgeon catch threatens the survival of the caviar industry (EIA 2003).

A main obstacle for a solution of the environmental problems in the region is the unsettled dispute on the legal status of the Caspian Sea among the five littoral countries (Peimani 2004/2005: 261-278; Amineh 2003). Their interests to profit most from their hydrocarbon resources have led to a neglect of environmental issues hampering a co-ordinated regional policy on environmental security and management of the Sea's resources. Such a policy is necessary to improve the environmental situation and reduce the potential for conflict among the five neighbouring countries (Zonn 2001: 69-70).

55.4.1 Possible Areas of Conflict on the Caspian Sea Crisis

The Caspian Sea's oil and gas resources must be transported long distances either by undersea pipelines or tankers (Winrow in this volume). Production and export of the offshore oil reserves has been limited due to the unsettled legal dispute (Amineh 2003). If production should increase, the areas at risk to be polluted are first a belt of deep-water oil fields between Azerbaijan and Turkmenistan, and the area around the Kashagan oil fields in the north Caspian off Kazakhstan, which is considered as the largest oil field that was discovered during the last 40 years. Most of the infrastructure needed to bring the offshore oil to international markets is not yet existent.

A large capacity undersea pipeline is planned for the oil fields in Azerbaijan. Other export options are the transportation of oil by rail, ship, or a combination of one of the two with pipelines. For example, the Baku-Tbilisi-Ceyhan pipeline that is expected to have a capacity of 1 million bbl/d (Amineh/Houweling 2004/2005). The Baku-Tbilisi-Ceyhan pipeline was officially opened on 25 May 2005. Another possibility is to connect a long-distance undersea oil pipeline to several shorter pipelines that serve offshore facilities. Such an option would increase the risk of oil release into the Caspian. Until now, there have been no major oil spills, a threat exists due to substantial pressure from exploratory drilling, offshore production, shipment of refined products, and increases in crude oil shipment (ITOPF 2003).

According to the Caucasus Environmental NGO Network (CENN) the Baku-Tbilisi-Ceyhan pipeline is economically, politically, and environmentally not viable. The construction costs are much higher compared to other transportation options such as through Iran to the Persian Gulf. Moreover, the pipeline passes various areas of conflict (Nagorno-Karabakh, South Ossetia, Abkhazia, Chechnya, Dagestan, Ingushetia, and the Kurdish territory in Turkey), where a possibility of pipeline destruction exists. Additionally, European environmental legal standards are not met. The pipeline might threaten the Georgian Borjomi Valley, a natural resort through which it passes (Amineh 2003: 197).

The legal uncertainty on the Caspian Sea affects the ownership of many offshore oil fields and potentially investing TNOCs. Disputed oil fields cannot be developed and tensions among littoral states are possible on the ownership question. There is even a possibility for military confrontation, given the hostile bilateral relations among some Caspian states due to their security interests. For example, Iran and Russia are concerned about US political, economic, and military expansion in other Caspian littoral states. These concerns affect also their relations with the other Caspian littoral countries. The tensions in Azeri-Iranian relations divide the littoral countries into different camps, e.g. the United States and Turkey siding with Azerbaijan while Iran has supported Armenia with military equipment in the Nagorno-Karabakh conflict. Iran fears unofficial claims by Azerbaijan to its own Azeri provinces and the harassment by Azeri police and border guards of Iranian truck drivers, along with Azerbaijan's good relations with Israel. Both countries accuse each other of supporting political opposition groups. In July 2001 these differences

between Iran and Azerbaijan almost resulted in a military confrontation between both countries (Peimani 2004/2005: 263). On 23 July 2001 two Iranian Air Force planes overflew a BP/Amoco survey ship that was exploiting the *Araz-Alov-Shargh* bloc licensed by Azerbaijan. The same day an Iranian gunboat entered Azerbaijan's territorial waters and threatened to fire on the survey ship. Iran aims to enforce its own claims on this part of the Caspian Sea (Olson 2002). As a result BP/Amoco suspended their work in the Araz-Alov-Shargh/Alborz bloc. These developments could have a negative effect on joint environmental management in the Aral Sea Basin and the Caspian region.

55.5 Environmental Management in Post-Soviet Central Eurasia

During the Soviet period environmental issues often had a nationalist underpinning, as Horsman notes: "Grassroots opposition to environmental degradation and exploitation; inter-ethnic competition for land, water and other resources, [...] [served] as a conduit for nationalist and republican elite challenges to Moscow's authority" (Horsman 2001: 1).

In the late 1980's, the major political movements that were closely linked to environmentalism were *Nevada-Semipalatinsk* in the Kazakh Soviet Socialist Republic, and *Birlik* in the Uzbek SSR. Nevada-Semipalatinsk was founded in 1989 after 5,000 people listened to the Kazakh poet Suleymenov in Almaty who denounced nuclear testing and called for a public meeting. This movement contributed to the suspension of nuclear testing in Semipalatinsk and developed links with international organizations opposing nuclear testing, and organized investigations on the level of radiation sickness in the area (Ruffin/ Waugh 1999; Jalling 2003: 169). In 1991 President Nazarbayev declared the test site closed. Like Nevada-Semipalatinsk *Birlik* (see: <<http://www.birlik.net>>) opposed environmental degradation in Uzbekistan but was explicitly more nationalistic (O'Hara 1998).

Since independence in 1991 environmentalism is no longer tied to political issues. Horsman explains this with these three developments: a) the nationalist aspect has been removed since Moscow no longer is a focus of common action for republican elites, nationalists, and environmentalists; b) political and economic problems in post-Soviet CE outweighed environmental activism; c) the current political elites that also belonged to the Soviet elite discourage criticism

of their former and present roles in their countries' economic and environmental mismanagement (Horsman 2001: 2).

Several NGOs have emerged since 1991. Among these NGOs are the *Green Salvation* in Kazakhstan, the *Tabiat* of Tajikistan, the *Ashgabad Ecological Club* in Turkmenistan, *Ecology* in Kyrgyzstan and Uzbekistan, the *Union in Defence of the Aral Sea* and *Amudarya* in Karakalpakstan, and the regional *International Central Asian Biodiversity Institute*. Most NGOs are grassroots organizations formed by people with local knowledge. Environmental NGOs must act cautiously and are often considered as political opposition by their governments. And somehow this is true, considering that some groups have sought parliamentary representation (Jalling 2003: 172).

On the state level several regional and bilateral inter-state agreements, joint commissions, and common development of policies and measures on the allocation of water have been concluded and carried out among the CE countries. Conflicts on access to water seem less likely than previously thought (OSCE/UNDP/UNEP 2003: 30).

55.5.1 Environmental Management: The Aral Sea

During the 1980's the Aral Sea crisis was recognized by the Soviet Union and in the transition period considerations to solve the problems were discussed. But due to lack of funding and the economic crisis any environmental initiatives were stalled. One plan was to divert water from the river Ob to increase irrigation and provide some water for the Aral Sea. This project would have been very uneconomic but could also not be realized anymore in 1991 when the Aral Sea region was divided among the newly independent states (Tantont/Heaven 1999: 364). This project would have replaced one environmental disaster by another one (Brown 2002).

The Aral Sea crisis has forced the seven states of the Aral Sea Basin (the five Central Asian republics as well as Afghanistan and Iran) to find a common solution to it. For the CA countries this is a rather new situation. During the Soviet period all directives came from Moscow. So far, the involvement of the seven countries in the Aral Sea Basin in addressing environmental issues has been uneven. Kazakhstan and Uzbekistan are most involved, Kyrgyzstan, Tajikistan, and to a lesser extent Turkmenistan are hardly involved, and Iran and Afghanistan are not involved at all. These levels of difference in involvement have

made cooperation difficult. Between 1991 and 1994 ca. 300 agreements were signed on the Aral Sea crisis. On 18 February 1992 the five CA states signed the *Almaty Agreement* to solve water disputes (Allison/Jonson 2001: 70–71, 73). Based on this agreement these five countries established a working group to oversee its enforcement (Elhance 1997: 214). While the Almaty Agreement is the central regional framework of cooperation on the Aral Sea crisis, so far it has not become an effective plan of action.

To get World Bank funding for their water resource management projects the five CA states have established additional organizations, such as the *Interstate Council for Addressing the Aral Sea Crisis* (ICAS) and the *International Fund for the Aral Sea* (IFAS). The ICAS members are 25 high-level representatives from the five CA countries who meet twice a year to develop policy strategies related to water use and its distribution among its member states. Its legal status remains unclear and its jurisdiction overlaps with the *Interstate Water Management Coordinating Commission* that was created prior to the ICAS at the Almaty Conference in February 1992. The IFAS's main task is to fund Aral Sea programmes and channel funds from donor countries and international agencies. The share of the five Central Asian countries' contribution to the agency is very low (0.3 per cent of GNP of Kazakhstan, Turkmenistan, and Uzbekistan, and 0.1 per cent of GNP of Kyrgyzstan and Tajikistan), and they have been slow in paying their contributions (Allison/Jonson 2001: 73).

The disputes between the different regional organizations over authority of managing the Aral Sea crisis have complicated the situation, and the activities of international donors worsened the situation further. The World Bank, the United Nations Development Programme (UNDP), and the United Nations Environment Program (UNEP) have agreed as one of their main objectives to strengthen the institutional capacity of ICAS and IFAS, but they disagreed on what instruments to use. USAID has worked through the *Interstate Council for Kazakhstan, Kyrgyzstan and Uzbekistan* (ICKKU), an economic cooperative organization created in 1993 to strengthen cooperation among the Syr Darya states (Weinthal 2000: 2). USAID argues that by supporting the ICAS/IFAS the World Bank would also support the former 'nomenklatura' instead of propagating a reform of these organizations.

In 1991 the United Nations Environmental Programme (UNEP) published a *Diagnostic Study for the Development of an Action Plan for the Aral Sea*.

In September 1992 a preparatory World Bank Mission was established whose main aims were: "Stabilisation of the Aral Sea levels in a sustainable range; rehabilitation and development of the Aral Sea disaster zone; strategic planning and comprehensive management of the water resources of the Amu and Syr Darya and; building of institutions for planning and implementing the above programs" (World Bank 1993). Its goals should be achieved in three phases. In the first phase an *Emergency Aral Sea Environment Assistance Plan* (ESEAP) should be completed within two to three years to quickly restore the decreasing productivity of human and other resources in the Aral Sea area.

Phase 1 started in 1994 with an estimated value of about US\$ 200,000,000. It was hoped that this amount would attract donors to finance different aspects of the proposed programme. Although some useful proposals were submitted, the programme itself was only a compilation of projects submitted by different institutions. Some donor organizations undertook projects unrelated to this programme. There was no clear objective, and even though some projects achieved good results, the overall programme did not make a significant contribution to the solution of the Aral Sea crisis (Tantont/Heaven 1999: 364). In 2000 UNDP concluded that donor assistance for capacity building was ineffective, that the regional institutions have no clear mandate and that they depend too much on donor assistance (UNDP 2000a: 5–6).

55.5.2 Environmental Management-The Caspian Sea

In the Caspian region joint environmental management is even more difficult due to the unsettled dispute on the legal status of the Caspian Sea. Thus, no regional agreement was signed by all five littoral states, and conditions, protection and sustainable management of the Caspian Sea environment and its resources remains largely dependent on national legislation combined with international cooperative initiatives. Such a missing regional agreement that defines the ownership and usage of the Caspian Sea's oil and gas resources even worsens the relations among littoral states.

As all five states have claims to oil and gas resources and many TNOCs are active or willing to invest in the Caspian oil and gas business, there is an urgent need for finding a solution to these problems. Several efforts have been made to encourage regional

and international cooperation on the management of the environment of the Caspian Sea, but the results are not always good. All five littoral states have national laws on environmental protection and on the use of natural resources, but they have no specific laws for the protection of the Caspian Sea. Several multilateral agreements are worked out in 2005, e.g. "On the Protection of the Environment of the Caspian Sea", "On the Preservation and Management of biological resources of the Caspian Sea", "On the Co-operation of the Caspian states in the field of hydrometeorology and monitoring of pollution of the Caspian Sea". Iran, Kazakhstan, and Russia are signatories to the Stockholm Convention on persistent organic pollutants. The five littoral states participate in various other international environmental conventions (SAP 2003: 7).⁶

Kazakhstan, Russia, and Turkmenistan have adopted national contingency plans (NCP). Iran is finalizing its NCP, and Azerbaijan must still begin its NCP. Another initiative is to develop a regional contingency plan for the Caspian Sea led by the Caspian Environment Programme (CEP, at: <www.caspian-environment.org>; ITOPF 2003). The CEP is a joint organization of all five littoral states, the European Union (EU), United National Development Programme (UNDP), and the World Bank. Its goal is sustainable development and management of the Caspian environment (SAP 2003: 4).

The World Bank and the European Commission are also involved in other environmental programmes such as the *Emergency Response Caspian Region Thematic Centre* (ERCRTC) established in Tehran under the CEP. In 2005 ERCRTC has been working on reports for each littoral state, dealing with the emergency response arrangement as well as risks and sensitive resources in each Caspian state. It also encourages regional cooperation in spill response, improved communications strategies, the collection of incident information for databases, and the organization of spill-response-related courses and workshops. This includes a refinement of the Caspian Sea Plan concerning Regional Co-operation in Combating Oil Pollution in Cases of Emergency. Regional Workshops have been held so far in Tehran (April 2002) and Baku (November 2001, November 2002). Without a resolution of the legal status of the Caspian Sea

any regional effort on spill response remains unlikely in the short-term. No Caspian country possesses adequate technology to clean up oil spills. Except for Iran, the other four Caspian countries expect oil companies and transport companies to implement adequate response equipment and materials for small spills. In Baku a Tier 2-3 oil spill response base has been established providing emergency back-up to the Azerbaijan-Supsa pipeline on land and emergency response for offshore drilling and production activities off Azerbaijan. In Kazakhstan response vessels are ready and personnel is trained. Turkmenistan and TNOCs active there have updated their response capacity. For large spills the littoral states rely on international assistance (ITOPF 2003).

Due to their severe economic problems, in the coming years the littoral governments will give higher priority to FDI, economic reform, job creation, and education than to environmental protection. Environmental problems are not dealt with by many ministries and local governments. The countries often lack the financial resources and skills to carry out monitoring and enforcement activities necessary to manage environmental crises. Limited financial contributions by international donors to the region are a major constraint (SAP 2003: 8).

55.6 Prospects for Environmental Management and Conflict Avoidance in Central Eurasia

The CE region is confronted with many environmental problems with decisive implications for the region's future. It is unlikely that environmental problems could lead directly to violent confrontations within and between the CE states. Environmentally related conflicts in CE are related to other factors such as ethnicity, political instability, and declining and/or diverging economic and living standards. The management of environmental problems depends to a large extent on political, and not on environmental considerations. Most members of the political elites of the eight CE republics were part of the former Soviet elite. They decide now on economic, health, and environmental policies. Popular participation in environmental management is resisted. Unsuccessful policies of political and economic reform, as well as unsuccessful environmental management, could erode popular support for the current leadership in CE and even lead to political instability. Existing inter-state agreements are many, but hardly implemented. They

⁶ Strategic Action Programme for the Caspian Sea-Caspian Environment Programme, as approved at the Tehran Steering Committee Meeting of November 5, 2003.

may also be not sufficient to manage future environmental crises. Inter-ethnic relations could become tenser, if resource scarcity, environmental degradation, migration, and lack of substantive economic and political reforms continue. These factors combined could lead to social tensions and provide a

source of identification with radical political Islam. Thus, environmental issues in CE could act as major catalysts in intensifying already existing divisions, as well as having serious ecological, developmental, and health implications.

56 The Central Asian Water Regime as an Instrument for Crisis Prevention

Julia Wunderer

56.1 Introduction

Most large rivers in the former Soviet Central Asian states of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan are either border-crossing or border-shaping. Such transboundary river systems increase the political complexity of a fair distribution of the essential water resources. Consequently, the geographical conditions of a region may amplify already existing conflicts. Hydrologically classified as arid to semi-arid, Central Asia even in the Soviet period has had to deal with a situation in which the demand for water is much higher than the available supply. Considering the increase in population and the intention of all Central Asian governments – except for Kazakhstan – to further extend their irrigation agriculture, the discrepancy between water demand and water supply tends to increase (Micklin 2002: 522). However, the environmental problems in the Central Asian region result less from a natural shortage of water; rather, they are caused predominantly anthropogenically by the dependence on the intensive irrigation agriculture (see chap. 55 by Rakel and chap. 57 by Martius/Froebrich/Nuppenau).¹

Since their independence in the second half of 1991, the Central Asian states have signed numerous agreements concerning water issues at both the bilateral and regional levels. Moreover, they established a number of water management institutions, mainly supported by the international community of states. The regional water regime in Central Asia goes beyond national laws, but is limited in its effectiveness. Obviously, the difficulties in implementation correspond to an inadequate formulation of the agreements' rules and targets.

Because of their capacity to address this complexity and to sanction undesirable behaviour of governments or communities, institutionalizing the terms of water distribution and developing norms and rules may contribute to peaceful conflict resolution. The Central Asian case is a good example for the necessity of water regimes and institutional settlements, but also for the fact that regimes are not sufficient to reduce security risks. Furthermore, water regimes require normative implications if peaceful effects are desired.

This chapter assumes that regulated conflict resolution by international regimes and their crisis reducing effects will only be successful if the inherent components are adequately addressed. Intergovernmental arrangements will be the reference point for the following analysis, whose main question is: Which are the conflict regulating effects of the regional water regime in Central Asia to resolve the environmental, economic and socio-political water-related problems, and which circumstances act as obstacles to regime implementation?

The first step to answer this question is to identify the existence of water-related conflict triggering indicators along the border-crossing courses of the Central Asian rivers. The analysis proceeds from the assumption that conflict resolution can only be sustainable when all dimensions of the crisis situation are identified, concerning both their probability of violence and their opportunities for regulation. The analytical pattern comprises the environmental, economic and socio-political dimensions, which may trigger conflicts or contribute to conflict resolution. The second step is to evaluate the regime frameworks and the progress of regime implementation with the leading premise of effects conducive to peace.

This chapter identifies the dimensions of conflicts over water in a politically instable environment and their correlations to the assumptions of the conflict-centred regime theory. A framework of conflict di-

1 Concerning the links between water, conflicts, and security in Central Asia see: Klötzli (1996); Horsman (2003); Micklin (2000, 2002); Weinthal (2002); Seidelmann/Giese (2004).

mensions is developed to analyse the multi-dimensional factors, and regime theory is introduced with its theoretical assumptions of conflicts (56.2). Then the Central Asian water regime is outlined with a focus on transboundary river systems (56.3) and an evaluation of the status of its implementation and success (56.4). To answer the question about the main obstacles for crisis prevention and affirmative effects of the water regime, the conclusions will deal with the conflict-conducive effects of the water regime within the three conflict dimensions as specified before (56.5).

56.2 Water Regimes and Conflict Dimensions

56.2.1 Theoretical Aspects and Effects Conducive to Peace of Water Regimes

The distribution of environmental resources such as water is basically problematic because it refers to a specific constellation of interests in which individual players do not possess an exclusive right to benefit from common goods. Due to water shortage, there is a potential for competition about water use. Rational players aim at the highest possible individual profits, whereas the resulting damage is equally distributed among the whole community. However, a restriction of the own use would lead to a profit for the other party, so that every consumer aims at most intensive possibly utilization of this good. International or regional institutions and regimes are needed to resolve this dilemma, as they create reliability in expectations and guarantee a common use of the water, with the effect that the exploration by other parties is not to be feared, or is at least restricted (Oberthür 1997: 35ff.).

Conflict settlement by cooperation seems to be an understandable pattern of response, as the affected players are interested in an intact environmental system and the usability of water resources, whereas “war over water seems neither strategically rational, hydrographically effective, nor economically viable” (Wolf 2001a: 29). Conflict-centred regime theory is suitable for the analysis of environmental conflicts due to its emphasis on regulated conflict resolution and the consideration of cooperative behaviour in water conflicts, due to its positive understanding of cooperation in an anarchic international system and the emphasis on the civilizing function of institutions. “Regimes can be defined as sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors’ expectations converge in a given area of

international relations” (Krasner 1989: 2). Referring to this definition a regulated conflict settlement is given “when the affected states to a conflict observe a set of rules designed to reduce conflict caused by use, pollution or division of a water resource or the reduction of the standing costs and the observance over time of these rules” (Haftendorn 2000: 65; for regime formation see chap. 52 by Borghese). Due to the characteristic of international and regional regimes as political institutions, a political component of the effectiveness of institutionalized arrangements is preferred that includes behaviour changes but does not renounce the ability to resolve conflicts² (Young/Levy 1999: 6).

Potentially peace-stabilizing outcomes of regional regimes are identified across three dimensions: *Stabilization of cooperation, capacity of problem-solving and civilizing impacts* (Zürn 1997: 469). First, water regimes contribute to negative peace – the absence of military violence – as their function as regulated and peaceful conflict regulation mechanism is given (Efinger/Rittberger/Wolf/Zürn 1990: 275ff.). Regimes prescribe instructions for behaviour, which reduce the probable deployment of violent. Second, regimes as institutions for problem-solving ensure that conflict potentials are lessened, thus curtailing the potential for violence. Third, interactions between international regimes may contribute to the civilization of total relations, overcoming potentially violent and national egoism by orientating the behaviour of states towards a new logic of interdependence (Zürn 1997: 476).

56.2.2 Dimensions of Conflict

The crux of regime effectiveness is their capacity for problem-solving, which corresponds to the social problems of the water issue. Conflicts over scarce natural resources are mainly traced to multidimensional conflict factors (Eberwein 1998), demonstrating the need for a complex strategy for dealing with the destructive effects of those conflicts. Put simply, the regulated conflict resolution by international or regional regimes and their crisis reducing effects will be successful when adequately addressing the inherent components. Otherwise, regimes are likely to prove ineffective.

2 This contribution is based on the work of Krasner, the Tübingen research group (Rittberger, Zürn, Efinger, Mayer, and Hasenclever), as well as on the results of Oberthür (1997) and Young/Levy (1999). Zürn (1997) gives a particularly relevant example of the function of regimes for peace order.

Table 56.1: Framework of Conflict Dimensions. **Source:** Developed by the author.

Context factors	Proximate factors
Environmental dimension	
Geographical situation, hydrological and climatic conditions	Supply-centred solutions
Vulnerability of societies concerning water scarcity	Environmental sustainability as guiding principles
Economic dimension	
General economic situation	Sustainable development strategies
Economical water use	Demand-centred solutions
Socio-political dimension	
General political conditions	Aspects of cooperation
Previous conflicts over water	International aspects

The following framework of conflict dimensions attempts to define a systematic approach for the classification of the relevant factors into the three social sectors, environment, economy, and politics. Such an approach is needed to assign each indicator a social sphere. Within these dimensions, different indicators can be divided “into context factors, that are harder to influence directly, and the more malleable proximate factors, directly influencing water relations between and within riparian states” (Mason/Bichsel/Hagmann 2003: 1).

Context factors are the variables situated in the surroundings of water scarcity. They concern naturally or socially caused preconditions or general conditions, which determine and possibly restrict the conflict parties’ options for effective action. Context factors include natural circumstances as well as general political and economic conditions, the existence of previous conflicts, and dependence on irrigation agriculture. The interacting parties face these conditions, and may influence the context factors only indirectly.

In comparison, *proximate factors* directly influence the water-related issues and constitute entry points for constructive conflict resolution. They relate to the political steering level and may consult national, regional or international measures. National or international politics, sustainable approaches or measures to improve water provision are subsumed under the category of proximate factors. Both kinds of factor can be identified in the three main conflict dimensions as defined below.

First, the *environmental dimension* outlines the geographical and hydrological preconditions of the availability of water, and describes the natural effects of water scarcity. The crucial question is whether the naturally given, unequal distribution of the essential

resource influences the transnational political constellation of conflicts. A central aspect within this dimension is the vulnerability of the societies in terms of water scarcity. These criteria refer to the physical conditions of the scarce water resources, and to the mitigation of this scarcity by improved water management or provision of new resources.

With regard to the problem-solving of anthropogenically caused environmental problems or environmentally induced conflicts the *economic dimension* is of most importance and refers to the social environment of water conflicts. The availability of the freshwater resources is very important for the economic development of a country, as agriculture and industry directly depend on water. Water scarcity is after all a function of supply and demand (Loneragan 2005: 28). On the one hand, an economic capacity is needed to respond adequately to water scarcity, and on the other hand, the economic activities as irrigation of agriculturally cultivated areas bear joint responsibility for the causation of water scarcity.

The third part of the relationship between water and conflict comprises the *socio-political dimension* of historical, political, and social aspects. Politically undesirable developments result in unsustainably dealing with the freshwater resources, for example by the refusal to sign regional agreements. Moreover, the perceptions of water scarcity or unjust water distribution should not be underestimated during the process of conflict resolution. The interests and the strength of political will to cooperate are of great importance within this dimension.

Table 56.2: Conflict Dimensions of Water-Related Conflicts in Central Asia^a. **Source:** Compiled by the author.

Context factors		Proximate factors	
Environmental dimension			
Geographical situation, hydrological and climatic conditions	<ul style="list-style-type: none"> • Geographical situation (desert, mountains, sea) • Main river courses of the Basin • Runoff generation 	Supply-centred solutions	<ul style="list-style-type: none"> • Increase of water supply • Improvement of water utilization
Vulnerability of societies concerning water scarcity	<ul style="list-style-type: none"> • Water quantity • Availability per person • Dependency on “imported” water • Capacities of dams and hydropower • Water quality 	Environmental sustainability as guiding principle	<ul style="list-style-type: none"> • Consideration of environmental necessities (local, regional, and international level)
Economic dimension			
General economic situation	<ul style="list-style-type: none"> • Gross domestic product and its growth • Indicators of poverty • Income differentials 	Sustainable development strategies	<ul style="list-style-type: none"> • Improvement of irrigation agriculture • Introduction of water fees • Exchange of energy resources and water
Economical water use	<ul style="list-style-type: none"> • Water usage (by agriculture, industry, households) • Irrigation agriculture and cotton cultivation • Complex of water and energy resources 	Demand-centred solutions	<ul style="list-style-type: none"> • Social equity • Poverty reduction
Socio-political dimension			
General political conditions	<ul style="list-style-type: none"> • Independency and state-building • Establishing of region cooperation 	Aspects of cooperation	<ul style="list-style-type: none"> • Political will to cooperate • Participation of civil society
Previous conflicts over water	<ul style="list-style-type: none"> • Existence of non-environmental induced conflicts • Causes and impacts of violently settled conflicts linked with water resources 	International aspects	<ul style="list-style-type: none"> • Influence of the international community • International water law

a) Due to the space limitations of this chapter it is not possible to discuss each aspect in depth.

56.3 The Central Asian Water Regime

There is considerable consensus that international agreements are indispensable for problem-solving in transboundary water conflicts (Horsman 2003: 87). When the former agreements became invalid in the early 1990's, the rudiments of a Soviet water allocation scheme served as a basis for the Central Asian water regime. This existing system made its establishment easier at the time, but nowadays the international relations are still influenced by the legacy of the

Soviet system, while the new republics refused to adapt the new conditions within the agreements. The current Central Asian water regime consists of a mesh of political declarations, legal agreements, and various water management institutions.³

3 *Interstate Commission for Water Coordination (ICWC), the River Basin Authorities of Syr Darya and Amu Darya (BVO) and the International Fund for the Aral Sea (IFAS).*

Table 56.3: The Central Asian Water Agreements. **Source:** Compiled by the author.

Title of the Agreement	Date of Signing	Signatory Parties
Statement of Heads of Water Economy Organizations of Central Asian Republics and Kazakhstan	12 October 1991	Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
Agreement on Cooperation in Interstate Sources' Water Resources Use and Protection Common Management	18 February 1992	Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
Agreement on Joint Activities in Addressing the Aral Sea and the Zone Around the Sea Crisis, Improving the Environment, and Ensuring the Social and Economic Development of the Aral Sea Region	26 March 1993	Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
Nukus Declaration of the Central Asian Republics and the International Community on the Sustainable Development of the Aral Sea Basin	20 September 1995	Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Representatives of the World Bank and United Nations
Agreement on Cooperation in the Area of Environment and Rational Nature Use	10 January 1997	Kazakhstan, Kyrgyzstan, Uzbekistan
Agreement on Joint, and Complex Use Water and Energy Resources of the Naryn Syr Darya Cascade Reservoirs in 1998	17 March 1998	Kazakhstan, Kyrgyzstan, Uzbekistan
Agreement on the Use of Water and Energy Resources of the Syr Darya Basin	07 May 1998	Kazakhstan, Kyrgyzstan, Uzbekistan
Protocol on Inserting Amendments and Addenda in the Agreement of 17 March 1998	07 May 1999	Kazakhstan, Kyrgyzstan, Uzbekistan

The formal regulations of the Central Asian water regimes can be registered according to their object. First, the *Almaty Agreement*⁴ of 18 February 1992 fixes general principles and acknowledges the right to water use by all states. The Almaty Agreement was caused mainly by political reasons, such as regional stabilization factors, and was less guided by environmental principles. It is a strong indicator for the political motives that the adoption of the agreement took place straight after the gain of sovereignty by the republics. Confusion and imponderability, conditioned by the transition process, forced the mutual affirmation to renounce national solos (Weinthal 2002a: 96). By this agreement, the governments elected the way of negotiated settlements regarding the water distribution in an early phase, before armed conflicts could occur.

Second, the following arrangements focusing on the Aral Sea crisis should be mentioned: The *Aral Sea Agreement*⁵ of March 1993 predominantly deals with the Aral Sea crisis and its context as well as the destructive consequences for the entire Central Asian region (for the specific conditions of the Aral Sea and its surroundings see Rakel in chapter 63 of this book). Complementarily, the *Nukus Declaration*⁶ of 1995 relies on the political principles of sustainability and acknowledges international environmental agreements. These settlements were reached mainly by support of international players such as the World Bank and are closely connected with the setting up, reforming, and establishing of the various water management institutions.

4 Agreement Between the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, Turkmenistan and the Republic of Uzbekistan on Cooperation in Interstate Sources' Water Resources Use and Protection Common Management, 18 February 1992; at: <<http://www.cawater-info.net/library/eng/agreement.pdf>> (2 April 2005).

5 Agreement on Joint Activities in addressing the Aral Sea and the Zone Around the Crisis, Improving the Environment, and Ensuring the Social and Economic Development of the Aral Sea Region, 3 March 1993, in: <<http://ocid.nacse.org/cgi-bin/qml/tfdd/treaties.qml>> (17 February 2005).

6 Nukus Declaration of the Central Asian Republics and the International Community on the Sustainable Development of the Aral Sea Basin, 20 September 1995.

Third, in the second half of the 1990's various agreements concerning the *exchange of water and fossil energy resources* were reached between Kazakhstan, Kyrgyzstan, and Uzbekistan as riparian states of Syr Darya. In the context of round tables, the heads of state endorsed an agreement in March 1998, which refers to the usage of water and energy resources in the Syr Darya basin⁷ (McKinney 2003: 198f.). An agreement of July 2001 within the *Council of the Central Asian Energy System* for establishing a common energy system to include the five national supply systems and connect them with the Russian energy system was promising for the time being. However, it could not prevent single states from pursuing their own interests, as the sudden ending of Uzbek deliveries of gas to Kyrgyzstan, or the Kyrgyz threat to cut off the water deliveries to Uzbekistan in the summer months (Gleason 2001).

In general, these agreements regarding water distribution and water use are rather unsystematic or even inconsistent with bilateral settlements or the national law. To sum up, it can be said that the water regime in Central Asia is not homogenous in its formation (Smith 1995: 364). This reduces the possibility of regime effectiveness, on which the following section focuses, while the conditions for regime formation have been described in various ways by other authors (cf. chap. 52 by Borghese; chap. 53 by Lindemann; and Weinthal (2002) on Central Asia).

56.4 Evaluating the Central Asian Water Regime

56.4.1 The Environmental Dimension

The environmental dimension impacts on the supply side of water scarcity and is outlined by the region's geographical and hydrological conditions. The total quantity of water resources in the Aral Sea basin should not be scarce, but factors such as population growth, land degradation, and water-intensive agricultural methods reduce the availability of water resources (Micklin 2000: 68; chap. 57 by Martius/Froeblich/Nuppenau). Weak water management institutions and insufficient water agreements deteriorate a situation where conflict potential is geographically

given by the difference between the water-rich and hydroelectricity-dependent states Kyrgyzstan and Tajikistan, and the fossil energy-rich but water-poor countries such as Kazakhstan, Uzbekistan, and Turkmenistan (Klötzli 1996: 281; Sehring 2004: 313; due to possible areas of conflict see chap. 55 by Rakel).

The improvement of efficient availability, mentioned in the Almaty Agreement and the later settlements, but hardly put into concrete terms, would require sufficient financial capacities and the political will to make investments. Apart from this, the targets and principles of the water management institutions are too insufficient to contribute to an effective water administration in the Central Asian region.

Economic interests, attempts to improve the living standard, and the introduction of context conditions to solve the socio-economic problems dominate the Almaty Agreement, while the environmental stress caused by the water deficit is hardly mentioned. To conclude, the leaders of the new republics were predominantly motivated by the interests of economic and security policy. However, within the Aral Sea Agreement for the regional cooperation concerning water management (see preamble of Aral Sea Agreement), the ecological problems in the Aral Sea region are the reference point. The Nukus Declaration contains some remarkable innovations, such as the acknowledgement of water and land as a basis for sustainable development, the objective of a more balanced forestry, and the improvement of water use efficiency (paragraph I, Nukus Declaration). The actual importance of the declaration is, however, reduced by its lack of reference to the Aral Sea and of any legally binding character (Klötzli 1997: 185). The means of problem-solving in the mentioned agreements are already scarce, but the intention to implement the confessions of sustainable environmental policy are even more meagre.

56.4.2 The Economic Dimension

Socio-economic and economic crisis factors may affect water conflicts as catalysts, transforming latent crisis situations into violently settled conflicts. The increase in social inequality – poverty, income differentials between classes and regions, weak economies – is one of the dramatic trends in Central Asia and may trigger violent conflicts, particularly if combined with inter-ethnically composed populations as in the Fergana valley (for the economic situation see chap. 57 by Martius/Froeblich/Nuppenau; Halbach 2001: 18).

⁷ Agreement between the Governments of the Republic of Kazakhstan, the Kyrgyz Republic, and the Republic of Uzbekistan on the Use of Water and Energy Resources of the Syr Darya Basin, 17 March 1998.

Beside these factors, the irrigation agriculture of cotton fields remains the predominant cause of water scarcity in Central Asia. The high share of water consumption for agriculture (93–98 per cent⁸) is just as problematic as are the losses of water by obsolete and ineffective irrigation systems (Micklin 2000: 36). The economic importance of the cotton cultivation and high export rates concern above all the republics of Uzbekistan and Turkmenistan, but its environmental side effects are distributed over the whole region.⁹

The republics that are poor in resources, such as Kyrgyzstan and Tajikistan, give priority to hydroelectric plants, since the share of hydroelectricity is more than 80 per cent of the total energy production.¹⁰ The Soviet water and energy systems were based on a centralistic administrative system of compensation between the Soviet republics. Thus, the problem of distribution of water resources and sources of fossil fuels only became relevant when the Soviet Union disintegrated, dividing this geographic area into several sovereign states.

Demand-centred solutions such as the reduction of irrigated land, the decline of cotton monoculture, and the diversification of agricultural products, as well as the improvement of irrigation efficiency, require a change in the behaviour of the local political and economic elites. In principle, these measures are suitable to counteract the tremendous water usage and resulting water scarcity in the region. The most formidable obstacle remains the dependency on cotton exports, which effectively renders the necessary reforms impossible.

The Almaty Agreement emphasizes the economic importance of water resources, but does not mention limitations of irrigation monoculture as a necessity (Preamble to the Almaty Agreement). In the Nukus Declaration the excessive water use from the rivers Amu Darya and Syr Darya for irrigation purposes is both criticized and acknowledged as the main reason

for the Aral Sea crisis (Preamble Nukus Declaration). The required measure is named as well: the “transition to a balanced and scientifically based system of agriculture and forestry” (paragraph I of the Nukus Declaration).

Overall, the influence of the regional water regime on national agriculture policy is limited; particularly as the Central Asian states are hardly dependent on each other in economic terms.¹¹ The regional agreements of cooperation are scarcely capable of regulating the high water usage by agriculture, while the national players are responsible for the fundamental changes in cultivating practices (Weinthal 2001: 68).

In comparison to the minor progress concerning the cotton monoculture, the regulation of water and energy is more successful. It is supposed that the direct effects of different water usages have strengthened efforts towards conflict settlement. Especially in the Fergana valley, the need for hydroelectricity and irrigation constitutes a high risk of conflict, with threatening gestures regularly made. At the same time, both pressure groups have a strong interest in problem-solving: on the one hand, the middle and lower downstream countries of the Syr Darya would like to limit the Kyrgyz controlling power of the flowing off. On the other hand, the withdrawal quotas resulting from the water agreements do not meet the requirements of Kyrgyzstan.

56.4.3 The Socio-Political Dimension

In the upheavals of the early 1990's, the Central Asian countries were challenged by the explosive tensions created by parallel demands for state-building processes and for developing structures and institutions of regional cooperation (List 2004: 95). The issue of water distribution along transboundary courses of rivers requires a particularly high measure of cooperation. As the proclamation of independent policymaking within the state borders means an essential part of state building, these simultaneous needs for state building and international cooperation are one of the main difficulties impacting on the development of regional cooperation over water resources (Weinthal 2002b: 46). Not least because of their common history and geography, the Central Asian republics are bound up with one another. The cross-border water-

8 In Kazakhstan the share amounts to 81 per cent and is therefore below the average (World Resources Institute 2003: “EarthTrends, Water Resources and Freshwater Ecosystems, Country Profiles”; at: <http://earth-trends.wri.org/pdf_library/country_profiles>, 11 February 2005).

9 Regarding the economic, social, and environmental costs of the Central Asian cotton monoculture, see International Crisis Group (2005).

10 World Resources Institute 2003: “EarthTrends, Data Tables, Energy and Resources”; at: <http://earth-trends.wri.org/pdf_library/data_tables/ene2_2003.pdf> (30 March 2005).

11 For example, the Turkmen and Uzbek cotton exports are mostly transacted with extra-regional states and companies.

Table 56.4: Central Asian Participation in International Water Law. **Source:** Compiled by the author.

Title of the Agreement	Date of Signing	Behaviour of Central Asian Republics
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	17 March 1992	Kazakhstan: ratified on 23 October 2000, not signed yet
		Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan: members of UN-ECE, but not signatory parties of the Convention
Convention on the Law of the Non-Navigational Uses of International Courses	21 May 1997	Kazakhstan: voted pro Convention, but did not ratify or sign yet
		Kyrgyzstan: no activities reported (neither consent nor refusal, abstention or absence)
		Tajikistan: absence at voting
		Turkmenistan: absence at voting
		Uzbekistan: supported the resolution, but abstained at voting

courses necessitate an agreement not only over water use, but also over establishing mechanisms for dispute resolution.

By joining the *Commonwealth of Independent States* (CIS) in December 1991, the Central Asian republics temporarily renounced regional cooperation. In view of such a problematic beginning of general cooperation, it is remarkable that the requirement for cooperation concerning water issues was identified at a relatively early moment: the first regional water agreement was signed in February 1992, and further settlements followed. The change in behaviour necessary for the success of regimes can only be attained if the political leadership is willing to cooperate. That applies to all kind of strategies for coping with environmental, socio-economic, or political causes and effects of water scarcity. Breaches of contract by Central Asian republics were reported regularly. For example, water quotas had been exaggerated, the guaranteed withdrawal of water had been withheld, or deliveries of sources of energy had not been made. As the regional water agreements and management institutions managed to become decisive by the influence of international players, the regional endeavours were not very serious from the beginning.

The transboundary watercourses trigger conflicts because two contradicting principles of International Law apply here: sovereignty and integrity. The use of water resources on state-owned areas may affect the integrity of other states, since upstream countries control water withdrawal and may even stop it. The Central Asian republics are very reserved about participating in international debates and regulations, as can be seen in the status of two important water conventions: The *Helsinki Convention*¹² of *UN Economic*

Commission for Europe (UN-ECE) of March 1992, and the *United Nations' Water Convention*¹³ of May 1997.¹⁴ Altogether, the Central Asian republics did not succeed in going far beyond declarations of intent: "The shortfalls between the promises (...) and the reality that no state even penned a draft treaty for the Aral Sea highlights this lack of effort" (Sievers 2003: 141f.). Crisis prevention could be improved if the Central Asian water regime were complemented by components of the international water laws, because the latter are linked with procedures for dispute settlement and sanctions.

56.4.4 The Environment and Security Initiative (ENVSEC)

When three international organizations agree on a coherent strategy regarding the links between environment and security, this may appear auspicious. The *Environment and Security Initiative* (ENVSEC) combines experiences and competences in the field of crisis prevention and democratic development: the *Organization for Security and Cooperation in Europe* (OSCE), in promoting development of peace within the context of economic development of the *United Nations Development Programme* (UNDP) and con-

12 Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 17 March 1992.

13 Convention on the Law of the Non-Navigational Uses of International Courses, 21 May 1997.

14 Status of the Watercourse Convention as of 15 August 2002, in: <http://www.internationalwaterlaw.org/Intl-Docs/Watercourse_status.htm> (16 April 2005).

cerning environmental issues in Central Asia which is a focus of the *United Nations Environment Programme* (UNEP).¹⁵

The integrated approach of the ENVSEC Initiative¹⁶ meets the challenges posed by the Central Asian water crisis, even though the financial and personnel endowment is unclear and the acceptance by the Central Asian players questionable. However, it is possible to nourish hope for the following affirmative aspects: *First*, the cooperation between the three international organizations tends to have success as the different experiences are combined. *Second*, the explicit inclusion and capacity building of civil society is of outstanding importance, fostering democratic participation, individual responsibility, and freedom of information. In this context, the project 'Awareness Rising and Public Participation in Decision-Making through Improved Access to Information and Environmental Education' is worth mentioning (Rampolla 2004: 53). *Third*, the multi-level consulting and participating process could lead to improvements in sustainable effects of the water regime. Strengthening the political will of national decision-makers will be the crucial point for internal measures, as well as for cooperation at the regional and international level. *Fourth*, the advantage of the ENVSEC Initiative could be the combination of environmentally induced factors as well as economic and security issues related to the water crises (see chap. 71 by Cheterian).

56.5 Conclusions

Until now, international conflicts or serious diplomatic incidents over the distribution and usage of water resources could be avoided. However, it is necessary to inquire to what extent this development was promoted by the regional water regime. Security interests took priority over environmental problems concerning the regional agreements in former Soviet Cen-

tral Asia, and as a result, violent ethnic conflicts over scarce water resources were avoided (Weinthal 2002b: 203f.). By including the water question in the agenda at the regional level, the water regime succeeded in creating a regular basis for mutual meetings and talks. Summits of secretaries of leading politicians and technological cooperation within regional water institutions ensure continuity of cooperation, which is indisputable for stabilizing security and peace. The regular dialogue counts as one of the main achievements of the Central Asian water regime. Except for single enforcements of unilateral interests with sad consequences for the neighbours, such as breaches of contract, a start has been made for regional cooperation. The unalterable border-crossing character of watercourses as an object of regulation determined these early attempts of regional cooperation. *It seems certain that the swift institutionalization of the water issue in the regional agreements and institutions in the early 1990's resulted in conflict-preventive effects.*

In the field of problem-solving it was found that the declared targets of the Almaty Agreement of February 1992 failed. The catalytic factors for regional vulnerability of conflicts could not be reduced by the agreements, mostly for the insufficient political will of Central Asian governments and their insufficient financial and technological capacities.

Within the *environmental dimension*, the blatant water scarcity caused mainly by anthropogenic factors has negative social and health effects on the local population, and the environmental damages are alarming. Inevitable differences of positions are conditioned by the natural space and the regional inequality of the water resources. The asymmetric water availability between the upstream countries, Kyrgyzstan and Tajikistan, and the downstream countries, Uzbekistan, Turkmenistan and Kazakhstan, corresponds to the abundance of other resources in the latter countries. The water conflicts became obvious only after the Soviet Union collapsed and the frontiers were internationalized, so that conflict regulation at the bilateral and international levels became necessary.

For providing sufficient water resources and their distribution in a just manner, the *economic dimension* is relevant, because the main cause of water scarcity is the intensive irrigation agriculture, which is traced to the dependency on the export of cotton. Therefore, a programmatic approach to problem resolution has to aim at changes in behaviour concerning the irrigation of arable lands by water saving and reducing losses of water, while ineffective water management increases the unsatisfactory water distribu-

15 The ENVSEC Initiative was founded in 2002 and focuses on Central Asia and South East Europe, in the meantime as well on Southern Caucasus and Eastern Europe. The NATO joined the Initiative as an associated member.

16 The Initiative proceeds on the assumption that the degradation of the environment and the unequal access to scarce resources on the one hand, and the conflict potentials of these factors on the other hand, are closely linked. Accordingly, the approach promotes environmental cooperation as a suitable instrument for crisis prevention (ENVSEC 2003a: 5, Rampolla 2004: 52).

tion and quality. The conflict potential caused by the differing needs for using the scarce water resources may be reduced, provided that a functioning system for the exchange of fossil energy resources and water resources can be introduced.

Water-related problems within the *socio-political dimension* are the Soviet legacy of water allocation and the process of transition, which has not been completed yet. The increased potential of conflict over the distribution of scarce water resources occurred by closing the compensation system of water and energy, and by a lack of an accepted regional arbitration authority. The repeated threats against neighbouring countries to use water as a mean to achieve economic benefits or political aims, or to attack hydroelectric plants, caused a distrustful and non-cooperative political atmosphere in Central Asia. Linked with authoritarian structures, the prevalence of economic interests and a lack of serious attempts to save water, the intended extension of irrigation areas is alarming. As a result, the growing demand further reduces scarce water resources and increases the relative potential for conflict.

Some success concerning short-term and medium-term stabilization cannot alter the fact that the crucial conflict potential and causes were merely addressed and regulated as the continuing differences in interests indicated. *The specifically named targets of the water agreement were achieved only to a limited extent. In terms of environmental problems, the improvement was nearly none, and the socio-economic effects on poverty and internal differentiations were merely reduced.*

Civilizing impacts of the total relations means the overcoming of national egotism with its tendency to violence, so that non-violent conflict resolution as a way of conduct is fostered by the recognition of enduring interdependencies. However, such peace-conducive effects of international or regional regimes should be observed and evaluated over longer periods of time to obtain reliable results. Because the regime genesis is still neither coherent nor completed, the impact of the Central Asian regime is not to be assessed finally. *But it is foreseeable that the tense international relations, the mutual blaming for the desiccation of the Aral Sea, and the repeated gestures of threat do not work towards such lasting impacts.*

The initial assumption was that the inherent design of a regional regime corresponds with its chance for success. The success of a regime is not only defined by its adherence to the agreed norms and rules, but also by a high capacity for problem-solving. In

both respects, the Central Asian water regime has many defects. The frequent unilateral breaches of regional contracts and the financial contributions for the regional water management institutions, which are often only fractions of the promised amount (World Bank 1998: 9), are indicators for the difficulties in implementation of the Central Asian water regime. Deficiencies in the political intentions of the Central Asian governance systems to improve the conditions for solving the water crisis are obvious. Furthermore, the difficulties in establishing a standardized common water regime and its insufficient problem-solving capacity are caused by the fact that the aims of sustainability and socially acceptable development were subordinate to economic profit-maximization.

In conclusion, the assumption of the conflict proneness of the Central Asian societies by water scarcity is proved true, explaining the interdependencies between the environmental, economic, and political conflict dimensions. Legal arrangements can create reliable expectations and provide the framework for diplomatic and non-violent regulations of the water issue. The renunciation of violent measures is a decisive success of the established institutions and agreements. However, the Central Asian case also indicates that the authority of legal agreements is rather low if there is no common goal of sustainable development and no true will of the state leaders to take extensive actions over all water-related dimensions. Regime success is already limited by their failure to reach fundamental changes of behaviour, so that water-related security risks in Central Asia continue to exist.

Water Resource Management for Improving Environmental Security and Rural Livelihoods in the Irrigated Amu Darya Lowlands

Christopher Martius, Jochen Froebrich and Ernst-August Nuppenau

57.1 Introduction¹

Reliable and safe supply of fresh water resources is one of the most important global environmental challenges (Rechkemmer 2004). Water resource management must become economically more efficient, ecologically sustainable, and also socially justifiable, especially so in the water crisis regions.

The Amu Darya River basin in *Central Asia* (CA) is one of these crisis regions where management of water resources is unsustainable and uneconomic, bearing great potential for social conflicts. CA is a region in economic and political turmoil, change, and transition. Whereas most countries of the region have adopted a fast transition to some form of market economy, the government of Uzbekistan has tried to pursue an 'Uzbek way' that relies on strong government control of its economy and a 'taxation', via a state order system, of the agricultural production (Pomfret/Anderson 2002). Agriculture accounts for 38 per cent of the GDP and is therefore the largest economic sector. It depends almost completely on irrigation, and especially in the lower Amu Darya region, water is the basis of the livelihoods of the 3.6 million people living here. Although the Amu Darya completely originates outside, in the mountain glaciers of the upstream countries Tajikistan and Kyrgyzstan, its water is the source of wealth.

Due to their tail-end situation, the irrigated *Amu Darya lowlands* (ADL) in eastern Uzbekistan and northern Turkmenistan pose particular challenges to water management. These lowlands are relatively

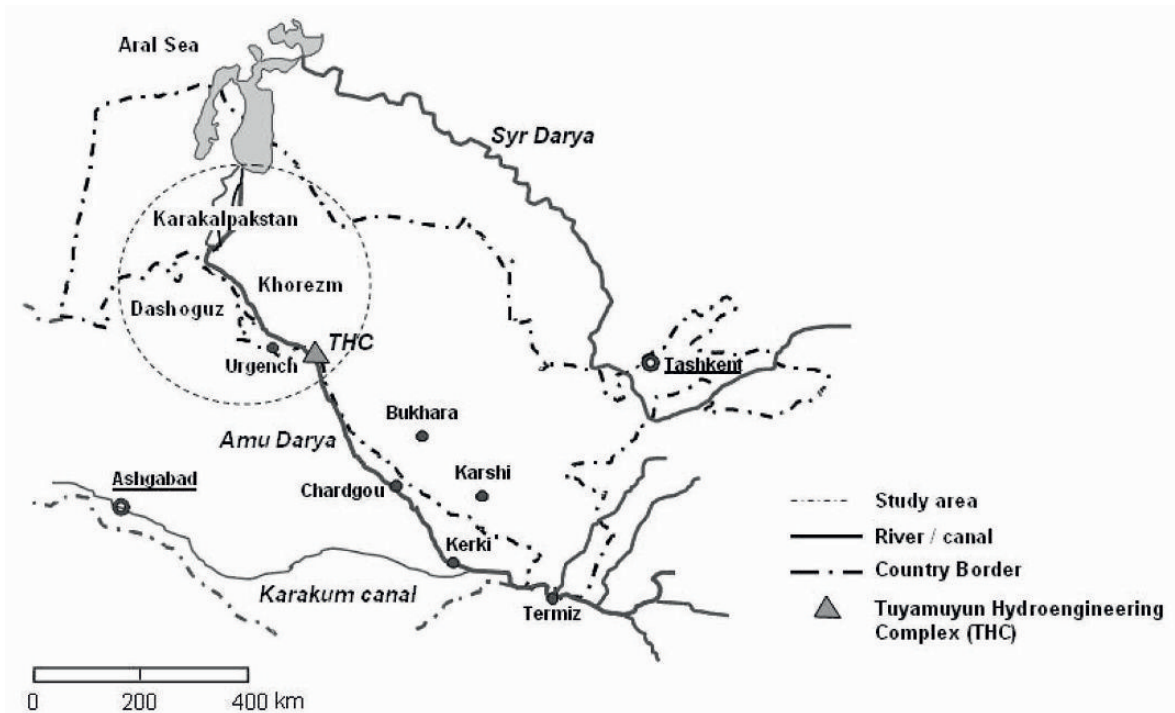
small oases of irrigated land amidst vast deserts (figure 57.1), but nevertheless account for roughly 25 per cent of all irrigated land in the Amu Darya basin. Here, water and land resources are at much higher risk of deterioration than upstream. This is aggravated by the present water resource management aiming at providing water for agriculture, but not addressing a more integrated, sustainable resource management.

After their independence in 1991, the Central Asian countries found themselves facing a situation characterized by inherited salinized, polluted and impoverished soils, huge and partly dysfunctional irrigation systems, and a 'path dependency' on cotton. In terms of quantity, water should not be a scarce resource in the Aral Sea basin, not even in dry years. However, several factors put water, as a resource, 'under stress'. Four factors (Tickell 2003; Brauch 2003, 2005, 2005a and chap. 4) drive the intertwined environmental and economic development in the irrigated lands of Central Asia (Giese/Sehring 2007, 2007a; Sehring/Giese 2009):

1. *Demography*: population growth has been high in all Central Asian countries in the 1990s, and continues so in Tajikistan with a 2.1 per cent population growth in 2006, but has been slowing down to average rates in Uzbekistan, Turkmenistan, Kyrgyzstan, and Kazakhstan (ADB 2007). Nevertheless, a high share of young people (e.g. 64% of the population is below 30 years of age in Uzbekistan) represents a future legacy for development. Increased food demand due to high population growth rates will prompt further expansion of irrigated lands, whilst increasing the risk of water unavailability (MA 2005a). Also, an increasing urbanization pressure on agricultural land is to be observed.
2. *Climate change*: the above-average climatic change predicted for CA will bring short-term gains in wa-

¹ This study was in part funded by the German Ministry for Education and Research (BMBF). We thank John Lamers, Oliver Olsson, Melanie Bauer, Bernd Kuzmits, Konrad Kellner, and Andreas Beyer for valuable input and discussions.

Figure 57.1: Irrigated Lowlands of the Amu Darya (Amu Darya Lowlands or ADL). **Source:** This map was drafted by the authors.



ter availability downstream (due to melting glaciers), but will on a long-term scale translate into lower water inflows from the mountains, higher water losses to the atmosphere, and larger vulnerability of agriculture from droughts.

3. *Increased water demand:* The lowlands, in the watershed, are particularly vulnerable to increased water diversions upstream. The upstream countries (Tajikistan, Kyrgyzstan) will be increasingly claiming 'their' water resources for themselves (chap. 55 by Rakel; chap. 56 by Wunderer). The lowland countries Uzbekistan and Turkmenistan consume 83 per cent of all water of the basin. Turkmenistan is insisting on its share of the water resources, used in ambitious 'development' projects. Further demand will be created if Afghanistan proceeds with developing its own irrigation systems at the Amu Darya, which may divert up to 10 per cent of the total water budget of the region.
4. *Land degradation:* The first three factors will likely result in reduced water availability in the irrigated ADL. This will trigger land degradation, reduce 'ecosystem services', the ability of the land to sustain human, and ecological well-being. Ecological degradation is already an issue; many former wetlands have been destroyed (Treshkin/Kamalov/

Bachiev/Mamutov/Gladishev/Aimbetov 1998), the Aral Sea has been depleted, and the irrigated agricultural land is suffering from nutrient mining and over-irrigation during the last 45 years. The annual costs of land degradation have been estimated by the ADB (2004) at about 7 billion US Dollars for all five Central Asian countries.

Failing water supplies and the interests of several countries in the water resources bear a certain potential for trans-national conflicts over the distribution of water resources. Nevertheless, we see a very low risk for this at present, as, historically, the 5 CA states have managed their water resources jointly, if not without friction, then well enough to avoid major conflicts. We argue here that it is the past and ongoing ecological deterioration which, given the linkage between the environment, human well-being and security (DFID 2006), provides much more reason for concern. Also, if the water resources are not managed in a sustainable way, that satisfies the needs of all users, conflicts may arise between differently endowed individuals rather than states.

Integrated water resource management (IWRM), an approach that balances technology-oriented water management with environmental, economic and social aspects, in our view provides a promising tool to

specifically address the complex situation in CA. For its intertwined problems of demographic growth, climate change, water demand and land degradation, IWRM is a suitable approach. We will show here that the specific background – the history of water management in the region (that produced the present large, formerly centrally managed irrigation systems), the present institutional set-ups, and the existence of a well-informed class of technicians – favours the step-wise implementation of key actions. Additionally, the emphasis is on key technologies in an inter-disciplinary framework. Such a framework is needed because isolated sectoral approaches have proven to be unsuitable to achieve resource-saving, economically adapted, and socially acceptable resource management. For example, privatizing water distribution and introducing water markets is unrealistic when implemented as an isolated measure. Reasons are: *First*, the prevailing rural poverty, poor nutrition status, and widespread health problems require that water is distributed as a social asset, being cheap and readily available, not an economic commodity². *Second*, most farmers lack the necessary capital for direct investments in water saving technologies. *Third*, the organizational and institutional set-ups in the management of river and canal systems do not address the ecological sustainability of the resource. Though local actors possess high-quality, although often under-estimated, know-how that can be gainfully employed, market approaches are beyond their skills. The local water administration's weak side is lack of modern concepts (such as a systems view), adequate planning instruments, regulatory mechanisms and equipment. There is a clear need to find entry points for putting in practice a system approach for IWRM.

This contribution is based on the authors' experience in the ADL.³ We will first describe the region and its specific problems (57.2), and then proceed to outline a scenario of how to achieve IWRM in the specific situation of the ADL (57.3).

57.2 The Lower Amu Darya Basin

The Aral Sea, once the fourth-largest fresh water lake in the world, today has been reduced to 15 per cent of the water volume and 35 per cent of the surface it had 45 years ago. The well-known cause is the huge expansion of the artificially irrigated area during the Soviet period. In fact, the 'Aral Sea Syndrome' (WBGU 1998) has often been analysed (Vlek/Martius/Werheim/Schoeller-Schletter/Lamers 2003) and elsewhere in this book by Rakel (chap. 55) and Wunderer (chap. 56).

The Amu Darya River is the major former tributary to the Aral Sea. With a length of 2540 km it is the longest river in Central Asia and starts in Tajikistan, runs through Uzbekistan, where it forms the border to Afghanistan, enters Turkmenistan, and returns to Uzbekistan (figure 54.1). On the way, huge water quantities for irrigation are extracted, primarily for the irrigated areas of Surkhandarya, Kashkadarya, and Bukhara (Uzbekistan), and mainly (through the Karakum canal) for Turkmenistan. The remainder is intercepted in the Tuyamuyun reservoir that marks the entrance of the ADL. The water is mostly being used up in the ADL, only eventual surpluses flowing to the Aral Sea.

Here we specifically focus on the *Amu Darya lowlands* (ADL), which we define as the whole of the irrigated lands between the Tuyamuyun reservoir and the Aral Sea, a region under intensive agricultural cultivation. This region belongs to two countries and consists of three administrative areas (figure 55.1). The province of Khorezm and the Autonomous Republic of Karakalpakstan are part of Uzbekistan and make up 250,000 and 500,000 ha of irrigated area, respectively, while the district of Dashoguz (310,000 ha irrigated) belongs to Turkmenistan. The total area (1,060,000 ha) corresponds to roughly one tenth of the Aral Sea Basin's area. In total, 3.5 million people live here, also corresponding to roughly 10 per cent of the Aral Sea Basin population.

The water supply to the ADL is controlled by the Tuyamuyun reservoir system. About 95–98 per cent of the Tuyamuyun's outflow is used for agricultural irrigation water, the remainder for private households and industry. The Tuyamuyun, completed in 1983, supplies water through a canal network that in Khorezm, alone, spans 16,000 km, not counting on-farm channels. Likewise in Khorezm, a network of 7,500 km of drainage canals collects the saline drainage water running off agricultural fields.

2 This is actually reflected in the present system of 'free' water supply to the farmers

3 See; Froebrich/Bauer/Ikramova/Olsson 2006, Froebrich/Kayumov 2004; Martius/Lamers/Ibrakhimov/Vlek 2004a, Martius/Lamers/Werheim/Schoeller-Schletter/Eshchanov/Tupitsa/Khamzina/Akramkhanov/Vlek 2004b; Vlek/Martius/Werheim/Schoeller-Schletter/Lamers 2003; ZEF 2003.

The annual agricultural water use in the Aral Sea basin of 54.4 km^3 is higher than the average availability of 50.4 km^3 (UN, WWAP 2003); drainage water re-use accounts for the difference (Froebrich/ Kayumov 2004). For the ADL, below Tuyamuyun, an average water volume of $38.9 \pm 13.6 \text{ km}^3/\text{year}$ is available (1981–2001; Ibrakhimov 2005); Drought years with a total water volume of less than 20 km^3 are statistically expected once every ten years (note that in 2001, the last drought year, total water volume was $13 \text{ km}^3/\text{year}$). As the entire water demand in the ADL amounts to about $20 \text{ km}^3/\text{year}$, droughts may entail serious yield losses of up to 33 per cent (Mueller 2006).

CA is experiencing a global warming above average, as exemplified by an average temperature gain of 1.2 to 2.1 °C in the region since the 1950's (far in excess of the 0.5 °C increase in global temperature; Giese/Mossig 2004), and by the 1–2 °C/century increase observed in Central Asia; this is much higher than the Asian average of 0.7 °C (Watson/Zinyowera/Moss/Dokken 1998). The IPCC also projects a temperature increase of 1–2 °C until 2030–2050 in the region. Glacier-melt runoffs have already increased by 15 per cent in the period 1959–1992. The same IPCC report predicts that an extra runoff may persist for decades, and in very large glaciers such as those found in CA even for a century or more.⁴ This will substantially increase the regional water resources. Nevertheless, there is no reason for relaxing the move towards greater sustainability of resource use, as water diversion is likely to be increasing, and on the long run, climate change will strongly reduce the overall water availability (McCarthy/Canziani/Leary/Dokken/White 2001).

Land degradation is an economic, social, and environmental problem in the transition economies of all five CA countries, seriously affecting the livelihood of the rural population by reducing the productivity of land and leading to agricultural losses as well as to increased costs for the agricultural production. In the ADL, land degradation manifests itself mainly through secondary soil salinization and water logging (Ibrakhimov 2005, Akramkhanov 2005), decreased fertility of pastures (ADB 2004), and reduction in forest areas (Worbes/Botman/Khamzina/Tupitsa/Martius 2006).

57.2.1 Agricultural Water Use as a Major Driver of Environmental Insecurity

Agriculture without irrigation is almost impossible in Central Asia. The irrigated land has been steadily expanded from 4.5 million ha in 1960 to 7.9 million ha today. In Khorezm, for example, there has been an increase from 200,000 ha in 1982 to 276,000 ha in 1999, i.e. a 38 per cent increase in 17 years. At the same time, the average probability of a farmer to obtain sufficient irrigation water declined by 16 per cent; i.e., the farmer has now a substantially higher risk of losing his crops due to insufficient water supply than 20 years ago. This is exacerbated by a strong year-to-year and regional (e.g. higher risks at the tail-end of the irrigation system) variation of water availability (Mueller 2006).

Cotton is the major crop in Uzbekistan. It is produced following a so-called 'state order' system, by which the government controls the distribution of crops on the fields; water supply and delivery of other inputs; prices, processing, and export are also controlled. Every region and farm must attain prescribed production goals. It has often been repeated that the Uzbek government finances a large portion of the state budget from the difference between local prices and world market prices of cotton (Rudenko/Lamers 2006; Guadagni/Raiser/Crole-Rees/Khidirov 2005). But farmers also benefit from the state order system. As many rural operations are poorly capitalized and non-state markets are still underdeveloped, the system functions as an effective credit system for important inputs (seeds, fertilizer, diesel, machines, water), guarantees stable input prices, and ultimately works as a risk protection strategy. For instance, state organizations were instructed to cancel debts incurred by farmers during the droughts of 2000 and 2001. Note that water is delivered for free, except for a small land-based fee.

The free water supply in the state order system provides no incentives for water saving. Similarly, the lack of land rights – land belongs to the state and is leased out for a maximum of 49 years – also does not stimulate sustainable resource use. Under pressure to meet production targets, the state farms in the past did not spare inputs for cotton cultivation such as irrigation water, fertilizers and pesticides, and nowadays, in spite of privatizations, the prevalent agricultural production system remains extremely uneconomic. This is not surprising, since most 'new' farmers are insufficiently prepared to run a farm enterprise.

4 This was confirmed by working group 2 (Cruz/Harasawa/Lal/Wu/Anokhin/Punsalmaa/Honda/Jafari/Li/Huu Ninh 2007).

Due to heavy irrigation, the groundwater levels rise quickly in spring every year, which results in capillary groundwater rise and salt encumbrance in the soil (Ibrakhimov 2005; Akramkhanov 2005). Cotton yields have only partially decreased due to worsening soil conditions, because the - widespread - leaching of salt from the fields in spring can partially compensate the degradation (Mueller 2006). In addition, since independence, investments in the operation and maintenance of the irrigation system have been extremely scarce. This has led to major losses in the water relocation system; Uzbekistan and Turkmenistan belong to the eight countries with the greatest per capita water usage in the world (WWF 2002). On the costs of cotton production, Uzbekistan performs very poorly compared with other countries with similar climate and conditions (World Bank 2003d, 2003b).

The risk of failing or untimely water supply for irrigation forces ADL farmers to rely on groundwater contributions and to secure as much water as possible once this is available. Farmers often reduce the outflow to the drainage channels as a strategy to save their crops during periods of insufficient water supply. This is a rational decision at the field scale, given the actual supply system functioning, but translates into emergent higher-level problems such as high groundwater tables and secondary soil salinization, which consequently prompts more leaching⁵. Consequently, hydrological textbook recommendations focusing on hydrologically 'sound' solutions alone will do little to improve water use efficiency, as long as they do not address the farmer's risk of not having sufficient water.

Altogether, the build-up of these vast irrigation systems during the last 70 years constitutes a "path dependency" that can not be rolled back today. Therefore, efforts need to be undertaken that fit the system, but are concerted to reform the water sector towards more rational and sustainable management. We suggest that the existing water management agencies and irrigation infrastructure represent - in contrast to many other regions - a promising entry point for a stepwise implementation of IWRM principles.

5 High groundwater tables lead to capillary water transport to the soil surface and evaporative losses to the atmosphere, while salts dissolved in the water build up the salt load in the soil, reducing soil fertility and crop growth. This is often combated with 'leaching', the flooding of the fields before planting them in spring.

57.2.2 Socio-economic Conditions: Poverty, Food Insecurity and Health Problems

As is expected from their history, the five Central Asian republics show a mixed picture regarding various development indices. For example, they all rank high on adult literacy rate (98.7–99.5%) and all rank low in life expectancy at birth (62.6–66.8 years), and human development index at 0.67–0.79. However, with regard to indicators of technology diffusion, e.g. number of telephone landlines, cellphones, or internet users, Tajikistan trails far behind all the other New Independent States (NIS) (all data from UNDP 2007). Uzbekistan⁶, which is most relevant here with regard to the ADL, ranks higher in GDP than Kyrgyzstan and Tajikistan, but lower than Turkmenistan and Kazakhstan (FAO 2004, World Bank 2003d, 2003b). With regard to the Environmental Performance Index (Esty/Levy/Kim/Sherbinin/ Srebotnjak/ Mara 2008) which gauges several aspects of environmental health and ecosystem vitality into one figure, all Central Asian countries rank in the third quarter of the list (occupying the ranks 79 to 107 of the country list).

Poverty is a particular problem in the peripheral and naturally disadvantaged (low-productivity drylands) rural regions of Uzbekistan where unemployment (25 per cent) is far above the national average (7 per cent; World Bank 2001). This was not always the case. In 1993 only 3.3 per cent of the rural population was below the poverty line of 1 US\$ per day, but in 2003 poverty has already reached 27.5 per cent or 6.8 million people (Sievers 2003).

Low income in the agricultural sector leads to nutritional problems in rural areas, where 78 per cent of the average income is spent on food (Herbst 2006). Note that the small scale production in household gardens is not sufficient in the ADL as in other countries because the productivity of home gardens is the lowest among the NIS (World Bank 2003d, 2003b).

Half of the drinking water supply in the ADL comes from the Tuyanumyun reservoir, where drinking water is withdrawn from the Kaparas basin and routed on to the cities of Nukus and Urgench, notably through pipelines. The quality of drinking water from the Tuyanumyun satisfies the Uzbek norms, but does not meet international quality standards. Notwithstanding, more than 90 per cent of the rural population in Karakalpakstan gain their drinking wa-

6 The economics of Turkmenistan are not being discussed here

ter directly from the open irrigation channels. This especially affects children under five years of age which are most susceptible to diarrhoeal diseases (Herbst 2006). The open waters are often fecally contaminated, have high salinity levels, or are polluted with pesticides (Herbst 2006; O'Hara/Wiggs/Hubbard/Wegerdt/Falzon/van der Meer 2001). Pesticide use in Uzbekistan has fallen due to its high costs, but the application rates in cotton remain high.

Due to low income, lack of education, inadequate nutrition and drinking water supply, and environmental pollution the health status of many citizens is critical (World Bank 2003d, 2003b). Nevertheless, the often claimed link of respiratory diseases to air pollution in the region remains unsupported (Wiggs/O'Hara/Wegerdt/van der Meer/Falzon/Hubbard 2003).

Since independence, Uzbekistan has reduced its cotton production in favour of wheat to achieve greater independence from imports and to achieve a higher food security. In 2004/2005 the country became autonomous in wheat supply, but at high economic costs (wheat could be imported at lower prices). Rice production also plays an important role in ADL; this highly water consuming crop is important in the national diet, produces high income (Rudenko/Lamers 2006) and therefore continues to be grown in spite of disincentives.

The socio-economic situation of Uzbekistan has to be seen in the context of IFPRI's cautioning (Pinstrup-Andersen/Pandya-Lorch 1998) against overlooking links between water supply, poverty and food security. In Uzbekistan, the prime challenge to food security and health problems is low water productivity; the country has one of the lowest water productivity levels in the world. The water productivity of poor farmers is often low because they lack training, equipment and funds for investing in more efficient technologies. Water productivity could be improved, for example by changing the current cropping patterns. Cai, Ringle and Rosegrant (2003) have shown that alternative crop mixes, with less cotton in Uzbekistan, would perform better in all indicators than the current crop mix, including farmers' value added. However, Rudenko/Lamers (2006) express caution against uncoordinated agricultural policy changes which are likely to have disastrous consequences.

57.2.3 Water Administration

Water distribution in the Aral Sea basin is controlled by the international *Interstate Commission for Water*

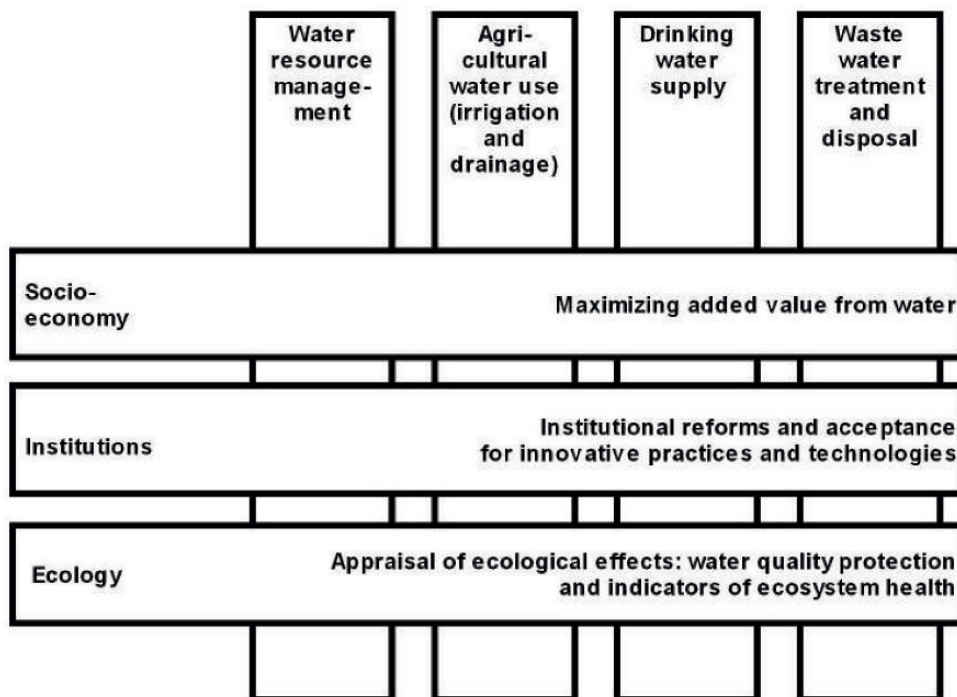
Coordination (ICWC) with Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan as members and Afghanistan as consulting partner (Sehring 2002, 2004a). The transport of the agreed water volumes in the main irrigation canals of the Amu Darya Basin is monitored by the *Basin Water Organization* (BWO) for Amu Darya (a similar BWO exists for the Syr Darya). More specifically, this is monitored by a BWO department called Upradik which also regulates the Tuyamuyun reservoir. The supply of water to Dashoguz in Turkmenistan occurs through three such large 'trans-national' canals which flow through Khorezm and Karakalpakstan. However, Turkmenistan has also built a channel that conveys water around Khorezm to Dashoguz. Giese, Sehring and Trouchine (2004) estimated that up to 80 per cent of the water in this canal is lost to infiltration in sandy soils and evaporation.

At the national level in Uzbekistan irrigation water is monitored by the *Basin Management of Irrigation Systems Authority* (BUIS), directly subordinated through the Ministry of Agriculture and Water Resources. The BUIS Lower Amu Darya, residing in Nukus, is responsible for the administration and allocation of water to Khorezm and Karakalpakstan. It is divided into 10 sub-departments (Management of Irrigation System, UIS), 6 of which are responsible for Karakalpakstan and 4 for Khorezm. These departments serve as connectors between the *Water User Associations* (WUAs, see below) and the state administration. In 2003, WUAs were introduced in the ADL, initially outlined according to hydrological criteria, but since 2005 WUAs have been designed based on the borders of the *shirkats* (former communal farms) (Zavgorodnyaya 2005). Since 2006, the introduction of water pricing schemes is being tested in pilot areas. These frequent re-organizations in the water sector indicate that distribution and allocation of water is still problematic, which represents a possible entry point for institutional improvements.

57.3 Integrated Water Resource Management (IWRM)

Analyses of many past development projects have shown that an overly narrow sectoral orientation produces solutions for water management which do not address the complex and delayed system behaviour and are therefore not sustainable (Dörner 1996). The introduction of IWRM is based on the Dublin principles, which emphasize the vulnerability of freshwater

Figure 57.2: Essential Utility Aspects of Water (vertical bars) and Cross-cutting Themes (horizontal bars) for Achieving IWRM in the Amu Darya Lowlands. **Source:** This figure was developed by the authors.



resources, the need for participatory planning and the consideration of the economic value of water (World Bank 2003c).

IWRM is defined by GWP as a process, which promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resulting economic and social welfare in an equitable manner, without compromising, the sustainability of vital ecosystems (GWP 2000b). Similarly, IWRM is understood by UNDP as a cross-sectoral policy approach, designed to replace the traditional, fragmented sectoral approach to water resource management that has resulted in unsustainable resource use (and also unsatisfying services). Based on the understanding that water resources are at the same time an integral component of the ecosystem, a natural resource, and a social and economic good (UNDP 2005), the IWRM approach aims at saving water and safeguarding water quality, supporting social and economic development, while at the same time preserving ecosystems.

The IWRM philosophy is widely diffused (Gyawali/Al-lan/Antunes/Dudeen/Laureano/Fernández/Monteiro/Nguyen/Nováček/Pahl-Wostl 2006); elements such as public participation and institutional reforms have attracted much attention (Lenton 2004), and there is a common acceptance of IWRM objec-

tives. However, its implementation is only partially realized in both developed and developing countries (UNDP 2003). The IWRM concept has been criticized insofar as it may be helpful to describe the complexity, but less so in pragmatically outlining implementation strategies (Gyawali/Allan/Antunes/Dudeen/Laureano/Fernández/Monteiro/Nguyen/Nováček/Pahl-Wostl 2006). Nevertheless it is considered a major achievement that the inclusion of socio-economic aspects and the integration of water quality and quantity will contribute largely to more sustainable water resources use than past fragmented approaches.

UNDP sees IWRM as a changing process with no fixed start or end points, which seeks to shift water management systems towards improved, sustainable states. The art lies in the right mix of selecting, adjusting, and applying available tools for a given situation (UNDP 2005).

57.3.1 Setting up an IWRM Framework for the Amu Darya Lowlands

Here, IWRM is understood as a general framework in which individual measures must be integrated in an integrated multi-sectoral approach; however, the practical feasibility considerably depends on the approach chosen. As a loose framework, we offer a matrix ap-

proach (figure 57.2) that combines the most urgent water management issues (vertical bars) with cross-cutting themes (horizontal bars). The IWRM concept must address all main water-related issues in a comprehensive manner and following hydrological (instead of artificial administrative) borders. For the situation at hand, the following four topics were identified: a) integrated management of natural ground and surface water resources; b) agricultural water use; c) drinking water supply and d) waste-water treatment and disposal. All categories must be reviewed related to their interaction and their mutual impact on water quantity and quality within the cross-cutting topics i) socio-economic aspects, ii) institutional aspects and iii) their impact on the ecosystem. To improve on organizational performance, economic efficiency and ecological sustainability, we suggest going along a matrix structure.

In the following a number of specific vertical and horizontal issues with respect to the lower Amu Darya basin will be described. The specific definition of what kinds of activities should be addressed will depend on local conditions, existing infrastructure, and specific demands of players in the region.

57.3.1.1 Water related themes

Integrated Management of Natural Ground and Surface Water. The dams of the Tuyamuyun reservoir play a critical role in the integrated management of ground- and surface waters downstream. Both, seasonal water availability and water quality depend on the operation and management rules of the Tuyamuyun complex. Currently, the Tuyamuyun dams are operated only for maximizing water quantity, where management rules are more based on past experience instead of formal plans. The Kaparas reservoir is predominantly filled during the winter months, when the Amu Darya has highest salt concentrations, whereas the low salinity summer floods – which could be used for drinking water – are directly channelled downstream for satisfying the irrigation water demands (Froeblich/Bauer/Ikramova/Olsson 2006). Modified operation rules would allow storing the low saline water during summer in the Kaparas reservoir and, by this, keeping the salinity in the drinking water below WHO standards of 1000 mg of salts per litre. It was shown that a reduction of the overall water deficit can be achieved even within a sequence of dry years (Froeblich/Bauer/Ikramova/Olsson 2006).

Changes in the dam operation will affect infiltration losses, the impact of shallow aquifers downstream, and the mobilization of pollutants to shallow

aquifers. Rises in groundwater levels not only affect soil salinization, but also, locally, the contamination of groundwater through the spread of latrines (Herbst 2006) and point pollution. Therefore, interactions between dam operation and groundwater resources need to be studied more thoroughly. This goes beyond the presently applied approaches in the region, and training is essential to support local managers in operation and management and to supply decision makers with the knowledge required. Supportive training programmes are also needed to introduce modern, GIS-based and integrative water planning and distribution tools, particularly, to secure water distribution by quantity and quality according to the users' varying needs in space and time.

Agricultural Water Use. Improved water use efficiency in agriculture can be primarily achievable by using all potential and economically acceptable water saving options based on an interdisciplinary assessment of costs, benefits and needs. For farmers, water should provide maximum agricultural yields which includes avoiding economic losses due to water shortage (Martius/Lamers/Vlek/Eshchanov/Rudenko/Salaev 2005).

Reducing water losses and transportation costs would require huge investments which the CA countries may be reluctant to make, given their low GDP and national budgets (Kijne 2005). Nevertheless, reducing the overall irrigated area, improving field water use through better water management in fields (including scheduling and levelling⁷), and selection of alternative crops are options that could easily reduce overall water needs. Adopting a safer operation of the irrigation system would require the adaptation of the water supply to the water availability in the system, making use of available risk assessment strategies and decision-making tools (Bos/Burton/Molden 2005; Hillel 1997; Mollinga/Bolding 2004).

The feasibility of potential innovations must be studied in parallel. For example, some irrigation technologies such as sprinkler irrigation or modern, self-regulating drip irrigation systems, would allow reducing the time-consuming and costly levelling of fields, but their adoption might still be more costly.

7 Scheduling water application to the periods of greatest water needs of the crop can reduce water wastage. Levelling fields is necessary in flood irrigation. It is practiced prior to planting and irrigating them in order to provide for a more uniform surface, which, if properly done, greatly reduces the time and amount of irrigation water application.

Increased water efficiency and reduced secondary soil salinization can furthermore be achieved through better on-site water management, improved rotations, conservation tillage, and the adoption of less water-consuming crops (Egamberdiev 2005; ZEF 2003; Kohlschmitt/Ehschanov/Martius 2008). Additionally, the introduction of salt-tolerant trees on marginal lands, for example, offers potential benefits for farmers because these trees may contribute to the drainage of the system through their own water demand (so-called bio-drainage: Khamzina/Lamers/Worbes/Botman/Vlek 2005; Khamzina/Lamers/Martius/Worbes/Vlek 2006). Low-cost approaches to irrigation management (Hillel 1997) are often advocated but have to be adapted through field tests with farmers before they can be successfully implemented. Economic assessments should allow a balancing of costs and benefits, built on comparative advantages of the various approaches for different soil types, crops and farm sizes.

Drinking Water Supply. A major need for improving drinking water supply is to achieve better use of the existing infrastructure and to provide water of sufficient quality to remote rural areas. Urgent maintenance is needed on the pipelines connecting the major cities (Urgench and Nukus) and the Tuyamuyun reservoir. Moreover, improving the management schemes of the different dams can contribute to increasing the availability of high-quality drinking water (Froeblich/Kayumov 2004). The provision of drinking water through pipelines to all of the widely scattered rural households is unrealistic for the next years. Bottled drinking water is available, but unaffordable for poor households in the region. In the case of leaking water tubes, innovative approaches to in-line-sanitation are available but also costly and unlikely to be implemented in the near future. As a short-term solution the provision of de-centralized point-of-use filter technology might precede or partly substitute the construction of long-distance supply systems. This would require building up local supplies, but could immediately and widely improve the existing low drinking water quality. Again, including drinking water into the framework of an IWRM concept requires the protection of water resources, their efficient distribution at different scales and with different quality, and the combination of decentralized and centralized purification and supply schemes.

However, Herbst (2006) pointedly makes the case that a rigorous implementation of simple hygiene measures in households may efficiently reduce the incidence of water-related health problems such as diar-

rhoea and hepatitis, much more than costly technologies. For this purpose sensible dissemination and training plans are required.

Waste-water Treatment and Disposal. Waste-water treatment technologies play a minor role in the ADL at present where latrines still prevail. However, there is a potential for pilot demonstration units of cheap, hygienic and decentralized water treatment facilities that may predominantly be installed in schools, kindergartens, hospitals, office buildings and small villages. They can serve as entry points for a later and wider implementation (Sasse 1998). Also, biogas produced from them may be an additional asset in energy supply (Eshchanov 2006), whereas the provision of distant villages with de-central biogas would provide increased energy supply security and independence from long distance pipe transfers.

57.3.1.2 Cross-cutting Themes

Socio-economic Assessments. Goal-oriented water management (McKinney/Cai 1997) aims at maximizing the overall welfare from the scarce resource, water. Also, economically optimizing water distribution (including a fair regional water distribution and the recognition of the 'social' role of water in poverty alleviation) has to be mentioned. Two important aspects need to be reconciled in this respect: the long-term priority of economic and ecological efficiency with the short-term adoption of technologies that fit the actual socio-economic and financial contexts of actors such as farmers and water authorities. The latter is extremely important to provide an entry point to get the IWRM started at all levels and this leads to our first step in the implementation strategy outlined below (58.3.3.1). However, under transition from central planning to market economy, as in CA countries, it is important to make water management to fit the emerging new structures of farming while combating poverty. A socio-economic approach to IWRM in the ADL should therefore be built on three main activities:

First, returns on investment and efficiency of technologies (Umetsu/Chakravorty 1998) must be calculated and the best strategies for introducing low cost technologies have to be identified. To assure an economically viable adoption of appropriate water saving technologies, pricing and incentive systems must be known (Cai/Ringler/Rosegrant 2001) and established on the micro level (WUAs) to ensure overall efficiency of competing farms. Prices are to be socially and economically determined. Water scarcity indicators and implicit water pricing will then allow decisions on in-

troducing of certain technologies by avoiding those that are expensive and inefficient, or modify technologies to make them cheaper.

Second, necessary economic tools must be made available to local actors for enabling them to maximize value added from scarce water and to minimize water provision costs. Available spatial water allocation models (Fang 2004; Schieder 2008) can help to reveal optimal flows of water from the river through canals to end users. The micro-level (WUAs) and the macro-level water-distributing organizations (BWO, BUIS) must be linked through appropriate scaling and may be integrated into an overall water demand model that analyses the impacts of technologies and distribution regulations.

Third, a monetary evaluation of willingness-to-pay for drinking water at different scales and with different user groups needs to be carried out, notably within a stratum of related income levels and poverty indicators, which can show how water pricing affects the welfare of population. The aim is to find solutions for an economization of water use that minimizes negative impacts for vulnerable downstream groups, e.g.; checking cross-subsidization opportunities.

All three activities should address both the quantitative and the qualitative aspect of water management. Since salinity is the most prominent water quality problem in the region, water pricing and incentive schemes must recognize the value differences of water at different quality levels, at different locations and at different periods of the year

Institutional Analysis and Institution-building. Reforming water management is a complicated process that needs monitoring of institutions (Saleth/Dinar 2004) and requires approaches which fit specifically into local cultures and policy frames. Institutional analyses should address four issues. *First*, the organizational structure of the current water management needs to be analysed in line with IWRM objectives and principles. *Second*, WUAs (or their follow-up organizations) must be assisted and trained in management because of their limited administrative experience (2005). *Third*, institutions in the water sector must be based on the principles of subsidiarity. *Fourth*, guidelines guaranteeing participation and involvement in local and decentralized decision should be part of the institutional change. Participative methods for planning of water distribution are new to the region. Therefore, the specific consideration of local decision-making structures is crucial, and necessitates training for introducing these approaches (58.3.3.4).

Ecological Monitoring. Ecological work in the IWRM context would need to be provided and indicators for monitoring the success in water saving, water quality improvements, and ecosystem health are in critical demand. Critical environmental health parameters that describe the situation before the start of innovations (baseline) should allow for measuring and documenting improvements. This requires a 'holistic' view; e.g. the agro-ecological aspects of land-use (crops, techniques and rotations) and its relationship to water management (more specifically the reduction of soil salinity through better water and land management) must be put forward. Furthermore, the role of pesticides (both residues from former applications and present practice) and their relation to human health needs to be further investigated, as few comprehensive data exist on this often debated issue. Uzbek laboratories must conform to international quality standards (ISO, GLP). Authorities must be assisted in setting up thresholds and guidelines for pollutants in accordance with international laws, and with the additional requirements of the specific CA situation (cold winters, hot summers) which may influence the behaviour of pesticides.

57.3.2 A Stepwise Implementation Concept

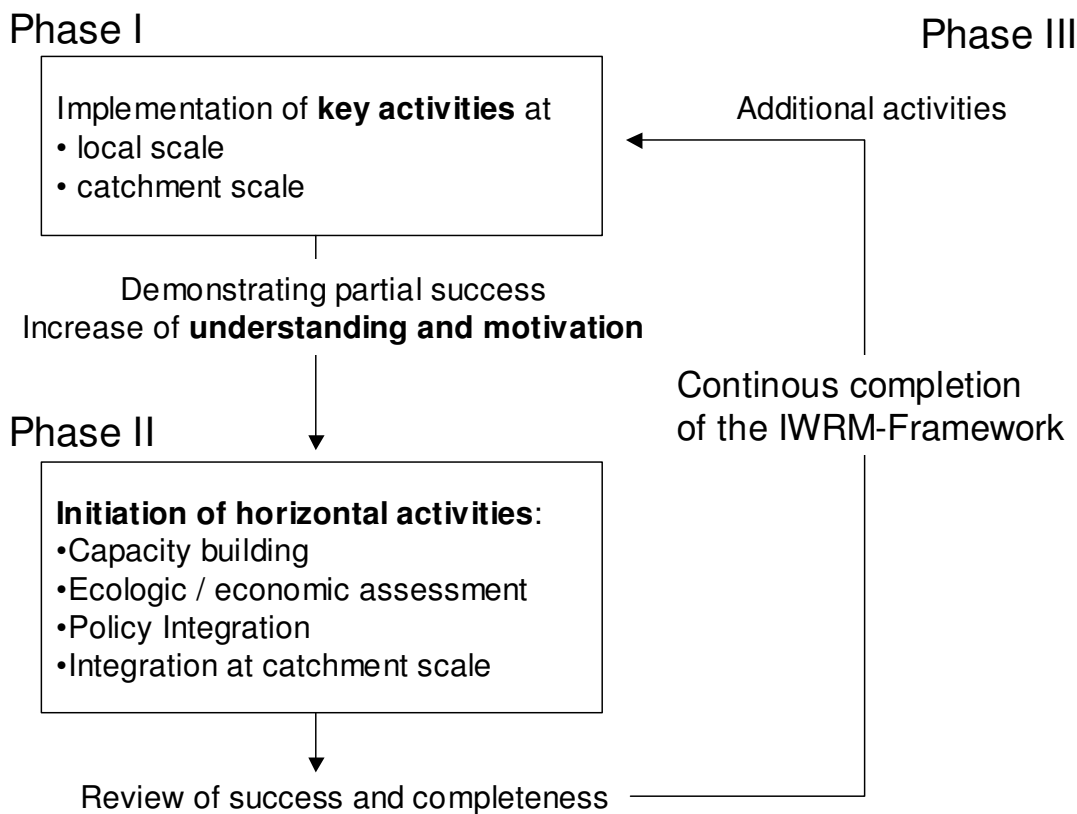
Apart from integrating the various water themes and cross-cutting issues, an approach towards better water management in CA should be strongly grounded on the following strategic principles of action:

57.3.2.1 'Implementation as-you-go'

Realizing the need for a multi-sectoral effort will require substantial changes in all water related issues, which quite obviously would not be achieved in one stroke. There is thus a substantial need to firstly reach a continuously growing understanding of and identification with IWRM principles at the decision making level and secondly to provide room for modifications and adaptations to experiences gained during the implementation process.

In this sense, we envisage an approach towards successful implementation of IWRM principles that builds on the stepwise implementation of feasible key technologies and links them into the general theoretical IWRM framework (we call this 'implementation as-you-go'). The importance of guaranteeing feasibility using a hierarchy of goals and a stepwise implementation of solutions has been highlighted in Kaiser/Rothenberger (2004) as well as by the GWP (2000b). Not only Uzbekistan, but also other transi-

Figure 57.3: Generalized pattern for implementing key activities as partial elements within an IWRM framework.
Source: Authors.



tion and developing countries need to solve water issues in the shortest time and with visible success. The central element behind this approach is to build the motivation for non-technical instruments by demonstrating the success of the concept as well as promote more easily accepted technological measures.

Figure 57.3 shows how different individual initiatives may be sequentially implemented. Provided that the link to the other vertical and horizontal themes is known, Phase I sees the initiation of key activities and technologies. Their successful adoption will lead to Phase II, which - building on the experience gained in Phase I - will address specific capacity building measures and first institutional reforms. After careful revision, Phase III may comprise either additional practical measures or further non-technical reforms.

Within the realization of the different measures and phases, it is also important to integrate the scales: the various levels of water management need to be addressed: the micro-level of field, farm and village as well as the regional large scale water attribution problems at the macro-level.

57.3.2.2 Introducing Key Technologies

Key technologies (table 57.1) are the major building blocks during the initial phase of implementation of the IWRM concept. They need not to be necessarily very sophisticated. Integrating those key technologies within the IWRM concept framework would provide visible results early on, but avoid falling back upon merely technological approaches without considering the cross-cutting social, economical and environmental issues.

This is not about delivering standard technologies blindly to inadequate, low-tech and low capitalization environments, rather an approach that has been criticized before as 'the crisis of innovation' in the water sector (Thomas/Ford 2005) has to be avoided. It will be required to take up the needs and requirements of the users in a stakeholder-oriented development scheme and refer to them during Phase II. This should include involving wherever possible, local, low-cost production facilities, service and maintenance that may provide additional incentives for investments and economical diversification. Private-public partner-

Table 57.1: Examples of key technologies to be implemented in the framework of an IWRM concept for the ADL.
Source: Compiled by the authors.

Sector	Key technology	Benefit
Water management	Automatic monitoring stations	Precise knowledge on temporal variability, on proportion and impact of polluted return water flows, input data for basin management including dam operation
	Remote sensing	Essentially required knowledge on water balance, water use and crop production for different scales (entire basin, region, farm)
	Dams and distribution weirs	Redistribution of water resources availability, multi reservoir complexes provide practical means to differentiate storage of high and low quality water
Irrigation	Levelling	Improvement of irrigation efficiency and reduction of water use for salinity reduction
	Mobile plastic canals	Cost effective reduction of water losses
	Self-regulating drip irrigation	Most precise water allocation, water saving and avoidance of soil salinization
Sanitation and drinking water supply	Rehabilitation of wells and Protection of well areas	Reduction of disease propagation, efficient system functioning
	Hand pump/motor pump wells	Decentralization of water supply with reduction of direct withdrawals from collectors
	Robust sewage water treatment	Eradication of fecal pathogen distribution and stabilization of oxygen consumption
	Pipe sealing	Reduction of recontamination, avoidance of new building and better use of existing infrastructure
	Point-of-use purification	In-line filter technology for reduction of pathogens, persistent organic pollutants (POPs) and heavy metal contamination. Enabling house water storage for irregular water supply

ships could lead to a fast-track approach to innovation according to the ‘leap-frogging’ paradigm in development⁸, provided that appropriate incentives are given.

57.3.2.3 Stakeholder Orientation

The involvement of regional stakeholders (farmers, water users, and representatives of water distributing agencies) in any of these activities is the key to success and sustainability of measures. The literature on partner orientation in development abounds with different approaches and concepts (van der Pol 2004) but shows a steady change in paradigms (Douthwaite/de Haan/Manyong/Keatinge 2001). However, the area of water management has been and is still especially prone to a predominant focus on technical solutions. The first necessary change would be to divert from

donor-driven projects to a stronger involvement of the local partners, such as has been quite successfully initiated by the CACILM⁹ initiative (ADB 2004). On a project level this would need to be translated into moving away from technology prescriptions to more equitable approaches for joint technology development (e.g., Douthwaite/de Haan/Manyong/Keatinge 2001).

57.3.2.4 Human Capacity-Building

An improved and more professional performance of actors in water distribution institutions has been repeatedly solicited by representatives of institutions in the Amu Darya. Therefore the stepwise implementation concept needs to be accompanied by capacity

⁸ Leapfrogging denotes the notion that regions with poorly developed technology or little economic basis can improve rapidly through the adoption of modern systems without going through intermediary steps (Bedi 1999; Seibel/Müller-Falcke/Bertolini 1999).

⁹ The *Central Asian Countries Initiative for Land Management* (CACILM) is an international effort to streamline the efforts for setting up national action plans for implementing the *UN Convention to Combat Desertification* (UNCCD) in the five CA countries, supported by, among other donors, the *Asian Development Bank* (ADB).

building as regards to horizontal and vertical issues. Since the Uzbek independence, funds for upgrading training capacities of teachers and trainers have been scarce. Local extension services are only slowly being building up. The training and education institutions often lack modern didactical approaches. Therefore, not only farmer schools and agricultural colleges must be set up, but also training facilities for the trainers themselves, which need to learn and adopt modern principles of adult education, problem-oriented analytical thinking, and stakeholder-orientation.

57.3.2.5 Long-term Commitment

Development projects are often characterized by short timeframes dictated by budgetary concerns, rather than development needs. The lessons learned from innovation transfer endeavours elsewhere (Douthwaite 2002) indicate that the necessary timeframe for innovations to hold is often underestimated, and may easily attain the time scale of decades.

Particularly in the ADL, only long-term commitment of international donors will provide the necessary incentives and signals to improvements and allow for the necessary follow-up on all levels. Hopefully, more long-term cooperative joint research and extension programmes will be established in the near future in CA; a few examples of long-term commitments are the ZEF/UNESCO project on land and water management in Khorezm (Vlek/Martius/Werheim/Schoeller-Schletter/Lamers 2003), the CACILM programme mentioned in 58.3.3.3, and the presence of institutions of the CGIAR system in the region.

57.4 Conclusions - Why Central Asia?

The declared Uzbek development policy of gradual change does not make this country a member of the so-called 'fast-track countries' among the CA states (WBGU 2005), an approach that has often been criticized. However, as the report of the *Commission on Human Security* (CHS) stated, security should centre on people - not on states (CHS 2003), and the advisory council of the Federal German Government on global environmental issues (WBGU) argues that, for security and humanitarian reasons, the international community should not write off countries like Uzbekistan (WBGU 2005). Similar arguments have been raised by the Human Security Network (HSN 1999), the CHS (2003) and in UNESCO documents (Goucha 2003).

For millennia, the people of CA have been highly dependent on agriculture for meeting their needs. They have learned to cope with an ever-changing environmental, institutional and economic framework. Today, however, the situation in the water sector - which has the largest impact on the natural resources - is characterized by strong path dependencies and an increasingly bleak economic and environmental outlook, particularly so for people in the lowlands. Even if the risk of trans-national conflicts should be regarded as low, the region still suffers from poverty linked to environmental degradation.

We have presented here an approach which, while building on an integrated, trans-national, systemic view on the problems, is pragmatic enough to 'implement doable things first'. We see this as the only way to achieve more human and environmental security. A stepwise implementation of key activities and technologies as a first move is intended to produce visible results that help to provide the ground for reaching acceptance for more advanced, institutional changes which must be considered as an prerequisite for implementing IWRM.

The authors believe that the presented IWRM approach is a viable avenue for improving livelihoods, restoring ecosystem services, and providing safety for the people and natural resources not only in the Amu Darya lowlands, but also in other comparable regions - throughout CA and elsewhere - suffering from similar human and environmental security problems.

58 Water Security in Times of Armed Conflicts

Mara Tignino¹

58.1 Introduction

With the end of the Cold War, international institutions such as the United Nations have been involved in a reconceptualization of security. While until the 1980's, states dealt with security issues focusing on military dimensions, during the last two decades, the linkages between environmental and security issues have progressively emerged (Brauch 2003c, 2005a, 2005b, 2005c). Parallel to these developments, the concept of human security has also appeared in the discourse of several international actors. This concept introduced by the United Nations Development Programme (UNDP) in 1994 postulates a shift from the security of the state to the security of the people.

The widening of the concept of security is reflected in the 2004 Report of the *High-Level Panel on Threats, Challenges and Change* established by the UN Secretary General which identifies "poverty, disease and environmental degradation" as being among the threats confronting the international community (UN, High-level Panel, 2004: 26–31). The Report mentions the concept of human security on several occasions (Brauch 2005). Although the place accorded to environmental threats in the 2004 Report is limited and the main subject of security policy still remains the state, national and international institutions increasingly highlight that security policies are analysed in a wider context that includes social and environmental dimensions. A special mention should be made to the UNEP Post-Conflict Environmental Assessment in Sudan. This study explicitly recognizes that among the root causes of the conflict are shortage of water and land degradation (Sudan: Post-Conflict Environmental Asssment 2007: 220–249).

In the debate on the security reconceptualization, water plays an important role. With continuing popu-

lation growth, economic development, and climate change, the challenges facing water are tremendous. It is worth noting that over 245 river basins are shared by two or more states covering an area of roughly 45 per cent of the earth's surface, and affecting approximately 40 per cent of the world's population (Boisson de Chazournes/Salman 1998). International organizations, experts, and the media have repeatedly underscored the role of water in international relations and the concomitant risks of tensions between countries for its utilization and management (Westing 1986; Falkenmark 1986; Homer-Dixon 1991; Gleick 1993; Remans 1995). On this ground, the twenty-first century has often been labelled as a period that is likely to experience wars over water. However, such a prophecy needs to be at best nuanced, at worst, rejected. Historical evidence shows that water has rarely been the primary reason for armed conflicts. Scholars, such as Thomas Homer-Dixon, director of the Peace and Conflict Studies Program at the University of Toronto, have already pointed out that water can be among the causes of a war, but is very rarely the sole cause and he went as far as to denounce "the myth of global water wars" (Homer-Dixon 1998). This approach has also been taken at the Second and Third World Water Forums held in 2000 and 2003.² In the course of the latter, several sessions were held under the theme "Water for Peace" where it was concluded that: "The vital nature of water makes it a possible cause of tension, but more importantly, a potential source of cooperation" (UNESCO/Green Cross International 2003: 106). In the same vein, the UN Secretary General (Annan 2005a) highlighted that water can be a "catalyst for cooperation" and that the com-

1 The author would like to thank her friend and colleague Ms. Lindsey Cameron for help in the preparation of this chapter.

2 See "Water Security in the 21st Century," Ministerial Declaration, Second World Water Forum, The Hague, 22 March 2000, para. 3, available at: <http://www.thewaterpage.com/hague_declaration.htm>; Ministerial Declaration, Third World Water Forum, Kyoto 23 March 2003, para. 11, available at: <<http://www.mofa.go.jp/policy/environment/wwf/declaration.html>>.

peting growing demands between uses and users can encourage cooperation on a regional basis.³

It is most often in this light that water is considered in relation to armed conflict: as a reason for going to war. However, this chapter will leave aside such issues related to *ius ad bellum* and it will focus on the consequences of armed conflicts on water and water installations. In this context, it will deal with the legal framework provided by *ius in bello* or International Humanitarian Law (IHL) regarding water.⁴

Armed conflicts are one of the causes of water insecurity in many parts of the world.⁵ Many factors cause water insecurity during armed conflicts. Such insecurity is often created by the destruction of dams, water pumping stations, treatment and sewage systems. The collapse of a high storage dam, for example, takes thousands of lives and has devastating economic and financial consequences (Westing 1986, Bergström 1990). Military activities often cause the insecurity of water supplies as well as of economic sectors dependent on this natural resource, such as agriculture, industry, fishing activities, and the transportation of goods and people through rivers. Furthermore, water security is also threatened by the environmental damage caused by the conduct of hostilities. Such damage leaves in its wake the negative impacts on the aquatic environment of rivers and on their ecosystem resulting in the destruction of natural habitats and in the loss of biodiversity. These various aspects of water insecurity will be dealt with in this chapter. In this context, the human and environmental dimensions of security (Brauch 2005a), which are interdependent, will be taken into account.

In times of war, IHL deals with the protection of water security through various provisions dealing with different aspects of armed conflicts. While having as their primary purpose safeguarding the life of people and property from wanton destruction, rules of IHL also provide a basis for preserving water as an integral

part of the natural ecosystem. The fact that the word ‘water’ did not occur until the 1970’s in instruments of IHL⁶ does not mean that before that date there was no protection of water security.

However, the regime on water security built up by the IHL does not address water security as an autonomous issue. The IHL deals with water through its objectives, namely the protection of the victims of war and the regulation of the conduct of hostilities. Thus, water is dealt with as a basic need of people, as a weapon or as an objective of military activities. This chapter will outline some of the main rules provided by the IHL dealing with water and it will suggest the need for a comprehensive protection of water security in times of armed conflict.

58.2 Water Security in the Conduct of Hostilities

Before considering the rules which deal with water security during armed conflicts, it may prove useful to identify some general principles of IHL which govern the conduct of hostilities. Most of these principles have a role in the protection of water. Such principles, identified by the International Court of Justice (ICJ) in 1996 in the Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons,⁷ include: the principle of the distinction that must be made between civilians and combatants and between military objectives and civilian objects;⁸ the prohibition of the use of weapons that cause superfluous injury or unnecessary suffering;⁹ the principles of humanity contained in the Martens Clause;¹⁰ and the principle of necessity, under which belligerents may only use that degree of force necessary to weaken or defeat enemy forces.¹¹ The principle of proportionality is also an underlying general principle of the IHL. This princi-

3 Message of the United Nations Secretary General for the World Water Day, 22 March 2005, available at: <<http://www.un.org/waterforlifedecade/waterforlifebklt-e.pdf>>.

4 This chapter will focus exclusively on freshwater issues and not on aspects of naval warfare. It will not deal with water issues in the terms of the aid to wounded and sick as well as in the context of the protection of water engineer.

5 In this regard, it should be noted that that the International Committee of the Red Cross (ICRC) conduct water-related activities in 40 countries affected by armed conflicts. See the map reproduced in the chapter (fig. 66.1).

6 It should be noticed that the 1949 Third and Fourth Geneva Conventions contain some explicit water-related provisions. They include the supply of water to prisoners of war, internees, and of persons whose liberty has been restricted during non-international armed conflicts. See Articles 20.2, 26.3 and 46.3 of the Third Geneva Convention and Articles 89.3 and 127.2 of the Fourth Geneva Convention. “Convention (III) relative to the Treatment of Prisoners of War,” Geneva, 12 August 1949; “Convention (IV) relative to the Protection of Civilian Persons in Time of War,” Geneva, 12 August 1949 in: ICRC: 75–152, 153–221.

7 ICJ, “Legality of the Threat or Use of Nuclear Weapons,” Advisory Opinion, 8 July 1996, *ICJ Reports* (1996), para. 78.

ple, prohibiting military action in which the negative effects clearly outweigh the definite military gain, is an important means for assessing whether or not the ‘collateral damage’ caused by attacks against legitimate military objectives are admissible under IHL.¹²

General principles of IHL, finding their first expression in some of the oldest instruments of IHL such as the *St. Petersburg Declaration* (1868) and the *Hague Conventions* (1899, 1907), have been reiterated in numerous instruments and in various forms. Laying down the basis of IHL, such principles have contributed to the development of this branch of international law. At the same time, they constitute principles that in their own right impose obligations on the belligerents (Sassòli/Bouvier 1999). Each of the general principles of IHL points to the conclusion that military attacks on water installations and damage to water resources are questionable, even in the

absence of specific rules of IHL addressing water issues in detail.

58.2.1 The Prohibition of Poisoning

In ancient and recent conflicts, the poisoning of water has been used as a method of warfare. Belligerents often deliberately render water unusable by disposing of chemicals, dead animals, and even human corpses into the water.¹³ Yet already in 1588, Alberico Gentili in his book devoted to *De jure belli* claimed that the prohibition of poisoning water was a well-established rule of international law (Gentili 1612). This prohibition was founded on the conviction that poison was prohibited because of its clandestine and insidious character. In 1758, Vattel described the point in this way: “There is even more general agreement in condemning the poisoning of streams, springs and wells. Certain authors give as a reason that thereby innocent persons, who are not our enemies, may be killed” (Vattel 1758, vol. III: 289).

The prohibition of using poison and poisoning weapons has been codified in Article 23 (a) of the 1907 Hague Regulations.¹⁴ The relevance of the prohibition of using poison to water protection is asserted in various national military manuals. For example, the UK military manual states that “poison and poisonous weapons ... are forbidden. Water in wells, pumps, pipes, reservoirs, lakes, rivers and the like,

8 The 1868 Saint Petersburg Declaration affirming that “the only legitimate object which States should endeavour to accomplish during war is to weaken the military forces of the enemy” was the first multilateral instrument to embody the principle of distinction. Since then it has been reiterated in numerous instruments. For instance, in its Article 48, entitled “Basic rule,” the 1977 Additional Protocol I of the Geneva Conventions (hereafter AP I) states: “In order to ensure respect for and protection of the civilian population and civilian objects, the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives and accordingly shall direct their operations only against military objectives.” See “Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight” Saint Petersburg, 29 November/11 December 1868, in: Schindler/Toman, 2004: 91–93. “Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I),” 8 June 1977, in: ICRC 1977: 3–87. State practice establishes the principle of distinction as a norm of customary international law applicable in both international and non-international armed conflicts. As regards to non-international armed conflicts, see: Bothe/Partsch/Solf 1982; Sassòli/Cameron 2005. See also *infra*.

9 See Article 23 (e) of the “Convention (IV) respecting the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land” (hereafter the 1907 Hague Regulations), The Hague, 18 October 1907 in: Schindler/Toman, 2004: 55–87. See also Article 35.2 of AP I stating that: “It is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering.”

10 The Martens Clause, named after the Russian delegate to the 1899 Hague Peace Conference was first introduced in the preamble of the 1899 and 1907 Hague Regulations and it appears in various instruments. In this regard, Article 1.2 of AP I states that: “civilians and combatants remain under the protection of and authority of the principles of international law derived from established custom, from the principles of humanity and from the dictates of public conscience.” See also the Preamble, paragraph 4 of the Additional Protocol II of the Geneva Conventions (hereafter AP II). “Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II),” 8 June 1977, in: ICRC 1977: 89–101.

11 See the 1868 St. Petersburg Declaration.

12 See Article 57 (2) (a) (iii) of AP I.

13 According to the ICRC, which ran a water-sanitizing operation in Kosovo in 1999: “Of the 20,000 wells in Kosovo, over half are believed to have been contaminated with animal or human remains or with rubbish, or have simply grown stagnant through lack of use.” See: “Balkan Crisis: Cleaning Wells in Kosovo” in: *ICRC News*, 99/37, 8 September 1999.

from which the enemy may draw drinking water, must not be poisoned or contaminated. The poisoning or contamination of water is not made lawful by posting up a notice informing the enemy that the water has been thus polluted” (UK Military Manuals 1958: para. III-112).¹⁵

The prohibition of using poison is one of the oldest rules in the means of warfare. Its status in customary international humanitarian law has been dealt with by several authors and it has also recently been restated in the book devoted by the ICRC to Customary International Humanitarian Law (ICRC, Customary International Humanitarian Law 2005, vol. I: Rule 72). Although the prohibition to use poison has been conceived for protecting people, such prohibition also has a bearing on the environmental protection of water. In this context, as an example one may mention the 1925 *Geneva Protocol for the prohibition of the use of asphyxiating, poisonous or other gases, and of bacteriological methods of warfare*.¹⁶ This instrument provides one basis for asserting the illegality of forms of chemical and bacteriological warfare having a harmful effect on water resources and it may be regarded as a special prohibition of the general rule codified by Article 23 (a) of the 1907 Hague Regulations.

14 See also: Article 70 of the 1863 “Lieber Code”; Article 13 (a) of the 1874 “Brussels Declaration” and Article 8 of the 1880 “Oxford Manual.” Moreover, Article 8 (2) (b) (xvii) and (xviii) of the 1998 International Criminal Court Statute (hereafter ICC Statute) declares the employment of poison and poisoned weapons as a war crime during international armed conflicts. “Instructions for the Government of Armies of the United States in the Field (Lieber Code),” 24 April 1863; “Project of an International Declaration concerning the Laws and Customs of War,” 27 August 1874, “The Laws of War on Land,” 9 September 1880. ICC Statute, 17 July 1998. These instruments are reprinted in: Schindler/Toman 2004: 3-40, 1309-1395.

15 See also the US Field Manual 1956: para. 37 (a); Colombia’s Basic Military Manual 1995: 49.

16 “Protocol for the prohibition of the use of asphyxiating, poisonous or other gases, and of bacteriological methods of warfare,” 17 June 1925, in: Schindler/Toman 2004: 95-97. Several instruments of disarmament law prohibiting the uses of certain weapons play an important role in protecting water resources. For example, see “Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects” Geneva, 10 October 1980, in: Schindler/Toman, 2004: 179-189. On the role of disarmament law for protecting environment, see: Roberts 2000; Brauch 2003a.

58.2.2 Protection of Objects Indispensable to the Survival of Civilian Population

Military attacks launched by the belligerents often have as a consequence the cutting-off of aqueducts and water distribution systems. In many cases, the collapse of water-related systems is not caused by the direct impact of bombs, but by the destruction of electrical networks. The bombing of the electric power grid and the ensuing cutting-off of water distribution, treatment and sewage systems, lead in many cases to the outbreak of water-borne diseases causing a great number of casualties.¹⁷ This must be considered in the analysis of whether an attack was proportionate. In addition, the IHL deals with these issues in another way: by providing a legal framework on the protection of objects having a civilian character and conferring a special protection of ‘objects indispensable to the survival of the civilian population.’

IHL confers a general protection, codified, *inter alia*, under Article 52 of AP I, on objects having a civilian character. This provision is of considerable importance in order to apply the basic rule contained in Article 48 stating the principle of distinction between civilian objects and military objectives. Civilian objects are defined negatively in that civilian objects are “all objects which are not military objectives.” According to Article 52, the definition of military objectives comprises two elements: “the nature, location, purpose or use which makes an effective contribution to military action” and “the total or partial destruction, capture or neutralization which in the circumstances ruling at the time offers a definite military advantage.” These elements must be considered in each attack against a military objective. Moreover, the belligerents also must take precautionary measures in the attacks “with a view to avoiding, and in any event to minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects.”¹⁸ The military advantage has to be concrete and direct and must be weighed against the civilian losses and damage resulting from an attack.

For certain categories of objects, IHL provides for special protection and it sets out specific rules limiting military attacks. The technique of conferring special protection on specified objects has been used in other instruments of IHL, such as in Article 27 of the

17 See Center for Economic and Social Rights: “Special Report: Water under siege in Iraq,” April 2003, available at: <<http://cesr.org/node/view/18>>.

18 AP I, Article 57 (2) (a) (iii) titled “Precautions in attack.”

1907 Hague Regulations devoted, among others, to the protection of historical monuments and in the 1954 “Convention for the Protection of Cultural Property in the Event of War and Armed Conflict.”¹⁹

In IHL, the category of objects having special protection includes “objects indispensable to the survival of the civilian population.”²⁰ According to Article 54 (2) of AP I: “It is prohibited to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works, for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse Party, whatever the motive, whether in order to starve out civilians, to cause them to move away, or for any other motive.” The list given by this provision is merely illustrative and it aims to give some examples regarding objects which are necessary for the life of people. In this regard, the ICRC Commentary states that “an exhaustive list could have led to omissions or an arbitrary selection” (ICRC Commentary 1987: 655).

The special protection conferred by Article 54 on objects such as drinking water installations and water supplies develops the prohibition of using starvation as a method of warfare (ICRC Commentary 1987: 655). This prohibition came up in the context of the necessity to prohibit methods of total warfare. Violation of the prohibition of starvation may constitute the crime of genocide when this act is committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group.²¹ Moreover, under the Statute of the International Criminal Court, the intentional use of starvation of civilians by depriving

them of the objects indispensable for their survival is a war crime.²²

Although Article 54 of AP I may be viewed as ensuring a broad protection of water, this provision establishes some exceptions. The first exception is contained in paragraph 3 of this provision, stating that the immunity of indispensable objects is lifted in cases where they serve as sustenance solely for members of the armed forces or as direct support for military action. Although some water supplies could serve to sustain armed forces, this exception is not a sufficient reason for depriving the civilian population of water. This view is confirmed by the restriction contained in paragraph 3 (b) *in fine*, which states that belligerents must refrain from acts which may be expected to reduce the civilian population to starvation or force them to move away. Paragraph 5 of Article 54 contains the second exception. This is related to the so-called ‘scorched earth policy’ applied in defence of national territory against invasions. However, derogation from the protection accorded to objects indispensable for the survival of the population is subject to strict limitations. The derogation may not be used in territories under occupation and imperative military necessity is required (ICRC Commentary 1987: 658).

In the context of non-international armed conflicts, Article 14 of AP II also protects “objects indispensable to the survival of the civilian population.”²³ The protection conferred by this provision of AP II has particular importance given that this instrument does not state a general protection of civilian objects such as those ensured by AP I. Although an explicit rule concerning a general protection of civilian objects is not expressly mentioned in AP II, the principle of distinction between military objectives and civilian objects also applies in non-international armed conflicts (Sassòli/Cameron 2005: 45). In this context, it should be underscored that Article 13 of AP II, codifying the general principle that protection is due to the civilian population against the dangers of hostilities, allows covering a general protection of civilian objects (Bothe/Partsch/Solf 1982: 677).²⁴ According to the ICRC Commentary, ensuring a general protection for

19 Article 27 of the 1907 Hague Regulations confers a special protection to “buildings dedicated to religion, art, science, or charitable purposes, historical monuments, hospitals and place where the sick and wounded are collected, provided that they are not being used at the time for military purposes.” See also: “Convention for the Protection of Cultural Property in the Event of Armed Conflict,” The Hague, 14 May 1954, in: Schindler/Toman 2004: 999–1025.

20 This category also includes installations containing dangerous forces such as dykes and dams. See *infra*.

21 See Article 2 of the “Convention on the Prevention and Punishment of Genocide,” Resolution 260 (III) A, United Nations General Assembly, 9 December 1948, in: Schindler/Toman 2004: 839–863. On the intent requirement, see ICTY, Krstic, Appeals Chamber, Judgement, 19 April 2004, Case No. IT-98-33-A, para. 134.

22 Article 8 (2) (b) (xxv), ICC Statute.

23 Article 14 of AP II reads as follows: “Starvation of civilians as a method of combat is prohibited. It is therefore prohibited to attack, destroy, remove or render useless, for that purpose, objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works.”

the civilian population implies: on the one hand, “an absolute prohibition of direct attack against the civilian population as such, or against civilians”; on the other hand, “reducing the effects of military operations which could affect protected persons” (ICRC Commentary 1987: 1449). Article 14 of AP II implements thus the general protection against the effects of the hostilities provided for by Article 13. At the same time, these provisions are also strictly linked to Article 3 common to the four 1949 Geneva Conventions stating that parties to a non-international armed conflict have the obligation to guarantee humane treatment for all persons not participating in hostilities.

The general protection conferred by IHL regarding objects having a civilian character and the special protection given by Articles 53 of AP I and 14 of AP II play a significant role in protecting water security in times of armed conflict. In this regard, it can be observed that some objects such as electrical facilities used for pumping or treating water may nevertheless be used by belligerents for both civilian and military purposes. In this case, belligerents may argue that such objects become military objectives. However, such attacks shall become illegal if the attack is expected “to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated.”²⁵ Therefore, when planning such attacks general principles of IHL such as those of proportionality shall be considered by belligerents (Lewis 2003: 487; Sassòli/Cameron, 2005: 57–58).

58.2.3 Protection of Installations Containing Dangerous Forces

Article 56 of AP I on international armed conflicts and Article 15 of AP II on non-international armed conflicts, conferring a special protection on dams,

constitute an important innovation in the limitations on the conduct of hostilities. Apart from the use of poison, the breaching by belligerents of water installations would be a devastating means of warfare. In old and modern wars, dams have been used as a defensive and an offensive weapon. Since the seventeenth century, the Dutch did not hesitate to breach the dams and flood their land with the aim of protecting their towns against invasion. This strategy, known as the Dutch Water Line, was used until the twentieth century. Another example is the breaching of the dykes by the Chinese during the 1930’s to stop the invading Japanese troops. On the other hand, the breaching of water installations has also been used as a dreadful offensive weapon. The destruction of the dams in the Eder and the Möhne in Germany in May 1943 resulted in the destruction of factories, in the loss of cultivated land and livestock, and in the killing of 1,300 persons (ICRC Commentary 1987: 666; Westing 1990a: 6; Bergström 1990, 40–41). Still, during the Vietnam War, 661 sections of dyke had been either damaged or destroyed during the course of the war (ICRC Commentary 1987: 666).

As a consequence of the impact of the destruction of such installations, it was necessary to include a special protection for water installations in the Additional Protocols to the 1949 Geneva Conventions. Conversely to the case of Article 54 of AP I which provides a list of objects indispensable for the survival of the civilians which is merely illustrative, Articles 56 and 15 of the AP I and AP II, respectively, contain an exhaustive list of the installations which may release dangerous forces. These provisions grant special protection to dams, dykes, and nuclear electrical generating stations. However, other installations can release dangerous forces in the case of attack; for example, one may think of factories manufacturing chemical or oil products which, if released, could endanger the natural environment and cause severe damage to the civilian population. Such incidents, which can sometimes be serious, have recently occurred in various countries in peacetime.²⁶ Although the special protec-

24 Article 13 of AP II, titled “Protection of the civilian population,” reads as follows: “1. The civilian population and individual civilians shall enjoy general protection against the dangers arising from military operations. To give effect to this protection, the following rules shall be observed in all circumstances. 2. The civilian population as such, as well as individual civilians, shall not be the object of attack. Acts or threats of violence the primary purpose of which is to spread terror among the civilian population are prohibited. 3. Civilians shall enjoy the protection afforded by this Part, unless and for such time as they take a direct part in hostilities.”

25 Article 57 (2) (b), AP I.

26 For example, see the benzene spill that occurred on 13 November 2005 in China as a result of the explosion of a petrochemical plant adjacent to the Songhua River. That spill, after having caused water contamination in the water supplies of the city of Harbin in China, would reach the Heilongjiang River, called the Amur River in Russia, and it would probably cause hazards to Russian towns. “China warns Russia of toxic slick”, 24 November 2005, available at: <<http://www.cnn.com/2005/WORLD/asiapcf/11/24/china.city>>.

tion accorded by the 1977 Additional Protocols is limited to specific installations, the considerations guiding such special protection should also apply to other installations such as chemical plants and petroleum refineries given the effects of these attacks (ICRC, Customary International Humanitarian Law, 2005, vol. I: 142). Moreover, when, under certain circumstances, these installations may become a military objective, measures of precaution shall be taken by the belligerents.

Articles 56 and 15 of AP I and AP II, respectively, place the security of water installations at the heart of their regime of protection. Installations containing dangerous forces are objects protected against attacks in conformity with Article 49 of AP I. These installations are *a priori* objects having a civilian character and they benefit therefore from the general protection granted by Article 52 of AP I. Article 56 of AP I establishes immunity for these objects “even where these objects are military objectives.” This immunity also covers military objectives located at or in the vicinity of these objects. The conditions for triggering the regime of special protection accorded to water installations are that the attack “may cause the release of dangerous forces” and “consequent losses among the civilian population.”

The protection of such water installations is, nevertheless, not absolute. As in the case of Article 54, Article 56 of AP I also contain some exceptions. This protection ceases, at least in international armed conflicts, if the dams or the military objectives situated in the proximity of water-related installations are “used for other than its normal function and in regular, significant and direct support of military operations” and if the attacks on these targets “is the only feasible way to terminate such support.”²⁷ The *German Military Manual* (1992) interprets “significant and direct support of military operations” as comprising “for instance, the manufacture of weapons, ammunition and defence materiel. The mere possibility of use by armed forces is not subject to these provisions” (ILA, 2004: 45).

In the case of “regular, significant and direct support of military operations,” the exigencies of military necessity may prevail and the special protection ceases. However, even when the special protection ceases, belligerents are required to take due precautions in military operations at or near the installations containing dangerous forces in order to avoid severe

collateral losses among the population and damaging properties.²⁸

The criteria established by Article 56 of AP I are stricter than those enshrined in Article 54 of AP I. It should be observed that some dams or dykes might have multiple functions, having both irrigation purposes and supplying electrical power. In this case, they benefit from the protection of Articles 54 (having the character of an irrigation work in the terms of this provision) and 56 of AP I. In such situations, water installations benefit from a double protection.

Paragraph 3 of Article 56 underscores that “in all cases, the civilian population and individual civilians shall remain entitled to all the protection accorded them by international law” and paragraph 4 prohibits reprisals against such installations and other installations containing dangerous forces mentioned in paragraph 1 of this provision. Finally, “launching an attack against works or installations containing dangerous forces” is a grave breach of IHL – a particularly serious war crime.²⁹

Dams and dykes may only be attacked in case they qualify as military objectives. In this case, practice shows that states are conscious of the high risk of severe incidental losses which can result from attacks against such installations when they constitute military objectives. Consequently, even states which are not parties to AP I, such as the US, stress the importance of the proportionality principle in assessing the legality of an attack against a dam or a dyke which is a military objective.³⁰ This assessment under the principle of proportionality reflects sensitivity to the severe losses that may ensue among the civilian population when dangerous forces of dams and dykes are released. It appears, therefore, that attacks could be envisaged in situations where they are indispensable to obtain an important military advantage, which could not be obtained in any other way, and all necessary precautions are taken.

58.3 Water Security under the Regime of Occupation

The conduct of hostilities through aerial bombardments, explosions, and gunfire clearly threatens water security in time of armed conflicts. Moreover, other risks to the security of water in occupied territories exist.

27 Article 56 (2), AP I.

28 See Articles 57 and 58, AP I.

29 Article 85 (3) (c), AP I.

30 See US Air Forces Pamphlet, para. 42.

Table 58.1: Excerpts of relevant instruments on water security during armed conflicts. **Source:** Compiled by the author.

Dates	Instruments	Quotations
1949	"Geneva Convention (III) relative to the Treatment of Prisoners of War"	Article 26: "3. Sufficient drinking water shall be supplied to prisoners of war ..."
1949	"Geneva Convention (IV) relative to the Protection of Civilian Persons in Times of War"	Article 55: "1. To the fullest extent of the means available to it the Occupying Power has the duty of ensuring the food and medical supplies of the population; it should, in particular, bring in the necessary foodstuffs, medical stores and other articles if the resources of the occupied territory are inadequate. 2. The Occupying power may not requisition foodstuffs, articles or medical supplies available in the occupied territory, except for use by the occupation forces and administration personnel, and then only if the requirements of the civilian population have been taken into account..."
1966	International Law Association, "Helsinki Rules on the Uses of the Waters of International Rivers"	Article XX: a.) "In time of war, other armed conflict, or public emergency constituting a threat to the life of the State ... The riparian State shall in any case facilitate navigation for humanitarian purposes."
1976	International Law Association, "Resolution on the Protection of Water Resources and Water Installations in Times of Armed Conflict"	Article I: "Water which is indispensable for the health and survival of the civilian population should not be poisoned or rendered otherwise unfit for human consumption." Article II: "Water supply installations which are indispensable for the minimum conditions of survival of the civilian population should not be cut off or destroyed." Article VI: "3. In occupied territories, seizure, destruction or intentional damage to water installations should be prohibited when their integral maintenance and effectiveness would be vital to the health and survival of the civilian population."
1977	"Additional Protocol to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts" "Additional Protocol to the Geneva Conventions of 12 August 1949 Relating to the Protection of Victims of Non-International Armed Conflicts"	"Additional Protocol to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts", Article 54: "2. It is prohibited to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works, for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse Party, whatever the motive, whether in order to starve out civilians, to cause them to move away, or for any other motive." "Additional Protocol to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts", Article 56: "1. Works or installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations, shall not be made the object of attack, even where these objects are military objectives, if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population. Other military objectives located at or in the vicinity of these works or installations shall not be made the object of attack if such attack may cause the release of dangerous forces from the works or installations and consequent severe losses among the civilian population."
1997	"United Nations Convention on the Law of the Non-navigational Uses of International Watercourses"	Article 29: "International watercourses and related installations, facilities and other works shall enjoy the protection accorded by the principles and rules of international law applicable in international and non-international armed conflict and shall not be used in violation of those principles and rules."

Dates	Instruments	Quotations
2002	United Nations Committee on Economic, Social and Cultural Rights, General Comment No. 15, "The right to water (arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights)"	"22 ... during armed conflicts, emergency situations and natural disasters, the right to water embraces those obligations by which States parties are bound under international humanitarian law. This includes protection of objects indispensable for survival of the civilian population, including drinking water installations and supplies and irrigation works, protection of the natural environment against widespread, long-term and severe damage and ensuring that civilians, internees and prisoners have access to adequate water."
2004	International Law Association, "Revision of the Helsinki and other International Law Association Rules on International Water Resources"	<p>Article 52: "Combatants shall not, for military purposes or as reprisals, destroy or divert waters, or destroy water installations, when such acts would cause widespread, long-term, and severe eco-logical damage prejudicial to the health or survival of the population or if such acts would fundamentally impair the ecological integrity of waters."</p> <p>Article 54: "1. An occupying State shall administer water resources in an occupied territory in a way that ensures the sustainable use of the water resources and that minimizes environmental harm. 2. An occupying State shall protect water installations and ensure an adequate water supply to the population of an occupied territory."</p>

Over-exploitation of water resources as well as the destruction of water networks, pipelines, and containers threatens the security of water in occupied territories. For example, these risks are illustrated by the situation in the Occupied Palestinian Territory. In this context it has been reported that in April 2002 during the Israeli incursions in the Old City of Nablus, "tanks and bulldozers completely destroyed the water networks, causing water shortage and floods."³¹ In dealing with such risks, the rules of IHL regarding the regime of occupation – especially those on the protection of property – have a bearing on water security.

The protection of property ensured by IHL would seem at first sight not of great utility in dealing with water protection in times of armed conflict. The extent to which the term property can be interpreted as encompassing public goods, such as water, may seem debatable. However, this term should be interpreted broadly. It is generally agreed that water installations and water *per se* constitute public or private property within the meaning of IHL and they cannot be destroyed "unless such destruction or seizure be imperatively demanded by the necessities of war."³² This pro-

hibition applies to the conduct of hostilities and to the administration of occupied territories.

In the context of the regime of occupation, the main source of IHL dealing with the protection of property is provided by the 1907 Hague Regulations.³³ This instrument reflects customary international law, binding therefore on all states.³⁴ This instrument distinguishes between public and private property. On one hand, private property is immune to confiscation.³⁵ On the other hand, movable public property and immovable state-owned property can be used by the occupant.³⁶ Regarding the uses of public

31 Palestine Hydrology Group, Fact Sheet "Water assaults during the last incursions", available at: <http://www.palestinemonitor.org/factsheet/palestinian_hydrology_group_water_assaults.htm>.

32 The 1907 Hague Regulations, Article 23 (g). See: Cassese 1992, Zemmali 1995, Roberts 2000, Boutruche 2000, Benvenisti 2003.

33 The negotiators of the 1949 Geneva Conventions included nevertheless some provisions on property. See 1949 Fourth Geneva Convention, Article 53. Moreover, Article 147 of the 1949 Fourth Geneva Convention, states that an extensive destruction and appropriation of property not justified by military necessity and carried out unlawfully and wantonly, constitutes a grave breach of IHL. See also ICC Statute, Article 8 (2) (b) (xiii) and Article 8 (2) (e) (xii), which includes the protection of property in international and non-international armed conflicts.

34 Judgements of international tribunals and national courts, including the Israeli High Court of Justice, confirm that the Hague Regulations are customary international law. See, for example, "Ayub v. Minister of Defence", H.C. 606/78, excerpted in: Sassoli/Bouvier 1999: 812–816.

35 Article 46 of the 1907 Hague Regulations provides that: "private property ... must be respected. Private property cannot be confiscated." Moreover, Article 33 prohibits pillage.

property, two conditions should be highlighted. The first condition relates to the purposes of the uses by the occupant. The occupant may use property for meeting its military needs “within the limits of what is required for the army of occupation and the needs of the local population” (Stone 1954: 697). In many respects, water is similar to the treatment of oil under IHL, and as such is subject to controversy. Despite that, in light of the Memorandum of Law concerning the “Israel’s right to develop new oil fields in Sinai and the Gulf of Suez”³⁷ elaborated by the United States in 1976, exploitation of natural resources for furthering domestic purposes is prohibited. For example, the occupant cannot extract water for its own population or ship it home.

The second condition deals with the limitations set up by Article 55 of the 1907 Hague Regulations and it refers only to public immovable property. This provision states: “The occupying State shall be regarded only as administrator and usufructuary of public buildings, real estate, forests, and agricultural estates belonging to the hostile State, and situated in the occupied country. It must safeguard the capital of these properties, and administer them in accordance with the rules of usufruct.” The doctrine of usufruct, embodied in Article 55, is derived from Roman Law and it may be found in national legislation of civil law countries and in common law countries through concepts such as life tenancy. The right of a usufructuary is, literally, the right to use the fruits of the property without depleting the corpus or the substance of the property. A case brought before French national courts during the 1920’s concerning the felling of French trees during the German occupation of Alsace between 1917 and 1918³⁸ dealt with Article 55. In that case, the Court affirmed that according to this provision, “the occupying State is only entitled to the rights of administration and usufruct of the real property, including the forests, of the enemy State. It should protect the substance of such property and administer it in accordance with the rules of usufruct.” The doc-

trine of usufruct plays an important role for determining the limitations of the occupant in the exploitation of natural resources, such as water. Water resources qualify as public immovable property.³⁹ Therefore, the usufructuary rights and duties apply to their uses.

The rules on property stated in the 1907 Hague Regulations are an important foundation for dealing with the threats to water security in occupied territories. The fact that these rules are contained in instruments such as the 1907 Hague Regulations that have universal acceptance by states, adds to its significance.

58.4 Protection of the Environment in International Humanitarian Law

An important facet of water security deals with the protection of the environment. The rules already analysed provide an indirect basis for preserving natural resources such as water. However, during the 1970’s, IHL included some provisions dealing expressly with the protection of the environment (Brauch 2003a). The 1976 “Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques” (hereafter ENMOD) and AP I, in its Articles 35 (3) and 55, addressed directly environmental aspects of warfare.⁴⁰ In both cases, the use of a wider range of means and methods of warfare during the Vietnam War (such as the defoliant Agent Orange), as well as the rise of environmental consciousness at a global level reflected in the 1972 Stockholm Declaration,⁴¹ had an important role in stimulating the inclusion of the protection of the environment during armed conflicts. The inclusion of explicit pro-

36 Regarding public movable property, Article 53 of the 1907 Hague Regulations provides that: “An army of occupation can only take possession of cash, funds, and realisable securities which are strictly the property of the State, depots of arms, means of transport, stores and supplies, and, generally, all movable property belonging to the State which may be used for military operations.”

37 “United States: Department of State Memorandum of law on Israel’s right to develop new oil fields in Sinai and the Gulf of Suez”, 1 October 1976, 16 “International Legal Materials” (1977): 733.

38 “Administration of Waters and Forests v. Falk”, French Court of Cassation, Criminal Chamber, 2 February 1927, extracts reprinted in: McNair/Lauterpacht 1981, vol. 4, Case no. 383: 563. A similar case also arose during the Franco-Prussian War, see: Oppenheim, 1952, vol. II: §282. The Military Tribunal of Nuremberg also dealt with the felling of trees in Poland during the German occupation. See: Falk, 1984: 36–37.

39 See the case: “N.U. Da Bataafsche Petroleum Maatschappij and others v. War Damage Commission”, Singapore Court of Appeal, 13 April 1956, in: *International Law Reports*, 1956, vol. 23: 810–849. In this case the Singapore Court of Appeal held that oil in the ground was a state-owned immovable property. Drawing a parallel between the exploitation of oil and water resources, the latter should be considered as immovable state-owned properties. See: Cassese 1992, Scobbie 1994/1995, Benvenisti 2003.

visions was prompted by the need to protect the life and the health of civilian population, as well as by the need to prohibit certain methods of warfare. In this manner, they develop the rules such as the principles of distinction and proportionality included in older instruments of IHL.

58.4.1 The 1976 ENMOD Convention

In the history of humankind one of the first environmental modification techniques is illustrated in the Bible. In the Book of Exodus, the Bible, describing the manner in how Moses and the Israelites escaped from Egypt, traversing the Red Sea which was dried up, gives an example of such techniques and of its consequences. When the powerful Egyptian army tried to follow Moses and its people, “Moses stretched out his hand over the sea, and at daybreak the sea went back to its place. The Egyptians were fleeing toward it, and the LORD swept them into the sea. The water flowed back and covered the chariots and horsemen – the entire army of Pharaoh that had followed the Israelites into the sea. Not one of them survived.”⁴² Seas and oceans can be nevertheless difficult for human beings to control without divine intervention. This is exemplified by the failure of attempts to provoke tidal waves or tsunami for hostile uses (Westing 1992). However, belligerents have often attempted to modify the course of rivers for hostile uses. For instance, in 1503, Leonardo de Vinci plotted with Machiavelli to divert the Arno River in the war between Pisa and Florence. Although this plan failed, in recent conflicts belligerents have also tried to resort to such techniques. In the course of the Iran-Iraq war, the latter tried to change the course of some rivers in order to

stop the enemy Iranian troops (Mollard-Bannelier 2001).

In this context, ENMOD provides rules for dealing with environmental modification techniques used for hostile uses both in peacetime and in times of armed conflicts. Article II of ENMOD defines the term “environmental modification technique” as: “any technique for changing – through the deliberate manipulation of natural processes – the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space.” Some states have included in their interpretive declaration of this instrument some interesting elements for dealing with the issue as to whether environmental modification techniques such as changing the natural state of rivers, falls within the scope of ENMOD⁴³. For instance, the declaration of the Republic of Korea when acceding to ENMOD affirmed that changing the natural state of rivers or other environmental modifications techniques such as flooding and inundation are covered by ENMOD provided they have widespread, long-lasting or severe effects.⁴⁴ The formula used by ENMOD establishes that it would be sufficient to fulfil one of the three conditions to be covered by this instrument.

In order to facilitate the interpretation of this instrument, the Parties to the ENMOD Convention have clarified the meaning of the terms “widespread”, “long-lasting” or “severe”. In particular, these terms have been interpreted as follows: “‘widespread’: encompassing an area on the scale of several hundred square kilometres”; “‘long-lasting’: lasting for a period

40 ENMOD Convention adopted by Resolution 31/72 of the United Nations General Assembly on 10 December 1976, in: Schindler/Toman 2004: 163–177. See also Article 8 (2) (b) (iv) of the ICC Statute providing that “intentionally launching an attack in the knowledge that such attack will cause incidental loss of life or injury to civilians or damage to civilian objects or widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated” is a war crime.

41 See: principle 26 of the Stockholm Declaration, United Nations Conference on the Human Environment, Stockholm, 1972, U.N. Doc. A/CONF.48/14/Rev.1, in: 11 “International Legal Materials” (1972): 1416.

42 Exodus 14: 26–28.

43 In this context it should be recalled Article 31 (2) (b) of the Vienna Convention on the Law of Treaties states that the means for interpreting the purpose of a treaty comprises “any instrument which was made by one or more parties in connection with the conclusion of the treaty and accepted by the other parties as an instrument related to the treaty.”

44 The interpretive declaration of the Republic of Korea reads as follows: “It is the understanding of the Government of the Republic of Korea that any technique for deliberately changing the natural state of rivers falls within the meaning of the term ‘environmental modification techniques’ as defined in Article II of the Convention. It is further understood that military or any other hostile use of such techniques, which could cause flooding, inundation, reduction in the water-level, drying up, destruction of hydrotechnical installations or other harmful consequences, comes within the scope of the Convention, provided it meets the criteria set out in article I therefore.” Text reprinted in: Schindler/Toman 2004: 176

of months, or approximately a season”; “severe’: involving serious or significant disruption or harm to human life, natural and economic resources or other assets.”⁴⁵

The ENMOD Convention is the first instrument of IHL which explicitly dealt with the environment. It is particularly relevant in cases where belligerents plan to resort to methods of warfare using the environment as a weapon, such as the diversion of rivers.

58.4.2 The 1977 Additional Protocol I

Articles 35 (3) and 55 of AP I represent an important development in the protection of the environment during armed conflicts. One can debate whether they provide identical protection or they are distinct. Although the preoccupations at the origins of these articles are the same, their *ratio* is different. On one hand, Article 35 (3) protects the environment as such and its protection is considered under the perspective of the methods and means of warfare. On the other hand, Article 55 - having the aim to protect the civilian population - relies on the protection conferred on objects having a civilian character. This provision deals with the environment in relation to the life of human beings. The close relationship between the environment and human beings emerges from the wording of Article 55 stating that damage to the environment would “prejudice the health or survival of the population.”

The articles of AP I which deal with the environment have an important place in the regime of IHL devoted to the protection of water, given that this resource is an essential component of the environment and damage to this resource may prejudice the health and the life of the population. Given that any war is susceptible of provoking damage to the environment, the issue of the threshold provided by articles 35 and 55 is important in order to determine whether there is a breach of IHL. The drafters of this instrument have chosen to refer to damage that is ‘widespread, long-term, and severe’ in both provisions of the AP I. Contrary to the provisions of ENMOD, these adjectives are joined by the word ‘and’, meaning that it is a triple, cumulative standard that needs to be fulfilled. Moreover, the meaning of these adjectives is not the same as the corresponding words used by ENMOD. In particular, the phrase “long-term” was understood by the adopting states to mean decades.

45 Understandings regarding the Convention, in: Schindler/Toman 2004: 168.

Given the high threshold of application established by these provisions of the AP I, some principles of IHL such as that of proportionality may prove to be of utility for lowering the criteria established by this instrument (Bothe 2001). Moreover, considering that the AP II regarding non-international armed conflicts does not contain provisions on the environment, the principle of proportionality has an especially important role in dealing with environmental damage in these situations.

The relevance of this principle, in the regime on environmental protection during armed conflicts has been underscored by the International Court of Justice, affirming that “States must take environmental considerations into account when assessing what is necessary and proportionate in the pursuit of legitimate military objectives.”⁴⁶ In this context, “collateral damage” to the environment that is disproportionate to the military advantage gained, is precluded by IHL.⁴⁷ As highlighted by one author: “what was considered as acceptable collateral damage decades or even years ago, that is, proportionate to the military advantage pursued, might not be regarded as acceptable today” (Desgagné 2000: 116). In the context of water resources, this statement is particularly true. Nowadays the strategic role of water emphasizes the vital importance and vulnerability of water, especially in times of armed conflict. While water, together with the rest of the environment, may suffer from economic activity in times of peace, the problem is far

46 “Legality of the Threat or Use of Nuclear Weapons”, para. 30. See note 7.

47 In this regard the 2000 “Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia” dealing, *inter alia*, with the assessment of the damages caused to the environment by the NATO bombing campaign against the Federal Republic of Yugoslavia, stated that: “Even when targeting admittedly legitimate military objectives, there is a need to avoid excessive long-term damage to the economic infrastructure and natural environment with a consequential adverse effect on the civilian population. Indeed, military objectives should not be targeted if the attack is likely to cause collateral environmental damage which would be excessive in relation to the direct military advantage which the attack is expected to produce.” “Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia”, 15 June 2000, para. 14-25, available at: <<http://www.un.org/icty/pressreal/nato061300.htm>>. For an assessment of the Report, see: Bothe 2001.

worse in times of war, when contamination is often deliberate rather than accidental.

In conclusion, IHL provides for explicit rules dealing with the environment. Moreover, the general principles of IHL governing the conduct of hostilities apply to the environment. In particular, the principles of distinction and proportionality are important assessment criteria for determining the legality of attacks which may have consequences on the environment. The application of these principles to the environment is set forth in the “Guidelines for military manuals and instructions on the protection of the environment in times of armed conflicts”. The Guidelines are intended as a tool to facilitate the instruction and training of armed forces and the UN General Assembly has invited all States to disseminate these Guidelines widely and to give consideration to the possibility of incorporating them into their military manuals and other instruments addressed to their military personnel.⁴⁸

58.5 Conclusions: Reflections on a Comprehensive Approach on Water Security

Although the security of water is dealt with by IHL, one may query whether the regime established by IHL is complete. Water is taken into account by IHL only when it meets its objectives. In that perspective, it is viewed only in its capacity as one of the basic needs of human beings, as a danger, or as part of the natural environment, but never autonomously. Although IHL focused on the protection of persons and their property, the rules of IHL play an important part in the security of water during an armed conflict (Zemmali 1995; Boutruche 2000). This assessment, nevertheless, does not exclude that some reflections can be made in order to develop the rules applicable to water and water installations. Different approaches could be used for qualifying water and for giving to water security another kind of protection than that conceived by IHL. In this perspective it is interesting to go beyond the protection accorded by IHL to water and to focus on the developments regarding water in peacetime as well as on the significance that this natural resource plays in the international scene.

In this context, it is interesting to mention the already cited “Water for Peace” sessions held at the Third World Water Forum in 2003. During these sessions, the view was supported that international law concerning the management and utilization of water is essential and should be developed for limiting the risks the development of future disputes over water. In this context, the role of the “United Nations Convention on the Law of Non-Navigational Uses of International Watercourses” (the UN Watercourses Convention) adopted by the General Assembly in 1997 was highlighted for preventing water disputes.⁴⁹ At the same time, these sessions focused also on the protection of water as such, given that this resource is an integral part of the ecosystem (UNESCO/Green Cross International 2003). Finally, water, as indispensable for life, is intrinsically linked with human beings and thus with the protection of human rights.

If access to water is a basic human need, its recognition as a right is still difficult. Although the “General Comment no. 15 on the Right to Water” adopted in 2002 by the UN Committee on Social, Economic and Cultural Rights recognizes the human right to water,⁵⁰ the Ministerial Declaration adopted at the Third World Water Forum (2003) does not mention this right, referring exclusively to the UN Development Goals and to the Plan of Implementation adopted at the World Summit on Sustainable Development in Johannesburg (2002).⁵¹

These considerations on water during peacetime draw attention to the complexities of this resource and to the need to develop a comprehensive approach integrating the various dimensions of water. In this context, one might wonder whether a different reading of the security of water in times of armed conflicts could be necessary in order to deal with the multiple facets of water. For instance, through the protection of the objects indispensable for the survival of

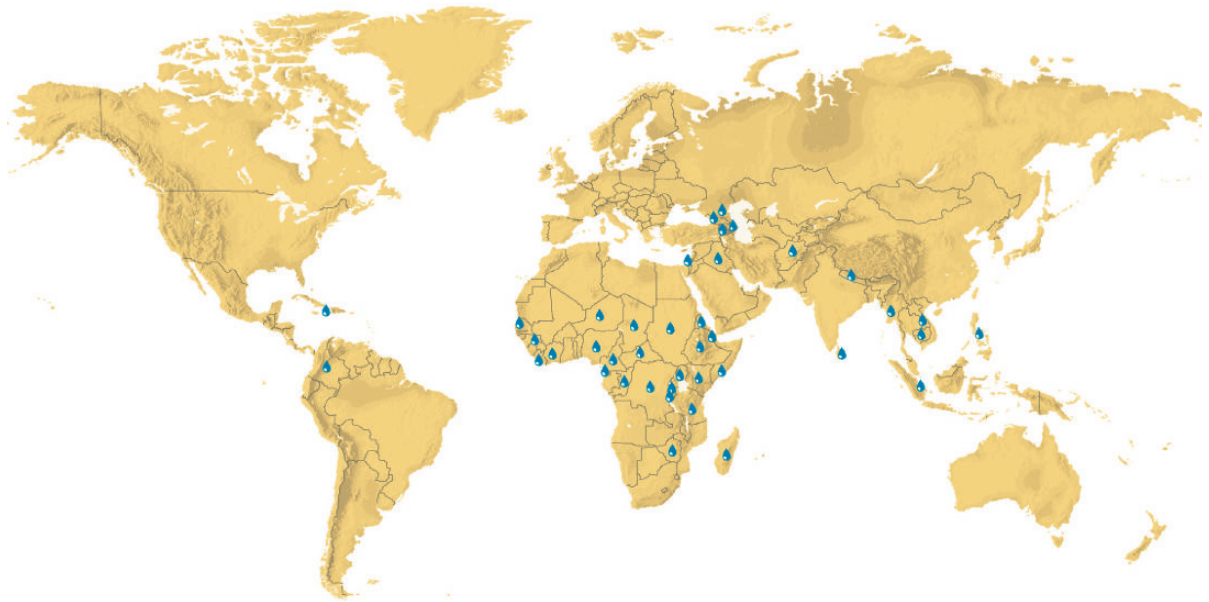
48 The Guidelines have been published as an annex to the resolution 49/50 adopted by the UN General Assembly on 9 December 1994. UN Doc. A/49/323 (1994), in: Schindler/Toman, 2004: 303–306.

49 “United Nations Convention on the Law of Non-Navigational Uses of International Watercourses”, 21 May 1997, U.N. Doc. A/RES/51/869, 36 “International Legal Materials” (1997): 700.

50 Committee on Economic, Social and Cultural Rights: “General Comment no. 15 on the Right to Water”, 26 November 2002, E/C.12/2002/11. Text available at: <www.unhchr.ch>.

51 According to the UN Millennium Development Goals it was agreed to halve the proportion of people without access to safe drinking water by 2015. United Nations Millennium Declaration, A/RES/55/2. See also Plan of Implementation, World Summit on Sustainable Development, Johannesburg, 2002.

Figure 58.1: Map of current International Committee of the Red Cross Water and Sanitation Programmes around the world. **Source:** The map is available at: <<http://www.icrc.org>>.



List of countries: Afghanistan, Armenia, Azerbaijan, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Colombia, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Georgia, Guinea Conakry, Haiti, Indonesia, Iraq, Israel, the Occupied and Autonomous Territories, Ivory Coast, Kenya, Laos, Liberia, Madagascar, Myanmar, Nepal, Niger, Nigeria, Northern Caucasus, Philippines, Republic of the Congo, Rwanda, Senegal, Somalia, Sri Lanka, Sudan, Uganda, Tanzania, Zimbabwe.

the population (Articles 54 of AP I and 14 of AP II), such protection can be read as integrating the access of water for protected people. This reading is supported by the “General Comment no. 15 on the Right to Water” affirming that during armed conflicts, “the right to water embraces those obligations by which States parties are bound under international humanitarian law.” Although IHL contains no mention of the right to water as such, many of its provisions⁵² are aimed at ensuring that persons or groups not or no longer taking part in hostilities are not denied water (Zemmali 2004). In this regard, the “Report of the International Commission of Inquiry on Darfur” has included in its analysis on the provisions relevant to the armed conflict currently undergoing in Darfur human rights violations and the right to water. Furthermore, the Commission of Inquiry on Lebanon, established the 2006 conflict, indicates the impacts of the damage or destruction of water facilities on the access to water.

52 For example the provisions protecting the objects indispensable for the survival of the civilian population or the obligations of ensuring water for specific categories of people. See note 6.

A different reading of water security in times of armed conflict should also include the security of this natural resource as such. In this context, the development of various instruments regarding shared water resources have an important role. These instruments should not be suspended in times of armed conflict, as observed by Briggs: “the mere outbreak of armed conflict (whether declared war or not) does not ipso facto terminate or suspend treaties in force between parties to the conflict” (Briggs 1985: 8).

Although there is still the lack of a general principle of international law in dealing with the effects of armed conflicts on treaties (Vöneky 2000), some water instruments, contain provisions on the effects of armed conflicts. Two ancient water instruments such as the 1921 Barcelona “Statute on the Regime of Navigable Waterways of International Concern”, focusing on the freedom of navigation and the 1923 Geneva “Convention relating to the Development of Hydraulic Power affecting more than one State” dealing with the carrying out of works for the exploitation of hydraulic power, indicate that in times of armed conflict they continue to be in force “so far as such rights and duties [of belligerents] permit.”⁵³ Moreover, the “UN Watercourses Convention” which is the first universal

instrument dealing with non-navigational uses of international watercourses,⁵⁴ in its Article 29 entitled “International watercourses and installations in time of armed conflict” also deals with these issues.⁵⁵

The provisions cited illustrate that international law includes indications on the effects of war on treaties dealing with shared natural resources such as international watercourses. Such provisions, along with the works of the *International Law Association*, provide guidance in this respect.⁵⁶ In this regard, it is also useful to mention that the *International Law Commission*, a subsidiary body of the UN General Assembly has included, since 2004, in its works, the topic of the effects of armed conflicts on treaties.⁵⁷

The works of the International Law Association and the International Law Commission could be used

as proving the formation *de lege ferenda* of a rule asserting that water treaties should continue to be in operation during armed conflicts. However, this issue is still an open question for international lawyers. As affirmed by the special rapporteur of the International Law Commission, Ian Brownlie: “It is not clear that there is a necessary implication from the object and purpose of such treaties that no effect ensues from an armed conflict, particularly when this affects the riparian State. The circumstances of each waterway vary considerably and much will depend upon the intensity of the armed conflict concerned” (ILC 2005: 32).

Although IHL deals directly and indirectly with the security of water and water installations, some reflections could be made on how to deal with these issues in a more comprehensive manner. In particular, it seems appropriate to think about the regime of protection of water during armed conflicts in light of a larger conception of water which takes into account the developments on the discourse of the qualification of water in peacetime. The point of departure of

53 Article 15 of the 1921 Barcelona “Statute on the Regime of Navigable Waterways of International Concern”, reads as follows: “This Statute does not prescribe the rights and duties of belligerents and neutrals in time of war. The Statute shall, however, continue in force in time of war so far as such rights and duties permit”. Two years later, the Geneva “Convention relating to the Development of Hydraulic Power affecting more than one State”, in its Article 9 contains an identical obligation: “This Convention does not prescribe the rights and duties of belligerents and neutrals in time of war. The Convention shall, however, continue in force in time of war so far as such rights and duties permit”. “Statute on the Regime of Navigable Waterways of International Concern”, Barcelona 20 April 1921, *League of Nations Treaty Series*, vol. VII: 37; “Convention relating to the Development of Hydraulic Power affecting more than one State”, Geneva 9 December 1923, *League of Nations Treaty Series*, vol. XXXVI: 77.

54 The states voting in support of the adoption of the UN Watercourses Convention were one hundred and two. Three states voted against, twenty-five states abstained and thirty-three states were absent. According to its Article 36, the Convention “shall enter into force on the ninetieth day following the date of deposit of the thirty-fifth instrument of ratification, acceptance, approval or accession with the Secretary-General of the United Nations”. As of December 2005, the UN Watercourses Convention has been ratified by twelve states (Finland, Hungary, Iraq, Jordan, Lebanon, Namibia, the Netherlands, Norway, Qatar, South Africa, Sweden, and the Syrian Arab Republic) and signed by eight countries (Côte d’Ivoire, Germany, Luxembourg, Paraguay, Portugal, Tunisia, Venezuela, and Yemen).

55 Article 29 reads as follows: “International watercourses and related installations, facilities and other works shall enjoy the protection accorded by the principles and rules of international law applicable in international and non-international armed conflict and shall not be used in violation of those principles and rules.”

56 See ILA 1976: “The protection of water and water installations”, Article VII, in: Report of the Fifty-seventh Conference, Madrid, 1976, (London 1978). Article VII reads as follows: “1. The effect of the outbreak of war on the validity of treaties or of parts thereof concerning the use of water resources should not be termination but only suspension. Such suspension should take place only when the purpose of the war or military necessity imperatively demand the suspension and when the minimum requirements of subsistence for the civil population are safeguarded.” ILA 2004: “Revision of the Helsinki and other International Law Association Rules on International Water Resources”, Article 55 in: Report of the seventy-first Conference, Berlin, 2004, available at: <http://www.ilahq.org/html/layout_committee.htm>. Article 55 reads as follows: “1. Treaties creating legal regimes for an international watercourse or part thereof are not terminated by war or armed conflict between the parties to the treaty. 2. Such Treaties or parts thereof shall be suspended only where military necessity requires suspension and where suspension does not violate any provision of this Chapter.”

57 ILC, 2005: “First report on the effects of armed conflicts on treaties”, A/CN.4/552, see, in particular, draft Article 7, available at: <<http://daccessdds.un.org/doc/UNDOC/GEN/No5/250/71/PDF/No525071.pdf?OpenElement>>. Draft Article 7 reads as follows: “1. In the case of treaties the object and purpose of which involve the necessary implication that they continue in operation during an armed conflict, the incidence of an armed conflict will not as such inhibit their operation. 2. Treaties of this character include the following: ... (f) Treaties relating to international watercourses and related installations and facilities.”

this reflection is nevertheless the recognition of the natural link between human beings, the environment, and water.

59 Environmental Security Concepts Revisited During the First Three Phases (1983-2006)

Simon Dalby, Hans Günter Brauch and Úrsula Oswald Spring

As we look ahead, we can see real risks that resource depletion, especially fresh water scarcities, as well as severe forms of environmental degradation, may increase social and political tensions in unpredictable but potentially dangerous ways. These new security challenges require us to think creatively, and to adapt our traditional approaches to better meet the needs of our new era.

Kofi A. Annan: Millennium Report (2000).

59.1 Introduction¹

In this chapter the authors assess the first three phases of research on environmental security (Rønfeldt 1997; Dalby 2002, 2002a; Brauch 2002, 2003, 2003b) and in chapter 97 below they outline the topics, the scope, the areas and the methods for a fourth research phase (Dalby 2006, 2007, 2008; Brauch 2005, 2005a, 2008, 2008a, 2008b).

This chapter discusses the main achievements of the three phases of environmental security research (59.2), and the lessons learned and yet to be learned with regard to the contexts of insecurity and the pillars of human security (59.3), it offers a brief review of some of the major critiques of the environmental security debate (59.4), and of the policy activities since 1990 translating research into action (59.5) and draws conclusions (59.6).

59.2 Three Phases of Environmental Security

Environmental security emerged as a discourse in the U.S. in the waning years of the cold war. Several arti-

cles (Ullman 1983; Mathews 1989; Myers 1989; Prins 1990; Rowlands 1991) stated the case for including the environment as a U.S. national security issue. Assumptions that environmental disruptions would lead to conflict were common; even more so were fears of wars to control scarce resources, and alarmist accounts of imminent chaos as environmental decay fed numerous social problems. This series of themes later found an especially vivid expression in Robert Kaplan's (1994, 1996, 2000) article on "The Coming Anarchy."

In the late 1980's, policy-makers put environment and security concerns on the international agenda. Most prominent were the authors of the '*Brundtland Report*' (WCED 1987) and Soviet President Mikhail Gorbachev who introduced the topic at the United Nations based on previous proposals by think tanks such as the *Worldwatch Institute* (L. Brown 1977). This scientific discourse and political debate focused on the environment as a threat to national and international security, and hence a matter of high politics which ought to be a priority for states concerned with preventing international conflict. National security was key here; the state was understood as the referent object in need of securing.

A second stage of the discussion emerged in the 1990's as researchers investigated the assumptions of the first phase and tried to operationalize the concepts in field research. Most high profile was a series of case studies conducted by Thomas Homer-Dixon

1 The authors are grateful to Patricia Kameri-Mbote (Kenya) and Czeslaw Mesjasz (Poland) for their very useful comments and suggestions that are reflected in this final text.

(1991, 1994, 1999; Homer-Dixon/Blitt 1998, see chap. 20 by Homer-Dixon/Deligiannis) and associates at the University of Toronto. In Switzerland, Günther Bächler (1998) as well as Bächler and Karl Spillmann (1996, 1996a, 1996b, 2002; see chap. 21 by Mason/Hagmann/Bichsel/Ludi/Arsano) led an interdisciplinary study on environmental conflict that produced complex analyses of environment and development issues. While the Canadian group focused on the linkage between environmental scarcity, stress and conflict, the Swiss group dealt with both environmental scarcity and degradation as causes of environmental conflict as well as matters of conflict resolution outcomes (Brauch 2005, 2006e).

The inductive case studies of the Toronto and Swiss groups were complemented with deductive approaches. Both focus on the complex interaction among environmental inputs, environmental-societal linkages and extreme outcomes. One difference between the second and third phase was leaving open the dependent variable - violent conflict or cooperation. During the third phase several research projects were pursued, some also addressing scarcity problems, such as:

- The *Global Environmental Change and Human Security* (GECHS 1999) project was launched as a framework for research cooperation and coordination.
- *ECOMAN*, *ECONILE* and *Environmental Change and Conflict Transformation* in Zürich and Bern continue the case study approach and focus on peaceful and cooperative management of renewable resource use in the Horn of Africa, the Nile region and other areas. This is part of a Swiss project on 'Research Partnerships for Mitigating Syndromes of Global Change'.
- The analytical and conflict theoretical syndrome approach of the *Scientific Advisory Council on Global Environment Issues of the German government* focuses on the patterned interaction of symptoms of global change with socio-economic processes (WBGU 1996, 1997; Biermann 1999; Biermann/Petschel-Held/Rohloff 1999).
- The *Transboundary Freshwater Dispute Database* at the Oregon State University and the *Global Assessment of Environment and Security* (GLASS) project at Kassel University.
- Several research teams (Peluso/Watts 2001) have analysed causes and intensity of violent conflicts, but only few have focused on environment and conflict linkages.

Other research, for example in geography (Bohle 2002), anthropology (Elwert 1990, 1999, 2003) and hydrology (Biswas 1993, 2004; Bogardi/Castelein 2002) has also produced theoretical and empirical results that are applicable to aspects of the environmental security discussion.

This scientific discourse was gradually picked up by the global peace (Oswald 1990a, 1992, 2008, 2008c; Brock 1991, 1992; Gleditsch 1997, 1998, 2001; Diehl/Gleditsch 2001, 2001a), security (L. Brown 1977; Renner 1989; 1996; Buzan/Wæver/de Wilde 1998; Wæver 2008, 2008a), environment (Carius/Lietzmann 1999) and development (Bhattacharya/Miller 1999) research communities. A joint NATO CCMS project by the U.S. DoD and the German Ministry of Environment promoted environmental security within NATO countries (Lietzmann/Vest 1999), and since then several NATO sponsored *Advanced Research Workshops* (ARWs) and *Advanced Study Institutes* (ASIs) have taken place and environmental security has become a key topic of NATO's Science Programme.²

What emerged in this debate, amid numerous methodological and empirical discussions, was a recognition that environmental change and resource scarcity and degradation was less likely to lead to international war than had been supposed in the first phase. While national security is important, and there are plausible arguments concerning threats of state collapse and internal conflict caused, triggered or intensified at least in part by environmental factors, the focus is more on state capacity and the policy dilemmas of social and environmental change.

The third phase includes analyses of global change linked to larger concerns about human security more generally rather than a focus on national security (see surveys: Brauch 2003, 2003a; Chen/Fukuda-Parr/Seidensticker 2003, Najam 2003; Dalby 2008). A new approach suggested identifying and mitigating syndromes of global environmental change.³ Furthermore, several research programmes and projects on global environmental change (IHDP, IGBP, WCRP, Diversitas, GECHS 1999, GWSP) fostered research and scientific networking on related issues. Case studies have fo-

2 See the website of NATO's Science Division, at: <<http://www.nato.int/science/>>.

3 See: WBGU 1996; Petschel-Held/Lüdeke/Reusswig 1999; Schellhuber/Block/Cassel-Gintz/Kropp/Lammel/Lass/Wiebke/Lienenkamp/Loose/Lüdeke/Moldenhauer/Petschel-Held/Plöchl/Reusswig 1997; Schellhuber/Wenzel 1998; for a research review: Brauch 2003, 2003b.

cused on climate change (Stripple 2002; Page/Redclift 2002; Brauch 2002; Schwartz/Randall 2003), soil (Vlek 2005), and on cooperative resource and conflict management of water (Bogardi/Castelein 2002; Oswald 2005; UNESCO 2006) as well as case studies on transboundary water basins⁴ and water-related conflicts.⁵

This research has focused on insecurity in many places looking for policy initiatives that can mitigate disruptions caused by environmental change. The community working on hazards and disasters (Wisner/Walker 2005; IFRC 2002a, 2005; Cardona 2004) has identified environmental and social vulnerabilities (Bohle 2002) as a result of natural hazards, storms and droughts. However, so far only few studies have discussed the linkages between hazards, disasters and conflicts that occur in complex emergencies (Oswald 2005a).

Recent research on conflict, on causes of civil wars and political violence in the South has shown that some 'new wars' (Kaldor/Vashee 1997; Kaldor/Albrecht/Schméder 1998; Kaldor 1999; Münkler 2002, 2005) are about struggles to control access to plentiful and valuable resources (Klare 2001; Collier/Elliott/Hegre/Hoeffler/Reynal-Querol/Sambanis 2003; Ross 2004) while others have pointed to the complex interaction between resource scarcity and abundance for conflict and cooperation (see chap. 51 by Kipping). Within resource-rich Third World countries, the competition over the control of scarce and abundant resources has often erupted along ethnic, race and class divides (Shiva 2002; Oswald 2002a; Gaitán 2003; Saruchera 2004). This research also looks to the efficacy of political institutions as an important factor in whether these competitions lead to violent conflict; cases of state failure suggest that violence connected to demographic and environmental stress is worst where states fail to provide basic political and administrative functions (Kahl 2003, 2006).

These three phases on environmental security and additional studies on global change, development and conflict suggest a whole series of causes that may be leading to insecurity and violence. But now the discus-

sion has shifted into what appears to be a fourth phase of research. In this fourth phase the crucial point is that the focus is on human security rather than environmental factors that may cause concern for national security. The assumption cannot be sustained any longer that environmental change is an independent variable in scientific investigations of security outcomes. Rather the analysis starts with people first and works backward to understand the circumstances, social, cultural and ecological threats, challenges, vulnerabilities and risks that render them insecure and may contribute to conflicts or cooperation. Focusing on human vulnerabilities, and then working back to understand the causes of those insecurities is an approach that differs from the earlier phases although it builds on many of their insights. But as we make clear in chapter 97, this research will need to focus on the global environmental dimensions of human security if it is to place human vulnerabilities in the appropriate context.

59.3 Lessons Learned and Yet to Be Learned

59.3.1 Contexts of Insecurity

The GECHS (1999: 20) Science Plan noted that there is "increasing acceptance that environmental degradation is at least a contributor to conflict and insecurity". For GECHS the debate has also shown: "how various factors or relations of inequality and impoverishment structure threats. ... Environmental change ... is related to insecurity through conditions of inequality, institutional weakening, and impoverishment. The second phase of environment and security work has reinforced the deficiencies in the research program that were identified in the first phase." The GECHS Science Plan suggests further research "to build upon the early empirical work ... and to provide additional empirical studies on environmental change and its relationship to a broader conception of security".

These studies could not explain either why the critical socio-economic constellations escalated into violent conflict, nor when and why conflict could be avoided by bilateral and multilateral cooperation of states, experts and representatives of civil society. Inductive case-study projects have laid the foundations for a third phase of empirical and theoretical environmental security studies that focus both on the complex environmental inputs and on the societal outputs in terms of peaceful disputes and violent conflicts. A

4 See UNESCO 2003a; Biswas 1993; Wolf 1995, 1998, 1999, 1999c; Wolf/Natharius/Danielson/Ward/Pender 1999; Peichert 2003; Dombrowski 2003; Scheumann 2003; Enrique 2004.

5 See Gleick 1993, 1993a, 1994, 1998, 2000; Hamner/Wolf 1998; Amery/Wolf 2000; Wolf 1995, 1998; Wolf/Hamner 2000; Shiva 2002, 2003; Bächler/Spillmann/Suliman 2002; Oswald 2005; see chap. 41-58 in part VII in this book.

consensus emerged that environmental stress is rarely the sole factor in precipitating conflict both within and between nations.

Schwartz (2002: 139) considers population growth as closely linked with environmental stress. Among the wide-ranging environmental factors he includes ozone depletion and global warming and among the localized ones those that affect small areas at different times (desertification, water pollution). He points to “five pathways to indirect internal conflict that involve environmental stress: economic decline, migrations, social fragmentation, erosion of civil society and curtailment of the state”. A major effect of environmental stress is economic decline that will affect the poor [and the middle classes] more than the rich. A second pathway is migration that is sometimes caused by floods, droughts or locusts, by a lack of arable land that again is often the result of environmental stress, but also by water and air pollution, as well as shortage of fuel wood. The complex interaction of environmental stress and its social, economic and political ramifications has often resulted in increasing urban violence.

Global warming may affect freshwater availability and food production what will have severe impacts on poorer nations, and may have possible longer-term security implications. Direct international conflicts may result from the increasing competition over access to water while others counted only few minor skirmishes over international waters due to increasing international cooperation. Internal conflict, especially in developing countries, has also occurred as a result of environmental stress (e.g. in Sahel due to drought) that made many nomads clash with agriculturalists in neighbouring and less affected zones. Schwartz (2002: 148) argues that causal linkages between environmental stress and conflict could be shown in individual case studies, but that future research is needed “to estimate the causal effects of environmental stress.”

Hauge and Ellingsen (1998, 2001) who integrated environmental degradation (soil erosion, deforestation) into a model of civil war concluded: “that environmental degradation does stimulate the incidence of conflict, but less so than political, economic, and cultural factors, or previous conflict history.” In conclusion, Gleditsch (2002: 56) suggested that resource and environmental aspects of conflict “should be examined within the context of a broader view of armed conflict” with a special focus at politics, economics, cultural factors and the conflict history.

Environmental factors are frequently poorly incorporated in this shift from national to human security.

The narrow interpretation of human security, in terms of ‘freedom from fear’ has not yet included environmental components. Likewise the environmental security literature has ignored discussions of human insecurity. Thus both discussions frequently miss each other. In the process they forgo the possibilities of conceptual clarification and empirical comparison. There have been few attempts so far to combine the ‘environmental’ (including water, food, health, and livelihood) with the ‘human security’ approach (GECHS 1999; Barnett 2001; Barnett/Matthew/O’Brien 2008; UN/ISDR 2004; UNU-EHS 2005).

Invoking ‘human security’ has an additional difficulty when the notion of vulnerable human beings and state institutions is formulated in terms of neo-liberal approaches. Contemporary security thinking emerged from Greek and Roman origins (Arends 2008), was consolidated during the period of enlightenment and classic liberalism and developed further in recent years by international economic arrangements known as ‘the Washington consensus’ in what is now also frequently called neo-liberalism (Saxe-Fernandez 1999, 2008; Calva 2003; Cordera 2003; Stiglitz 2002).

In the doctrines of classic liberalism, the protection of individual freedoms and economic rights (protection of private property) and the preference for market forces determined much of the thinking about security (Rothschild 1995). Many of these themes have been picked up in the current discussion of human security, often without this intellectual heritage being remembered. As we will argue below there are important limitations to these formulations of security that need to be transcended in reformulating the environmental dimensions of human security.

During the contemporary neo-liberal period the objects of securitization have sometimes shifted from human beings to a defence of national interests often reflecting those of multinational enterprises and ruling elites and to a comprehensive legitimization of a widening of national security interests restraining and reducing individual rights and freedoms of classic liberalism. The offensive protection (‘pre-emption’) and promotion of economic and energy security interests by the neo-conservative ideologues have been complemented with a Wilsonian legitimization strategy to make the ‘world safe for democracy’. From this perspective, the human security debate has been perceived as a challenge to the effort to dominate and to dictate the global security agenda (Harle/Moisio 2008).

In the classic liberal thinking the knowledgeable individual property owner is the ‘person’ that stands

in for humanity in all its collective and social complexity (Rothschild 1995). But a large part of humankind lives in poverty, marginalized, and often highly vulnerable, without fundamental human rights and fulfillment of their basic human needs (Strahm/Oswald 1990). These people are confronted with a dual challenge from traditional and neo-liberal policies. With regard to the first challenge, entire communities struggle to maintain their social coherence and cultural diversity based on traditional rights and mutual solidarity (Salinas/Oswald 2003; Oswald 2008b). Neo-liberalism has forced increasing segments of urban and rural poor as well as highly trained young people to migrate (in the so called “brain drain”), destroying traditional livelihoods, social networks, economic structures, cultural bases and domestic order, thus contributing to social fragmentation, erosion of family relationships, and also organized crime that increasingly confronts parts of society with a ‘survival dilemma’ (Brauch 2002, 2003, 2008c).

Focusing on these dimensions of the human predicament suggests the need to think about security with a focus on human beings and their social networks, an approach that is loosely encompassed under the term ‘human security’. But, as the rest of this chapter suggests, we need to understand humans in their social and environmental contexts, rather than as the supposedly autonomous male property owners that traditional liberalism has assumed as ‘humans’. We also have to recognize the social disruptions that economic neo-liberalism has caused in the last few decades, a series of phenomena that are only partly captured in the critiques of ‘globalization’ (Fuentes/Rojas 2005; Kaplan 2003).

59.3.2 Pillars of Human Security

There are four ‘pillars’ of human security in the literature. The Canadian approach focuses on ‘freedom from fear’⁶, in particular on political violence. The discussion in *Responsibility to Protect* (ICISS 2001) and Canadian government policies as well as the initiatives of the Human Security Network (see chapter by Fuentes in this volume) have suggested that human security is about political rights and the necessity for governments to guarantee these freedoms by respecting civil rights and ensuring that the rule of law is fair and free from arbitrary repression.

The Japanese approach has focused on ‘freedom from want’ (Shinoda in this volume), that deals with themes of development rather than security. The Human Security Commission, headed by Sadako Ogata and Amartya Sen (CHS 2003) has tried to combine both calling for ‘protection’ and ‘empowerment’. The United Nations (Annan 2005) has suggested a third pillar of human security as ‘freedom to live in dignity’. Here the respect for cultural differences is also important in ensuring that cultures that support people are maintained intact.

UNU-EHS has proposed a fourth ‘pillar’ of human security as ‘freedom from hazard impacts’ (Bogardi/Brauch 2005). While natural hazards cannot be prevented, their impact depends both on the environmental and social vulnerability (Bohle 2002) of the affected people and on their bottom-up resilience strategies (Oswald 1991, 2005). More specifically this discussion focuses on the vulnerabilities of the poor in particular who live ‘in harm’s way’ so frequently on marginal land subject to storms, erosion, floods, or in hazardous lands on the sides of volcanoes (Cardona 2004; Pelling 2003a; chap. 87 by Nathan). Adding in technological dangers, as was seen in the 1980’s in the disaster in Bhopal (Shiva 2008; chap. 14 by Milbert) where poor people lived adjacent to a dangerous chemical plant, suggests a further vulnerability as a result of living in marginal settlements surrounding industrial facilities.

In addition to these prompt and local vulnerabilities the literature on global environmental change suggests that people in these marginal locations are now most likely to suffer from the disruptions caused by global climate change (IPCC 1998, 2001, 2007, 2007a, 2007b,). In so far as extreme weather events (storms, hurricanes, droughts, forest fires) and other hazards are more likely in the changing biosphere (Brauch 2002, 2003d, 2003e; IFRC 2002, 2005; Munich Re 2002, 2006) then the poor and marginal are made the victims of the economic and resource consumption that drives, literally, global change (Steffen/Sanderson/Tyson/Jäger/Matson/Moore III/Oldfield/Richardson/Schellnhuber/Turner II/Wasson 2004). Bangladesh is a key case to illustrate the new equity problems caused by global warming (IPCC 1998, 2001, 2007; Huq/Ali/Rahman, 1995; Huq/Asaduzzaman 1999; Huq 2001; Brauch 2002). In this case the projected sea-level rise caused by climate change is the greatest in a country that contributes the least to this new threat. In contrast those countries that have contributed most greenhouse gases, both in the past and in the present, have often objected to calls to reduce

6 See: Krause (2004, 2004a); Mack (2004, 2004a); Human Security Centre (2005); Dedring (2008); chap. 83 by Black/Swatuk.

their CO₂ output, and thus failed to fulfil their self-proclaimed obligations to developing countries.

These vulnerabilities are also sometimes enhanced when the spreading impact of the global economy disrupts local and indigenous modes of the economy (Dalby 2002). In ecofeminist formulations of this matter development is understood as a 'war on subsistence' (Mies 1998; Shiva 1988; Mies/Shiva 1993; Bennhold-Thomsen/Mies 1999; Bennhold-Thomsen/Faraclas/Werlhof 2001; Oswald 1991 and chap. 90). As the cash economy invades rural areas survival may depend on the availability of money, some of which may have to be earned elsewhere and sent back to the rural family as remittances. However, in many cases men leave to work in the cities or in foreign countries. They either never return or only intermittently send cash to support the family left behind. This situation creates manifold vulnerabilities in addition to disrupting family and community life and entrusting women with the sole responsibility for their survival (Oswald 1990; Serrano 2004; chap. 89).

Where disaster strikes marginal rural people, with little 'food' or 'economic security' except their land and the tools and animals to work it, face a dilemma of whether to leave and abandon their way of life and hope to rebuild if and when they return, or stay in hopes of being able to survive and salvage what they can as soon as the threat has passed. Any notion of 'human security' that formulates rural social systems as that which should be secured needs to focus on human rights in a way that enhances social resilience. Human rights have to include this dimension of 'freedom from want' if the environmental dimension, one that may be increasingly important as global change accelerates in coming decades, is to be incorporated into 'human security' discussions (Brauch 2006, 2006g). The urban poor living in hazard prone habitats are facing similar challenges (Cardona 2004; Pelling 2003; Davis, 2006; chap. 13 by Wisner/Uitto; chap. 14 by Milbert).

A more nuanced understanding of people as social beings aligned in networks of support and community, and one sensitive to the gendered formulation of the 'human being' in the human security discourse, is needed. Complex social networks sustain humans in normal times. Their vulnerabilities in time of change, conflict, hazard or disaster are usually a matter of disruption or failure of these networks, without which people become isolated and vulnerable, precisely because of these social disruptions.

59.4 Critiques of the Environmental Security Debate

The research on environmental security has triggered many critical replies from different scientific disciplines and competing schools. For example, from an international relations perspective Diehl and Gleditsch (2001a) have pointed to limitations and gaps in the environmental security field, including insights without evidence (empirical and theoretical shortcomings), and on primary focus on environmental conflicts rather than cooperation (Hagman 2005). Midlarsky (1998, 2001) discussed whether democracies are more successful "in protecting the environment and therefore in limiting the violence-generating conditions from environment degradation" and Conca (2001) concluded that environmental cooperation may have benefits but that it does "not help prevent or mitigate violent conflict" and that more conflict management may be needed. Homer-Dixon and Gleditsch disagreed on the maturity of environmental security research. While Gleditsch pointed to nine flaws, Schwartz, Deligiannis and Homer-Dixon (2001) defended the progress reached so far but both see more convergence on the future research agenda.

Gleditsch pointed to five crucial resources over which wars may be fought: a) territory, b) strategic raw materials, c) sources of energy, d) water, and e) food. In the Malthusian tradition population growth contribute to resource scarcity where harsher competition over resources may result in violence. Environmental scarcity has been challenged from a Cornucopian perspective (Deudney 1991; Lomborg 2001) pointing to human inventiveness, the role of trade, substitution of raw materials, price increases encouraging technological change. Gleditsch noted that environmental factors were excluded in most studies on the causes of war (e.g. Midlarsky's 1992), and that this literature ignores political (e.g. system of rule), economic (poverty, economic development) and cultural (ethnic, religious, linguistic fragmentation) variables, as well as gender issues (Oswald 2001). Gleditsch (2001) also pointed to the dangers of using the future as evidence by making inferences on the basis of future trends. The literature was also not always careful to distinguish between internal and international conflict. Possibly, many scholars suggested, environmental conflict should be analysed as a development issue. Several researchers have argued that resource abundance is more likely to lead to conflict while scarcity fosters cooperation (Berdal/Malone 2000) although such discussions need careful empirical valida-

tion looking at many case studies to make such generalizations (Ross 2004). In their reply, Schwartz, Deligiannis and Homer-Dixon (2001) called for: a) filling data gaps, b) operationalizing key variables, c) specifying contextual factors, d) dealing with complexity and e) encouraging methodological pluralism.

This eclectic critique ignores the work of the Swiss group and of many other projects of the third generation of environmental security studies and offers no alternative research design that could lead to a fourth stage of environmental security research. It ignores the methodological weaknesses of quantitative methods, and the significant contribution of comparative case study methods such as structured focused comparisons using qualitative methods, and excludes the knowledge of the natural sciences on complex often nonlinear and chaotic linkages among the natural and human, the supply and demand factors of global environmental change that cause, trigger, intensify or contribute to environmental scarcity and degradation, nor does it discuss their impact on environmental stress. Among the extreme outcomes, Gleditsch and his colleagues only focus on the least likely case: environmental conflict, ignoring the direct linkage between climate change and an increase of hydro-meteorological hazards and their potential socio-political consequences that often result in low-level violence below the level of conflicts and wars diagnosed in the literature on causes of conflicts.

Peluso and Watts (2001) challenged the Canadian environmental security school and rejected “automatic, simplistic linkages between ‘increased environmental scarcity’, ‘decreased economic activity’, and ‘migration’ that purportedly ‘weaken states’ and cause ‘conflicts and violence’”. Instead they focus on “ways that resource environments (tropical forests or oil reserves) and environmental processes (deforestation, conservation, or resource amelioration) are constituted by, and in part constitute, the political economy of access to and control over resources.” They claim that both shortage and abundance and processes of environmental rehabilitation and amelioration are often associated with violence. They offered a critique of Neo-Malthusian thinking linking Marxian political economy, cultural studies with a new political ecology, focusing on power relations in defining, controlling and managing nature and trying to re-map the relationship between environment and security. They do not look for environmental triggers of violent conflicts rather they offer “accounts of the ways in which specific environments, environmental processes, and

webs of social processes are central parts of the way violence is expressed” (Peluso/Watts 2001: 25).

Hartmann (2001: 39–62) pointed to weak definitional foundations, a one-sided case study selection (where scarcity led to violence), a moderate Malthusian thinking combined Cornucopian hopes in human ingenuity, to cultural biases with regard to Third World cases that localized the blame instead of analyzing the global context, an old-fashioned view of the state as a solitary actor, and to a lack of appropriate gender perspectives. Hartmann suggested that it was necessary to cross disciplinary boundaries and to include the results of political economy and ecology, as well as anthropology and development studies.

The case studies, for example on violence and environmental struggle in India (Bavsikar 2001), and on the Bhopal Gas Disaster (Rajan 2001), analyse three dynamic modalities of violent environments: 1) the forms, periodicities and repertoires of environmental violence, 2) the intersection of violent extraction with resource and environmental characteristics, and 3) the normalization of environmental violence. They focus on the patterns, tactics, or rhythms of violence and the changing technologies of extraction and changing loci of resource control. These case studies are not comparative nor are they able to contribute to an alternative model.

Conca and Dabelko (2002) suggested shifting the focus of research and of the policy debate from ‘ecological security’ (Pirages/DeGeest 2004) or from ‘violent outcomes’ of environmental stress to environmental peacemaking. Conca (2002) argued that the ecological security agenda in OECD countries has “constituted an obstacle to international cooperation” in those countries where the ecological insecurity is most severe, and he suggested a shift from the linkage between environmental degradation and conflict to the question “whether environmental peacemaking can trigger broader forms of peace.” He suggested two pathways first by transforming mistrust, uncertainty, suspicion, divergent interests and short horizons through practices of environmental cooperation; and second by viewing peace not as stable interstate relations but as shared identities. Environmental peacemaking should lead to confidence building and should lay the “foundation for transforming the national-security state itself”. According to Conca research should focus on: a) deepening and broadening trans-societal linkages; b) on emergence and strengthening of regionally grounded identities; and c) on the transformation of state institutions to foster cooperative interactions. Instead of analyzing the complex in-

teraction between factors of global environmental change, environmental stress and extreme or fatal outcomes, Conca and Dabelko deal only with the most optimistic cases where environmental issues have been resolved by cooperation. However, the crucial question of when and why environment security matters are resolved by cooperative policy processes and when they result in violence, is not being addressed.

The World Bank's Governance and Natural Resources Project analysed linkages between natural resources and conflict (Bannon/Collier 2003). They argue that abundance and greed rather than scarcity and grievance were conducive to civil wars that were often financed by the export of commodities, e.g. diamonds (Angola, Sierra Leone), tropical timber (West Africa), coltan, gold, drugs and oil that often financed violent secessionist movements, as well as poor governance and corruption. Bannon and Collier (2003: 8–16) assert that the best protection against civil war is economic development. By raising economic growth, diversification of dependence on one commodity, reducing the exposure to price shocks, higher transparency of natural resource revenues, exclusion of rebel organizations from markets, ending the finance of illicit commodities, tightening scrutiny of illicit payments, and attracting reputable companies to risky environments the dangers of resource wars are reduced.

In a second publication: *Breaking the Conflict Trap. Civil War and Development Policy*, Collier, Elliott, Hegre, Hoeffler, Reynal-Querol and Sambanis (2003) focus first on the economic costs during conflict and the legacy effects of civil wars (e.g. decline in GDP per capita, refugees and internally displaced persons, psychological trauma) as well as on the global effects of civil wars (economic and social spill-overs, refugees and diseases, drug production and trafficking) before they turn to the causes of civil wars. They discuss the role of rebel groups as political and business organizations, the role of ethnic factors and of the availability of natural resources but they ignore both environmental factors and the results of the environmental security research.

From an anthropological, ecological and peace perspective, Oswald (2005, 2005a, 2007a) suggested a 'hydrodiplomatic' approach as a strategy for resolving transboundary water-related conflicts with regard to the Rio Bravo (USA/Mexico). This might be done by a combination of demand-side management, technologies to increase supplies, negotiations on the local, regional and international political level (top-down) as well as by social and economic organizations (bottom-

up), institution-building for training, development of policy, norms and laws, public works and a culture of water as identity processes.

Most recently Colin Kahl (2006) has produced a comparative analysis of scarcity, abundance and political ecology hypotheses of conflict causation focusing mainly on the diverse histories of the last few decades in Kenya and the Philippines. This carefully crafted evaluation of the competing paradigms concludes that all approaches have some strengths but none of them adequately conceptualize all the factors involved in teasing out the complexity of the relationships between environment, resources and conflict within developing states. He concludes that state actions, or rather the lack of state action in the case of state failure, is a major factor in the emergence and persistence of widespread political violence.

59.5 From Research to Action: Policy Activities Since 1990

Notwithstanding many of the important criticisms of the formulation of environmental security in these academic debates, and the widespread recognition of a lack of precision in the formulation of the term 'environmental security', since the 1990's, the widening of the security concept has progressed and concepts of 'environmental security' (UNEP, OSCE, OECD, UNU, EU) have been widely used in policy discussion. Several major international reports (Brandt-Report 1980; Brundtland Commission 1987; Commission on Global Governance 1995) put the linkage between environmental stress and conflicts and conflict resolution on the political agenda of international organizations. The Millennium Report of the Secretary General mentioned several international organizations that have addressed the linkages between environmental stress and conflicts. However the World Summit on Sustainable Development in Johannesburg (2002) in its political declaration and plan of implementation referred to 'food security' but neither 'environmental' nor 'human security' were included. UN Secretary General Annan (2003: 12) pointed to the potential threats posed by environmental problems and he suggested that the UN system should "build additional capacity to analyse and address potential threats of conflicts emanating from international natural resource disparities". Most recently once again the policy discussions have been taken up by the United Nations Development Report (2007). The 2007–2008 Development Report specifically fo-

cuses on climate change and the possible impacts this may have on insecurity of various kinds, and in turn the potential difficulties this poses for human development in many places.

In this regard, UNEP has been active in three areas: a) *Disaster Management Branch* (DEPI), b) *UNEP's Ozone Action Program* (DTIE), and c) *UNEP's Post Conflict Assessment Unit* (Haavisto 2003). In January 2004 UNEP identified a "need for scientific assessments of the link between environment and conflict to promote conflict prevention and peace building" (Töpfer 2004). The UNEP Division of Early Warning and Assessment (DEWA) launched an *Environment and Conflict Prevention* initiative to stimulate "international efforts to promote conflict prevention, peace, and cooperation through activities, policies, and actions related to environmental protection, restoration, and resources (Lonergan 2004).

The *Organization for Security and Cooperation in Europe* (OSCE) has dealt with security risks from environmental stress. Among the non-traditional security risks confronting OSCE countries in Central, Eastern and South-Eastern Europe, in the Caucasus, in Central Asia and other parts of the former Soviet Union are trans-boundary pollution, shortage of drinking water, disposal of radioactive waste, reduction of human losses in man-made disasters and natural catastrophes (on ENVSEC initiative, see chap. 55 by Rakel; chap. 57 by Martius/ Froebrich/Nuppenau; chap. 71 by Cheterian).

The *Organization for Economic Co-operation and Development* (OECD) has addressed the linkages between development, environment and conflicts in several policy statements, such as *Development Assistance, Peace and Development Co-operation of the 21st Century* (OECD/DAC 1997) and in a scoping paper on the economic dimension of environmental security that are reflected in the *Guidelines on Conflict, Peace and Development Co-operation* (OECD/DAC 2000, 2001).

The European Union has pursued two strategies for 'environmental security': a) integrating environmental goals into all sectoral policies (*Cardiff process*), including in development, foreign and security policies; and b) stressing conflict prevention and management in its activities in international organizations (UN, OSCE) and for specific regions. At the Barcelona European Council in March 2002, a sustainable development strategy was adopted that emphasized the integration of environmental concerns into sectoral policies. The European Council in Seville (June 2002) approved a conflict prevention programme that

aimed both at short-term prevention and at the root causes of conflict, in its development cooperation with poverty reduction, and in its strategy against terrorism. The European Council meeting in Thessaloniki in June 2003 approved a 'green strategy' of the EU (Brauch 2003, 2005). Environmental security issues have also been put on the policy agenda of many other international organizations, such as ASEAN⁷, NAFTA, OAS⁸, and the African Union⁹.

59.6 Conclusions

While the first phase of environmental security research focused on concepts and on their legitimization and critique, the second phase has been theory-oriented and empirically-based with a strong emphasis on case studies. In the third phase a plurality of methods have been applied: from qualitative case-studies, to syndromes of global change and scientific approaches to mitigate them, to quantitative analyses of state failures, and quantitative analyses of the causes of violent conflicts, to assessments of cooperative efforts in trans-boundary fresh water dispute resolution, to simulations of the interdependence between water availability and food crises.

While quantitative methods may contribute to the recognition of complex linkages among structural determinants, and thus to an advance in our knowledge (by way of a *heuristic* function), they are nevertheless not sufficient because they exclude the complexity of the interactions between nature and humans that can be neither modelled nor predicted. As Kahl's (2006) recent work in particular suggests, the method of structured, focused comparative case studies (George 1979, 1988, 1993) can reconstruct the complex interactions among the determinants of global environmental change, environmental stress and its fatal out-

7 See: Press Release of the ASEAN Ministerial Meeting on Haze, Siem Reap, 4 March 2003, at: <<http://www.aseansec.org/14264.htm>>.

8 See: "Quebec Summit of The Americas: US Government Informal Consultation With Civil Society on Potential Environmental Initiatives" on 14 February 2006 in Washington D.C., at: <[http://www.summit-americas.org/Documents%20ofor%20Quebec%20City%20Summit/CSO-\(USA\)-comments-eng.htm](http://www.summit-americas.org/Documents%20ofor%20Quebec%20City%20Summit/CSO-(USA)-comments-eng.htm)>.

9 See: Jenny Clover: "Human-Centred Environmental Security In Africa", FAST Project co-ordinator in the Africa Security Analysis Programme at the Institute for Security Studies, in: *African Security Review* Vol 14 No 2, 2005, at: <<http://www.iss.co.za/pubs/ASR/14No2/CClover.htm>>.

comes. Both *reactive* and *pro-active* or *anticipatory* learning for launching adaptive and mitigating responses requires knowledge and an understanding of these interactions that go beyond the competence of any discipline and can probably only be achieved by inter- and multidisciplinary research teams.

During these three phases what has not been done is notable: there is a lack of research on hazards and disasters, gender sensitivity, social vulnerability, bottom-up resilience as well as peace building. The fourth phase will need to incorporate these matters in a larger framework that encompasses many dimensions of human security in the new contexts of urbanization and climate change. Another shortcoming of the environmental security research and policy debate has been an overemphasis on research results conducted by scientists in North America and Europe. In an effort to overcome this narrow Eurocentric bias, the following chapters introduce diverse perspectives by scholars from the South.

60 Environmental Security: Academic and Policy Debates in North America

Richard A. Matthew and Bryan McDonald

60.1 Introduction¹

For the environmental community of North America, the 1990's began with great enthusiasm and energy, buttressed by a grave sense of urgency. In the post-Cold War world, sustainable development and conservation were widely embraced as pillars of a new world order. After being sidelined for much of the 1980's, the environment was restored to a position of primacy on the global agenda, and in short order elements of environmental rescue snapped into place like pieces of a global green jigsaw puzzle - *Our Common Future*, the Rio Earth Summit, Agenda 21, the Framework Convention on Climate Change, the Convention on Biological Diversity, the Global Environmental Facility, and so on. The *North American Free Trade Agreement* (NAFTA), which came into effect in 1994, included an environmental side agreement that promised to bridge the elusive gap between free trade and environmental protection.

The sceptical, obstructionist mindset of the Reagan and Bush I presidencies was swept away by the science-based environmentalism of Clinton and Gore. A heady mixture of capacity, resolve and opportunity wafted through Washington's corridors of power, sloshed across energy-hungry Canada, and spilled southwards into a Mexico seeking rapid economic development. The environment, the new American administration argued, could be saved without sacrificing human development, and the United States would lead this effort through the example of its own behaviour and through the authority attached to being the world's only remaining superpower.

While environmentalists in North America and around the world were rallying around sustainable development and *Agenda 21*, the North American secu-

rity community found itself at sea after five decades of unwavering focus on preventing a nuclear war with the Soviet Union. The process of rethinking security soon became intertwined with the process of environmental rescue.² The linkages were forged by many people, for many reasons. Some believed that in our degraded global environment, natural resource scarcity was rapidly becoming a significant contributor to violent conflict (Homer-Dixon 1991, 1999; Gleick 1993). Others looked at the sheer size of the world's militaries, and their ugly Cold War footprints, and concluded it was time for these powerful entities to be greened and harnessed to an environmental agenda (Butts 1999). Still others sought to integrate environmental issues into the larger project of complementing - or replacing - the concept of national security with the concept of human security (Lonergan 1999).

While a plethora of initiatives in Canada and the United States explored often highly original ways of associating the environment with security, these initiatives triggered a sobering, cautionary response literature. How would such a linkage be viewed in the developing world (Dalby 1992)? Could it lead to the securitization of the environment (Käkonen 1994)? Could the cultures of environmentalism and security be reconciled enough to ensure the effort produced more good than bad (Deudney 1990)?

In this chapter we examine several of these initiatives, focusing on North American scholars and giving a fair amount of attention to the behaviour of the Clinton-Gore administration, which sought to lead on this new policy agenda.³ We conclude that efforts to

1 A few portions of this chapter appeared in *ECSP Report 8* (Summer 2002), published by the Woodrow Wilson Center's Environmental Change and Security Program.

2 See: e.g. Mische/Ribeiro 1998; Renner 1989; Deudney 1990; Finger 1991; Homer-Dixon 1991; Dalby 1992; Kaplan 1994; Käkonen 1994; Levy 1995; Deudney/Matthew 1999; see also chap.20 by Homer-Dixon/Deligiannis.

3 We do not include Mexico that is partly covered in chap. 90 by Oswald Spring.

link environment and security have had mixed results. For example, some practitioners have reasoned that if natural resources are becoming so scarce that countries will fight over them, then we need to lower the bar for development at home in resource-rich protected areas such as Alaska and the Arctic – hardly the outcome sought by scholars and environmentalists. On the other hand, the environment has been fused successfully to the burgeoning paradigm of human security, which is emerging as the foreign policy focus of middle powers such as Canada and Japan. Most problematically, we argue that popularizing the concept of environmental change as a complex, global threat marked by much uncertainty established a discursive model that the current Bush II administration has adapted for explaining terrorism to its public, and for justifying enormous expenditures and pre-emptive action through reference to a formulation of the precautionary principle. The zeal with which some scholars acted to establish the policy relevance of their work has had some unintended, and negative, consequences. At the same time, however, Al Gore has done much to reframe climate change as a global and human security issue, integrating natural and social science research into a powerful presentation for practitioners, and compelling all North Americans to think in the often unfamiliar terms of global connectedness and interdependence.

60.2 Origins of Environmental Security in North America

Efforts to link environment and security have not in any sense been confined to North America, and, in fact, much of the most important, influential and inspiring analysis has been conducted by scholars in Scandinavia, Germany, Australia and many parts of the developing world, such as Pakistan and India. The brief history we provide here, focused mainly on events and writings in North America, should be understood as part of a larger story, to which North America contributed and with which it has interacted in many ways.

Responding to global concerns about the impact of human behaviour on the natural world, the contemporary formulation of the environmental movement emerged in North America in the 1960's, building on an earlier era of conservation identified with individuals such as John Muir and associated with achievements such as the founding of the Sierra Club and the establishment of a national park system. Envi-

ronmental historian John McCormick (1989) points to several factors that converged in the 1960's to promote the transformation of earlier conservation movements into modern environmentalism. The proliferation of nuclear weapons, the post-World War II continuation of wartime levels of military spending, and the rapid pace of economic development raised general concerns about the high-consumption character of advanced industrial society. Scientific evidence began to record and explain the magnitude and variety of human-generated environmental change with great – and disquieting – precision. Environmental accidents, such as oil spills, increased in number and captured public attention. In North America, as in Europe, baby boomers entered a period of intense social critique and activism that engendered, among others, civil rights movements, women's movements, antiwar movements, and back-to-nature movements. In 1962, Rachel Carson wrote an impassioned account of the human recklessness evident in gratifying immediate needs by spraying the planet with poisonous pesticides such as DDT, which gave rise to new forms of birth defect and social criticism.

Concern about the environment gathered critical mass throughout the 1960's and 1970's. Throughout much of this period, however, environmental concerns seemed of little relevance to national security analysis and planning. Defence institutions were generally regarded as an intractable part of the problem. From an environmentalist perspective, they were irresponsible entities that resisted the regulatory constraints emerging around the Clean Air and Clean Water Acts; dumped and abandoned enormous quantities of solid and toxic waste on land and at sea; secretly tested nuclear and other environmentally destructive weapons, exposing humankind to radioactive contamination and other health threats; and were willing to destroy nature when preparing for or engaged in war. But they had to be tolerated in an anarchic world dominated by superpower rivalry and ever vulnerable to the threat of all-out nuclear Armageddon.

Nonetheless, evidence of the harmful effects of using defoliants in Southeast Asia during the Vietnam War (Neilands/Orians/Pfeiffer/Vennema/Westing 1972; Westing 1976) did lead in 1977 to two important international agreements: the Additional Protocol I to the 1949 Geneva Convention on the Protection of Victims of International Armed Conflicts and the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (Brauch 2003c).

The ‘limits to growth’ thesis propounded by Meadows, Meadows, Randers and Behrens (1972) and the first OPEC oil crisis in 1973 stimulated some fear about how resource scarcity might endanger economic growth in the North and create competitive conditions ripe for armed conflict. The Carter Doctrine, affirming the strategic value of the oil-rich Middle East, was in part a response to these concerns.⁴ But discussions of energy self-sufficiency garnered little support. After all, through trade, arms, and ingenuity one could gain access to anything as long as the real threat to the United States was held in check: the threat of Soviet expansion.

But while the structure and character of the Cold War shaped security thinking in much of the Western world, the elaboration of broader concepts of security did gain some attention. The environmentalist Lester Brown (1977), described by the *Washington Post* as “one of the world’s most influential thinkers,” wrote an exploratory piece on *Redefining National Security*. In 1982 the Independent Commission on Disarmament and Security Issues, chaired by the Swedish socialist Olof Palme, released a report on *Common Security*. The authors of this report distinguished between ‘collective security’ (security against armed force provided to its members by NATO) and ‘common security’, which focused on non-military threats such as those posed by environmental degradation and poverty. This conceptual trajectory was pushed further in Richard Ullman’s 1983 article “Redefining Security,” in which he sought to broaden the concept of national security to include non-military threats to a state’s range of policy options or the quality of life of its citizens. In the mid-1980’s, former Soviet President Mikhail Gorbachev expressed a similar perspective through the notion of ‘comprehensive security’, and in his speech to the UNGA in 1989 he promoted the concept of ‘ecological security’.

In 1986 the Chernobyl nuclear facility experienced a meltdown that caused widespread harm and even wider spread anxiety. Arguments about environmental threats to human welfare and security seemed suddenly very persuasive. The *World Commission on Environment and Development* chaired by former Nor-

wegian Prime Minister Gro Harlem Brundtland (1987), issued its report: *Our Common Future* that focused on the interlocking processes of population growth, food production, ecosystem protection, energy use, industrialization, and urbanization, the authors argued for a global commitment to sustainable development. To fail to make this commitment, they contended, would place the future of much, perhaps all, of humankind in jeopardy.

By the late 1980’s, as the Cold War approached absolute zero and environmental awareness rose to unprecedented levels, and as some of the more threatening implications of rapid technological change were being worked out by researchers, articles began to appear making explicit linkages between environmental change and security. Influential writings by Jessica Mathews (1989, 1997), Norman Myers (1989), and others began to be widely circulated in policy circles. Arguments varied enormously, but the basic idea that environmental change was serious enough to be considered a security issue made sense to many analysts, activists, and practitioners.

60.3 Environment and Security during the Clinton-Gore Era

Perhaps in response to the articles on rethinking national security published at the end of the Cold War, former President George Bush added threats posed by environmental change to the *National Security Strategy of the United States* in 1991.⁵ The following year the Clinton administration was installed in Washington. Vice President Al Gore and others took seriously the claim that the health of the environment was a matter of utmost importance to the long-term interests of the United States and the world.

The level of interest in Washington increased notably when the journalist Robert Kaplan published an article in *The Atlantic Monthly* in which he described environmental change as “the national security issue

4 During his 1980 “State of the Union Address”, President Carter declared: “Let our position be absolutely clear: an attempt by any outside force to gain control of the Persian Gulf region will be regarded as an assault on the vital interests of the United States of America, and such an assault will be repelled by any means necessary, including military force.”

5 “Global environmental concerns include such diverse but interrelated issues as stratospheric ozone depletion, climate change, food security, water supply, deforestation, biodiversity and treatment of wastes. A common ingredient in each is that they respect no international boundaries. The stress from these environmental challenges is already contributing to political conflict. Recognizing a shared responsibility for global stewardship is a necessary step for global progress. Our partners will find the United States a ready and active participant in this effort” (Bush 1991).

of the early 21st century” (Kaplan 1994: 61). Kaplan's thesis in *The Coming Anarchy* was simple and, for many policymakers searching for a new security paradigm, compelling: combine weak political systems, burgeoning urban populations, grinding poverty, environmental degradation and scarcity, and a flood of cheap weapons, and societies could become highly volatile. This lethal mixture, Kaplan suggested, already was generating high levels of violence in West Africa; soon it would affect the rest of the planet. This was likely to happen because at the very root of the social collapse evident throughout West Africa was extensive environmental degradation—a problem the entire world was experiencing. The pathways to violent anarchy might differ from one place to the next, but all of humankind was being pushed along one of them. The state of the environment, Kaplan concluded, had become a matter of national security. This analysis intrigued both Clinton and Gore who were searching for an explanation of the tragedies unfolding in Haiti, Somalia and Rwanda.

Often working behind the scenes and in a context of stiff resistance from other senior White House officials, Gore used a variety of strategies to introduce environmental concerns into key agencies and policy areas.⁶ So successful was Gore in rallying support in the foreign policy arena that in 1996 Secretary of State Warren Christopher (1998), an individual who until then had seemed scarcely aware of environmental problems, made a corner-turning speech at Stanford University that caught the attention of both environmentalists and foreign policy-makers around the world. According to Christopher (1998):

The environment has a profound impact on our national interests in two ways: First, environmental forces transcend borders and oceans to threaten directly the health, prosperity and jobs of American citizens. Second, addressing natural resource issues is frequently critical to achieving political and economic stability, and to pursuing our strategic goals around the world.

Indeed, “Environmental initiatives can be important, low-cost, high-impact tools in promoting our national security interests.” What sort of environmental initia-

6 Gore proved especially adept at restructuring in situ policies and institutions and at using environmental initiatives as a basis for advancing diplomatic goals. The so-called ‘Gore bilateral,’ forged with his counterparts in Russia, South Africa, and elsewhere, are a series of high-level agreements to cooperate on shared environmental problems that are typical of Gore's resourcefulness. For a sense of his perspective on environmental issues, see Al Gore (1992).

tives? Christopher outlined an ambitious four-part programme for his Department:

- Produce an annual report to assess global environmental trends and identify American priorities, beginning in 1997;
- Establish a dozen Environmental Opportunity Hubs to involve American embassies in assessing and addressing regional environmental issues worldwide;
- Host an international conference on treaty compliance and enforcement within two years;
- Promote an array of partnerships with business, and bilateral, regional and global initiatives to channel environmental problems into the social settings that have the resources and will to solve them.

Unfortunately, within a few years budget constraints and other obstacles had largely erased everything from the State Department's far-reaching and even visionary agenda. Internal opposition, deeply ingrained and hard-to-change behavioural patterns, lack of congressional support, and the inability of anyone to articulate a clear set of foreign environmental policy goals help explain the mixed results of these efforts (Hopgood 1998).

Problems within the State Department, however, did not put the brakes on efforts to integrate environmental concerns and national security. In July 1996, John Deutsch, then director of the *Central Intelligence Agency* (CIA), discussed the relationship between intelligence and the environment in a speech to the World Affairs Council. According to Deutsch, the potential for using CIA capabilities and archives to provide useful environmental intelligence at a low cost is great.⁷ Another support was outlined in a speech by Deputy Under Secretary of Defense for Environmental Security, Sherri Goodman (1996), who signalled her office's desire:

to understand where and under what circumstances environmental degradation and scarcity may contribute to instability and conflict, and to address those conditions early enough to make a difference, [and] to determine where military environmental cooperation can contribute significantly to building democracy, trust and understanding.

The flurry of policy statements in 1996 capped several years of diverse and relentless efforts to integrate en-

7 In fact, as discussed below, several initiatives were well advanced by 1996, although problems associated with concerns about declassification criteria persisted.

environmental concerns into national security policy. Attention focused primarily on ways in which environmental change could threaten national interests and hence become relevant to the traditional mandates of military and intelligence institutions. But U.S. environmentalists and security specialists also considered ways in which security institutions and practices can and do affect the environment adversely, as well as ways in which security assets could be applied to restore the environment and support domestic and foreign environmental policies.

60.4 The U.S. Discourse: Environmental Threats to 'National Security'

One can discern in the considerable academic and policy activity that took place from 1990 to 2005 in the U.S. at least eight ways of linking environment to security. This list is not intended to be definitive, nor is it a typological list with a clear ordering logic. Instead it is an attempt to capture the principal areas of research and policy, together with some of the criticisms they triggered, evident in the U.S. during this time period.⁸

60.4.1 Tension, Instability, Conflict and Violence Affecting U.S. Interests Caused, Amplified, or Triggered by Environmental Problems

According to researchers such as Peter Gleick (1991, 1993), Michael Klare and Thomas Homer-Dixon (1994, 1999; Homer-Dixon/Blitt 1998) the potential for environmentally escalated violence is significant and growing. Gleick (1993b), for example, has written extensively on the possibility of 'water wars'. Throughout the world, the demand for fresh water is increasing due to population growth and economic development. Many states rely heavily on sources that serve other countries as well. Pollution, depletion, and natural limits affect the availability of water. As demand grows beyond supply, which UNEP FI (2005) predicts could be the case in fifty-two countries by 2025, tension could grow as well, especially if animosity already exists. This may be especially true in places like the Middle East, where several states compete for the already stressed waters of the Jordan, Nile, Tigris, and

Euphrates. Klare (2001) extends Gleick's concern about water to consideration of other resources such as oil, timber, gems and minerals. While other researchers point out that, historically, states have almost always found ways to cooperate over shared water systems (Wolf 1997) and others raise important questions about this type of analysis (Lowi 2003); many acknowledge that acute need may overwhelm regional cooperation in the years ahead, leading to tension and perhaps armed violence.

Homer-Dixon (1994, 1999) has argued that environmental factors could have a far greater impact on intrastate violence. He contends that the prospects for environmentally induced or amplified state institutional failure, ethnic conflict, urban violence, and mass migration are high and likely to increase. Through a series of globe-spanning case studies, his team of researchers paints a foreboding image of a future in which environmental scarcity plays a growing role in generating violent outcomes, especially in developing countries already straining under the burdens of poverty, inefficient and corrupt governments, ethnic hatred, and renegade militaries. Work on the scarcity-conflict thesis has received a great deal of criticism. Some critiques focus on the recommendations and predictions resulting from the research, rather than on the underlying theoretical notion that environmental degradation can indirectly contribute to security threats (Deudney 1990; Peluso/Watts 2001). Other critiques emphasize serious methodological flaws in the research (Levy 1995). Compelling arguments also have been developed by mainly European scholars suggesting that careful quantitative analysis does not support the conflict-scarcity thesis, but uncovers instead a strong link between abundant, lootable natural resources and violent conflict (Collier/Hoeffler 1999; Collier/Hoeffler/Soderbom 2001; Hauge/Ellingsen 1998; Gleditsch 1997).

60.4.2 Activities Affecting U.S. Access to Environmental Goods Abroad

The cornucopian thesis (Gleditsch 2003) promoted by writers such as Julian Simon and Herman Kahn (1984) suggests that under conditions of resource scarcity, innovation accelerates and technology often can be used to develop substitutes. Where this is not possible, others note that trade will often prove an economical approach to meeting shortfalls (Deudney 1990). But some analysts contend that substitution and trade will not always succeed. The easy access the

⁸ For a European perception of 'environmental security' as a US national defence goal, see Brauch 2003: 89–90.

U.S. has enjoyed to the world's natural resources may diminish.

Recently numerous conflicts have taken place over access to fisheries (Porter 1995). Popular discussions of the Gulf War (1990) and the Iraq War (2003) suggest that U.S. desire to protect access to cheap oil played a major role in the decisions to use force. It is conceivable that states will one day consider using force to protect environmental goods such as rain forests - which regulate climate, serve as important carbon banks, and contain high levels of biodiversity - if diplomatic solutions prove unsuccessful. In short, factors such as resource depletion, population growth, and economic development in the South could affect U.S. access to or enjoyment of some natural resources.

60.4.3 Terrorist Activities Responding to Environmental Degradation, Targeting the U.S. Environment, or Using Ecological Systems as a Medium for Spreading Terror

In the wake of the 11 September 2001 terrorist attacks and the anthrax incidents of October 2001, one of the great doomsday scenarios that has seized the imagination of the American public and policymakers is that of a group of terrorists contaminating the water, food, or air supply of one or more major American cities with some dangerous substance such as plutonium or a virulent pathogen. Recent studies suggest that the country is vulnerable to this sort of attack and unprepared to respond. In April 1998, following the 'anthrax scare' in Las Vegas, FBI Director Louis Freeh described chemical and biological terrorism as "the greatest vulnerability we have right now."⁹ At the same time, Attorney General Janet Reno stated: "We need to make sure we have a significant stockpile - and I don't think we do - of vaccines and other medications."¹⁰ Numerous researchers have suggested that there is a growing risk of a major chemical or biological attack on the U.S. Small incidents have already been identified, such as in 1985, when members of a religious cult contaminated several restaurant salad bars with salmonella, causing 751 people in Oregon to become seriously ill (Torok et al. 1997). A growing

concern in the U.S. is the steady stream of attacks on targets such as commercial logging, government facilities, bio-engineering companies and land developers by groups such as the Earth Liberation Front and the Animal Liberation Front.¹¹ These network-structured organizations are difficult to neutralize and have demonstrated a willingness to engage in violence.

60.4.4 Greening the Military

While many environmentalists promote deep structural changes that would tend to render the military obsolete, some are more pragmatic, aware that throughout the world militaries are highly trained, well-organized, and well-funded social institutions. Moreover, in a world that regularly produces a vast array of threats - including the threat of armed aggression - militaries are not likely to be dismantled in the near future. One must ask whether they can be made less environmentally destructive than they have been in the past. For in the past militaries throughout the world - and especially in the United States and the former Soviet Union - have been reckless and cavalier, devouring energy, treading carelessly over vast tracts of territory, experimenting with lethal weapons, and generally creating and disposing of huge quantities of toxic chemical and solid waste (Feshbach 1995).

According to Kent Butts (1994 1996), in the 1990's the Department of Defense decreased toxic waste by fifty per cent. In cooperation with Sweden, it developed guidelines for environmental standards for military training and operations. It worked with Russia and other Arctic nations to reduce radioactive contamination of the Arctic region. The Australia-Canada-U.S. trilateral commission is another example of an attempt to address environmental problems cooperatively. Base cleanup was somewhat less successful, and anecdotal evidence suggests that throughout the world militaries continued to treat the environment in a reckless manner. Nonetheless, environmental awareness appears to have penetrated this historically single-minded and independent entity, and even generated more sustainable forms of behaviour. Even as the American military became more focused on fighting wars in Afghanistan, Iraq and the global war on terror, it continues to address environmental issues.¹² Further research needs to be done, however, to fully

9 "Pentagon undergoes mock terrorist attack", in: CNN, 30 May 1998; at: <<http://www.cnn.com/US/9805/30/terror.pentagon/>>.

10 "Reno, FBI head report on terrorism", Associated Press, 22 April 1998.

11 Stefan H. Leader; Peter Probst: "The Earth Liberation Front and Environmental Terrorism", 2002; at <<http://www1.umn.edu/dcs/earthliberationfront3pub.htm>>.

assess the ecological modernization process still under way in the defence sector.

60.4.5 Using Military and Intelligence Assets to Support Environmental Initiatives

Intelligence and defence possess highly sophisticated resources that can assist in environmental assessment and monitoring and in developing 'green' technologies. This issue received considerable attention in the United States in the 1990's. Under the aegis of Vice President Gore, the CIA permitted civilian scientists to examine archived material that might be useful in assessing environmental degradation. The 'Medea Group', set up by the *National Intelligence Council* (NIC) in 1992, determined that archived satellite imagery was of great scientific value. Moreover, current intelligence technology is so sophisticated that satellite imagery could be used to diagnose the health of forests as well as monitor deforestation. It can penetrate water well enough to assist in evaluating the condition of fisheries. It already has been used to track and help fight forest fires. In view of this, the NIC began exploring ways to make the CIA's data gathering and analysis capabilities available to environmental consumers, including foreign and nongovernmental organizations. In 1997 the *Director of Central Intelligence (DCI) Environmental Center* was created partly for this purpose.

Some observers are sceptical of this initiative, on the grounds that the CIA's penchant for secrecy and other responsibilities might corrupt its public offerings. Critics advocate the development of commercial satellite systems. But the technological sophistication of intelligence assets may not be achievable in the private sector for many years, although the private-sector demand for surveillance technologies seems strong. Thus efforts to build bridges between the CIA and new consumers could remain important.

The U.S. military also possesses extensive resources that might be detailed to environmental policy initiatives, including technology-driving programmes, land restoration projects, treaty monitoring, and, possibly, treaty enforcement. Experiments in the 1990's with recycling technologies and ecosystem res-

toration, by different branches of the U.S. military, may serve as models for future endeavours. Discussions on using the U.S. military (or NATO or UN forces) to monitor compliance with international environmental law remain at a preliminary stage and face stiff opposition.

One of the more fascinating features of these various activities is the notable expansion of interagency communication and cooperation. It seems inevitable that addressing environmental problems will be most successful if the different types of expertise and experience spread throughout the American government are coordinated. Government departments and agencies have a history of being less than forthcoming with each other and of zealously trying to protect and expand their jurisdictions and budgets regardless of how resources might be most efficiently deployed. Concern about the environment may be breaking down some of this hostility and distrust. Intelligence agencies have signalled their intention to be more accessible to agencies that never consulted them in the past. The Departments of Energy (DoE) and Defense (DoD), together with the *Environmental Protection Agency* (EPA), signed a Memorandum of Understanding in 1996 stating that they would try to cooperate in this area.¹³ Of special importance, through the Environmental Change and Security Project, the Woodrow Wilson Centre has hosted regular meetings since 1994 that bring together diverse government officials, scholars, and representatives of environmental NGOs to discuss different aspects of environmental security.

60.4.6 Promoting Dialogue, Building Confidence, and Transferring Technology

Within American military circles there is much informal talk about the value of face-to-face encounters to relieve tensions, address fears, and improve transparency. In the 1990's, this desire created another promising approach to linking environment and security. Conferences on environmental security have provided a new context for dialogue. These can have collateral benefits insofar as they create greater awareness of the concerns, incentives, and beliefs of other countries. Throughout the 1990's, the U.S. hosted or par-

12 See for example the websites of the Office of the Deputy Undersecretary of Defense for Installations and the Environment; at: <<http://www.acq.osd.mil/ie/>> and: Defense Environmental Network & Information eXchange (DENIX); at: <<https://www.denix.osd.mil/denix/denix.html>>.

13 For a comprehensive listing of these activities, see: *Environmental Change and Security Project Reports* published annually since 1995 by the Woodrow Wilson Center in Washington, D.C.

participated in conferences and workshops on environmental themes, such as those organized by the Army War College, the Asia-Pacific Centre for Security Studies, and NATO through its Partnership for Peace programme.

60.4.7 Providing Disaster and Humanitarian Assistance

In recent years the U.S. military has been called upon to assist in natural and humanitarian disasters. The suitability of military forces for such roles has been demonstrated during responses to the 2004 South Asian Tsunami, Hurricanes Katrina and Rita in 2005, and the October 2005 Northern Pakistan earthquake. For example, in response to the December 2004 tsunami, the U.S. deployed over 18,000 military personnel to assist with search and rescue, disaster assessment and recovery operations. In times of crisis and disaster, the U.S. military will likely continue to find itself involved in helping with water and food distribution, managing population flows, and combating disease outbreaks. If it is to succeed, it will clearly require more focused training and a more robust mandate than have been the case in the past.

On this issue, it is important to remember that in many smaller countries the military is the only state resource that can be called upon to help implement and monitor state-wide policies and assist in managing disasters and other crises. Because these often have an important environmental component, some training in environmental factors may be crucial to success.

60.4.8 Environmental Peacebuilding

A new and related focus is emerging through the work of a network of U.S. scholars that includes Erika Weinthal (2002), and Ken Conca and Geoff Dabelko (2002).¹⁴ Their current research objectives are to clarify the role of environmental considerations in post-conflict peacebuilding; to define the current state of our knowledge about environment-peace linkages; to identify both the benefits and challenges of incorporating environment, sustainability, and human security into post-conflict reconstruction and development in-

itiatives; to identify environmental management strategies as a tactic for building confidence between former parties in conflict; and to identify the most pressing research and policy agendas around these questions. The principal goal is to identify the environmental conditions necessary for sustainable peace and the circumstances under which environmental initiatives can help to facilitate that goal.

To date, conventional approaches to post-conflict peacebuilding have concentrated on United Nations peacekeeper operations and civilian missions that include economic reconstruction, institutional reform and election oversight. Too often lost in this approach is a focus on efforts to foster human security and sustainability. Ignoring environmental management in post-conflict peacebuilding ignores another potential strategy for building trust and cooperation as steps towards broader peace. The core premise of this new research project and the starting point for inquiry is that overlooking considerations of environmental quality, ecosystem health, and the natural resource base from which people extract their livelihoods risks undermining any gains that may be made in the political sphere and through development-assistance initiatives. If this is correct, then it becomes necessary to explore environment-peace linkages in a deeper, more specific, and targeted way than has been done to date.

60.5 Canadian Discourse on Environmental Change and 'Human Security'

While it was a Canadian scholar, Thomas Homer-Dixon, who caught the attention of the U.S. administration in the early 1990's and whose central arguments are described above, the Canadian experience in this arena has differed significantly from that of the United States. As in the U.S., Canadian scholars fiercely debated the scarcity-conflict thesis, and this debate will not be reiterated here. Concerns about Canadian access to natural resources, environment and terrorism, greening the military, using military and intelligence assets to support environmental initiatives, and promoting dialogue by focusing on shared environmental threats have all been expressed in Canada, but with far less fanfare and intensity than in the U.S. for obvious reasons. Canada has a small military and intelligence capacity, and a much more modest role on the world stage. It is a resource rich country with a natural resource based economy, and far less concerned about its access to foreign resources.

¹⁴ The text for this subsection is based on the unpublished description of a workshop on environmental peacebuilding that was written by Ken Conca, Geoff Dabelko, Richard Matthew and Erika Weinthal. The workshop was held at Duke University on 29–30 November 2006.

Perhaps the most vibrant development in Canada during the time period under discussion has been the growing effort to link global environmental change to the concept of human security, which has moved into a central position in Canadian foreign policy and scholarship. Canadians have also made a significant contribution to the resource curse debate, and are involved in the emerging issue of environmental peacebuilding.

60.5.1 Global Environmental Change and Human Security

Canadian research on global environmental change and human security is covered in detail by Jon Barnett, Richard Matthew and Karen O'Brien (2008). Therefore, we limit ourselves to very brief comments. The concept of human security became popular with the 1994 United Nations Development Programme's Annual Report. In this report, human security "was said to have two main aspects. It means, first, safety from such chronic threats as hunger, disease and repression. And second, it means protection from sudden and harmful disruptions in the patterns of daily life" (UNDP 1994: 23). The report also emphasizes four key dimensions of human security: it is universal, its components are interdependent, it is easier to protect through prevention than intervention, and it is people-centred (UNDP 1994: 22). In the past 14 years, the term human security has been redefined in numerous ways and it has become central to the foreign policy paradigms of several countries, including Canada and Japan. The Canadian formulation is well-covered by the Government of Canada (<<http://www.humansecurity.gc.ca/menu-en.asp>>). The Canadian approach stresses 'freedom from fear' and its work is centred on six areas of activity: protection of civilians; conflict protection; peace operations; governance and accountability; public safety; and new policy development. In this context, the environment is scarcely mentioned let alone focal. However, during the same period that the Government of Canada developed human security as its foreign policy focus, several Canadian scholars were prominent in establishing an international project to explore linkages between global environmental change and human security. A highlight of this work was the development of a new definition of human security "as something that is achieved when and where individuals and communities have the options necessary to end, mitigate or adapt to threats to their human, environmental and social rights; have the capacity and freedom to exer-

cise these options; and actively participate in pursuing these options (GECHS Science Plan 1999). In other words, human security is a variable condition where people and communities have the capacity to manage stresses to their needs, rights, and values" (Barnett/Matthew/O'Brien 2008).

The issue, however, is a part of the focus of Liu Center for Global Issues established at the University of British Columbia and initially directed by Senator Lloyd Axworthy. One of the Center's research areas is "the connections between environmental change and human security, defined in terms of wellbeing."¹⁵

60.5.2 Environmental Peacebuilding

Canadian researchers are participating in the environmental peacebuilding initiative described above. Earlier work in this area includes the edited volume *Conserving the Peace* (Halle/Matthew/Switzer 2002), produced by the International Institute for Sustainable Development in Winnipeg.

60.5.3 The Resource Curse

Important work examining linkages among natural resource exploitation, human rights abuses and violent conflict has been carried out by Philippe LeBillon (2001, 2002, 2003a, 2003b; LeBillon/Addison/Murshed 2003; LeBillon/Khatib 2004). This work has been well-received as more empirically defended than the scarcity-conflict thesis discussed above (see chap. 83 Swatuck/Black).

60.6 Conclusion

In the U.S., research, debate and policy focused on integrating environmental concerns into 'national security' have been a small part of a larger global effort to explore linkages between various conceptions of environmental change and national well-being. It is also a rather small part of national security thinking and policy in the U.S. itself. In both contexts, it is a controversial undertaking, freighted with rhetorical and analytical tension that has mobilized scepticism and resistance from security specialists and environmentalists alike. The former fear obscuring national security planning and preparedness (Levy 1995); the latter a degradation of environmental policy and of the envi-

15 See at: <<http://www.ligi.ubc.ca/Programs/index.cfm?fuseaction=Environment>>.

ronmental movement (Deudney 1990). It is a small piece of a large picture, but a piece that has come into focus quickly, that has attracted billions of US\$ in the U.S. alone, that has garnered attention throughout the world, and that has mobilized many critics as well as supporters.

There are good reasons to be concerned with the real world effects of linking environmental change to national security. The first is the problem of blow-back. Having persuaded many security practitioners and other senior policymakers that environmental change is a serious threat, environmentalists now find themselves having to defend the value of protecting wilderness in remote, resource-rich environments such as Alaska and the Arctic Circle. For example, in 2003 and again in 2005 President Bush presented a plan for developing the *Arctic National Wildlife Refuge* (ANWR) that was rejected by a slim majority in the Senate. As of February 2007 Bush has lifted restrictions on oil and gas development in Alaska's Bristol Bay.¹⁶ The danger of framing something as a national security issue is that, once this is accepted in the U.S., it has the potential to trump any other way of framing the issue. Placed side by side, protecting the U.S. is always going to trump protecting wilderness if Congress and the public can be persuaded that such a choice needs to be made. And while this trade-off has yet to be fully accepted, incremental moves within this logic have already been taken.

A second reason for concern is that the more extreme variants of the neo-Malthusian conflict-scarcity thesis – such as the violent and anarchic world expressed by Robert Kaplan (1994) and tied to the research of Thomas Homer-Dixon (1991, 1994; chap. 20 by Homer-Dixon/Delingiannis) – may have created a perception of complex global threat that politicians and the security community can exploit. In the days after the 11 September 2001 terrorist attacks against the U.S., President Bush noted that in crafting their response his administration would not distinguish between terrorists and those who harbour them. By 2002, the Bush administration had developed a doctrine justifying the pre-emptive use of force in the war on terrorism, which was first publicly announced during the President's commencement address at West Point Academy:

For much of the last century, America's defence relied on the Cold War doctrines of deterrence and containment. In some cases, those strategies still ap-

ply. But new threats also require new thinking. Deterrence – the promise of massive retaliation against nations – means nothing against shadowy terrorist networks with no nation or citizens to defend. Containment is not possible when unbalanced dictators with weapons of mass destruction can deliver those weapons on missiles or secretly provide them to terrorist allies. We cannot defend America and our friends by hoping for the best. We cannot put our faith in the word of tyrants, who solemnly sign non-proliferation treaties, and then systemically break them. If we wait for threats to fully materialize, we will have waited too long. Homeland defence and missile defence are part of stronger security, and they're essential priorities for America. Yet the war on terror will not be won on the defensive. We must take the battle to the enemy, disrupt his plans, and confront the worst threats before they emerge. In the world we have entered, the only path to safety is the path of action. And this nation will act. Our security will require the best intelligence, to reveal threats hidden in caves and growing in laboratories. Our security will require modernizing domestic agencies such as the FBI, so they're prepared to act, and act quickly, against danger. Our security will require transforming the military you will lead – a military that must be ready to strike at a moment's notice in any dark corner of the world. And our security will require all Americans to be forward-looking and resolute, to be ready for pre-emptive action when necessary to defend our liberty and to defend our lives.¹⁷

The justification for a pre-emptive strike is similar to that provided by environmentalists for the precautionary principle – “a willingness to take action in advance of scientific proof [or] evidence of the need for the proposed action on the grounds that further delay will prove ultimately most costly to society and nature, and, in the longer term, selfish and unfair to future generations.”¹⁸

A third concern is that it is certainly not clear that linking the environment and national security has resulted in more investment in ecologically sustainable behaviour and green research. At the Earth Summit in Johannesburg there were numerous reports suggesting that progress was slower than expected or needed. It does not seem credible to even suggest

16 Announcement of this available at: <<http://www.peopleandplanet.net/doc.php?id=2947>>.

17 See at: <<http://www.whitehouse.gov/news/releases/2002/06/20020601-3.html>>.

18 Taken from the Wikipedia entry at: <http://en.wikipedia.org/wiki/Precautionary_principle>.

that, so far, linking the environment to this strand of high politics has paid a measurable dividend.

There are, however, also several reasons to be encouraged by the academic and policy activity in Canada and the United States over the past fifteen years. First, elements of the U.S. military, including the Marines and National Guard, have gradually accepted that they will have to play major roles in addressing humanitarian and natural disasters such as Hurricanes Rita and Katrina, the Indonesian tsunami and the earthquake in Kashmir, and that their efforts will be more productive if they are prepared for these types of events and able to work effectively with entities such as human rights and environmental NGOs that have expertise but cannot be forced into a traditional command hierarchy.¹⁹

Second, the direction taken by the Bush-Cheney administration has run counter to the aspirations of its predecessor, but it has opened a political space in which former Vice-President Al Gore has been able to operate with a high level of success. His documentary and book *An Inconvenient Truth*, have educated millions of Americans and others about the science of climate change, and the threat it is posing to human security.

Third, linking environmental change to national security was disturbing to many environmentalists. But one of the outgrowths of this activity has been the new research agenda examining links between the environment and peacebuilding. This is likely to be a far more comfortable association for many, as peacebuilding is not a primarily military activity but rather one that fully encompasses the human rights and development communities

Finally, the work on global environmental change and human security is creating a platform for influencing the foreign policy direction being charted by Canada and other countries such as Norway and Japan.

Ultimately, one must conclude that research and policy activities in North America have generated mixed results, but that there is great promise evident in many of the elements of this programme that have emerged recently and shifted the centre of attention towards human security and peacebuilding, and away from framing the environment as a national security issue on the grounds that it has or will become a significant cause of violent conflict.

19 These comments are based on Matthew's direct experience working with U.S. Marine Forces Pacific on planning for humanitarian and natural disasters.

61 The Debate on Ecological Security in Russia, Belarus and Ukraine

Alexander Sergunin

61.1 Introduction

Ecological security was nearly a taboo in the Soviet era. Only during the Gorbachev period environmental issues reached the national agenda when Gorbachev (1987) introduced the idea of ecological security in his book on *perestroika* and New Political Thinking. However, on the practical level the debate was mostly devoted to the implications of the Chernobyl catastrophe (1986). The broader debate on numerous environmental problems was at an embryonic phase, public attention was preoccupied with the political cataclysms of the early 1990's. Only in the 1990's the environmental security debate emerged.

This chapter explores how environmental problems have affected the CIS security discourse, including threat perceptions and national security doctrines and it examines how different national schools (Russian, Belorussian and Ukrainian) identify their approaches to the solution of the ecological problems.¹

61.2 CIS Security Thinking in the Post-Cold War Period: Changing Perceptions

The political and academic communities in the *Commonwealth of Independent States* (CIS)² were surprised by the post-Cold War dynamics that did not come overnight. But it took almost a decade to redefining the national security concepts of Russia, the

Ukraine and Belarus and to produce thorough academic analyses. Several fundamental changes in the CIS security thinking were caused by the post-Cold War environment.

First, in contrast with the traditional security thinking that emphasized 'narrow' (military) security, the CIS countries accepted a broader security concept. According to the Russian Law on Security (1992), not only military but also economic, social, information, and ecological aspects of security are important. According to this law, "security is a freedom from internal and external threats to vital interests of the individual, society and state" (Yeltsin 1992: 5). The same principles were developed in the Russian Ecological Doctrine (2002).

Second, in addition to a new definition of security, there is a growing understanding among CIS strategic planners that in the age of globalization the focus of national and world politics is gradually shifting from the 'hard' (military) to the 'soft' (non-military) security domain. This was unusual for the Soviet security policy. The Soviet Union had always emphasized the development of full-fledged armed forces (both nuclear and conventional) and the military had a major saying in the decision-making. In the post-Cold War period 'hard' security lost its former importance, a new agenda was de-securitized, 'normal', non-security issues became objects of global co-operation. 'Grand' policy retreated to the shadow and 'low politics' (economy, societal issues, ecology, migration, etc.) dominated the scene.

Third, there was a dramatic change of threat perceptions. For instance, Russian and Ukrainian national security doctrines³ asserted that these two countries faced no immediate danger of large-scale aggression, and that, because the countries were beset with a myriad of debilitating domestic problems, the greatest threat to their security was now an internal

1 This study covers only three Slavic CIS states – Belarus, Russia and Ukraine because both the approaches and the agenda are different in other post-Soviet countries.

2 The CIS is the international organization, or alliance, established in late 1991 after the dissolution of the USSR and consists of 11 former Soviet Republics: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Ukraine, and Uzbekistan. Turkmenistan discontinued permanent membership as of 26 August 2005 and is now an associate member.

3 Belarus still maintains a more traditional (military-oriented) approach to national security.

Figure 61.1: Map of the Russian Federation. **Source:** Map 3840, Rev. 2, January 2004. United Nations, Department of Peacekeeping Operations, Cartographic Section. Reprinted with permission.



one. For example, the national security concept of the Russian Federation (1997) stated:

An analysis of the threats to the national security of the Russian Federation shows that the main threats at present and in the foreseeable future will not be military, but predominantly internal in character and will focus in the internal political, economic, social, ecological, information and spiritual spheres (Yeltsin 1997: 4).

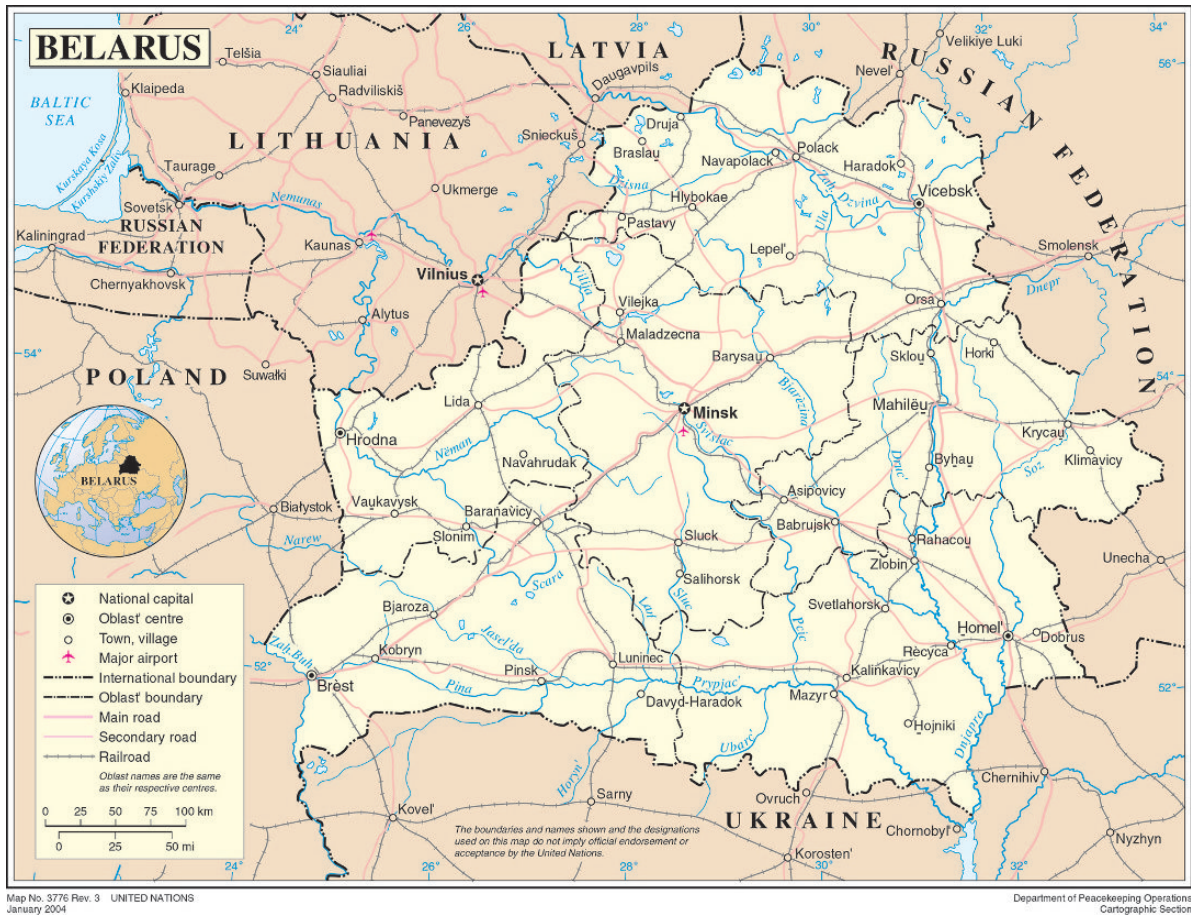
This is a distinct departure from previous doctrines. For example, the military doctrine of 1993 were based on the assumption that the main threat to Russia's security was posed by external factors such as local conflicts, territorial claims or violations of the rights of Russian-speaking minorities in the former Soviet republics (Yeltsin 1994).

Fourth, the predominance of the 'soft' security agenda has questioned the role and capabilities of the old actors (NATO, OSCE, etc.) in dealing with a new set of challenges. Several new institutions, such as the *Council of the Baltic Sea States* (CBSS), the *Barents-Euro-Arctic Council* (BEAC), and the *Arctic Council*

(AC) were set up to better cope with new problems rather than traditional actors. Among the 'old' multilateral institutions, especially the European Union (EU), the Council of Europe, the *Nordic Council* (NC), the *Nordic Council of Ministers* (NCM) and international financial institutions (IFIs) were more responsive to the 'soft' security problematic. It took the CIS foreign and security policies some time to adjust to this new reality.

Fifth, the post-Cold War period brought a new pattern of the globalization and regionalization relationship. It became a commonplace to ascertain that globalization and regionalization are the two sides of the same coin and different words (e.g., glocalization) are used to denote this complex phenomenon. The world faces the erosion of the nation state and of national sovereignty, the shift of power from the national level to supranational and sub-national institutions. The CIS is a part of this global dynamics and cannot ignore the rules dictated by it (although the

Figure 61.2: Political Map of Belarus (1997). **Source:** Map 3776, Rev. 3, January 2004. United Nations, Department of Peacekeeping Operations, Cartographic Section. Reprinted with permission.



Belarusian President Alexander Lukashenko tries to challenge this point from time to time).

The CIS is particularly affected by the regionalization in the transatlantic space due to the enlargement of NATO and the EU, Baltic and Nordic sub-regional co-operation, Eurasia (*Shanghai Co-operation Organization*), and Asia-Pacific (APEC (*Asia-Pacific Economic Co-operation*), and the ASEAN (*Association of South-East Asian Nations*) Regional Forum).

Initially, many CIS countries underestimated the role of regionalism in 'soft' security co-operation. They saw regional co-operation as either as a low priority (compared to 'grand policy') or a room for diplomatic manoeuvring (if 'grand strategy' failed). For this reason the CIS countries were quite suspicious about the regionalist nature of a number of sub-national and international initiatives (e.g. the EU's Northern dimension or Euroregions). These countries were afraid of strengthening separatist tendencies in a number of regions (e.g. Kaliningrad, Karelia

and the Russian Far East in Russia; Eastern and Western Ukraine and Crimea in Ukraine) as a result of their deep involvement in regional co-operation. Only with time the CIS states realized that regionalism brings more positive than negative results and started to think of its border areas as 'pilot' regions (Sergounin 1999). In addition, many environmental problems (e.g. Chernobyl catastrophe, water pollution in Neman, Don and Dnepr, etc.) have a trans-boundary effects and call for concerted efforts by several actors. As part of a new strategy CIS countries paid a serious attention to joining appropriate regional and sub-regional institutions.

For example, Russia concluded a *Partnership and Co-operation Agreement* with the EU (1994) and now takes part in various EU programmes on cross- and trans-border co-operation. Moscow participates in the activities of various sub-regional organizations such as the CBSS, BEAC, AC and the *Black Sea Economic Co-operation* (BSEC) (including on environment protec-

Figure 61.3: Political Map of Ukraine (1993). **Source:** Map 3773, Rev. 4, January 2005. UN, Department of Peacekeeping Operations, Cartographic Section. Reprinted with permission.



tion). In addition, Russia joined as a full member the ASEAN Regional Forum (1996) and the APEC (1998) organizations which are also involved in discussions of ecological issues. The Ukraine takes part in the BSEC and in a Euroregion in the Carpathian area. Belarus (regardless its xenophobic attitude to Western institutions participates in the Neman Euroregion (together with municipalities in Kaliningrad, Poland and Lithuania).

However, many elements of traditional security thinking still prevail and current CIS security thinking represents a mixture of different schools and approaches.

61.3 IR Schools and Environmental Security of CIS Member States

Ecological security has been a highly debated issue in the CIS International Relations (IR). It should be noted that all three alternative perspectives of IR - *state-centric* (realist), *multi-centric* (idealist or liberal),

and *global-centric* approaches to international politics (Rosenau 1982: 1-7) - exist in the CIS countries. Each school developed its own vision of environmental security.

61.3.1 Realism

Currently, realism is a dominant paradigm in the CIS countries. This group of theories regards the states as a key unit of analysis. Realists are rather reluctant to see ecological issues as a part of a global security agenda and believe that the implications of these problems for international relations are overestimated. 'Power politics', 'balance of power', and 'national interests' are still most valuable theoretical categories for them. Realists view globalization mostly as the emergence of the patterns of political control and domination which extend beyond borders (such as hegemonic control or spheres of influence), but they reject the argument that the idea of globalization is ac-

accompanied by a deepening sense of community (Klyuchnik 2002; Sekatskiy 2002). They believe that each country should solve its ecological problems by efforts of its own (or with a minimal international assistance) to avoid external control.

The realists are also sceptical about global governance, a product of globalization. They prefer to speak of world power distribution, world leadership, and 'concert of powers', alliances, etc. In their opinion, multilateral institutions are little more than vehicles for powerful states to establish rules and norms of action that are in their interest. Participation in an international institution does not mitigate the anarchic nature of world politics; the states are interested in survival at the very least, and in pursuing power at the most. Even those neo-realists who understand in principle the need for managing global problems believe that such governance is possible only when it is exercised by a superpower or by a coalition of the most powerful states (Klyuchnik 2002; Kozhinov 2001).

The greatest fear of realists about globalization and global governance is that countries might be unable in the future to control their own development. In this sense globalization means the denationalization of politics, markets and law (Klyuchnik 2002). The fear of external intervention to solve domestic ecological problems is also used by CIS realists as an argument for government protection of domestic markets and national industries. They claim that transnational corporations erode the ability of nation states to regulate their own economies and often use environmental issues as an excuse to intervene into the internal affairs of the CIS countries and they refer to the unfair competition with local business. For example, the Russian conservatives blamed the local branch of Greenpeace for helping multinationals to compete with Russian forestry and atomic energy industries.

In response to global challenges the realists suggest that the CIS political leadership should be more assertive in ensuring national security interests (Klyuchnik 2002; Zadokhin 2001). They articulate several alternatives to the global leadership in ecological security, including a greater reliance on bilateral and regional security co-operation and organizations, such as the Russian-Belarus Union Treaty, the Tashkent collective security system (CIS countries), the Shanghai Organization for Co-operation, etc. (Klyuchnik 2002). They warn the CIS leaders that ecological security co-operation with Western countries should be taken with a grain of salt and should strictly correspond to national interests and be of a short term and non-binding nature.

61.3.2 Liberalism

For the CIS multi-centric IR theories, non state actors are important entities in international relations that cannot be ignored; in addition, the state is not a unitary and often not a rational actor. This group of theories views multilateral institutions, along with the states, as crucial actors in world politics. Moreover, liberals believe that international institutions and law can be safeguards against anarchy in international relations and bring order and justice to world politics. For this reason, some versions of liberalism have been labelled as 'liberal institutionalism' or 'liberal transnationalism'.

The CIS liberalism emphasizes globalization trends in world politics, which strengthen the trend toward a global management of various developments (including ecological problems) and generally increases the relevance of international legal frameworks, thus reducing global anarchy. Although the trend toward a multipolar world is not neglected within the liberal perspective, it argues that the future development of the international system is no longer predominantly determined by the shape and outcome of rivalries among the major centres of power, but increasingly by the dynamics of their common development and interdependence (Bazhanov 2002; Khrustalev 1992; Zagorski/Zlobin/Solodovnik/Khrustalev 1992: 5-13). The liberals argue that the geopolitical drive for control over territories does not matter anymore, and suggest that it should be replaced by global thinking (Zagorski 1995: 5-8).

The CIS liberals view globalization and global governance as both an objective process that is impossible to resist and, at the same time, an opportunity for the CIS countries (Bazhanov 2002; Znachkov 2001). They believe that globalization is a chance for the CIS states to join the most developed part of the world and to reform their economy and socio-political systems with the help of the international community.

61.3.3 Globalism

Contrary to the realist and liberal schools, the CIS globalists depart from the assumption that the global context within which states and other entities interact and supranational structures are more important than nation states. Some globalists question the very existence of the nation state in today's world. National governments are unable to resist global processes and have to submit to universal laws dictated by the global dynamics.

The CIS globalist paradigm is not monolithic and consists of several sub-schools. The environmentalism is one of them. The environmentalist version of the CIS globalism was one of the first to re-define the concept of security in the post-Soviet period. According to Academician Yablokov (1992: 98), one of the leading Russian environmentalists, "National security is no longer purely military. I am sure that Russia's national security is environmental by at least one-third". Contrary to geopolitical threats which are mainly hypothetical, ecology directly affects the nation's economy, health, climate, etc.

Under the pressure of environmental concerns, nearly all CIS foreign policy schools included an ecological dimension in their security concepts. The environmentalists believe that traditional diplomatic methods are not sufficient for resolving ecological problems which have now tended to become global rather than national or regional. They believe that their countries, along with the entire world, should develop a 'new thinking' based on a common interest in survival (Pli-mak 1996; Shirokov 2003).

The concept of sustainable development is a key goal of environmentalists. As one Belarussian expert suggests, this concept aims to introduce a new, optimized, system of international division of labour, energy savings, development of alternative energy sources, environmentally clean agriculture, etc. (Shirokov 2003). Under the pressure of the environmentalists all three countries took part in the Pan-European Ecological Partnership "East-West" that has been launched by 12 post-Soviet countries and some European states in April 2002. This partnership is solidly based on the sustainable development approach (see at: <<http://www.priroda.org/docs/bul-rus-IL.doc>>).

Some environmentalists are quite radical in their policy recommendations. They recommend the dissolution of political boundaries and a de-ideologization of international relations. In order to cope with ecological problems, humankind should be able to forecast both the near and distant future and should consider all components of these problems in their historical and physical developments. Since only scientists are able to make good forecasts, this stratum should be charged with political management. National and international economies should be based on new technologies targeted at the rational exploitation of natural resources. Contrary to public and private properties, co-operative property would be the best form of ownership to deal with environmental issues. Trans-national rather than national bodies should be

in charge of global problems as nation-states are unable to cope with them any longer (Burlak 1992).

To sum up, the entire picture of the CIS debate on ecological security is very diverse and fragmented. This has hampered the formulation of a single national or CIS policy in the sphere of environment protection. None of the countries has a clear environmental strategy although on paper all of them have relevant legislation. Which environmental problems do the CIS countries presently face?

61.4 Problems and Solutions

Specialists identified several key environmental problems facing the CIS Slavic space (figure 61.4): pollution (61.4.1), terrestrial pollution (61.4.2), forest destruction (61.4.3), climate change (61.4.4), fisheries and marine environment (61.4.5), and nuclear safety (61.4.6).

61.4.1 Pollution

All three Slavic states suffer from heavy industrial pollution. The main source of industrial pollution is sectors, such as metallurgy (Russia and Ukraine), chemical industry (all three states), cellulose and paper-producing plants (Russia and Belarus) and nuclear industry (Russia). For example, in 2005 22 Russian cities with population of 14,3 million were indicated as areas with the level of air pollution that exceeded norms more than 10 to 50 times (The Russian Ministry of Natural Resources 2006).

All three republics also face soil pollution from pesticide use although a discussion on the preference of organic fertilizers has recently started. One more problem which is especially salient for Russia and Ukraine is the pollution of the surrounding seas. For example, the Baltic, Barents and Black Seas suffer from heavy water and air pollution because they are located in highly industrialized areas.

The Baltic Sea is one of the world's most polluted seas. Wastewater and sewage often goes untreated straight into the sea. Agricultural chemicals are destroying marine eco-systems. Over-fishing is threatening bio-diversity. Moreover, illegal oil spills from shipping are detrimental to the region's environment. St. Petersburg remains the main source of pollution: it contributes 2/3 of pollution generated by the Russian north-western regions (The Russian Ministry of Natural Resources 2006). Already the daily waste of local industries in the St. Petersburg area amounts to 120

Figure 61.4: Key Environmental Problem Areas in Russia. **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/commonwealth/russia_environmental98.pdf> from the *Handbook of International Economic Statistics* (1996). This map is in the public domain.



tons of ammonium, 40 tons of nitric anhydride, 132 tons of oil products, 36 tons of phosphor, 50 tons of iron, and 2 tons of phenol (Kukk/Jervell/ Joenniemi 1992: 114; Roundtable discussion 2006). Barely two third of industrial wastewater in the area is purified. The sediment that is created after the cleaning is usually thrown into the Neva River or the Gulf of Finland. Resulting from a dam near St. Petersburg, coastal water pollution (industrial and agricultural) has increased one and a half times in early 1990's (now being 1500 mm/m^3).

Not only the Baltic Sea but also the Arctic zone became a subject of concern. According to some data, Russian oil companies pour some 20 to 30 million tons of oil into the Siberian forests and rivers (Yablokov 1992: 96). The Kola Peninsula has also been in trouble. According to the hydro-meteorological service in the Murmansk Region, one third of water samples taken in the region were classified as containing a high degree of industrial and agricultural pollution,

and of these, a further one third contained an extremely high degree of pollution (International Challenges 12.4: 36; The Russian Ministry of National Resources 2006).

To counter this situation, some experts maintain that international agreements on the marine environment of the Baltic Sea and the Arctic Ocean should be fully implemented.⁴ Forceful action must be taken on sustainable production techniques and investment in clean technology. For example, the Helsinki Commission (HELCOM) addresses the region's ecological problems. The HELCOM elaborated an extensive *Baltic Sea Joint Comprehensive Environment Action*

4 As far as other forms of pollution are concerned all three Slavic countries are the parties to international agreements on air pollution, air pollution-nitrogen oxides, air pollution-sulfur 85, biodiversity, climate change, desertification, endangered species, environmental modification, hazardous wastes, marine dumping, ozone layer protection, ship pollution, wetlands, etc.

Programme which identified 132 ecological hot-spots, most of which are in the eastern part of the Baltic Sea. However, because of the lack of resources, the programme has not been accomplished. Now the HELCOM concentrates on the development of the Action Plan on the Baltic Sea (The Russian Ministry of Natural Resources 2006).

The EU-Russian co-operation is the most crucial venue for the success of various regional endeavours. Priorities of a future common EU-Russian environmental policy in the Baltic and Arctic regions include: (a) keeping the Baltic Sea and the Arctic Ocean clean and reducing the release of pollutants to marine and fresh waters; (b) protecting biological diversity and ensuring sustainable use of natural resources, and (c) reducing emissions of greenhouse gases (Commission of the European Communities 2000, 2001, 2003; Vollebaek 2000: 59).

According to the Northern Dimension Action Plans 2000 (2001-03) and 2003 (2004-06), the EU supported investment projects in major 'hot spots' to reduce the pollution of the Baltic Sea, particularly in the Kaliningrad, St. Petersburg and the River Neva catchments areas (Commission of the European Communities 2000, 2003). The EU also supported a monitoring system on the environmental problems of the region in co-operation with the European Environment Agency.

It is also suggested to establish a link not only between the CBSS and BEAC but also with the AC (Ásgrímsson 2000: 54). The Council has a well-developed environmental programme that heavily focuses on the *Northern Dimension Initiative* (NDI) area and could be a very valuable addition to existing arrangements in this field. For example, the Council has an Arctic Monitoring and Assessment Programme that aims at monitoring pollution on the Russian coast of the Arctic Ocean (Forster 2000: 96; see chap. 73 by Hoogenesen).

It should be noted that not only the EU and sub-regional organizations but also some IFIs played a major role in the new environmental strategy, such as the *International Bank for Reconstruction and Development* (IBRD), *European Bank for Reconstruction and Development* (EBRD), *European Investment Bank* (EIB), etc. (Commission of the European Communities 2003; Eliasson 2000: 69). For example, their support was crucial in initiating the idea of the *Northern Dimension Environmental Partnership* (NDEP) in 2001. The IFIs were also quite helpful in funding specific projects in Russia's north-western regions.

The Nordic multilateral institutions also contributed to the regional process. In 1990, the NCM created the *Nordic Environmental Finance Corporation* (NEFCO), a risk capital institution with a total capitalization of ECU 80 million. The purpose of this corporation has been to facilitate the implementation of environmentally beneficial projects in the Nordic region. NEFCO invested ECU 245,000 in waste treatment and recycling in St. Petersburg, provided the St. Petersburg local government with a ECU 1,2 million loan for a municipal waste water treatment, and provided the Kostamuksha iron pellet plant (Karelia) with a ECU 1,8 million loan to carry out a modernization programme (Sawhill 1998: 66-67).

In 1996, the NC established a special environmental lending facility within the *Nordic Investment Bank* (NIB), with an initial capitalization of ECU 100 million. This facility aims to reduce the trans-boundary pollution in the *Barents-Euro-Arctic Region* (BEAR) and the Baltic Sea area by providing long-term loans and loan guarantees for public and private projects. Particularly, the NIB funded a number of projects on wastewater treatment in Kaliningrad, St. Petersburg and on the Kola Peninsula.

Country-to-country or bilateral co-operation is also important for solving Russia's environmental problems. For example, Finland and Karelia jointly monitor the ecological situation on their common border. Finnish consultants assisted in implementing a district heating system project (\$50 million cost) in the Murmansk Region (Council of the European Union 2001a).

Norway helped with the modernization of the Pechenganikel metallurgical combine to reduce trans-boundary pollution (Sigurdsson 1997: 133-134; Sawhill 1998: 66). A Russian-Norwegian agreement on co-operation in combating oil pollution in the Barents Sea was adopted in 1994, introducing notification commitments in emergency situations (Stokke 1997: 170). The UK set up a programme worth £2 million a year that focuses on air and water pollution, waste management, cleaner production, and sustainable forest management in Russia (Vaz 2000: 56).

The main threats to the Black Sea environment are polluted water, heavy metal, organic compounds, and oil-related pollutants. Waste water containing phosphorus and nitrogen-related elements is especially dangerous. The water supply in some areas of Ukraine contains toxic industrial chemicals up to 10 times the concentration considered to be within safety limits (see at: <<http://www.nationsencyclopedia.com/Europe/Ukraine-environment.html>>). The pollution of the na-

tion's water has resulted in a large-scale elimination of the fish population, not only in the Black Sea but also in the Sea of Azov (The Russian Ministry of Natural Resources 2006).

Air pollution is also a significant environmental problem in Ukraine. In 1992, Ukraine had the world's seventh-highest level of industrial carbon dioxide emissions, which totalled 611.3 million metric tons, a per capita level of 11.72. In 1996, the total had dropped significantly to 397 million metric tons and has so far remained at the same level.

It should be noted that these problems are generated not only by coastal regions of six countries (Bulgaria, Georgia, Moldova, Romania, Russia and Ukraine) with a population of 16 million but also by quite remote territories (ranging from Germany to Belarus and inner areas of Russia) via the big rivers, such as the Danube, Dniester, Dnieper and Don. The whole population of this area is about 165 million (Ryaboi 2006).

To cope with the environmental problems of the region the *Black Sea Commission* (BSC), the inter-governmental organ of the six coastal states, has adopted a Black Sea Protection and Recovery Strategic Plan (1996). The BSC budget in year was rather modest (US\$ 300,000) and allowed only limited monitoring activities. The BSC co-operates with OECD (*Organization for Economic Co-operation and Development*) and the EU (TACIS programme).

A concerted effort of these organizations forced the coastal states to tighten their environmental standards. In addition, there industrial activities in five of six littoral countries declined. This also contributed to a certain decrease of pollution. According to the international ecological expedition that examined the north-western (most polluted) part of the Black Sea in 2006, there is some modest progress towards a decreasing pollution and increasing bio-diversity in this area (Ryaboi 2006).

61.4.2 Terrestrial Pollution

This problem is especially important for Russia. Major mineral and metallurgy exploitation activities in Siberia and on the Kola Peninsula have disrupted the landscape in many places. Exploration for oil and gas, the development of new fields and other activities connected with petroleum affect heavily the interests of reindeer herding. Military exercises and transport were very damaging to the environment as well.

61.4.3 Forest Destruction

As Russian forests make up 25 per cent of the entire world's forestry, they play a crucial role in the functioning of the global biosphere and the climate of the planet. The Siberian taiga absorbs as much, or even more, carbon dioxide as the globe's rain forests, thereby stabilizing the atmosphere (Yablokov 1992: 96). Industrial and agricultural activities destroying forests in Siberia and on the Kola Peninsula, forest degradation through encroachment and over-exploitation violate the regional ecosystem balance; deteriorate animal and human living conditions (Heininen/Käkönen 1991). Scientists also point out that an additional effect of deforestation consists of the soil releasing more methane into the atmosphere than before. Methane is a powerful gas, which alters the atmosphere to a far greater extent than carbon dioxide, thus speeding up the greenhouse effect.

The international community has also been concerned about this problem. Reflecting these concerns, a parliamentary conference on deforestation was held in 1992 in Washington, DC. At the initiative of EU representatives, a special resolution on the Siberian forests was adopted. In March 1999 the BEAC also launched the Barents Region Forest Sector Initiative that aims at improving sustainable forest management and conservation, human resource development and socio-economic sustainability of the Barents region (Commission of the European Communities 2000: 12).

Again, the EU is the most important Russia's partner in this area. A number of EU initiatives were oriented to protect forests against atmospheric pollution (Council Regulation EEC No. 3528/86), to prevent forest fires (Council Regulation EEC No. 2158/92) and to protect forests from dangerous agricultural activities (Council Regulation EC No. 1268/99).

In the context of the *Baltic Sea Agenda 21* process, an *Action Plan on Forests* was adopted in 1998. The following problems were identified as key areas for priority action within the NDI: (1) promotion of sustainable forest management and efficiency in private forestry within the Baltic Sea region through the establishment of organizational structures or networks of forest owners and exchange of information on advisory services; (2) a gap analysis on forest conservation areas; (3) establishment of demonstration areas to illustrate forest management practices; (4) setting up a regional group for exchanging experiences and technological know-how, and promoting the use of wood-based energy; (5) promotion of the use of wood and wood-based products; (6) exchange of informa-

tion and national experiences on criteria and indicators for sustainable forest management; and (7) increasing networking and expertise in the forest sector through human resource development (Commission of the European Communities 2000: 14).

Since 2000 the Joint Research Centre's (JRC) *Global Vegetation Monitoring Unit* (GVMU) has been running a project called Sib-TREES (*Siberian Taiga Resources and Environmental Monitoring by Satellites*). This pilot project highlights the applications of earth observation with satellites for determining baseline inventories of forest resources and for forest monitoring (logging operations, fires, etc.) in northern regions (see, at: <<http://ies.jrc.ec.europa.eu/gem.html>>).

A 'Forest Sector Programme for the Northern Dimension' was presented to the Luxembourg ministerial conference on the NDI (April 2001) by the BEAC. The programme provided a good basis for further work in the areas of sustainable forest management, environmental conservation, and development of the forestry sector (Council of the European Union 2001b).

61.4.4 Climate Change

The deforestation and intensive use of fossil fuels are two major sources of the greenhouse effect. According to the report *Environment in the European Union at the turn of the Century* (1999), the world-wide increase in the use of fossil fuels will lead to a 3°C increase in the mean temperature in Finland and Northwest Russia between 1990 and 2050, this being one of the highest temperature increase expected in Europe (Commission of the European Communities 2000: 12). The greenhouse effect may result in a long-range climatic change. Because of the greenhouse effect, biologists predict that tundra areas will shrink and forests will creep north along coasts, up mountain slopes, and into former tundra areas. These processes would likewise change the composition of plant and animal communities. This warming trend has major implications for human activities in the North (offshore and onshore oil drilling, hydroelectric projects, and agriculture). In order to combat climate change, the EU and Russia aim at launching a regional pilot scheme for climate change joint implementation projects and projects to improve energy efficiency and better monitoring emissions (Commission of the European Communities 2000: 13).

61.4.5 Fisheries and the Marine Environment

The Black, Baltic and Barents seas severely suffer from water pollution. The stocks of some species such as cod and salmon are under pressure due to over-exploitation and water quality problems. In the Baltic Sea the fisheries sector is covered by the Agenda 21 Action Programme aiming at sustainable fisheries by harvesting within safe biological limits. This should be done by applying a precautionary approach and by gradually achieving a balance between the harvesting capacity of fleets and the target reference points for stocks based on long-term management strategies for all the fish stocks regulated by the *International Baltic Sea Fishery Commission* (IBSFC). A resolution on the long-term management strategy for the cod stocks was adopted in 1999 and the *Salmon Action Plan* (SAP) was adopted in 1997 (Council of the European Union 2000).

To protect the marine environment Brussels and Moscow adopted an EU-Russia Fisheries Co-operation Agreement in July 2006 (<http://www.delrus.ec.europa.eu/en/news_848.htm>). Russia and Norway have already made an arrangement pertaining to the fisheries of the Barents Sea. The EU-Russian co-operation on protection of bio-resources includes the following priorities:

- Equipping fishing boats with EU-mandated satellite-based *vessel monitoring systems* (VMS);
- Co-operation in the field of research, scientific work and fisheries management;
- Implementation of SAP to support restoration of damaged habitats, development of fishing surveys and monitoring in salmon index rivers;
- Achievement of sustainable aquaculture – action to minimize the environmental impact of aquaculture (Council of the European Union 2001a).

61.4.6 Nuclear Safety

For all three Slavic CIS countries the consequences of the 1986 Chernobyl catastrophe had many ecological, economic, social and political implications (figure 61.5). The northern part of Ukraine, the southern section of Belarus and the south-western part of Russia were affected by the fallout from the Chernobyl *nuclear power plant* (NPP). Belarus and Ukraine have especially suffered from the catastrophe. 23 per cent of the Belarussian territory with 1,3 million population were contaminated by the fallout (Office of Communications of the President of the Republic of Belarus 2006). Over three million Ukrainians live in danger-

ously radioactive areas and 12 per cent of arable land is contaminated.⁵

Fortunately, over the last decade the level of radiation in all contaminated areas has remained stable. For example, in 2006 the average radiation level was for: Kyiv - 0,012 mR/hr, the Kyiv Region - 0,009-0,017 mR/hr (the standard level is 0,050 mR/hr) and Chernobyl - 0,035 mR/hr (the acceptable threshold is 0,080 mR/hr) (Ukrainian Ministry of Emergency Situations 2006). The same was true for the Russian regions of Bryansk and Tula that also suffered from the Chernobyl catastrophe (The Russian Ministry of Natural Resources 2006).

In addition, Northern Russia has the largest concentration of military and civilian nuclear installations in the world. More than 80 nuclear submarines are located there, with over 200 nuclear reactors stored within them (Ahunov 2000: 73).⁶ According to some assessments, the operational risks of the 10 reactors in NPPs located in north-western Russia and Lithuania (6 of which are of the same type as at Chernobyl) also present a serious threat to the population and a large area of Europe (Commission of the European Communities 1998; Patten 2000: 12). Spent nuclear fuel and radioactive waste in Russia is also an extensive and worrying problem.

The Russian environmentalists believe that the northern part of Russia and Arctic Ocean are most vulnerable to nuclear contamination. Tens of thousands of cubic metres of seriously contaminated nuclear waste have been gathered here (Ahunov 2000: 73). Radiation emanating from nuclear munitions factories in Krasnoyarsk, Tomsk, Chelyabinsk used to float into the Arctic Ocean down the great Siberian rivers. From 1964 to 1991, fluid and solid radioactive waste has been dumped into the Barents and Kara seas. According to the Yablokov Commission's report (1992), the USSR dumped 16 nuclear reactors into the Kara Sea (including 6 with nuclear fuel). Also, a container with nuclear waste from the ice-breaker 'Lenin' has been dumped in a similar fashion. General radioactive waste amounts to 319.000 curie in the Barents Sea and 2.419.000 curie in the Kara Sea.⁷

The European multilateral institutions have given particular attention to nuclear safety in north-western Russia. The Nuclear Safety Account (NSA), as a special grant facility within the EBRD, has been established to serve as a mechanism to finance operational and near-term technical safety improvements for Soviet-designed reactors in the former socialist countries. The NSA is capitalized at ECU 257.2 million, provided by fourteen donor states (including the Nordic countries, above all Finland, Norway, and Sweden) and the EU. The NSA provided grants for safety upgrades in the Kola and Leningrad NPPs, amounting to 45 and 30 million ECU, respectively (Sawhill 1998: 66-67).

In 1995 the Nordic countries initiated an international Contact Expert Group (CEG) under the aegis of the International Atomic Energy Agency (IAEA). The group is made up of representatives of twelve countries and three international organizations. It meets regularly at least twice a year and co-ordinates a number of projects on nuclear waste and nuclear submarines, particularly in north-western Russia (Ahunov 2000: 73-74).

The Russian Federation signed several quite promising agreements with Sweden and Norway on handling nuclear waste and nuclear safety issues. According to these documents priority should be given to the following concrete projects: NEFCO to remove hazardous nuclear waste stored on board of the vessel *Lepse* in Murmansk; the Arctic Military Environmental Co-operation which also aims at the treatment of radioactive waste in Murmansk; the joint Norwegian-Russian arrangements on environmental co-operation in connection with the dismantling of nuclear submarines; and multilateral energy efficiency projects under the BEAC, *International Energy Agency* (IEA), *Economic Commission for Europe* (ECE) and Energy Charter auspices.⁸ The Netherlands contributed 0,5 ml guilders to the *Lepse* project (Forster 2000: 96). UK provided £ 5 million for the nuclear clean up in the Kola Peninsula (Vaz 2000: 56). A special project was signed between the ministers of defence of Russia, the U.S. and Norway to construct a concrete container for long-term storage of spent nuclear waste fuel (Ahunov 2000: 74).

The nuclear challenges in north-western Russia are of such a magnitude that a concerted international action was necessary. This is why in Bodø in March 1999

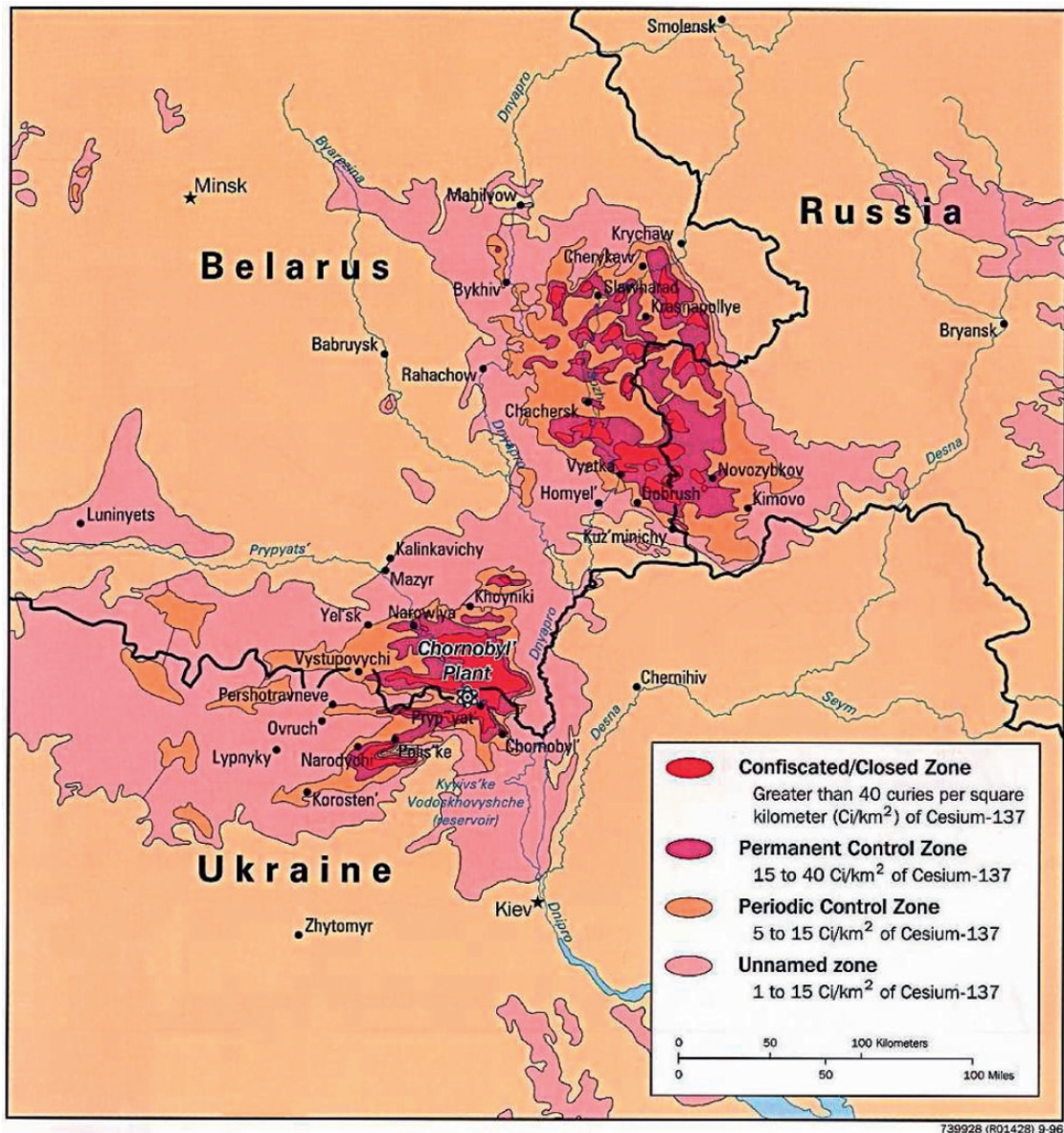
5 See e.g. at: <<http://dev.prenhall.com/divisions/hss/worldreference/UA/environment.html>>. There is an extensive scientific literature on the assessment of this nuclear accident.

6 According to the EU sources, there are approximately 300 nuclear reactors (20 per cent of the world's total) in the region (Commission of the European Communities 2000: 14).

7 See: *Izvestiya*, 20 April 1993; *International Herald Tribune*, 28 April 1993; Gizewski (1995: 25-41).

8 See: *Rossiyskaya Gazeta*, 13 March 1997.

Figure 61.5: Map of Radiation Hotspots Resulting from the Chernobyl' Nuclear Power Plant Accident in 1986. **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/commonwealth/chornobyl_radiation96.jpg> from Handbook of International Economic Statistics 1996. This map is in the public domain.



the BEAC recommended that the interested nations and the EU should negotiate with Russia a *Multilateral Nuclear Environmental Programme in the Russian Federation* (MNEPR). This international agreement could serve as an umbrella for all projects on nuclear waste and spent fuel in Russia. It was planned that the agreement could contain a set of obligations for Russia and could establish a mechanism for better co-ordination. Such a programme could greatly facilitate planning and implementation of nuclear projects

in North-western Russia. But the negotiations were quite difficult and took almost four years. The most difficult questions consisted of tax and customs exemption, including liability, access and auditing (Eliasson 2000: 69; Vollebaek 2000: 59). The MNEPR agreement was signed on 21 May 2003 in Stockholm.

The EU strategy for Russia in the pre-MNEPR period explicitly linked nuclear safety programmes to two basic conditions: (a) the existence of Russia's strategy for radioactive waste and spent fuel manage-

ment, and (b) the conclusion of the MNEPR framework agreement. This strategy was quite successful and both objectives were achieved. Prior to the signing of the MNEPR the financial support given by the EU to the nuclear safety-related projects in north-western Russia totalled more than € 66 million (Commission of the European Communities 2001).

After the MNEPR entered into force, the EU-Russia co-operation on nuclear safety has aimed at:

- obtaining a commitment from the Russian government that the design lifetime of the Leningrad and Kola NPPs will not be extended;
- enhancing operational safety actions and supply of equipment for these NPPs, including additional training of personnel, upgrading the control room panels, creation of alternative shutdown systems, construction of a radioactive waste cementation facilities, development and construction of a treatment facility for radioactive liquid waste, development of leak detection and fire detection systems, etc.;
- developing exploratory projects, such as assessment of necessary improvements at the Russian submarines' unloading facilities at Iokanga and Gremikha; feasibility study for the rehabilitation of the Andreev Bay technical base (Murmansk region) that was initially built for storage of spent fuel and radioactive waste from nuclear submarines (reportedly there are over 20,000 spent fuel elements on the site); the environmental impact assessment for de-fuelling activities of laid-up nuclear submarines at Zvezdochka (Severodvinsk, Archangel region); the removal of damaged spent nuclear fuel from the Lepse service ship; the design, licensing and construction of a 80-tonne Murmansk storage cask for damaged spent nuclear fuel assemblies; the assessment of the safety of storage of radioactive waste in several important facilities located in the Murmansk and Archangel regions; the optimization of the transport schemes for spent nuclear fuel - removed from service ships, ice-breakers and laid-up nuclear submarines - from Northwest Russia to the Southern Urals (Mayak plant); the storage of spent nuclear fuel in Mayak; the assessment of several potential disposal sites and concepts for short-lived radioactive waste in North-western Russia, etc.

As far as the financial side of the EU-Russia co-operation is concerned, under the MNEPR funds are to considerably increase. At the same time, both Brussels and Moscow increasingly emphasized the need to

make such a co-operation more equal in financial terms (especially given the current recovery of the Russian economy).

The problem of nuclear waste has also been a topical issue for the Ukraine. The nuclear industry is the key component of the Ukrainian energy sector. Its 15 nuclear reactors provide 52 percent of the total Ukrainian energy supply (more than gas, oil, coal or hydro-energy). Currently, the Ukraine has to spend tens of million dollars to remove the spent fuel from NPPs to Russia. Experts suggested to construct nuclear waste storage sites on the Ukrainian territory to save money for other energy projects (see at: <<http://www.rainbow.gov.ua/action/>>).

61.5 Conclusion

Globalization has dramatically changed the CIS security thinking. New and broader definitions of 'national' and 'international security' were adopted. The top priority were 'soft' security issues. Environmental protection is one of the most important priorities on the CIS security agenda. The role of various international security organizations has been reassessed. Newly created regional institutions came afore to address non-traditional security challenges. A new strategy on regional ecological co-operation has been developed.

The CIS countries had also to adjust the centre-periphery balance in order to cope with new challenges for the sub-national level of their security. The era of globalization has required new approaches to national sovereignty and necessitated a combination of national and multilateral solutions to environmental security problems. At the same time, it should be noted that the CIS debate on environmental security still represents a mixture of traditional (realist) and more advanced (liberal, globalist) approaches. While in Russia and Ukraine the trend is in favour of the second group of theories, in Belarus the realist approach still prevails.

Although major environmental problems are still pertinent, some progress has been achieved in all three countries. Among the positive changes the following trends could be noted:

- A better legal basis for international co-operation (especially with the EU) has been achieved. In addition to specific EU-Russia, EU-Ukraine bilateral agreements, environmental issues have been placed into a better conceptual and legal framework. For example, the Ukraine has become part

of the European Neighbourhood Policy with a concrete Action Plan. Russia develops its co-operation with Brussels under the aegis of the 'EU-Russia Common Spaces' concept. Belarus is involved in the sub-regional environmental co-operation in an indirect manner (via the Neman Euroregion).

- Some institutional framework for ecological co-operation has been established - EU programmes (TACIS, INTERREG), sub-regional organizations (CBSS, BEAC, AC, BSEC, etc.), IFIs (NEFCO, NSA), umbrella-type projects (NEDAP, MNEPR), etc.
- The level of air and water pollution has declined for major pollutants, such as metallurgy, chemical, cellulose/paper-producing and nuclear industries after stricter ecological standards were established and cleaner technologies were introduced.
- A number of joint EU-Russian projects to prevent deforestation of North-western Russia were successfully completed.
- The situation in the areas that were contaminated by the Chernobyl nuclear accident has remained stable and there was even some progress in terms of decreasing the level of radiation.
- Some European-Russian nuclear safety projects (modernization of NPPs, improvement of storage and treatment of nuclear waste, etc.) have been successfully implemented (albeit most of them were of limited or exploratory nature).

To sum up, the constructive dialogue between Europe and the CIS countries on environmental problems (both on the inter-governmental and non-governmental levels) is very important to support the positive changes in the environmental strategies of the CIS countries.

62 Linking Knowledge Systems for Socio-ecological Security

P.S. Ramakrishnan

62.1 Introduction

With increasing awareness about the state of our environment, concerns about over-exploitation of resources and issues, not only just biophysical but also socio-economic and cultural dimensions relevant to rehabilitation of degraded ecosystems are now gaining importance.¹ These concerns for a socio-ecological systems approach for dealing with rehabilitation of degraded systems are largely arising from policy formulations and a whole range of market pressures on natural resources to fuel rapid industrialization of the developing and the developed world (key drivers), which gets exacerbated by pressures exerted locally by communities (proximal drivers) leading to changing or degrading landscapes.²

Recently recognized human-induced ecological drift collectively termed 'global change' (inclusive of climate change, land use dynamics, land degradation and desertification, biological invasion by exotics and the linked biodiversity depletion), and the market driven 'globalization' of economies have added another set of dimensions to biodiversity conservation and management.³ The results emerging from these

global analyses that the adverse impacts are likely to be more in the developing than in the developed world, and even in the developing world, the vast majority of the marginalized rural poor are likely to be impacted much more than others are confirmed through a few location-specific studies (Ramakrishnan 1992, 2001).

In particular, are a large section of 'traditional societies' (those living close to nature and natural resources around, in biodiversity rich areas), depending upon them for a whole range of non-timber forest products (Patnaik 2002), and also managing a whole range of biodiversity-dependant traditional agroecosystems (Swift/Ingram 1996; Swift/Vandermeer/Ramakrishnan/Anderson/Ong/Hawkins 1994).

With depleting natural resources leading to breakdown of traditional agroecosystems, we are also losing much of the relevant traditional knowledge available with local communities, particularly those determining ecological processes linked to social processes, traditional ecological knowledge (TEK) determining ecosystem or landscape level functions (water, soil fertility and nutrient cycling), on which these traditional societies depend for their survival (Ramakrishnan/Das/Saxena 1996). With a great economic divide arising from all this between the developing and developed world, and that between the rich and the poorer sections within the developing itself, global human security is under threat (Dragun/Tisdell 1999; Steffen/Jaeger/Carson/Bradshaw 2001). Viewed in the context of emerging concerns, it is appropriate that Brauch (2003b) suggests a new phase of research on *human and environmental security and peace* (HESP) that should combine ecological concerns (climate change, water, soil) and human dimensions (population growth, urbanization, pollution, agriculture and food) based on the expertise from both the natural and social sciences.

In a developing country context, as in India for example, about 25 per cent of the over a billion people are traditional societies living in biodiversity rich re-

1 See: Ramakrishnan (1992); Ramakrishnan/Campbell/Demieire/Gyi/Malhotra/Mehndiratta/Rai/Sashidharan (1994).

2 See: Indian National Science Academy/Chinese Academy of Sciences/U.S. National Academy of Sciences (2001); Lambin/Turner II/Geist/Agbola/Angelsen/Bruce/Coomes/Dirzo/Fischer/Folke/George/Homewood/Imbernon/Leemans/Li/Moran/Mortimore/Ramakrishnan/Richards/Skånes/Steffen/Stone/Svedin/Veldkamp/Vogel/Xu (2001).

3 Bondeau/Bugmann/Campbell/Canadell/Chapin/Cramer/Ehleringer/Elliott/Foley/Gardner/Goudriaan/Gregory/Hall/Hunt/Ingram/Korner/Landsberg/Langridge/Lauenroth/Leemans/Linder/McMurtrie/Menaut/Mooney/Murdiyaso/Noble/Parton/Pitelka/Ramakrishnan/Sala/Scholes/Schulze/Shugart/Smith/Steffen/Sutherst/Valentin/Walker/Woodward/ Zhang (1997); Dragun/Tisdell (1999).

gions being dependant upon biodiversity linked TEK for meeting with their livelihood needs (Ramakrishnan 2001). These traditional societies remain highly marginalized for reasons that we have not been able to provide a developmental pathway based upon their own value systems based on the TEK that they possess. Further, arising from our studies on socio-ecological systems of north-eastern hill regions of India (Ramakrishnan 1992), we realized that TEK forms an important basis for linking biophysical ecological systems with equally complex social systems, a linkage which Brauch (2003b) sees as critical to understand outcomes and conflict constellations. It is in this context, an understanding of 'knowledge systems' - 'traditional' available with traditional societies and the formal that is text-book based, and the connectivity that could be established between the two, for an integrated view of socio-ecological systems assume significance (Ramakrishnan/Boojh/Saxena/Chandrashekara/Depommier/Patnaik/Toky/Gangawar/Gangwar 2005). Indeed, there is now this increasing concern amongst all to get close to nature, based on the concept of a 'cultural landscape' that they are already on the verge of losing (Ramakrishnan/Boojh/Saxena/Chandrashekara/Depommier/Patnaik/Toky/Gangawar/Gangwar 2005), or that they have already lost and wish to rediscover to the extent possible, based on the available knowledge base in the given natural situation (Maurer/Holl 2003) or even construct urban cultural landscapes (Shutkin 2000; Burel/Baudry 2003), with emphasis upon democratic renewal through a process of community participatory regional planning and environmental justice. This is the context in which the following discussion on the role of knowledge systems for environmental and linked human security has to be seen.

Starting with a discussion on our present state of understanding of 'knowledge systems', with emphasis on TEK, two case studies are used as illustrative examples of the role of knowledge systems for linking ecological conservation with sustainable livelihood/development of traditional mountain societies - one from the north-eastern hill region of India which happens to be an extension of the Himalayan mountain ranges on that end, and another from the Garhwal and Kumaon region of the Central Himalayan mountain region. This review concludes with a brief discussion on such an approach to empower these marginalized sections of mountain societies by providing them with a better quality of life, as part of a short-term developmental strategy. This approach is critical for 'environmental security' linked with 'human security'.

62.2 Knowledge Systems?

The knowledge systems that we are concerned with here are: (i) the text-book based 'formal knowledge' that are based on biophysical principles divorced from the human dimensions of the knowledge system; and (ii) the empirical knowledge, being derived through an experiential process has a strong human dimension linked to it, the communities who still have this in the tropical world tend to see both intangible (with social, cultural and spiritual values) and tangible (in the area of biodiversity conservation and economic benefits) accruing to the society. Extending into ecological, social, economic, cultural and institutional dimensions, a mix of these two knowledge systems can be seen to be of value to society, depending upon socio-ecological levels in which a given society operates. In this scale, industrialized societies who are largely divorced from nature can be seen to be on one extreme, being largely dependant upon 'formal knowledge' based technologies, whilst traditional societies living in biodiversity-rich areas can be seen to be on the other extreme, still being largely concerned with traditional knowledge that they have been able to conserve to a larger or lesser degree until the present. Both these knowledge systems, therefore, are trans-disciplinary in that they touch upon the more tangible biophysical, and socio-economic, and the linked institutional dimensions, and the intangible cultural and spiritual dimensions too. Therefore, knowledge systems, with appropriate linkages between the two, is being seen here as a powerful tool to related to a value system that a given society understands and appreciate, and therefore being able to contribute to a participatory developmental process with concerns for ecological conservation, particularly in the context of the developing tropics.

62.2.1 Formal Knowledge

'Formal' knowledge derived through an 'hypothetical-deductive' process arising from a biophysical understanding of ecosystem landscape processes has been well studied and elaborated over a century ago, and refined over a period of time (Odum 1971). This knowledge base that deals with biophysical attributes of ecosystems has been used to extensively address a whole range of ecosystem management, and often has worked well in the context of the industrialized world. Applying biophysical dimensions of ecology has caused problems in effective management of ecosystems. To this context this chapter will contribute.

62.2.2 Traditional Knowledge

There is now an increasing realization that the formal knowledge base alone is not adequate to address community participatory natural resource management issues, rather this knowledge should be linked with traditional knowledge and societal perceptions (Ramakrishnan 1984; Berkes/Colding/Folke 2003), which must also be related to the formal knowledge base of the given system (Ramakrishnan 1992). Ecosystem management issues are impinging on socio-economic and cultural dimensions of many traditional societies deriving not only tangible but also intangible benefits from natural resources around them (Ramakrishnan 1996; Ramakrishnan/Saxena/Chandrasekhara 1998). This traditional wisdom is based on the intrinsic realization that man and nature form part of an indivisible whole and therefore should live in partnership with each other. This ecocentric view of traditional societies is widely reflected in their attitudes towards plants, animals, rivers, and the earth (Ramakrishnan 2003a; Ramakrishnan/Saxena/Chandrasekhara 1998). *Traditional ecological knowledge* (TEK) based on an experiential 'trial and error' process must be analysed and integrated with the 'formal' knowledge to arrive at community participatory solutions to ecosystem management with sustainable livelihood and developmental concerns integrated into it.

Pre-Columbian societies in the Americas held the widespread view that the Earth and all her creatures are sacred, and therefore permission had to be sought before the resources could be used, or else the spirits guarding them would seek revenge (Hughes 1996; Ramakrishnan/Saxena/Chandrasekhara 1998). For these subsistence societies, which met a variety of their needs through the use of local resources, impermanence, transience and renewal formed central themes of life itself, for symbolic, spiritual and even functional reasons (Hay-Edie/Hadley 1998). For the enlightened sages of the eastern tradition, the forest is a world of wisdom, peace and spirituality (Saraswati 1998); being so, a strong feeling of human participation in the universal order pervades the 'Vedas', the ancient scriptures of the Hindu religion, suggested to be at least 5000 years old. This implies that humans are inseparable from their environment; sacredness begins with the five elements of existence - the earth, water, air, fire and 'Akasa' (void or non-existence, the opposite of matter), being worthy of worship (Vanucci 1993). The concept of the 'Cosmic Tree' ('Tree of Life') represents the centre of the Universe, in the

eastern culture and is part of the traditional belief system.

Even today, the highest and most rugged features of the mountain landscape, relatively inaccessible and rich in nature's endowments, evoke a sense of overwhelming sanctity amongst many societies around the world (Berbaum 1997), being seen as the abode of the Gods. Certain mountains are singled out as sacred, Himalayas in the Indian subcontinent, Mount Everest and Mount Kailas in the Himalayas for the Hindus and Buddhists, Mount Fuji and Koyasan in Japan, and Xishuangbanna in Yunnan province of China, for the Buddhists; the people in Bali, in Indonesia seeing the mountain, Gunung Agung representing the axis around which the Universe is organized. All these traditional beliefs and identities of the people can be seen in the light of shared territory, common rights and similar lifestyles (Kaushal 2001).

Indeed, regions of ecological prudence exhibit a symbiotic relationship between biophysical ecosystems and social systems, with strong cultural interconnections between the two. Thus, culture and environment are complementary, even in various stages of evolution, being a product of animistic religious belief system, fine-tuned subsequently (Ramakrishnan 1996, 2003a). Such belief systems are a fundamental aspect of a people's culture and strongly conditions their use of natural resources.

The benefits accruing from this TEK-based belief system are of three kinds: (i) *economic* - traditional crop varieties and lesser known plants and animals of food value, medicinal plants, etc. harvested from the wild; (ii) *ecological/social* - manipulation of biodiversity, at varied scalar dimensions; ecologically at the species and sub-specific levels, going up to ecosystem and landscape levels; socially touching upon individual decision-making going through the family, village and ethnic group levels for coping with uncertainties in the environment and global change for controlling; (iii) *ethical* - cultural, spiritual and religious belief systems centred around the concept of the sacred species, sacred groves and sacred landscapes (Ramakrishnan 1996, 2001).

The whole body of knowledge centred on direct economic benefits derived from plant and animal species is part of ethno biology, and has potential value for the society at large. Whilst knowledge centred around traditional uses of species for food, medicine, etc. are well documented (National Academy of Sciences 1975, 1979; Hladik/Hladik/Linares/Pagezy/Semple/Hadley 1993; Parrotta 2001), their sustainable extraction from the wild is still an issue, and the re-

sults on this front are only patchy, an area that needs to be further explored (Peters 1994).

TEK dealing with ecological functions at varied scalar dimensions, species, ecosystems and landscapes is an emerging area that connects ecological with social processes, with tangible benefits such as manipulating soil-water regimes and hydrology, soil fertility and nutrient cycling through appropriate organic residue, etc., with implications for natural management, an area of research initiated by this author way back in the early 1970's, and now widely recognized as relevant to natural and human-managed ecosystem rehabilitation and management (Ramakrishnan 1992). At another level looking into the intangible values attached to species, ecosystems and landscapes, the focus has moved to ethical dimensions (Ramakrishnan 1996; Ramakrishnan/Saxena/Chandrasekhara 1998) by looking into socio-culturally valued species, ecosystems (sacred groves) and landscapes (sacred/cultural landscapes), which are dealt with below.

62.2.2.1 Sacred Groves

The concept of 'sacred grove', a small patch of the natural ecosystem, devoid of human habitation and protected by human societies is a good example of the impulse to protect nature in a relatively undisturbed state, and is seen as an area for religious rituals to propitiate their Nature-linked deities, Wind, water, fire, sun, etc., as well as a site for the worship of their ancestral spirits an expression of the spirituality associated with nature (Ramakrishnan/Saxena/Chandrasekhara 1998), and could be viewed as symbolic of 'nature-human' interconnections; being the earliest expression of this cultural linkage, this could be seen as the earliest appearance of the 'sacred' in the evolutionary scale of socio-ecological systems.

Widely distributed in Africa, Asia, the Austro-Pacific region and the Americas, many of these groves still exist, though modern civilization has taken its toll. Europe had sacred groves in ancient times, but now most of them have disappeared; the ones like that at Kozmin Copse in the Kanin Tundra, with sacred birch and fir trees, is a notable exception, where offerings in cash and kind are still made (Hughes/Chandran 1998). Widely distributed in India, but rapidly dwindling, this traditional method of social fencing of ecosystem types as conservation patches is now being rediscovered, as repositories of germ plasma in an otherwise a highly degraded landscape (Ramakrishnan 2001). Indeed, sacred groves have now been identified as an important pathway for biodiversity conservation (Ramakrishnan/Boojh/

Saxena/Chandrashekara/Depommier/Patnaik/Toky/Gangawar/Gangwar 2005).

One such striking example is the Mawsmi sacred grove located in an otherwise highly degraded landscape, being maintained and protected by the Khasi tribe for animistic religious and cultural reasons, in the Cherrapunji region in the State of Meghalaya in the north-eastern hill region of India, bordering Bangladesh (Khiewtam/Ramakrishnan 1993). The ecological situation here is particularly dramatic in that this area is geographically significant, being one of the areas of highest rainfall in the world. This grove itself is a relict rain forest ecosystem, containing climax vegetation which was once widespread in the area. With a high annual rainfall of 12 m. on the average, which may go up to 24 m. in an exceptional year, as in 1974, such a high rainfall combined with human disturbance of the ecosystem, act as a major stress on the fragile rain forest system in the region; once cut down by the humans, the forest has not come back in most of the region, except for this protected forest.

This fragility is exacerbated by highly acidic and leached soils developed over limestone formations that have extensive underground tunnels with many stalactites and stalagmites (karst topography). Therefore, the soils themselves have few nutrients to support the large biomass of the sacred grove. However, a thick, fine root mat, developed on the surface layers of the soil, ensures tight cycling of nutrients released from litter decomposition, before it is lost from the system. The soil itself has little physiological role, except that of providing anchorage, and storing water in the interstices and some mineralization. We have shown that the forest, which is developed over hundreds of years, once destroyed often does not regenerate; and the fragile and tight nutrient cycling gets disrupted (Khiewtan/Ramakrishnan 1993). The nutrients that are released through deforestation get washed away by the intense rainfall. It is not surprising then that the landscape of Cherrapunji, except for the relict sacred grove, has been largely eroded. The Cherrapunji ecosystem that now stands deserted due to deforestation inflicted sometime in the past is now unable to recover to its original state as represented by the relic sacred grove. The community itself has banned the still prevalent major land use practice of the region, namely shifting agriculture (Ramakrishnan 1992), in and around the Cherrapunji area through their own traditional tribal institutions. However, it is too late to set in motion the natural recovery process of the forest ecosystem.

Linked with the drastic loss in biodiversity is the human suffering which now is immense. Water is a scarce commodity during the dry months in this high rainfall spot of the world, a contender for being the wettest spot on earth. The water flows away to the plains of Bangladesh down below, as in Cherrapunji, there is no vegetation to hold the water and the soil, and there is no soil to enable forest recovery. It is a vicious circle! For fuel wood, the tribal villager has to trek long distances. The ruins of villages all around remind one of the past and its out-migrations. The tribesman who is traditionally bound to the land and forests has been forced to seek other avenues for survival. No wonder the British, who tried to govern the north-east from Cherrapunji, because it reminded them of the Scottish highlands of the British Isles, had to abandon it because of too much rain. It is too late to rehabilitate what is already lost, because of the high cost of recovering this extremely fragile ecosystem. The surface mining of coal, which is the only option left for the local people, has created its own environmental problems, such as deeply scarred landscapes, polluted drinking water, etc. adversely impacting the quality of life itself.

Though Cherrapunji represents an extreme case, hundreds of sacred groves spread all over the Indian sub-continent virtually form islands of biodiversity in a highly degraded landscape, many of them are being lost rapidly to modernization (Ramakrishnan 1992). Not so long ago, the Khasi tribe, of Meghalaya in north-east India, who inhabits the Cherrapunji area, also had one sacred grove for each village. With the advent of Christianity in the region, the motivation for conservation has gradually been lost (Khiewtam/Ramakrishnan 1989). It is in such a context that an understanding of the sacred grove ecosystem functioning becomes even more significant as a source for biodiversity and as an ecosystem model on the basis of which a site-specific rehabilitation strategy of the degraded landscape could be designed, with peoples' participation.

62.2.2.2 Sacred and Cultural Landscapes

The concept of 'sacred landscape' (often referred to as cultural landscape) *represents* an elaboration of the sacred grove concept. Here again, the concept of a '*spatially diffused sacred landscape*' represents an earlier stage in social evolution, as seen by us on the basis of extensive analysis done in this area (Ramakrishnan 1996; Ramakrishnan/Saxena/Chandrasekhara 1998) where a given landscape (a set of interconnected ecosystems) often occupy a large area, are linked to a be-

lief system, but have no specified institutional arrangements to control resource use. The later stage in this socio-ecological evolutionary sequence would lead to '*spatially specified sacred landscape*', which often is a watershed unit, with more precise restrictions imposed on natural resource use. The guiding principles that regulate the use of natural resources are embedded in the codified and often non-codified institutions that have evolved. The social institutions linked to biological resource management are often linked also to religious or spiritual myths and socio-cultural belief systems. These sacred institutions were originally intended to boost social solidarity rather than promoting environmental consciousness *per se*. While religious norms explicitly foster social solidarity, the conservation values, *ipso-facto*, also get fulfilled.

Sacred landscapes (diffused and spatially specified landscapes) have traditional societies living within, as a part of the landscape unit. Here, therefore, traditional societies have co-evolved with their environment, modifying nature but actively maintaining it in a diverse and productive state, based upon TEK, socio-cultural practices and/or religious beliefs. From a socio-ecological viewpoint, these interconnections are significant for ensuring a sustainable livelihood for traditional societies, e.g., the shifting agricultural societies in India and elsewhere in the tropics (Ramakrishnan, 1992, 2001; Ramakrishnan/Saxena/Chandrasekhara 1998).

Spatially diffused landscape. One of the striking examples of a spatially diffused sacred landscape, with few codified norms and practices but covering a large zone of human influence, is the notional sacred landscape traced by the Ganga river system (Ramakrishnan 2003a). Starting from the higher reaches of the origin of this river in the north, at Gaumukh in the central Himalayan region, passing through the alpine, temperate and sub-tropical mountain ranges (with many small tributaries joining in the Garwahl in the Uttaranchal State of the Central Himalayan mountain region), and tracing its way through the large geographical region of the Indo-Gangetic alluvial plains, the river system eventually ends up in the Bay of Bengal, in the east. Human-managed ecosystems range from the terraced agroforestry systems of the mountain slopes, valley land agriculture between the hills, and expansive and agricultural lands of the Indo-Gangetic plains. All are nurtured by the sacred river system in a variety of ways through flooding and silt deposition. This biodiversity-rich natural landscape has many religious institutions dotted along the course of the river - Gangotri, Jannotri, Badrinath, Kedarnath,

Figure 62.1: Demojong, the land of hidden treasures: Pictorial depiction of holy sites in West Sikkim, Eastern Himalayas.
Source: Ramakrishnan (1996).



Rishikesh and Haridwar, all in the mountains; *Sanggam*, the sacred confluence of Ganga, Yamuna and the mythological Saraswati rivers at Allahabad, and *Varanasi* further down, and many smaller temples all

along, in the Indo-Gangetic plains before the Ganga river meets the Bay of Bengal.

In the east Asian Japanese Kii mountain region of *Koyasan*, *Kumano Sanzan*, *Yoshino* and *Omine* is

another 'spatially diffused' sacred landscape, rich in biologically diverse temperate forests, Buddhist temples and monasteries (UNESCO World Heritage Centre 2001) Being a hub for cultural and religious interactions since ancient times, the region represents a blend of the indigenous Shinto religion, based on nature worship, and Buddhism that came in subsequently. *Koyasan*, which is the location for the Kongobu-ji temple of the Shingon sect of Buddhism brought from China, is a major sacred landmark for the Japanese, and is part of the great pilgrimage route running through the Kii mountain range. At the root of this belief system is the religious belief that mountains, forests, lakes, ponds and other elements of nature are sacred places where deities live, that mountains are the home of the Gods of wealth and prosperity, and that a dead person climbs a mountain on his/her way to heaven; and that rivers and sea are holy entry points to paradise. Here in this landscape, the natural merges with the cultural heritage, to form a complex but integrated whole.

Spatially defined landscape. An example of a spatially defined landscape is the 'Demajong', a cultural landscape, extending from Khangchendzonga to sub-tropical rain forests down below (figure 62.1) in west Sikkim in the eastern Himalayas. The sacred nature of the landscapes is defined by Tibetan Buddhist philosophy; the landscape with well defined sacred boundaries is conserved through institutional norms and well specified institutional arrangements that are often codified to delimit human usage. The air, soil, water and biota are all sacred. Any alteration of the landscape is restricted and circumscribed by cultural norms. The guiding principles for natural resource use are strictly enforced through social institutions designed to allow small alterations, whilst larger alterations to ecosystems that destabilize them are prohibited, because the sacred treasures ('ter') hidden by the incarnate of Buddha, to be discovered slowly by enlightened Lamas at appropriate times will get destroyed, with adverse impacts on human welfare. With a variety of rituals linked to the diverse communities living within the landscape boundary, who have their own pre-determined rights for natural resource use, larger community participation is ensured. Though, these and many other spatially defined sacred landscapes have usage restrictions, traditional societies live as an integral part of it, being involved in a variety of agriculture and animal husbandry practices, and extraction of *non-timber forest products* (NTFPs). It is in this context that there was a strong social reaction when the governmental agencies attempted to have a

hydro-electric project initiated within the 'Demajong' landscape region, which was finally abandoned under pressure.

The concept of a sacred landscape as a whole could be viewed as a dynamic and evolving one (Ramakrishnan/Saxena/Chandrasekhara 1998; Ramakrishnan/Boojh/Saxena/Chandrashekhara/Depommier/Patnaik/Toky/Gangawar/Gangwar 2005). For example, a sect called 'Bishnois' founded about 500 years ago in the north-western Rajasthan desert region in India, practiced the absolute protection of all life, with the landscape itself being viewed as sacred. Founded by a spiritual leader saint Jambeshwarji, among many other well laid out rules that they have to adhere to, non-violence is an important one. The sacred groves with the dominant tree 'Khejri' (*Prosopis cineraria*) which is a sacred species too, within a cluster of Bishnoi villages form an integrated natural-cultural landscape. The sacred groves of the Bishnois called 'Orans', are widely known in the Indian region for their conservation ethos of protecting the tree - 'Khejri', and the associated wildlife - Blackbuck (*Antelope cervicapra*); in this process all the associated biodiversity also is protected. This tradition of protecting nature arose in the year 1730, when 363 Bishnoi men, women and children of the village Peepsar laid down their lives to protect the Khejri trees, when the then Prince of Jodhpur tried to fell the trees for firing his lime kilns; this was the beginning of this new sect under their spiritual leader.

The Khejri tree itself is not only an economically important species, specially revered and valued for its pods as food, leaves as fodder and manure, and branches as fuel wood and construction materials, by the local people; it is also an ecologically significant keystone species, supporting rich associated biodiversity - an example of the intangible with tangible benefits (sacred species discussed below). This value system of the 'Bishnois' resulted in islands of biodiversity being established wherever the Bishnoi village/village clusters were located. Thus in this case, a village cluster of the Bishnois with the protected sacred groves and the wildlife associated with it could be viewed as a sacred landscape unit rich in biodiversity, with institutions that determine resource use, based on their belief system. Indeed, these islands of biodiversity exist in an otherwise largely desert landscape where non-Bishnois live.

62.2.2.3 Sacred Species

At the lowest level in the hierarchical organization of the concept of sacred in many parts of the developing

tropics, but at a higher level in social evolution, is the concept of 'sacred species'. These socially selected species are valued for cultural/spiritual reasons (Ramakrishnan/Saxena/ Chandrasekhara 1998). For example, the sacred Basil (*Ocimum sanctum*), Neem (*Azadirachta indica*) became sacred as part of a conscious decision by the Hindu society that linked the intangible to the tangible value for its multipurpose use and medicinal properties. A whole range of spiritual taboos are too attached to the extraction of NTFPs from the wild, with possible implications for sustainable extraction from the wild, an area which awaits analysis.

A variety of socially valued species that are also ecologically important keystone species often determine ecosystem level processes – soil moisture regimes, soil fertility and nutrient cycling – thus contributing to the build-up of associated biodiversity.⁴ We have shown this as a generality through our research results from the Asian, African tropics, and remnants of this knowledge still existing in the Mediterranean Europe where sacred species are now largely confined to Christian monasteries (Ramakrishnan/Saxena/Chandrasekhara 1998) Indeed, many species/set of species may be common to different regions of the world - *Ficus* spp. for the Asian and African region; *Quercus* spp. mountain regions of the Asian and African tropics. Others may be location specific – e.g. *Alnus nepalensis* in north-eastern hill regions and *Prosopis cineraria* in the Rajasthan desert in India; *P. africana* in Cameroon, etc.

62.3 Linking Conservation with Participatory Sustainable Development

In an extensive review we have looked at the big divide that exists between the way biosphere reserves are currently managed by the reserve managers in the south and central Asian context who tend to offer rather simplistic solutions to complex socio-ecological problems on the one hand, and on the other hand the 'ideal' with a key role for TEK, as perceived by a section of the scientific community, so that community participation could be ensured (Ramakrishnan/Rai/Katwal/Mehndiratta 2002). Indeed, these are the

kind of dilemmas that marginalized traditional societies, being totally dependent upon nature and natural resources for meeting with their livelihood needs, face elsewhere too, whilst reconciling ecological conservation with sustainable livelihood/development concerns that they face (Ramakrishnan 1992; Hanna/Folke/Maler 1996; Gyasi/Kranjac-Berisavljevic/Blay/Oduro 2004; UNDP 2004a). The following two case studies are illustrative of the kind of problems in dealing with conservation linked to sustainable development.

62.3.1 The Shifting Agricultural Landscape in North-east India

Traditional societies in north-east India, comprising of the seven States of Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland, Mizoram and Tripura (figure 62.2), with subsistence farming, operate a whole range of customary multi-species complex ecosystems, ranging low-intensity management-based shifting agriculture on one extreme, through middle-intensity management oriented agro-forestry systems, in which crop and associated biodiversity play a key role in determining the ability of the multi-species agro-ecosystems to cope up with environmental uncertainties (figure 62.3). In managing these agro-ecosystems, resource cycling occurs between them and the linked natural ecosystems (forests, grasslands, wetlands, etc.), forming part of a unique culture-specific landscape. Being linked to the biodiversity around them, it is not difficult to see that biodiversity in all its scalar dimensions forming the fundamental building blocks for sustainability of these agroecosystems, the associated TEK playing a key role in their agro-forestry system based redevelopment models; the objective is towards combining productivity with system resilience (Ramakrishnan 1992, 2001; Swift/Ingram 1996).

With TEK playing a key role, is an important basis for designing a variety of agro-forestry system models that combine productivity with resilience; the pathways could vary depending upon the socio-ecological status of the communities' concerned (Swift/Vandermeyer/Ramakrishnan/Anderson/Ong/Hawkins 1994; Ramakrishnan 2001). In the early successional forest fallow forests arising from shifting agriculture (locally called jhum) of north-eastern hills of India, a socially valued species like Nepalese alder (*Alnus nepalensis*) is a significant keystone species, fixing up to 125 kg ha⁻¹ yr⁻¹ N, and therefore could improve crop yield substantially, under shorter shifting agricultural cycles,

4 See: Ramakrishnan/Chandrashekara/Elouard/Guilmo-to/Maikhuri/Rao/Sankar/Saxena (2000); Ramakrishnan/Boojh/Saxena/Chandrashekara/Depommier/Patnaik/Toky/Gangawar/Gangwar (2005).

Figure 62.2: Two case study sites in India: shifting agricultural landscape, north-eastern hill region of India (dot and arrow on the right top); the central Himalayan Garhwal region (dot and arrow on top left); and the Demajong sacred landscape in Sikkim Himalayas (dot and arrow in the middle) of the Himalayan range of mountains in India. **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/middle_east_and_asia/india_pol01.jpg>. This map is in the public domain.

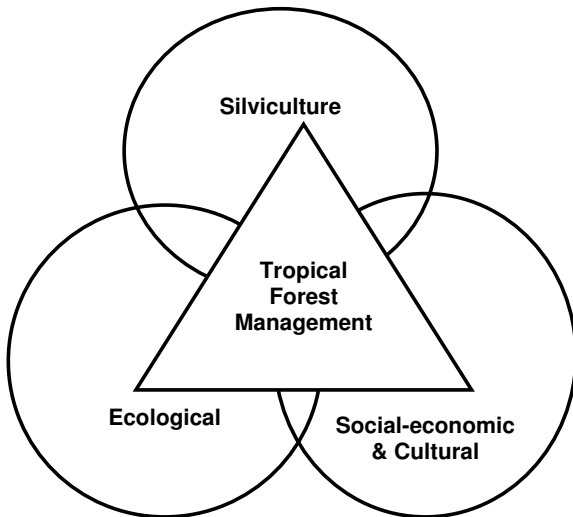


and thus contributing to system sustainability. Many bamboo species like *Dendrocalamus hamiltoni*, *Neohozua dulloa*, *Bambusa tulda*, and *B. khasiana* also fall in this category due to their ability to conserve ni-

trogen, phosphorus and potassium in the early successional fallows, as these species are abundant in early successional jhum fallows (Rao/Ramkrishnan 1987, 1989).

and human-managed biodiversity; (iii) carbon sequestration to mitigate 'global change'; (iii) redevelop a 'cultural landscape' based on their own value systems.

Figure 62.4: Interdisciplinary interactions called for in tropical forest management and conservation.
Source: Ramakrishnan (2001).



62.3.2 Redeveloping the Central Himalayan Landscape

To take another example from a mountain region with settled agriculture, oaks (*Quercus* spp.) in the central Indian Himalayan region of Garhwal (lat. 29°26'N - long. and 31° 28' N; 77°49'E - 80°6'E) are socially valued with a lot of music, dance forms, poetry and folk-tales linked with them (Ramakrishnan/Saxena/Chandrasekhara 1998; Ramakrishnan/Chandrashekhara/Elouard/Guilmoto/Maikhuri/Rao/Sankar/Saxena 2000). They are also important fodder and fuel wood species, apart from performing not so obvious functions such as maintenance of soil fertility through efficient nutrient cycling, soil moisture conservation through extensive root system, both within the natural and human-managed agro-ecosystems, thereby supporting associated biodiversity too. In fact these oak species have been consistently removed by the timber extractors over the last more than 100 years, and the foresters have replaced them with fast growing Pines (*Pinus roxburghii*), which are of no socio-ecological value to the locals and therefore resented by them. During the 1970's when the women in the region went and hugged trees when the timber extractors went to fell trees in these mountains, the causative factor was attributed to mere sharing of benefit by the locals from timber extracted; indeed, the

real reason being large-scale forest conversions adversely impacting upon depleted water resources, declining soil fertility and breakdown of both agriculture and forest based rural economy. Indeed, oak in the Central Himalayan region could be seen as a powerful tool to trigger community participation, because of the cascading impacts it has on ecosystem/landscape level processes, which in turn have implications for sustainable livelihood/development concerns of mountain societies in the Central Himalayan region of India (figure 62.5).

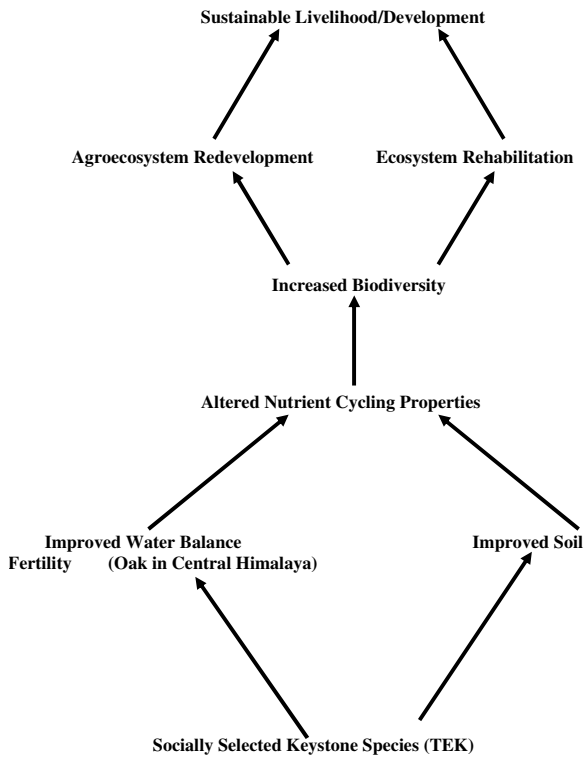
In short, this set of species could be seen as modulating landscape functions at mid-elevations of the Central Himalayas, impacting upon both the tangible and intangible benefits that communities seek from the biodiversity around (Ramakrishnan/Boojh/Saxena/Chandrashekhara/Depommier/Patnaik/Toky/Gangwar/Gangwar 2005).

62.4 Conclusions

If one looks at the ecological history of a country like India, right from the colonial period until recent times, the natural resources in the resource-rich mountain regions of the country where traditional societies live, have always been exploited by outsiders, with little benefits accruing to the local communities. Having degraded the landscape and thus adversely impacting upon their land use based livelihood activities, the suggested developmental pathways for these societies have always been alien to traditional value systems of these people, and have always relied on text-book based technologies, which time and again have been rejected by these societies. This alienation of traditional societies has posed serious human security issues arising from continued marginalization of these people.

Sabur (2003, also chapter in this volume) saw, a major rethinking of human security in the south Asian region since 1990, where it is now being seen more and more centred around, human dignity and human development and humane governance. Chari and Gupta (2003) go a step further and view that human security is under greater threat in the south Asian region, in the context of globalization of economies and global change, contributing to accelerated degradation of water, forests, farmlands, and fisheries. To sum up, Brauch (2005) sees the need to study and document, economic and social vulnerabilities with implications for environmental human security, and this he suggests can be achieved only through a dy-

Figure 62.5: TEK centred on the socially selected keystone species, *Quercus* spp., acting as a trigger for rehabilitation of the mountain landscape in the Central Himalaya. **Source:** Ramakrishnan (2001).



dynamic equilibrium between humankind and its surroundings. We have tried here to take this a step forward, with implications for traditional societies of the Asian region, by taking an approach towards the integrity of socio-ecological systems that these communities value, using knowledge systems as a powerful tool.

What emerges from the above discussions is that there is an urgent need to integrate 'traditional' knowledge available with them with the formal knowledge, and evolve 'hybrid' technologies based on a value system that they understand and appreciate and therefore participate in the process of conservation linked sustainable development; this assumes greater significance in the context of uncertainties arising from ecological 'global change' and economic 'globalization'. Linking cultural diversity with biological diversity (Ramakrishnan 2003b, 2003c) as the basis for sustainable management of natural resources, leading towards a sustainable livelihood is seen as the way out to ensure human security for these marginalized and neglected societies, including those who often are referred to as 'indigenous' or 'tribal' socie-

ties. Sustainability means different things to different people; what we should be aiming for as far as traditional societies are concerned to take care of the immediate short-term developmental needs (Ramakrishnan 1993, 1995), allowing such empowered communities to determine for themselves the direction/s that they wish to take for a long-term sustainable developmental plan.

In short, in many developing countries of the tropics, problems of rebellion and insurgency by marginalized sections of the minority traditional societies often arise from the lack of understanding of their value system linked with traditional knowledge; this has often lead to unsuccessful attempts towards a developmental pathway, de-linked from the human dimensions. This in a larger context acts as a trigger against global human security. The ultimate objective is to ensure global human security, by enabling different sections of society to have 'cultural landscapes' that are dynamic, based on a value system that they can relate with, both in space and time (Ramakrishnan/Boojh/Saxena/Chandrashekar/Depommier 2005a).

The two case studies discussed here indicate that a community participatory land use developmental initiatives have been shown to happen through small-scale model initiatives as in the Central Himalayan region, and through a larger regional initiative in the State of Nagaland in north-eastern hill regions of India. This is something which has not happened over the last more than 100 years in spite of governmental efforts. This linkage of ecological conservation linked with sustainable development, I believe, in the ultimate analysis is a step towards global human security.

63 Environmental Security in Northeast Asia

Miranda A. Schreurs

63.1 Introduction

This chapter addresses environmental security in Northeast Asia, focusing primary attention on China, Japan, the Korean Peninsula, Mongolia, and the Russian Far East. Reflecting the low status accorded to environmental protection in much of Northeast Asia prior to the 1990's, 'environmental security' as a concept is relatively new to both the scholarly and political debate in the region. Rapid industrialization, however, has resulted in such serious pollution and natural resource degradation that governments are being forced to pay more attention. This has especially been the case since the 1992 *United Nations Conference on Environment and Development* (UNCED). Increasingly, linkages are being made by scholars and practitioners between environmental protection and the concepts of 'human security', 'ecological security', and 'environmental security'.

This chapter suggests that while not often couched explicitly in the language of 'environmental security', there is growing awareness among policy makers that the region's environmental degradation is causing human health problems, worsening the quality of life, threatening long-term economic growth potential, contributing to political instability, and in some cases contributing to regional frictions and even deadly conflict. This is leading to changes in environmental laws and programmes throughout the region and greater discussion of environmental degradation as a threat to national well-being.

The chapter considers the nature of the environmental challenges confronting Northeast Asia and the ways these have been linked to environmental security debates. The prospects for greater domestic political attention to environmental conservation and the formation of regional cooperative mechanisms for addressing environmental security challenges are also considered.

After a brief review of the environmental security debates (63.2), and of the growing environmental

awareness and its implications for the environmental security debates (63.3), the role of NGOs and environmental scientific communities (63.4) and the implications for environmental security debates is considered for this diverse region (63.5) and specified for China (63.6). Furthermore the chapter addresses the international dimensions of Northeast Asia's environmental security problems as well as the regional cooperation for environmental security (63.7), linking environmental and human security concerns to official development assistance (63.8), assessing the regionalization of environmental protection (63.9) and drawing general conclusions (63.10).

63.2 Environmental Security Debates

Traditionally, international relations scholars of East and Northeast Asia (figure 63.1) have treated security as a matter of the protection of national borders from external threats and the state from domestic insurgencies. They have looked at the security alliances, military structures, and threat perceptions of states in the region. In recent years, however, there has been a growing move to treat security in more comprehensive ways. This has resulted in a focus on the implications of 'non-traditional security' threats, including disease, poverty, and pollution, to the economic, social, and environmental stability of individual states and the region more generally (e.g. Radtke/Feddema 2000; Theranian 2000; Thakur/Newman 2004; Igarashi/Sasaki/Takahara 2005).

Slowly, new security paradigms are coming to be accepted in the region. It is becoming increasingly well-understood that in both the short- and the long-term, many of the largest threats to the populations, economies, and governments of the region are not strictly military, but are tied to poverty, disease, migration, pollution, and natural resource degradation.

Within the scholarly community, in the past decade, there has been a push to examine what the growing demand for energy in the region means for re-

Figure 63.1: Map of East Asia (political), 2004. **Source:** University of Texas, Austin, PLC map collection. The map is in the public domain.



gional and economic security (e.g. Calder 1996, 1997; Manning 2000; Stares 2000; Wesley 2006). There has been considerable attention paid to the link between the region's growing energy consumption and its vast array of environmental problems, including air pollution, acid rain, and global climate change that threaten human health and long-term sustainability (e.g. Drifte 2003; OECD 2007a; Hyun/Schreurs 2007; Brettell 2007).

While East Asia has done far better than Africa in reducing poverty, the number of people living in poverty in East Asia is still in the hundreds of millions. This has led scholars to look into the links among poverty, migration, and human security (e.g. Akaha/Vassilieva 2006; Caballero-Anthony/Emmers/Acharya

2006). The international scare caused by SARS and the recurring incidents of Avian flu have opened eyes to the potential for epidemics that could threaten large numbers of people. There is also growing concern that global warming could increase the occurrence of diseases largely considered to be under control in the region, such as malaria (e.g. Schreurs/Pirages 1998; Dupont 1998, 2002; Caballero-Anthony/Emmers/Acharya 2006). With growing awareness of the deteriorating state of the natural environment and the severe pollution problems in many parts of East Asia, scholars, governments, and international organizations have started to explore the implications of pollution, resource depletion and environmental degradation on human health, sustainability, domestic po-

litical stability, and regional relations (e.g. World Bank 2001c; Harris 2005; Worldwatch Institute 2006; Hyun/Schreurs 2007).

In Northeast Asia environmental degradation and competition over scarce resources have the potential to contribute to political instability in a region that still has many remaining territorial disputes and where distrust among neighbours is still an issue. At the same time, the need to address common environmental problems opens the door to greater cooperation among states of the region. Joint environmental projects, cooperative research, and harmonization of standards and processes can serve the dual function of strengthening environmental capacity and improving ties among nations which for historical reasons have little experience with regional cooperation. Ken Conca and Geoffrey Dabelko (2002) have argued that while environmental degradation and pollution can pose real challenges for a state both internally and in its foreign relations, it can also provide a seed for the development of cooperation. Precisely because environment is a matter of 'low politics' this makes it a challenge through which inter-state contact and communication can be built up. Over time the development of networks among individuals, organizations, and states for addressing pollution and resource degradation can help to develop trust and mutual understanding. In the long run, cooperative problem-solving can contribute to an improved security environment. Mark Valentia and James P. Dorian (1998) have similarly argued that the region's energy problems could lead to competition, but also provide the potential for multilateral cooperation. Whether or not this line of reasoning will take hold in Northeast Asia remains to be seen.

Comparatively speaking, the Northeast Asia region suffers from what Gilbert Rozman (2004) has dubbed a case of "stunted regionalism." Still, there are signs that to at least some extent a sense of regionalism may be developing as economic, investment, cultural, and other ties deepen (Pempel 2005). Geun Lee (2007) suggests that in most issue areas, the states of Northeast Asia have yet to develop a shared understanding of common problems or what he calls a "regional inter-subjective community." Instead, he argues, that in most issues areas it is still only expert communities who share a common perception of environmental threats. Still, this kind of common perception among expert communities provides the basis for a deepening of cooperation as more and more actors gain awareness of environmental threats and begin to seek out ways of initiating change. Growing coopera-

tion among the governments of China, Japan, South Korea and the Association of Southeast Asian Nations in addressing economic, natural disaster, and environmental issues could work to strengthen prospects for some form of loose regime building in the future (Tan/Boutin 2001; Curley/Thomas 2006).

63.3 Growing Environmental Awareness: Implications for Environmental Security Debates

It can be argued that environmental security debates, which largely developed in the West, would have had a far more difficult time taking root in East Asia had it not been for the end of the Cold War. The collapse of the Soviet Union and the subsequent political and economic transitions in Russia altered significantly the meaning of the Russian presence in Northeast Asia. No longer was the Soviet Union considered the dominant security threat in the region. Although relations between Japan and Russia remain somewhat strained as a result of the territorial disputes involving the Northern Territories, the importance of engaging Russia in regional dialogue became increasingly accepted. The collapse of the Soviet Union also coincided with important political transformations in the region. Both Taiwan and South Korea transitioned from authoritarianism to democracy beginning in the late 1980's. Moreover, by this time the economic transformations initiated by Deng Xiaoping had led to growth rates in China that were among the highest in the world, and that were making China an integral part of the regional and global economy. Japan, South Korea, and Taiwan are now among the largest investors in China and trade relations among them have made the region highly economically interdependent. Japan also began to seek a new role for itself in the region (Maswood 2000).

While the North Korea situation remains a major security dilemma for the region, the otherwise altered security situation has encouraged the shift in scholarly and political debate to a wider range of issues, including human and environmental security.

63.4 NGOs and Environmental Scientific Communities

Important political and economic transformations in the states of the region have brought new actors into the environmental policy making arena. The end of

the Cold War coincided with the democratization of South Korea and Taiwan. It also eased China's entry into the world economy. A major outcome of the democratization of South Korea and Taiwan and the economic opening and shift toward capitalism in China has been the opening of political space to a larger number of actors. In the environmental realm, this has meant that many new players have been permitted on the scene. They have applied soft (and sometimes hard) pressure on governments to take environmental degradation more seriously.

In South Korea and Taiwan prior to the late 1980's, environmental protest was largely suppressed by authoritarian regimes. With democratization, several powerful environmental networks and groups formed, including *Green Korea*, the *Korean Federation of Environmental Movements*, *Greenpeace Taiwan*, and the *Taiwan Environmental Protection Union*. These groups have pressured the Korean and Taiwanese governments to strengthen environmental laws and have helped to stimulate environmental debate in local and national politics. Several of their leaders have acquired powerful political positions and helped introduce new environmental perspectives into political debates.

In Japan too, there have been important changes to the environmental movement since the beginning of the 1990's. While Japan as the oldest democracy in the region has long had environmental groups and movements, few operated at the national level or were concerned with international or regional environmental issues. This began to change in the 1990's as the Japanese state took on a larger global environmental role. With growing public interest in environmental protection, numerous new environmental groups emerged, including some with an interest in East Asia's pollution problems. Political institutional barriers to the creation and functioning of environmental groups were also addressed, so that it has become easier to form non profit organizations (Hasegawa 2004). Although still weak in the policy making process, these groups now have greater access to policy makers and have used their new positions to push the government to address global warming and nature conservation issues more aggressively.

In China there has been a rise of environmental movements as well. While many of these groups are similar to the kinds of environmental groups that were sanctioned by the former Communist states of Europe – that is, groups that assist the state in establishing an image of the state as a protector of nature or that aid the state in fulfilling its policy goals – there

are also a growing number of instances of environmental activists in China that are challenging environmentally destructive projects (Wu 2003; Yang 2005). Pollution levels are so bad in China that it has become difficult for China's leadership to ignore the health problems the pollution is causing or the impact it is having on China's economy. The leadership is starting to admit that if China is to sustain its economic growth, it will have to confront its very low energy efficiency levels and establish new energy sources without contributing to the already health-threatening pollution levels of many of China's urban regions. It has also started to recognize that it is incapable of implementing the vast array of environmental laws and programmes needed to deal with the country's pollution nightmare without the assistance of the public. Thus, the government has allowed some environmental groups to open their doors.

The first environmental NGO to register in China was the *Academy for Green Culture* (now called *Friends of Nature*) in 1994. *Global Village Beijing* and *Green Home* were then set up in 1996. In 2006, the Chinese State Environmental Protection Administration announced that there were 2,700 registered environmental groups in the country. Through their interaction with the State Environmental Protection Administration, groups such as *Environment Defense* have had some limited success in broadening debate about environmental problems in China. Environmental groups, however, tend to take on the language used to describe environmental problems by the state. This is done in part to show that they are working along side policy makers, and not against them.

Numerous new environmental scientific groups and research and policy think tanks have been set up as well in the various countries of the region. These institutions have been important to the provision of much needed scientific information regarding the extent of environmental problems and the effects of pollution on human health, agriculture, climatic systems, ecological systems, and the like. Prior to the 1980's, Northeast Asia lacked not only a vibrant environmental movement, but also the basic scientific institutions that are needed to adequately understand the causes and consequences of environmental degradation.

While there is no explicit regional institution focused on environmental security in Northeast Asia along the model of the Institute for Environmental Security in Europe, various academics and researchers, such as those at Korea University, the Institute of Defense and Strategic Studies in Singapore, and the *United Nations University* (UNU) have worked to es-

establish networks of researchers working on environmental security issues and to inject environmental security perspectives into policy debates. It should be noted that international foundations, like the Ford Foundation and the *United Nations Environment Programme* (UNEP) have been critical to this process.

63.5 A Diverse Region: Implications for Environmental Security Debates

Northeast Asia is a very diverse region, economically, politically, ethnically, and in terms of population density and natural resource endowments and constraints. This diversity significantly influences environmental security perspectives, the nature of environmental security problems, pollution control capacities, and the potential for cooperative-problem solving in the region. The range of environmental problems afflicting the region is vast, but also differentiated by country and region.

At one extreme is Mongolia, with just 2.79 million people, a population density of only 1.78 persons per square kilometre, and a per capita *gross domestic product* (GDP) measured on a *purchasing power parity* (PPP) basis of just \$ 1900 (CIA 2006). Many parts of Mongolia are still pristine and on the whole, environmental conditions are relatively good. Yet, Mongolia has suffered from sustained droughts and desertification. The Mongolian government has identified land degradation, desertification, deforestation, loss of biodiversity, and urban air pollution as its most serious 'ecological security' concerns. The first four of these are closely inter-related. Land degradation due to both natural and man-made causes, including the rapid development of farm land, overgrazing, mining activities, and settlement near the country's limited water resources, has contributed to the degradation of an estimated 70 per cent of Mongolia's pastureland. Land degradation is exacerbated by desertification, which according to some estimates, threatens as much as 90 per cent of the country. Approximately 40 per cent of Mongolia's territory is already arid or desert, and between the early 1960's and the beginning of the 2000's, the area covered by sand increased by an estimated 8.7 per cent (UNEP 2002b).

Notably, environment and sustainable development were included as one of the eleven priority areas of the Government of Mongolia's Good Governance for Human Security Programme, which was an-

nounced in 2001. There is growing awareness that protection of the fragile Mongolian environment is critical to the future of the country, and especially to the quasi-nomadic life-style of a significant part of the population. Mongolia has taken various steps to strengthen its environmental capacity since the UNCED. The 1992 Constitution guarantees Mongolian citizens the right to a healthy and safe environment and to be protected against pollution and ecological imbalance.

A Ministry of Nature and Environment was established, an extensive array of environmental laws was introduced, and Mongolia joined major international environmental agreements. Yet, the country's environmental problems are growing worse and environmental capacity and coordination remain insufficient to meet the country's needs.

At the other extreme is Japan, with a population of 127.5 million, a population density of 337 persons per square kilometre, and a per capita GDP (PPP basis) of \$ 31,600 (CIA 2006). Japan is one of the most densely populated and highly urbanized countries in the world. It also has among the most developed environmental regulatory systems in the world. At one time considered one of the most polluted countries on the planet, in the late 1960's and early 1970's Japan introduced an extensive and sophisticated pollution control regime (Gresser/Fujikura/Morishima 1981; Broadbent 1998). By the end of the 1970's, Japan had become a global leader in the production of certain types of pollution control technology, energy efficient production systems, and mass transport systems, and had done much to reduce air and water pollution levels (Moore/Miller 1994; Imura/Schreurs 2005). Despite remaining problems, including the loss of natural ecological systems and urban air pollution (including dioxin and nitrogen oxides), in Japan the dominant framing of the region's environmental problems are in relation to the lessons other states can take from the Japanese experience with pollution control. In the 1990's the Japanese government revamped its environmental regulatory regime, strengthening its focus on sustainability. In the 2000's, environmental conservation efforts in Japan began to be linked more explicitly to the concept of 'human security' (see chap. 84 by Shinoda) and the United Nations' *Millennium Development Goals*' (MDG) focus on poverty alleviation.

63.6 The Case of China

China's deteriorating environmental situation has become a matter of grave concern to policy makers domestically and internationally. Although seldom described explicitly in environmental security terms, there are growing references in public speeches to the country's grave pollution problems. The Chinese government announced that in 2005 there were 76 environmental emergencies and 536 people were poisoned by dangerous chemicals.¹

The current population of 1.3 billion will continue to grow reaching and most likely exceeding 1.4 billion around 2020 to 2030 before finally levelling off and then decreasing (assuming no inward migration) (UN, DESA 2006). Although on a per capita basis, Chinese use far fewer natural resources and emit far less pollution than do Japanese, South Koreans, or Americans, the sheer size of the Chinese population means that the society's footprint is very large and getting larger.

China's economy has been growing at astounding speeds since economic reform policies were introduced beginning around 1980. The number of Chinese living in poverty decreased from 250 million in 1978 (an estimated 30 per cent of the rural population) to 42 million in 1998 (4.6 per cent of the rural population) (UNDP 2001). In 2005, the number living in absolute poverty was down to 23.65 million.² In many ways, China has become the new economic miracle of East Asia. China's middle class is now estimated to be around 20 per cent of the population, and could grow to 40 per cent by 2020 if growth rates continue to be strong.³

China's rapid economic growth, however, has placed enormous strains on the environment. According to the *State Environmental Protection Administration* (SEPA 2006), pollution resulted in 511.8 billion yuan (US \$ 64 billion) in losses in 2004. SEPA Minister Zhou Shengxian noted in April 2006 that pollution was contributing to social instability and that there had been 51,000 environment-related disputes the previous year.⁴ Water pollution throughout much of China is severe. Rivers that run through major urban areas of China are of such poor quality that they

are not safe for human consumption (Economy 2004). Marine pollution has become so serious that fishing must be banned several months a year. In 2005, there were 82 red tides, which combined caused direct economic losses of 69 million yuan or US \$ 8.5 million.⁵

China's strong economic growth has been fuelled by coal, which produces sulphur dioxide, a precursor of acid rain, and carbon dioxide, a major greenhouse gas. Sulphur dioxide is believed to contribute to 400,000 premature deaths annually in China.⁶ Prime Minister Wen Jiabao noted that while China has surpassed its economic development targets in the 2000 to 2005 period, it had missed one of its key environmental targets: to cut sulphur dioxide emissions by 10 per cent. Instead, sulphur dioxide emissions rose by 27 per cent.⁷

Development, consumption, population pressures, and industrial pollution are taking their toll on natural resources and ecological systems. China has surpassed Japan as the world's largest catcher and harvester of fish. It is also now the world's second largest importer of forest products after the United States. China is among the countries in Asia with the largest number of plant, mammal, and bird species that are critically endangered, endangered, or vulnerable (UNDP/UNEP/WB/WRI 2005: 204-13; WRI 2006).

The scale of these problems and their substantial economic and health costs has pressured China's leadership to give a higher priority to environmental protection. At the China Council on International Cooperation on Environment and Development's annual meeting in November 2006, SEPA Minister Zhou announced to a group of international environmental experts that China's environmental situation was at a "critical point" and that "in some places, environmen-

1 "Over 500 Chinese Poisoned in Pollution Accidents Last Year", in: *Xinhua News Agency*, 6 June 2006.

2 "China Pledges Greater Efforts in Poverty Alleviation in Next Five Years", in: *Xinhua News Agency*, 25 May 2006.

3 "China's Middle Class to Reach 40 Percent in 20 Years, Scholar", *Xinhua News Agency*, 14 September 2005.

4 "Chinese Premier Sets Out Strategy to Tackle Environmental Pollution", in: *People's Daily* (24 April 2006); at: <http://english.people.com.cn/200604/24/eng20060424_260577.html>.

5 "China Reports Diminished Red Tides in 2005," in: *People's Daily Online* (11 January 2006); at: <http://english.people.com.cn/200601/10/eng20060110_234336.html>.

6 See Bradsher, Keith; Barboza, David, "Pollution from Chinese Coal Casts a Global Shadow," in: *New York Times* (11 June 2006, late edition: Section 1): 1; WHO <http://www.wpro.who.int/countries/chn/health_situation.htm>.

7 "Chinese Premier Sets Out Strategy to Tackle Environmental Pollution", in: *People's Daily* (24 April 2006); at: <http://english.people.com.cn/200604/24/eng20060424_260577.html>.

tal problems have affected people's health and social stability, and damaged our international image."⁸ In response to the growing environmental crisis, the Chinese government has passed numerous environmental laws and begun a process of reorganizing its environmental administration. There are some signs of success; for instance, there has been improvement in the air quality of some major urban areas (Rock 2002).

Environmental conservation has been incorporated more centrally in the 11th Five-Year Plan (2006–2010). The plan calls for using a “scientific approach to development” and the building of a “harmonious socialist society” that is built on the principles of equity and justice. As described by the government of China, the plan reflects “a keener attention to the issues of humanity, society and the environment, as well as the economy.”⁹ The plan calls for cutting energy consumption per unit of GDP by 20 per cent and total discharge of carbon dioxide by 10 per cent by 2010 relative to the end of the 10th five-year plan (2005), and increasing forest cover from 18.2 per cent to 20 per cent.¹⁰ Both the *Organization for Economic Cooperation and Development*¹¹ and the *China Council for International Cooperation on Environment and Development*¹² independently recommended in November 2006 to the government of China that to deal with China's looming environmental problems, it should consider elevating the status of the State Environmental Protection Administration to that of a ministry, take measures to strengthen environmental capacity and enforcement at the local level, enhance public access to environmental information, and

strengthen international cooperation, among other recommendations.

63.7 The International Dimensions of Northeast Asia's Environmental Security Problems

Many of the environmental problems affecting the countries of Northeast Asia have international security dimensions to them (even though this is seldom how these problems are discussed). Here several illustrative examples are provided: environmental refugees from North Korea; transboundary acid rain and yellow sand; greenhouse gas emissions and global climate change; transboundary river and marine pollution; over fishing and fishing disputes; energy exploration and territorial disputes; and nuclear energy and nuclear waste disposal.

63.7.1 Humanitarian Crisis in North Korea

The Democratic People's Republic of Korea (hereafter, North Korea) is a unique case. According to its first ever State of the Environment Report, deforestation is among the country's most serious environmental problems. Deforestation, brought on in part by the country's severe energy shortage and the resultant demand for firewood, has led to wide-scale erosion, flooding, water degradation, and biodiversity loss (UNEP 2003e). These problems, in turn, have contributed to the malnutrition that affects over one-third of North Korea's population. In fact, nowhere in East Asia is there a humanitarian crisis as serious as that found in North Korea. North Koreans have had to endure a decade of wide-spread hunger, malnutrition, and starvation (Amnesty International 2004).¹³ The *United Nations' World Food Programme* (WFP) estimates that two million people died there during the 1990's from starvation and hunger remains widespread. Provision of humanitarian aid to the North, however, has become entangled in the politics surrounding North Korea's nuclear weapon's programme. The WFP has been hampered in its efforts to provide humanitarian assistance to the country, however, due to the unwillingness of donor states to

8 “Environment Situation at ‘Critical Point’”, in: *China Daily* (13 November 2006).

9 Pan, Letian, 2006: “Key Points of the 11th Five-Year Plan” (7 March 2006); at: <http://english.gov.cn/2006-03/07/content_246929.htm>.

10 Government of China, 2006: “China to Contribute to World's Sustainable Development” (11 November 2006); at: <http://english.gov.cn/2006-11/11/content_439588.htm>.

11 OECD [Organization for Economic Cooperation and Development], 2007a: “Environmental Performance Review of China: Conclusions and Recommendations”; at: <<http://www.oecd.org/dataoecd/58/23/37657409.pdf>>.

12 China Council for International Cooperation on Environment and Development, 11 November 2006. General Report of Policy Recommendations, CCICED 2006 Annual General Meeting; at: <<http://eng.cciced.org/cn/company/tmxb143/card143.asp?tmid=967&lmid=5230&siteid=1>>.

13 Amnesty International, January 17, 2004: “Starved of Rights: Human Rights and the Food Crisis in the Democratic People's Republic of Korea (North Korea)”, in: ASA 24/003/2004; at: <<http://web.amnesty.org/library/Index/ENGASA240032004>>.

provide North Korea with aid after it conducted missile tests in July 2006 and a nuclear test in October. As of 30 November 2006, the *World Food Programme* (WFP) had only been able to obtain 13.2 per cent of the funds it had requested from donor states for recovery assistance for vulnerable groups in North Korea (UNWFP 2006). Hunger and starvation have, moreover, led many North Koreans to attempt to flee their impoverished state even at the risk of torture, imprisonment and possible execution if caught (Lee 2007).

63.7.2 Acid Rain, Yellow Sand, and Greenhouse Gas Emissions

Transboundary air pollution problems are also becoming increasingly serious threats to the region. An estimated one-third of China is affected by acid rain. Researchers at the Chinese Institute of Environmental Science and Qinghua University estimate that acid rain causes China 110 billion yuan (US \$ 13.3 billion) annually.¹⁴ Both Japan and South Korea are concerned that their domestic efforts to address air pollution and the pollutants that contribute to acid rain are being offset by acid deposition that has its origins in China.

The increasingly severe and frequent sand storms originating in the arid regions of China and Mongolia have become increasingly hard to ignore. Approximately 15.9 per cent of China's territory is desert (Hu Tao/Wu Yu-ping/Zhang Ling-yun 2006). While sand storms are a naturally occurring phenomena, there is concern that as a result of soil erosion, desertification, and overgrazing, the sand storms are getting worse (Brettell 2007). During particularly severe storms, sand fills the air in Beijing. It can also affect the Korean Peninsula and Japan (Wong 2001; Wilkening 2004). The dust and sandstorms are five times more common than they were in the 1950's. In one particularly bad storm in April 2002, dust levels in Seoul reached 2,070 micrograms per metre, double the level considered hazardous to human health. Scientists also warn that airborne pollutants, including heavy metals and carcinogens, are binding with the sand and dust as the storms travel over China's industrial areas. The sand and dust storms are dangerous to

14 "Acid Rain Costs China Annual Loss of 110 Billion Yuan," in: People's Daily Online, (11 October 2003); at: <http://english.people.com.cn/200310/11/eng20031011_125803.shtml>.

respiratory health, damage croplands and livestock, damage equipment, and ground airplanes.¹⁵

As industrialization proceeds in China, demand for energy is expected to grow substantially. The International Energy Agency predicted that possibly as early as 2009, China would surpass the United States as the world's largest contributor to greenhouse gas emissions.¹⁶

These three atmospheric pollution issues are the ones receiving the greatest amount of attention from the international community. It appears to be widely understood that China's future will be the globe's future.

63.7.3 River Pollution

In November 2005, an explosion at a chemical plant in Jilin Province, China led to the release of 100 tons of a toxic mix of benzene, aniline and nitrobenzene into the Songhua River. The explosion killed five workers, injured 70 more, and required the evacuation of 42,000. The chemical disaster, one of the worst in China's history, was initially kept from the public, and the downstream city of Harbin, with a population of 4 million, was simply told that their water supply system would be shut down for routine maintenance. The scale of the disaster, however, eventually demanded that the government inform the population. Harbin's water supply was shut down for four days as the toxic slick slowly moved downstream. The Songhua River eventually joins the Heilongjiang River, which is named the Amur River once in Russia (Mao/Li 2006).¹⁷ The toxic spill became a matter of grave concern in neighbouring Russia and an embarrassment to the Chinese government. The government was forced to apologize to Russia and provide financial and technical assistance to deal with the spill. The crisis spurred the government to examine measures that could be taken to strengthen pollution control enforcement and emergency response measures. It

15 "North East Asian Dust and Sand Storms Growing in Scale and Intensity", 8th Special Session of the Governing Council/Global Ministerial Environment Forum (29-31 March 2004); at: <http://www.unep.org/GC/GCSS-VIII/PressRelease_E4.asp>.

16 Bradsher, Keith; Mouawad, Jad: "China to Pass U.S. in 2009 in Emissions," in: *New York Times* (7 November 2006, section C): 1

17 UNEP: "The Songhua River Spill, China: Field Mission Report" (December 2005); at: <http://www.unep.org/PC/apell/disasters/china_harbin/unepmr.pdf>.

also led to the establishment of an International Rivers Commission with Russia.

63.7.4 Over-fishing, Territorial Disputes, and International Conflict

There is strong and growing demand for fish in East Asia. Over-fishing has led to losses of key species in coastal waters and this has forced fishing boats to move to more distant waters in search of their catch. There are still many unresolved territorial disputes in the waters of East Asia. Fishing disputes have erupted throughout East Asia when fishing vessels enter disputed territorial waters. There have been dozens of incidents involving the exchange of gun fire because of such fishing disputes.

In one particularly serious fishing dispute between North and South Korea, North Korean crabbers were accompanied by North Korean navy boats when they breached the Northern Limit Zone that was established by the United Nations in 1953 as a marine armistice border. The North Koreans were searching for crabs that they could sell for hard currency. South Korean patrol boats tried to force the North Korean boats out of the area. Tensions escalated and shooting erupted resulting in one of the bloodiest battles between the North and the South since the end of the Korean War. One of the North Korean torpedo boats was sunk along with its crew. The United States sent two warships to the region in response (Schreurs 2007). Fishing disputes have erupted between all of the nations of the region – between Japan and South Korea, Japan and Russia, China and South Korea, Russia and South Korea, and Russia and China.

Less dramatic, but still worrisome incidents occur on a yearly basis. Relations between Japan and South Korea have grown strained in recent years over fishing disputes near the Dokdo/Takeshima Islands. Problems between Japan and Russia have grown serious as well. In August 2006, one Japanese fisherman was fatally shot by the Russian Coast Guard after his fishing boat entered disputed waters and then allegedly tried to flee (Schreurs 2007). Until the territorial disputes in the region are resolved, it is unlikely that the fishing disputes will cease.

63.7.5 Energy Security and the Environment

Rising energy demand has raised a wide array of environmental and security concerns for the region. Japan, Taiwan, and South Korea are heavily dependent on imported oil to meet their domestic energy needs.

'Energy security' has long been a concern for these energy poor nations. More recently, China – a nation with abundant coal supplies as well as some oil reserves – is becoming concerned about its energy security as well. As a result of its rapid economic development, China's domestic energy production can not keep pace with demand. China became a net importer of oil early this decade, and has been intent on enhancing energy efficiency and securing oil reserves as a result (IEA 2007; box 63.1).

Concerns about energy security and the region's heavy dependence on foreign oil have pushed many countries in the region to search for oil and natural gas in regional seas. Competing territorial claims in areas that have or are suspected to have oil or natural gas reserves threatens competition and the heightening of tensions among regional states. Ownership of the oil-rich Spratly Islands is disputed by China, Taiwan, the Philippines, and Vietnam (Calder 1997). Similarly, Japan and China are in disagreement over the ownership of oil reserves in the East China Sea.¹⁸

The search for energy security has also been a major factor behind the push for nuclear energy. The governments of the region have promoted nuclear energy in an effort to diversify their energy supplies and improve their energy security. More recently, they are also justifying nuclear energy development as a 'clean energy' that does not contribute to greenhouse gas emissions. Nuclear energy development, however, has raised various environmental justice concerns pertaining to the citing of nuclear power plants and waste facilities. It has also raised concerns about nuclear proliferation.

The criticality accident at the Tokaimura uranium reprocessing facility in 1999 and other problems at nuclear facilities have made it very difficult for the Japanese Ministry of Economy, Trade, and Industry to continue with its plans for the development of additional nuclear facilities. The government has, nevertheless, pushed through with its development of a spent fuel reprocessing facility and interim high-level radioactive waste storage facility at Rokkasho mura in Aomori Prefecture.

Also problematic is that there is no permanent nuclear waste deposit site in East Asia for medium- and high-level radioactive waste. Efforts to develop a permanent waste depository for medium-level radioactive

18 Anthony Faiola: "Japan-China Oil Dispute Escalates: Relations Already Uneasy as Tokyo Accuses Beijing of Tapping Disputed Fields", in: *Washington Post* (22 October 2005): A17.

Box 63.1: "China's Share of World Energy Demand will Continue to Expand". Executive Summary. **Source:** IEA (2007: 6-7). Reprinted with permission.

China's energy needs will continue to grow to fuel its economic development. ... However, the rate of increase and how those needs are met are far from certain. ... In the Reference Scenario, China's primary energy demand is projected to more than double from 1742 million toe in 2005 to 3 819 Mtoe in 2030 - an average annual rate of growth of 3.2%. China, with four times as many people, overtakes the United States to become the world's largest energy consumer soon after 2010. In 2005, US demand was more than one third larger. In the period to 2015, China's demand grows by 5.1% per year, driven mainly by a continuing boom in heavy industry. In the longer term, demand slows, as the economy matures, the structure of output shifts towards less energy-intensive activities and more energy-efficient technologies are introduced. Oil demand for transport almost quadruples between 2005 and 2030, contributing more than two-thirds of the overall increase in Chinese oil demand. The vehicle fleet expands seven-fold, reaching almost 270 million. New vehicle sales in China exceed those of the United States by around 2015. Fuel economy regulations, adopted in 2006, nonetheless temper oil-demand growth. Rising incomes underpin strong growth in housing, the use of electric appliances and space heating and cooling. Increased fossil-fuel use pushes up emissions of CO₂ and local air pollutants, especially in the early years of the projection period: SO₂ emissions, for example, rise from 26 million tonnes in 2005 to 30 Mt by 2030.

China's energy resources - especially coal - are extensive, but will not meet all the growth in its energy needs. More than 90% of Chinese coal resources are located in inland provinces, but the biggest increase in demand is expected to occur in the coastal region. This adds to the pressure on internal coal transport and makes imports into coastal provinces more competitive.

China became a net coal importer in the first half of 2007. In the Reference Scenario, net imports reach 3% of its demand and 7% of global coal trade in 2030. Conventional oil production in China is set to peak at 3.9 mb/d early 7 in the next decade and then start to decline. Consequently, China's oil imports jump from 3.5 mb/d in 2006 to 13.1 mb/d in 2030, while the share of imports in demand rises from 50% to 80%. Natural gas imports also increase quickly, as production growth lags demand over

the projection period. China needs to add more than 1300 GW to its electricity-generating capacity, more than the total current installed capacity in the United States. Coal remains the dominant fuel in power generation. Projected cumulative investment in China's energy-supply infrastructure amounts to \$3.7 trillion (in year-2006 dollars) over the period 2006-2030, three-quarters of which goes to the power sector.

China is already making major efforts to address the causes and consequences of burgeoning energy use, but even stronger measures will be needed. China is seeking ways to enhance its energy-policy, regulatory and institutional framework to meet current and future challenges. In the Alternative Policy Scenario, a set of policies the government is currently considering would cut China's primary energy use in 2030 by about 15% relative to the Reference Scenario. Energy related emissions of CO₂ and local pollutants fall even more. Energy demand, nonetheless, increases by almost 90% between 2005 and 2030 in the Alternative Policy Scenario. Energy-efficiency improvements along the entire energy chain and fuel switching account for 60% of the energy saved. For example, policies that lead to more fuel-efficient vehicles produce big savings in consumption of oil-based fuels. Structural change in the economy accounts for all the other energy savings. Demand for coal and oil is reduced substantially. In contrast, demand for other fuels - natural gas, nuclear and renewables - increases. In this scenario, the government's goal of lowering energy intensity - the amount of energy consumed per unit of GDP - by 20% between 2005 and 2010 is achieved soon after. The majority of the measures analysed have very short payback periods. In addition, each dollar invested in more efficient electrical appliances saves \$3.50 of investment on the supply side. And China's efforts to improve the efficiency of vehicles and electrical appliances contribute to improved efficiency in the rest of the world, as the country is a net exporter of these products. Such policies would be all the more critical were China's economy to grow more quickly than assumed in the Reference and Alternative Policy Scenarios. China's primary energy demand is 23% higher in 2030, and coal use alone 21% higher, in the High Growth Scenario than in the Reference Scenario.

waste, which requires safe burial for decades (as opposed to tens of thousands of years for high-level radioactive waste), proved highly contentious in South Korea resulting in massive demonstrations until the government established a plan whereby the community which voted to house the storage facility would receive a huge compensation package (300 billion yuan or US \$ 288 million). Taiwan, which has also had trouble finding a suitable location for a medium-level radioactive waste depository is now adopting a strategy similar to that that was employed in South Korea

(Bae 2007). Still, neither country has a final site for their high-level radioactive waste.

Most dramatically, North Korea, which is suffering from a severe economic crisis and shortage of energy, decided to restart its moth-balled Yongbyon nuclear reactor. For many years, the international community believed that North Korea was using the Yongbyon reactor to mask its development of nuclear weapons. In 1994, the United States reached an agreement with North Korea to shut down the Yongbyon reactor, which produces plutonium, in exchange for

the development of two larger, light water reactors. Light water reactors are of a design that makes it difficult to convert their waste into nuclear weapons. The Yongbyon nuclear reactor's spent fuel rods, however, remained a source of concern because their plutonium could be converted for use in nuclear weapons. While under the early negotiations for the 1994 Agreed Framework North Korea was to ship its spent-fuel rods from the Yongbyon reactor to a third country, North Korea announced that it would hold onto the fuel rods until the completion of the building of the two light water reactors.

Soon after being elected, George W. Bush listed North Korea as a member of the 'Axis of Evil'. Then, in October 2002, the United States made public that it had intelligence that North Korea had a clandestine nuclear weapons programme. The U.S. stopped shipments of oil to North Korea in a bid to use sanctions to alter the North's behaviour. Instead, North Korea pulled out of the Agreed Framework as well as the Nuclear Non-Proliferation Treaty. In doing this it expelled the United Nations Atomic Energy Agency inspectors who were monitoring North Korea's compliance with the Agreed Framework. North Korea is now believed to have developed several nuclear weapons and is known to have conducted one nuclear test in 2006 (Shim/Schreurs 2007).

After several years of difficult Six Party Talks (negotiations that were held between North Korea and the five other major regional powers: the United States, China, Japan, South Korea and Russia), in February 2007, the North agreed to shut down the Yongbyong nuclear facility and give up the spent fuel rods it was using to manufacture nuclear weapons. This was done in exchange for oil, which the country desperately needs. The deal did not, however, solve the problem of the nuclear weapons which were already created. Whether or not the North can be persuaded to give up any nuclear weapons it possesses remains to be seen.

63.7.6 Regional Cooperation for Environmental Security

The kinds of transboundary and international environmental problems outlined above are becoming serious enough that governments in the region are slowly warming to the idea of bilateral and multilateral cooperation. Not all of the issues outlined above have made it to the table or receive equal policy attention. The humanitarian disaster of North Korea remains so entangled with traditional military security

concerns that the region has had trouble addressing the situation effectively. The territorial disputes that aggravate fishing and offshore energy disputes between countries have also not been given systematic or comprehensive attention.

Still, in recent years, growing attention has been turned to many of the environmental problems discussed above. This has been done through various bilateral and multilateral channels.

63.8 Linking Environmental and Human Security Concerns to Official Development Assistance

China, Japan, and the Republic of Korea are among the twelve largest economies in the world. China's case, however, is rather unusual. While ranking third in the world after the United States and the European Union in terms of its total gross domestic product (GDP) on a purchasing power parity (PPP) basis, this ranking masks its still relatively low per capita income levels and wide income disparity. While coastal areas boast considerable wealth, more rural communities are still impoverished. Due to China's huge population of over 1.3 billion people, per capita GDP (in PPP terms) in 2005 was still only \$6,800 compared to \$31,600 for Japan and \$22,600 for South Korea. Despite being one of the largest economies in the world, China remains a recipient of development assistance from Japan, South Korea, and Europe. Whereas in the past, much of this assistance was focused on infrastructure development, now much of it targets environmental pollution.

For Japan, the richest nation of the region, the end of the Cold War and the transformation of domestic political realities among its neighbours, has meant a rethinking of its role in regional affairs. Japan had long been pressured by the United States and European countries to contribute more to global problem solving. Japan's economic miracle had made Japan the second richest nation in the world, but in contrast with the United States, Great Britain, or France, one with limited international political influence. Japan's success with economic exports, moreover, had resulted in considerable trade frictions and a feeling that Japan was benefiting economically from its security relationship with the United States without in turn contributing sufficiently to global affairs. Japan's Constitution and domestic coalitions that supported a pacifist role for Japan, moreover, meant that there were still restrictions on the extent to which Ja-

pan could participate in international peace keeping operations.¹⁹ Thus, in the 1980's and into the 1990's, Japan began a search for other means to make such contributions, including official development assistance and environmental protection (Inoguchi/Jain 2000; Hirata 2002).

Overseas development assistance (ODA) became one channel for exerting soft power. In the 1980's, Japan emerged as one of the world's largest ODA providers. Japan's growing ODA loans and grants, while sought after by developing states, also came under considerable scrutiny. Japan found itself being criticized for tying ODA loans to Japanese corporate involvement and for supporting projects that were environmentally destructive or harmful to native populations.

The confluence of pressures on Japan to increase its global involvement, the end of the Cold War, and rising international concern with global environmental destruction provided Japan's ruling Liberal Democratic Party with a new possibility for carving out a niche for itself as a global environmental leader. In the 1990's, environmental protection became one of the pillars of Japan's foreign policy. This led to a greening of Japanese ODA as can be seen in Japan's first ODA Charter (1992), which outlines an aid philosophy that links environmental conservation to development assistance.²⁰ In 2003, there was a revision of Japan's ODA Charter and for the first time ODA disbursement was put in 'human security' terms. The revised charter maintains as its first principle that "environmental conservation and development should be pursued in tandem"; this is now considered, however, to be part of a larger strategic focus on 'human security' (Sunaga 2004; Fernandez 2006).²¹

China's pollution problems have become a big area of concern for Japan. China's pollution has the potential to offset environmental improvements made by Japan. Thus, it is not surprising that China was the single largest recipient of Japanese environmental ODA throughout the 1990's (Sderberg 2002). In 1996, Japanese grant aid was used to establish the Sino-Japanese Friendship Centre for Environmental Protection, which is affiliated to the State Environmental Protection Administration, and houses a variety of dif-

ferent environmental institutions, NGOs, monitoring centres, and research bodies. The Japanese government has also funded the Japan-China Comprehensive Forum on Environmental Cooperation (1996) to promote regular dialogue among private enterprises, local governments, academics, and NGOs. Beyond this form of capacity building, Japanese ODA has targeted problems ranging from desertification to air and water quality and flood control. A model city programme was established with the hope that by improving air quality and addressing acid rain in Guiyang, Dalian, and Chongqing, other cities would be able to learn by example.²² While China will continue to receive environmental ODA in the coming years, overall assistance to China is declining as public opinion in Japan becomes less favourable to providing aid to this increasingly rich and powerful economic competitor.

In the future, other countries in the broader East Asian region are likely to become the primary recipients of Japanese environmental ODA, including Mongolia, Vietnam, Indonesia, and the Philippines. Thailand, which has been another big recipient of Japanese environmental ODA, like China is likely to graduate out of the status of being an aid recipient in the coming years (Sunaga 2004: 23).

South Korea has also become a donor of environmental aid. South Korea went from being an aid recipient to an aid donor only quite recently, establishing an Economic Cooperation Fund in 1987 and the *Korea International Cooperation Agency* (KOICA; at: <<http://www.koica.go.kr>>) in 1991. The guiding principles of Korean ODA include relieving poverty and supporting sustainable development. China and Indonesia are South Korea's largest aid recipients. As the South Korean government becomes increasingly concerned about the implications of China's desertification and acid rain problems for environmental conditions on the Korean peninsula, South Korean aid is starting to be directed at addressing regional environmental problems although as Esook Yoon (2006) argues, currently there is a stronger focus on economic development projects, than environmental protection ones.

It should also be noted that at the same time that China is itself a recipient of ODA, it is has been providing aid to Africa for sometime and is beginning to

19 Since 1993, Japan has been participating in United Nations Peacekeeping operations.

20 Government of Japan, 1992: "Japan's Official Development Charter" (June 1992).

21 Government of Japan, 2003: "Japan's Official Development Charter" (29 August 2003).

22 Japan, Ministry of Foreign Affairs, 2001: "Japan's Environmental ODA for China: Pursuit for Sustainable Development"; at: <<http://www.mofa.go.jp/policy/oda/category/environment/pamph/2001/index.html>>.

do so for its poorer Asian neighbours as well. Chinese assistance tends, however, not to include the environmental conditionalities made by other aid providers (Perlez 2006). China has developed a form of internal aid dispersion as well, with eastern regions providing environmental and development assistance to western ones, under its 'Go West' campaign.²³

63.9 The Regionalization of Environmental Protection

There are now various channels through which multilateral environmental cooperation occurs. Since 1991 Japan has been hosting an annual meeting of the environmental ministers of regional countries known as the Environmental Congress for Asia and the Pacific (*EcoAsia*).²⁴ The idea of the workshop is to enhance networks, exchange information, and develop common priorities. Since 1999, there has been an annual *Tripartite Environmental Ministers Meeting* (TEMM) among the environmental ministers of Japan, South Korea, and the People's Republic of China.²⁵ Five prioritized areas for mutual cooperation were initially established under the TEMM: raising consciousness of a Northeast Asian environmental community; working towards fresh water pollution prevention; preventing land based marine pollution; promoting cooperation for environmental industries; and pursuing environmental conservation in Northwest China. There are now also regular TEMM working level meetings and numerous special projects, such as cooperative research being conducted on sandstorm control and climate change. TEMM also created a *Tripartite Environmental Education Network* (TEEN) to enhance cooperation among groups in the three countries working on environmental education.

A priority for the region has been to enhance monitoring capacities and basic environmental information. One of the first cooperative endeavours was the Acid Deposition Monitoring Network in Northeast Asia that was initiated by the Japan Environment Agency. Initial expert meetings were held in 1993 and the first inter-governmental meeting of the network

was in 1998. In the mid-1990's, an *Asia Pacific Network for Global Change Research* (APN) was formed to promote global change research and interaction between the science community and policy makers in the Asia-Pacific Region.²⁶

Most of these multilateral cooperation projects work on a voluntary basis. Due to the unwillingness of states in the region to give up any degree of sovereignty, these regional groups can do little more than work to build capacity, promote joint scientific research and information exchange, and initiate targeted pollution control projects. The fact that many of the problems affecting the region originate in China is also problematic. It means that downwind Japan and South Korea are left to foot the bill (Drifte 2003). This creates a certain wariness in Japan and South Korea related to the establishment of new cooperative projects and programmes. Still, these early steps at cooperative problem-solving are a much needed foundation for dealing with the region's pressing environmental security problems.

63.10 Conclusion

There has been a dramatic transformation of environmental policies and programmes in Northeast Asia. Environmental security is still not a widely understood concept in Northeast Asia. When environmental problems are put into 'security' language, it tends to be done in relation to 'human security'. As the pluralization of environmental communities in the region continues and regional and global environmental cooperation expands, however, it is likely that environmental security frames - particularly as linked to human security - will gain a stronger place in domestic political debates. Environmental cooperation is also likely to deepen in the coming years although it may be decades before the states of the region show themselves willing to commit to legally binding agreements that require emission reductions and penalize states for non-compliance.

23 "Go West' Campaign to Accelerate", in: *China Daily*, 17 January 2005; at: <<http://www.china.org.cn/english/2005/Jan/118055.htm>>.

24 EcoAsia has a web page for the regional exchange of environmental information; at: <www.ecoasia.org>.

25 See the TEMM website for dissemination of environmental information; at: <www.temm.org>

26 See the two websites: <www.eanet.cc> and: <www.apn-cr.org>.

64 Environmental Security in the Arab World

Mohammad El-Sayed Selim

64.1 Introduction

The concept of environmental security has emerged in the mid 1970's to reflect awareness of the threats posed by expanding environmental problems (Brauch 2000, 2003, 2005, 2005a). Since then, two major traditions of environmental security emerged. According to the first tradition, environmental security refers to that area where environmental concerns and security strategies interact. According to this definition, environmental issues are no longer pure technical issues to be handled by technocrats alone. They are part of the overall concept of 'national security', as they could pose more threats to that security than traditional military sources. This definition assumes the presence of a major link between environmental issues and national security concerns. Some advocates of this definition refer to four main types of linkages, (i) the impact of environmental problems on the likelihood of inter-state conflicts and wars, (ii) the impact of environmental problems on human survival in its broadest sense, (iii) the impact of wars on environmental degradation; (iv) the form of political interaction or institutional structure that can best protect against degradation of the environment (Winnefeld/Morris 1994; Dyer 2000; Foster 2001). This tradition tends to 'securitize' the concept and places it within the context of the traditional security strategy.

The second tradition views environmental security as 'securing the environment', which means taking a series of steps to ensure that the ecosystem will be preserved. It focuses on conceptualizing environment and security within the context of sustainable development rather than conflict and conflict resolution. The assumptions are that a secure ecosystem is fundamental to individual and community health and survival and that understanding environmental security in security terms rather than environmental ones diverts attention from the more immediate and real insecurity problems of environmental degradation and narrows policy options by focusing on symptoms than

causes. In this tradition the concept of environmental security is approached from a rather technical perspective and used interchangeably with the concept of the protection of the environment. Environmental security is viewed as a part of the overall concept of 'human security' (Teng 1999; Thakur 2000; Elliot 2000; Najam 2003).

Whereas the first tradition has dominated the primarily 'Northern' discourse on environmental security, some 'Southern' analysts and policy makers subscribe to the second tradition (Pachauri 2000). This is understandable given the fear in the South that environmental issues could be used to justify intervention in the domestic affairs of southern countries (Saad 1995).

In the Arab world, attention to environmental issues began in the early 1980's due to the global trend focusing on environmental threats and acute environmental problems. By the early 1990's, one can identify a new trend in the Arab world linking environmental issues with security which led to an emerging Arabic literature on environmental security. In 1992 King Saud University (Saudi Arabia) published: *Environmental Security* by Sadek, and in 1997 Al-Madani, a Bahraini scholar, published *Our Environment is in Danger*. Both authors employed the concept of environmental security adhering to the second tradition. With the environmental security concept they referred to technical strategies to 'protect' the environment, thus de-politicizing the environment. In fact, most Arab scholars approach the question of environmental security from a technical perspective (Al-Qasmi/Al-Ba'aini 1997). This reflects the Arab sense of vulnerability if environmental issues were approached from a political-security perspective, especially in relation to water.¹

This chapter reviews Arabs approaches of environmental security by assessing the extent to which this concept has been integrated into Arab discourses on environment and security (64.3), outlining the main environmental issues in the Arab world (64.4), evalu-

ating Arab performance in dealing with them, and determining the relationship between environmental and political issues (64.5). The key arguments are that the environmental question cannot be assessed in a purely Arab context; rather they must also be assessed in a Middle Eastern and African framework, as some of the most crucial environmental issues are quite linked to the wider Middle Eastern framework, especially with regard to water issues. These environmental questions are highly politicized and closely linked to security issues. This link has been articulated in the interaction between Middle Eastern conflicts and the deterioration of the environment in the region, and the emerging conflicts over environmental issues, and the fact major Arab rivers stem from non-Arab sources. When the Middle Eastern multilateral negotiations were launched in 1991, a special working group was earmarked for the environment. The deliberations of this group showed the extent to which environmental issues are politicized (Oka 2003). This will lead us to review the linkages between environment and security in the Arab world and the Middle East (64.6).

64.2 Profile of the Arab World

The Arab world comprises twenty two countries mostly located in North Africa and West Asia and extending from the Atlantic Ocean to the Arabian (Persian) Gulf and from the Mediterranean and the southern Anatolia in the North to the Victoria Lake in the heart of Africa (figure 64.1). The total area of the Arab countries is 14.1 million km². It has a total population of almost 304 millions according to 2003 estimates, and it is projected to rise to 386 millions in 2015. Whereas the world population has increased during the 1975–2003 era by 1.6 per cent, the Arabs

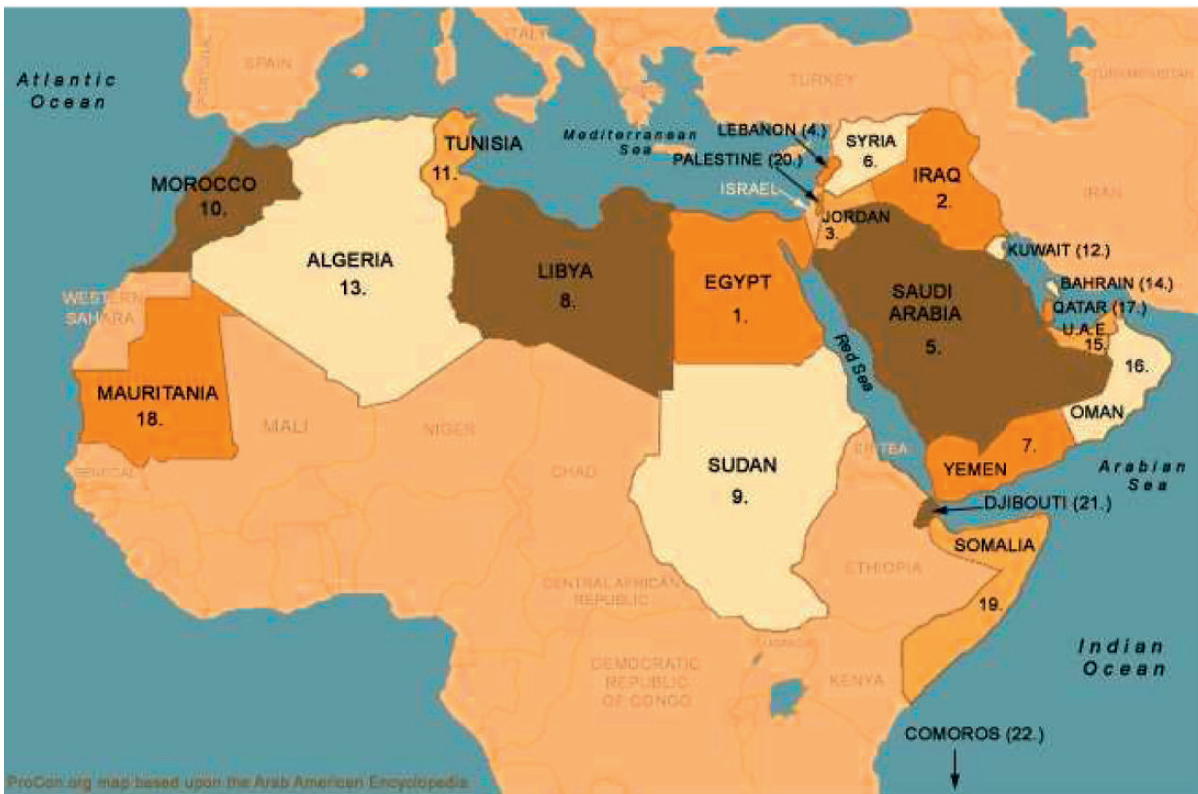
grew by almost 2.7 per cent. In 1975, almost 41.7 per cent of the Arabs lived in urban centres (compared to 37.2 per cent globally). This percentage increased to 54.7 per cent in 2003 (compared to 48.3 per cent globally). Population below the age of 15 years represent almost 36.3 per cent of Arab population) compared to 28.9 per cent at the global level (UNDP 2005a).

The Arab world is located in the Great Desert belt extending from northern Africa across the Red Sea to the Arabian Desert, an area which is characterized by its dry climate. Of the total area of the Arab world, 14.5 per cent is usable for agriculture with 4.2 per cent currently in use. This includes areas with rain-fed irrigation for cereals, and irrigated and natural grazing areas. In most Arabian Gulf states the desert represents almost 98 per cent of the total area. In Egypt, desert represents almost 94 per cent of the total area. All Arab countries are coastal at the Atlantic Ocean (Mauritania, Morocco), the Mediterranean (North African countries, Syria and Lebanon), the Red Sea (Egypt, Jordan, Saudi Arabia, Yemen), the Indian Ocean (Somalia, Djibouti, Comoro Islands), and the Arabian Gulf (Iraq, Gulf Cooperation Council States). As this has facilitated intraregional maritime transportation, it also created maritime pollution problems. The sources of the main rivers in the Arab world, the Nile, Tigris, and the Euphrates are located outside the Arab world, which is a source of conflicts between upstream and downstream countries.

Despite their oil wealth, and with the exception of Bahrain, Qatar, Kuwait, and the United Arab Emirates (which comprise only 2 per cent of the total Arab population) Arab countries belong to medium and low human development categories in the Human Development Index of the United Nations Development Programme (UNDP), ranging between the ranks of 58 and 71 (Libya and Oman respectively) till the ranks of 151 and 152 (Yemen and Mauritania respectively). According to the 2003 statistics, the total GNP of Arab countries is US\$ 773.4 billions. The GNP per capita is almost US\$ 2611 compared to the global GNP per capita of US\$ 5801. Whereas Arab GNP grew by an average of 0.3 per cent in 1990–2003, global GNP grew by 1.4 per cent annually during the same period (UNDP 2005). These statistics show that the Arab world lags behind the global averages of development and that due to its location it faces major environmental problems. Its resources may not be sufficient to deal with these problems effectively.

1 In a review of the environmental paradigm of the Arab Human Development Report of 2002 this author found that there was no reference to the linkages between environmental and political issues in the Arab world, such as the destruction of the environment in Palestine and the Gulf region as a result of political decisions, or the political conflicts rooted in environmental issues such as the Turkish-Syrian conflict over the distribution of the water of the Euphrates (Selim 2004); see also Scheumann (2003) and chap. 44 by Aydin/Ereker on the Euphrates and Tigris; on the Jordan river: see Dombrowsky (2003); Haavisto (2003); chap. 45 by Hayek, chap. 46 by Selby, chap. 47 by Jägerskog; on the River Nile: see chap. 48 by Adly/Ahmed and chap. 49 by Kamari-Mbote/Kindiki.

Figure 64.1: Map of the member states of the Arab League. **Source:** This map is in the public domain: <<http://www.usiraqprocon.org/images/Maps/Arableague.html>>.



The 22 Countries of the Arab League and the year of their admittance: 1. Egypt (1945), 2. Iraq (1945), 3. Jordan (1945), 4. Lebanon (1945), 5. Saudi Arabia (1945), 6. Syria (1945), 7. Yemen (1945), 8. Libya (1953), 9. Sudan (1956), 10. Morocco (1958), 11. Tunisia (1958), 12. Kuwait (1961), 13. Algeria (1962), 14. Bahrain (1971), 15. U.A.E. (1971), 16. Oman (1971), 17. Qatar (1971), 18. Mauritania (1973), 19. Somalia (1974), 20. Palestine (1976), 21. Djibouti (1977) and 22. Comoros (1993).

64.3 The Arab Discourse on Environmental Security

Arab concerns on environmental questions emerged in the early 1980's when Arab policy makers expressed concerns on the quality of the environment and various books were published on environmental protection. However, this environmental concern was not linked to national security. The concept of environmental security emerged in the Arab public discourse in the early 1990's in policy statements and academic writings referring explicitly to linkages between environmental concerns and security strategies.

One can categorize academic and public writings into sub-groups depending on exact environmental issues being dealt with and whether these writings have approached these issues from a security perspective. The list of the writings reviewed is not meant to be ex-

haustive of the Arab literature on environment, but rather representative of the main themes dealt with in the Arab world. The publications in Arabic are categorized below into nine general themes.

64.3.1 The Environment in General

These writings are introductions to environmental issues, and do not specifically refer to the Arab world or to environmental security. But as the first books in Arabic in this field, they alerted a generation of Arab policy makers and scholars to the centrality of attending to environmental issues. The first book by Al-Sharnouby (1976) on *Man and the Environment* was followed by Najm, Al-Banna, and Abou Ayash (1986), Abdel-Maksoud (1997) Al-Sharnouby (1999), Al-Zouka (2000) and Mousa (2000), and Sariya (2003).

64.3.2 The Relationship between Environment and Education

By the late 1980's, a group of Arab scholars developed high school curricula to alert students to the importance of the environment. The first book entitled *Environmental Education* was published by Al-Sharrah (1986) in Kuwait which was followed by Al-Demerdash (1988) in Cairo. While the first book presented a curriculum for secondary schools, the second focused on higher education. At least four more books were published later by Al-Sabarini and Al-Hamad (1994), Metawe (1995), Al-Jabban (1997), and Al-Lakkany and Mohammad (1999), in addition to dissertations submitted to faculties of education and environmental institutes.

64.3.3 The Relationship between Environment and Development

Several Arabic books established linkages between environmental and developmental issues proving that environmental degradation negatively influences development. In 1990, the United Arab Emirates University published proceedings of the international conference it held on the economic and environmental dimensions of development in the Gulf Cooperation Council countries (United Arab Emirates University 1990). This was followed by books by Al-Sayed (1992), Al-Kandary (1992), Al-Bayaty (1996), Kassem (1997), Al-Gallad (1998), Embaby (1998), Kishk (1998) Al-Sheikh (2002), and Al-Sara'wy and Masoud (2001). These writings alerted Arab readers to the developmental costs of neglecting environmental issues.

64.3.4 The Relationship between Environment and Mass Media

Mass media analysts have focused on proving that mass media could play a major role in creating public awareness of environmental issues and how to deal with them. The most important of these writings are those by Al-Killini and Madkour (2000) and Saleh (2003), both were published in Egypt.

64.3.5 The Social Dimension of the Environment

This is the least researched issue in the Arab environmental discourse. A group of Egyptian sociologists conducted field studies on social and anthropological issues of the relations between environment and soci-

ety (Al-Gohary/Shukry 1995). But this aspect was not followed up by other scholars or stressed by policy makers. Thus, awareness of the social dimensions of environmental issues is still in its infancy which reflects the technical nature of Arab conceptualization of the environment.

64.3.6 The Relationship between Environment and Psychology

Some Arab scholars have developed an interest in the question of the impact of environmental degradation on human psychology. Such interest has led to the emergence of the new discipline of "environmental psychology," in some Arab universities. In fact, two books were published under this title by Gaber, Mahfouz, and Al-Khalifi in 1992 and by Al-Sabwa in 1997. The last book looked at the psychological and cognitive changes in Egyptian workers as a result of their exposure to Carbon disulfide (CS₂). Recently, Abdel-Hady (2003) published a book analyzing the impact of environment and pollution on the intelligence and creativity of the children.

64.3.7 The Relationship between Environment and Islam

As a part of the rise of Islamism in the Arab world, Arab scholars paid special attention to the development of 'an Islamic' view on environmental issues. This trend was not restricted to the environment; rather it extended to all academic disciplines, including the natural sciences. The main argument is that Islam has articulated a view on environmental issues and that attending to this view is a part of the Muslim's approach to life. But none of the "Islamic" perspectives on the environment was necessarily different from other perspectives. But the emphasis was on rooting environmental issues in Islam. The first book was published by Al-Saidi (1994), to be followed by a number of books such as Abdel-Azim (1999), Abdel-Maksoud (1986), Al-Sheikh (2000), Al-Shirazi (2000), Zahran (2000) and Murad (2003). All of them attempted to prove that Islam had developed an environmental paradigm which persuades the believers to protect their environment.

64.3.8 Specific Environmental Issues in the Arab world

The most widely studied environmental issues are those related to water shortages, pollution, and deser-

tification. Water shortages are so acute that some analysts used the concept of 'water security', such as Algerian scholar Al-Makhadmy (1999). The most important of these writings are those by Farrag (1986), Mekhemr and Hegazy (1996), Al-Akkal (1996), Nahar (1997) and Bakr (1999). Other analysts focused on the issue of pollution. The pollution issue was tackled by other analysts such as Al-Sara'wy and Masoud (2001), Kassem (1997), and Mousa (2000). Less attention was given to the issue of desertification (Balba' and Nassim 1994; Hassan n.d).

64.3.9 Environmental Security

The only book in Arabic by Sadek (2000) addresses environmental security from a purely technical perspective focusing on environmental protection, even though it introduces the concept of 'general environmental security'. Sadek, a specialist in microbial environmental pollution, did not identify linkages between environment and national security. He referred to water security, security against microbial weapons, maritime pollution and electro-magnetic pollution.

The concept of environmental security was indirectly used in other publications. Al-Qasmi and Al-Ba'aini (1997) referred to environmental security in their book: *Securing and Protecting the Environment* and Al-Banna (2000), an Egyptian scholar, stressed the indirect link between environment and security through the intervening variable of development. His argument is that environment impinges on security through its impact on the developmental process. This approach is contained in another book by Al-Madani (1997) published by the Arab Gulf University in Bahrain that argued that environmental degradation is a national security threat. He referred to the impact of such degradation on the fall of Communist regimes in the early 1990's. But direct linkages between environment and security were not specified. Tolba (1992), the former head of the United Nations Environment Programme, also referred to the destructive impact of wars on the environment and that "environmental pressures are a result and an outcome of the political tensions and military conflicts." Tarraf (1998) also argued that environmental hazards call for a re-definition of the concept of security. However, there were no suggestions on the directions of such a redefinition.

What are the main characteristics of the Arab literature on the environment and environmental security? In answering this question, one may utilize Sunderlin's (2003) classification of the three paradigms on the en-

vironment where he distinguishes between: class, managerial, and individualist. The Arab literature falls under the category of the managerial paradigm. This paradigm views environmental issues as a primary result of processes of industrialization and modernization, and the lack of proper state control and governance, rather than from the capitalist mode of production as the proponents of the class paradigm argue, or from the aggregate individual values and preferences as the advocates of the individualist paradigm believe. It covers these issues at the organizational level focusing mainly on relations among various state organizations. The state is seen as the major reference point in dealing with the problem. The essential tools for addressing environmental concerns is improved state management and control, and better coordination between various state organizations. The Arabic literature on the environment is of a technocratic nature focusing mainly on technical issues related to the environment and does not frame them within its conceptualization of national security. This literature is mostly non-ideological, and not supportive of any ideological trend. In the Arab world environmentalists belong to different ideological traditions. In short, the Arab paradigm on the environment is mainly *non-ideological*, and *apolitical* although it approaches the issue from a state perspective. The emphasis is on the organizational aspects of the state rather than on political ones.

A minority group of Arab intellectuals articulates a discourse on the environment quite close to the main arguments of the class paradigm. They tend to view environmental issues in political terms and put the responsibility for environmental problems in developing countries on the shoulders of developed countries. They refer to the emergence of a 'new global environmental system' characterized by the dominance of a 'new environmental imperialism'. This system is the main source of most environmental problems of developing countries such as nuclear waste disposal in developing countries, ozone depletion and global warming. This trend is best represented by the Bahraini scholar Ismael Al-Madany (1997).

64.4 Main Environmental Threats to Arab Security

The two major environmental threats perceived in the Arab world are those related to water scarcity, desertification and land degradation.

64.4.1 Water Scarcity and Arab Security

Water Scarcity is the most serious environmental threat to Arab security, as virtually all Arab countries are well below the line of 'water stress'. The World Bank has classified 22 countries as below the water poverty line where per capita water availability in cubic meters/year is below 1000. Among them fifteen are Arab countries. The annual per capita water in Qatar, Kuwait, Libya, and Bahrain is 91, 95, 111 and 112 m³/year. In Saudi Arabia, Jordan, Yemen, Tunisia, Algeria, and Oman the figures are 241, 318, 340, 434, 517 and 874 respectively. If this is the case today, one can imagine the water famines, the Arabs will be confronted with in ten years given present levels of population growth. Due to poor agricultural technologies, agriculture remains the major user of water sources in most Arab countries. A low level of efficiency is noted in the utilization of water in all sectors. This has generated many problems such as water logging, salinity, low productivity and infertility of soil and deterioration of the quality of ground water. Further water governance remains fragmented among various institutions, which generates problems for the rationalization of water use. The problem is further aggravated by high population increase, the geographical location of Arab countries in the Great Desert belt, the lack of national programmes to rationalize water consumption; and almost 60 per cent of water resources in the Arab world originate from outside the region which gives rise to tensions in using jointly-shared water. This is acutely clear in the cases of the Nile, the Euphrates and Tigris. These cases are a source of present and potential conflicts and will be reviewed later (Issa 1994): Al-Tamimi.

64.4.2 Desertification and Land Degradation

Deserts cover most of the Arab world. Almost 14.3 per cent of Arab lands are suitable for agriculture (with rainfall up to 400 mm). About 89 per cent of Arab land receives a rainfall below 100 mm. Most of these areas are deserts or desertified sand suitable only for grazing. Most Arab lands are threatened by desertification due to anthropogenic activities including overgrazing that is responsible for almost a quarter of the desertification. About one fifth of the total area is threatened by desertification due to forest/shrub clearing operations, compared to 2 per cent and 1 per cent of the total area lost annually due to salinization and urban expansion (UNEP 2003a).

64.4.3 Other Environmental Hazards in the Arab World

There are other environmental hazards in the Arab world, such as the degradation of the marine environment, biodiversity losses, decline of the quality of the atmosphere and climate change, and the impact of sea-level rise on land especially on the Nile Delta. Coastal zones in the Arab world are under stress as a result of demographic shifts from rural to urban areas, landfills and dumping of untreated waste. The marine environment is increasingly threatened by land-based sources of pollution, and by the heavy ship traffic in the region. Out of the world's exported oil, 60 per cent is transported through the Straits of Hormuz. The charged water could cause irreversible damage to marine ecosystems. The coasts of some Arab countries have been increasingly shrinking as a result of the sea-level rise. This issue has particularly threatened the Egyptian Nile Delta which has been eroding during the last quarter of a century. Further, the unique biodiversity of the Arab world is at serious risk from increased human activities. The main issues are the degradation and/or destruction of habitats and loss of species. This is mainly the result of population growth, agricultural and urban expansion into ecologically sensitive areas, poverty and unsustainable use of biota, and industrial pollution. Finally, urban air pollution is emerging as a serious threat facing most cities. Cities are experiencing air pollution with gases and particulates and lead at levels often-exceeding global standards.

The main sources of air pollution are energy and industrial production and transportation. The last factor accounts for almost 90 per cent of air pollution in urban centres which is mainly due to poor maintenance, aged cars, low quality fuel, and poor traffic management. Stationary sources, such as outdated power generation stations, are another major source. Finally, the region is also experiencing climate change as a result of burning of fossil fuel (UNEP 2003a).

64.4.4 Climate Change as a Security Challenge

Finally, it seems that global warming and climate change has begun to impact upon Arab countries (IPCC 2007, 2007a, 2007b; Brauch 2002, 2007j, 2007k, 2009). In May 2007, British Foreign Secretary Margaret Beckett said that the Middle East is the most vulnerable to the negative consequences of global warming as this area comprise 5 per cent of world population and only 1 per cent of its water resources.

She added that climate change will result in the loss of almost 80 per cent of Nile water resources, and the loss of main parts of the Nile Delta which could make 2 million people homeless, which will result into major conflicts between the riparian states. However, these forecasts were disputed by Mahmoud Abu-Zeid, Egypt's Minister of Water Resources.²

64.5 Arab Strategies to Deal with Environmental Threats

There is an increasing awareness in the Arab world at the governmental and non-governmental levels of the urgency of the environmental problems the Arabs are facing. Thus, most Arab countries have established national institutions (ministries, or public corporations) on issues related to the environment³, issued national strategies for environmental protection⁴, developed NGOs to support the work of the governmental institutions⁵, issued various journals to deal with the environmental issues⁶, and established academic institutions to major into the study of environmental issues.⁷ Arab countries have also signed and ratified over 64

international and regional governmental conventions and agreements on the protection of the environment. Among the most important are the three Rio conventions with sustainable development focus, the *United Nations Convention to Combat Desertification*, the *Convention on Biological Diversity*, the *UN Framework Convention on Climate Change*, and the *Montreal Ozone* convention. Implementation of some of these conventions has been rather modest for many countries due to lack of adequate resources. The Montreal Ozone convention has achieved the most successful level of implementation in the Arab world.

At the Arab regional level, there has been a concerted effort within the framework of the *League of Arab States* (LAS) to co-ordinate Arab environmental strategies. LAS has established a Department of Environment and Sustainable Development responsible for coordinating Arab environmental projects. A *Council for Arab Ministers Responsible for the Environment* (CAMRE) was also established in 1989. CAMRE meets annually to review common environmental issues. It elects an Executive Bureau of seven members for a term of two years and a chairman and it presented to the *World Summit on Sustainable Development* in Johannesburg (September 2002), an Assessment Report on the progress made towards achieving sustainable development. CAMRE also launched the *Arab Initiative on Sustainable Development* to be implemented in the region in cooperation with UN agencies such as UNEP. In its session in Benghazi, Libya in December 2003 it adopted "The Arab Environmental Work Programme of CAMRE for 2004 and 2005" (CAMRE 2003). This CAMRE document dealt with programmes such as desertification and increasing the green land, industry and the environment, education and environmental mass communication, capacity-building in the area of environmental legislation, follow-up of international environmental treaties, and completion of statistical data bases on the environment. There have also been various regional initiatives to combat desertification such as the *Sub-Regional Action Programme* (SRAP) for West Asia and the Arab Maghreb Union.

2 Mahmoud Abu-Zeid, Press interview with Al-Masry Al-Youm, in: *Al-Masry Al-Youm*, Cairo, 12 and 14 May 2007.

3 For example, in Egypt, Lebanon, Palestine, and Tunisia ministries for the environment were established. In Kuwait, United Arab Emirates, Saudi Arabia and Libya public corporations on the environment were created.

4 Such as *The Strategy and National Work Program to Combat Desertification in the United Arab Emirates*, issued in 2004 and *The Environmental Strategy of Kuwait* issued in 2000.

5 Such as the *Friends of the Environment Association in the United Arab Emirates* established in 1992.

6 Such as *Muntada Al-Bee'a*, a non-periodical review issued by the Arab Network for the Environment and Development in Egypt, *Al-Bee'a wa Al-Tanmiya*, a monthly journal issued by Technical Publications Ltd in cooperation the Middle East Center for the Transfer of Appropriate Technology in Lebanon, *Al-Emirate Wa Al-Bee'a*, a quarterly issued by the Federal Corporation for the Environment in the United Arab Emirates, *Shu'un Bee'iya*, a monthly issued by the Association of the Friends of the Environment in the United Arab Emirates, *Al-Bee'a*, a monthly issued by the Kuwait Foundation for the Protection of the Environment, *Minbar Al-Bee'a*, a monthly magazine issued by the UN Program for the Environment in Bahrain, *Assuit University Bulletin for Environmental Research*, a quarterly issued by Assuit University in Egypt, and *Bee'atona*, a monthly issued by the Kuwaiti Public Corporation on the Environment.

7 Such as the *Institute of Environmental Studies and Research* in Cairo and Ain Shams universities in Egypt, the *Center for Environmental Studies and Research* in Sultan Qabos University in Oman, and the *Center for Environmental Development for the Arab Region and Europe* in Egypt.

The Gulf Cooperation Council (GCC) has also initiated the Prize of the GCC for Best Environmental Works.

At the level of NGOs the *Arab Network for Environment and Development* (RAED) was formed in 1990. It comprises NGOs in Arab countries majoring in environmental issues. In 1995, RAED was granted an observer status in meetings of CAMRE, and it participates in its meetings and secretariat. It also sponsors various activities at the Arab, Mediterranean, and regional levels for the protection of the environment.⁸ These strategies have been helpful in creating public awareness of environmental hazards in the Arab world. Environmental problems in the Arab world still pose a major security threat. According to Mustafa Tolba, the leading Arab environmental specialist, “environmental problems have begun to impact upon the health of present generation, and threaten the future ones.”⁹ This is due to the prevalent paradigm in the Arab world that environmental issues are residual ones, which results in limited financial allocations to deal with them. It is a result of inefficient government bureaucracies, inadequate legislation, and most importantly of the tendency to view environmental issues as purely technical ones that do not pose immediate security threats.

64.6 Linkages between Environment and Security

With regard to the Arab environmental paradigm and environmental issues in the Arab region, a high level of asymmetry exists between them. Whereas the Arabs subscribe to a managerial-technical paradigm, environmental issues have strong political dimensions. These dimensions are reflected in the two-way relationship between environmental issues and political conflicts. Environmental issues have been the sources of conflicts especially between Arabs and non-Arabs of the Middle East, and in Africa. This is clearly reflected in water issues especially in the Nile, Euphrates, and Tigris. The Nile flows through ten countries until it reaches its destination in Egypt (Peichert 2003; see chap. 48 by Adly/Ahmed and chap. 49 by Kameri-Mbote/Kindiki). Egypt is dependent on the Nile for the survival of its 70 million people. According to a 1959 agreement with Sudan, the Egyptians are entitled to 55 billion cubic meters of Nile water a year, while Sudan gets 18.5 billion. But with the population

growth, this quota is increasingly falling below the needs as demand for water in Egypt increased to 68 billion cubic metres in 1998. Upstream countries are beginning to engage in agricultural projects utilizing water, which will mean a reduction of the Egyptian quota. They claim that they were not part of the Egyptian-Sudanese agreement are not bound by the treaties signed on their behalf by Britain and Italy during the colonial eras (see chap. 49 by Kameri-Mbote/Kindiki). Recently, Tanzania has announced it will build a 150 km long pipeline to divert Nile water originating from its land. Ethiopia is also beginning to launch similar projects. The Egyptians suspect that foreign influences are playing a role in persuading riparian states to launch these projects in order to pressure Egypt. Egyptian president Anwar Sadat threatened to go to war against Ethiopia if it tampered with the Nile water.

The same potentially conflictual relationship characterizes relations between Syrians, Iraqis, and Turks over the use of the water resources of the Euphrates and Tigris, which originate from Turkey (Scheumann 2003). Turkey argued that these rivers are not international rivers, and that it has the right to use their water resources with no obligations towards Syria and Iraq. It argued that Turkey has not claimed that it shares with Iraq its oil, and Iraq is not entitled to share the water resources of the two rivers with Turkey. Turkey has built a huge complex of dams (GAP: *Great Anatolia Project*) which reduced the annual average flow of the Euphrates within Syria from 32 billion cubic meters to 20 billion (chap. 44 by Aydin/Ereker). Syria depends on the Euphrates for almost 80 per cent of its water needs and is already plagued by shortage of water, with an annual water availability of almost 1,000 cubic meters per capita. The water that passes to Syria from Turkey is also laden with agrochemicals and pesticides which poses serious health threats. Turkey also threatened to impound the Euphrates water if Syria did not strain the Kurdish militia operating from its territory. At present, Turkey and Syria have been able to contain this emerging conflict over the distribution of the water resources of the Euphrates. This is essentially because Syria does not have many options to deal with Turkey. A flare up of conflict may be possible if present political alignments in the region change. In 1987 Turkey suggested to build the ‘Peace Pipeline Project’ to sell water to Middle Eastern countries through pipelines. The Arab countries were reluctant to accept the Turkish suggestion because it would give Turkey a leverage over their survival. The idea seems to have been accepted

8 See the report of RAED submitted to CAMRE in December 2003 which outlines its projects (Council of Arab Ministers Responsible for the Environment 2003).

9 Interview in: *Minbar Al-Bee'a*, 5,3 (September 1992): 9.

by Israel. The problems of the Euphrates and Tigris have also influenced Syrian-Iraqi relations. In 1974, both countries were on the brink of war when Syria established the 'Revolution dam' on the Euphrates which reduced the flow of the Euphrates to Iraq by 25 per cent. The Saudi mediation averted war. In 1990, Syria and Iraq signed an agreement to share the water resources of the Euphrates (42 per cent for Syria and 58 per cent for Iraq),

The Jordan River has been a source of conflict between Jordan and Israel (Dombrowsky 2003; chap. 45-47 above). The Jordan basin (Jordan and Yarmuk rivers) is Jordan's sole source of surface water. Jordan tried to build storage systems on the Yarmuk, but these were destroyed by the Israelis in 1967. Israel also objected to Jordan's building of a dam at Markarin on the Yarmuk near the Syrian border in the 1970's, and the Al-Wahda dam on the upper Yarmuk in 1990 because both project would affect its water shares. The 1994 Jordanian-Israeli peace treaty dealt with the water issue in a way that gave Israel a larger share of the water resources of the Yarmuk River (Gann 2001).

Wars and conflicts have also contributed to the destruction of the environment in the Arab world. The prime targets of such impact were the Arabian Gulf region (Westing 2003) and Palestine (Haavisto 2003; UNEP 2003c, 2006a). The 1991 Iraqi invasion of Kuwait, the 1991-2003 UN blockade against Iraq, and the 2003 Anglo-American invasion of Iraq have resulted in major environmental damages in the Gulf region (UNEP 2003, 2003a, 2003d). The attack on Iraqi industrial facilities in January-February 1991, led to the loss of electrical production firms which had a negative impact on water supply, sanitation and refrigeration. The loss of electricity disrupted systems of pumping saline water from irrigated lands in the southern floodplain, leading to widespread water logging and salinization. Bombing of chemical and industrial plants led to the release of numerous toxic chemical compounds into the atmosphere, soil, and local waterways. The livestock and agriculture in Iraq were devastated by disease and epidemics due to lack of vaccines caused by the destruction of production plants, and by the lack of pesticides and fertilizers as a result of the bombing of chemical plants (UNEP 2003b).

The American forces also used depleted uranium ordnance which had seriously affected the Iraqis and the Kuwaitis as well. It is estimated that around 290 metric tons of depleted uranium were fired by the Western forces during the war (UNEP 2003a). During their retreat from Kuwait in February 1991, Iraqi

forces uncapped seventy-six oil wells and allowed oil to flow freely into land. Another 99 wells were deliberately damaged. Approximately 60 million barrels were released. Over 246 pools were formed, covering an estimated area of 49 km². Estimates of total quantity of oil accumulated in the pools ranged from 25 to 50 million barrels. More than 600 Kuwaiti oil wells were set on fire by retreating Iraqi troops, burning between 2.5 and 6 million barrels of oil per day from the end of February till the beginning of April 1991. The environmental damage in Kuwait was estimated at US\$ 40 billion (Abdulraheem 2000; Austin/Bruch 2000; Omar/Briskey/Misak/Asem 2000; UNEP 2003).

The economic sanctions imposed on Iraq after the war constrained its ability to deal with these environmental hazards, which led to the decline of the quality of the Iraqi environment. The 2003 Anglo-American invasion of Iraq has also witnessed the extensive use of depleted uranium munitions against civilian targets. Today, the Iraq environment is in shambles as a result of almost 12 years of wars and blockades (UNEP 2003, 2003a).

Likewise, the Israeli-Palestinian conflict had major negative impacts on the Palestinian environment, especially after the Second Intifada (Uprising) of September 2000. The environment was used as a tool to crush the Intifada, as the Israeli army destroyed trees, filled in wells, and damaged water infrastructure. The Israelis have also disposed of hazardous waste in Palestinian controlled area, and destroyed greenhouses and crops. Water tankers are frequently attacked and most of the water is controlled by the Israelis to be used inside Israel and for the settlers, which had resulted in major water shortage (Twite 2003; see chapters by Twite and Dajani in this volume). The building of the 'settlements' and of the 'Separation Wall' has destroyed thousands of agricultural lands and made it impossible for many Palestinians to reach their farms (chap. 67 by Dajani; chap. 66 by Twite). The environmental consequences of the Israeli settlements have been documented by Amnesty International report issued in 2003 (Amnesty International 2003; Whitson 2005). The Advisory Opinion of the International Court of Justice issued on 9 July 2004 regarding the Separation Wall also referred to the impact of the Wall, built on occupied Palestinian territories on the life of the Palestinians (International Court of Justice 2004).

The 2006 war between Israel and Hezbollah also had major consequences for the environment of Lebanon. During the war, Lebanese oil storages and their pipelines were destroyed which resulted in 15,000

tons of oil pouring into the Lebanese coast of the Mediterranean Sea thereby causing major environmental damages (Khuraybit 2006).

The political character the environmental issues in the Arab world was reflected in the deliberations of the Middle Eastern Working Group on the Environment which was formed within the multilateral track resulting from the Madrid peace conference of October 1991. The deliberations of this group that was chaired by Japan witnessed major disagreements on the relationship between environmental and political issues and the strategies for dealing with environmental hazards (Oka 2003).

The Israelis suggested to give priority to environmental questions and to establish a regional framework for cooperation with joint teams to deal with the environmental issues. It also suggested giving priority to the uses of air pollution, climate change, and maritime pollution of the Mediterranean. Egypt advocated linking the progress of regional cooperation on the question of the environment to the settlement of the Arab-Israeli conflict arguing cooperation on the question of the environment should be a part of an overall regional cooperation, and suggested engaging the United Nations Environment Programme in regional projects for cooperation. It also contended that priority should be given to issues such as desertification, marine environment, air pollution, and natural disasters, and demanded that the point of beginning in establishing a regional system for cooperation was to determine the parties that caused the environmental damage and holding them responsible for it. The Egyptians rationalized their approach on grounds that Israel has caused tremendous damage to the Palestinian environment by building settlements on agricultural lands and removing trees. They also wanted banning anti-environment military activities, and committing all regional powers to get rid of radioactive materials within their territories in an indirect reference to the Israeli nuclear programme (Goma'a 1994).

The Israelis and the Egyptians agreed on one point, that is, the need to engage outside powers in building a regional system for cooperation in the field of the environment. However, whereas the Israelis preferred an engagement by Japan, the U.S., and the European Union, the Egyptians wanted also the UN to be involved. Also, whereas the Egyptians preferred to begin by dealing with grand issues such as nuclear and chemical weapons and their impact on the environment, the Israelis preferred to deal with purely technical issues. It is obvious that the Egyptians advocated the politicization of environmental issues. This

is not because they adhere to a politicization paradigm, but mainly because they wanted to use the card of environmental cooperation to accelerate the peace process. The Egyptians wanted to safeguard against creating a precedent of regional cooperation and normalization without progress on the political issues. Further, despite its technical character, the Israeli approach had major political objectives, that is, to establish an Arab-Israeli regime for cooperation, a regime which will have political implications.

With the collapse of the peace process in 1996, the meetings of the Environment Working Group were suspended. Understandably, such collapse led to a further worsening of the regional environment especially in the occupied territories after the Second Intifada of September 2000. Recently, a joint Jordanian-Israeli research centre was established under American sponsorship to major in the study of the ecosystem of the Dead Sea area. It remains to be seen if this experience will survive the political upheavals of the Middle East.

64.7 Conclusion

Since the 1990's there has been an increase in Arab interest in and concern about environmental issues. This was reflected in a general trend to establish institutions, formulate strategies, issue academic and policy-oriented books and literature, and develop NGOs which major in the field of environment. There has been a trend to coordinate environmental policies among Arab countries within the framework of CAMRE and to coordinate policies with the UNEP. The Arab environmental paradigm is characterized by its emphasis on the managerial-technical character of environmental issues. It tends to de-politicize these issues and deal with them outside the main thrust of the national security strategy. Perhaps the only exception is the Arab approach to environmental issues in the Middle Eastern framework. The Arabs also tend to view environmental issues as residual issues compared with statehood, sovereignty, and territory. This has resulted in limited resource allocations to environmental issues and the tendency to rely on foreign support.

In the meantime, environmental issues in the Arab world have strong political components by virtue of their linkages with the larger Middle Eastern and African frameworks. This is reflected in the two way relationship between regional conflicts and wars as was reflected in Palestine and the Arabian Gulf region.

There are conflicts over environmental issues and such issues were the main causes of conflicts and wars in the region. The linkage was also articulated in the deliberations of the Environment Working Group of the Middle Eastern talks in the 1990's. It was clear that the sides have different views of the strategies to deal with environmental hazards and the relationship between regional environmental cooperation and the Middle East peace process.

As the deterioration of environmental issues in the Arab world were noted despite the increased interest in these issues. The Arabs must change their environmental paradigm towards integrating the environment into their overall national security strategy that is, 'securitizing' their concept of the environment. This will result in more allocations to deal with environmental issues, but it will also require more bureaucratic efficiency. Perhaps, they should think of establishing a regional environmental agency to deal with the common issues as is the case in Europe. There is no shortage of suggestions to deal with environmental issues in the Arab world. The UNEP and CAMRE studies and the *Arab Human Development Reports* are full of proposals on how to deal with environmental issues. The heart of the problem lies in the commitment, the paradigm, and in enhanced bureaucratic efficiency.

65 In the Name of Security: In the Name of Peace – Environmental Schizophrenia and the Security Discourse in Israel / Palestine

David Newman

65.1 Introduction

This chapter focuses on the relationship between the military and environmental dimensions of the security discourse in Israel and Palestine. The issue of environmental and human security in Israel and Palestine lags behind the environmental discourse in most parts of the industrialized world. The reconceptualization of the security debate in recent years to include many issues over and beyond the traditional discourse of military security has not impacted Israel and Palestine in a major way. While the traditional military, territorial, and demographic dimensions of the security discourse have continued to play centre stage in the political agenda of the country, the latter – along with a host of other civil society issues – has largely been ignored as constituting a sort of ‘luxury’ issue, subsumed by the ongoing concern with the perceived existential and physical threats of the political conflict. For Israelis, security means safety from suicide bombers (for the individual) and from an existential threat to the State as a whole (for the collective), while for Palestinians, security is safety from Israeli soldiers and roadblocks (for the individual) and from the ongoing process of Occupation (for the collective). The fact that the environment in this region is undergoing a constant process of degradation is, at the most, of concern to aware citizens but is not defined in terms of security. For both Israelis and Palestinians, ‘security’ still belongs to another realm of discourse.

This chapter will address the notion of environmental security in Israel/Palestine from two, inter-linked, perspectives. In the *first* place we will address the wider issues of environmental and ecological threat faced by societies who do not undertake actions aimed at preserving and replenishing scarce resources within the context of a growing population and a semi-arid and arid environment. We identify a form of environmental ‘schizophrenia’ where the so-

ciety and its institutions are aware of the ecological problems, discuss them in great detail, but fail to act accordingly in an effort to prevent further environmental degradation. *Secondly*, we will examine the way in which the existence of the political and military conflict impacts, both directly and indirectly, on environmental management, resulting in an even more serious problem of resource scarcity and degradation than would otherwise have been the case. There are direct and indirect impacts of the conflict on the way that the physical environment is managed, often making use of the securitization discourse as an excuse for bypassing the normal planning and statutory authorities. The chapter concludes with a brief discussion of the implications of conflict resolution and a peace agreement on the environment. While peace is obviously a positive development, the hasty implementation of development projects ‘in the name of peace’ without due recourse to the necessary environmental checks and balances, could result in substantial and irreversible damage to the environment.

65.2 The Traditional Securitization Discourse in Israel

The nature of the Israeli security discourse is closely tied to the perceived existential threat facing the State from its Arab neighbours, the need to maintain a strong military deterrent and the desire to retain control of territories which provide the State with a security/strategic advantage. Contextually, the Israeli security discourse centres on the need for physical security against invasion or terrorism, while the Palestinian need for security is more firmly rooted in the need for economic wellbeing and national self-determination. As such, each views the other as constituting the main threat through which their own human security is threatened and denied. Despite the events

of the past two decades, including peace agreements with both Egypt and Jordan, as well as the (failed) beginnings of dialogue with the Palestinians aimed at finding a political solution to the conflict, the nature of the security discourse has not changed substantially throughout this period.

The traditional notions of military and political security in Israel-Palestine have been the subject of much academic research. This can be typologized in three broad categories:

65.2.1 Military Security

Israel has been in a state of perpetual conflict since its inception over fifty years ago. The main issue on the public agenda throughout that period has been the issue of military security, as defined through the role of the IDF (Israel Defence Forces) and the notion of the “people’s army”. Security is defined at the collective level in terms of the perceived existential threat facing the country from the wider Middle East region and the need to maintain strategic superiority. At the individual level, security is defined through the need to fight terrorist activities and, most recently, the growth in suicide bombings inside Israel’s civilian centres. Kam (2003) defines three major categories of threat facing the country, namely the conventional military capabilities of the Arab states, the non-conventional ballistic and chemical weapons, and the threat of terrorism and guerrilla warfare, the latter two having gained prominence in recent years, as the conventional threat has largely been removed (Kam 2003). This has resulted in the recent construction of the ‘separation fence’ between Israel and parts of the West Bank,¹ the Israeli government proposal to ‘disengage’ from the Gaza Strip,² and the prevention of Palestinians from entering into Israel. Military deterrence is also defined through Israel’s nuclear weapons programme which, despite

the surrounding secrecy, is widely assumed to be the most advanced in the region (Cohen 1998).

65.2.2 Territorial Security

Territory is perceived as constituting a central plank in the Israeli understanding of security. Given the small area of the country (20,000 sq. kms excluding the Occupied Territories) and the fact that in the pre-1967 territorial configuration, the country’s population was concentrated in a narrow coastal strip located between the sea in the west and the West Bank in the east, many Israelis perceive the need for territorial expansion as a guarantee of greater security (Newman 2002). During the 1967 Six Day War, Israel extended its territorial control through the conquest of the Sinai Peninsula, the Golan Heights and the West Bank. These areas were seen as providing a territorial buffer between Israel and her neighbours, although the major buffer – the Sinai Peninsula – was returned to Egypt as part of the Camp David Peace Accords. Successive Israeli governments have argued for the retention of the Golan Heights and the Jordan valley as a guarantee to future security and the creation of “defensible” borders (Horowitz 1975; Al-lon 1976; Cohen 1986). In reality, the peace agreement with Egypt and the introduction of a multinational peace force into the Sinai Peninsula (to the south), the peace agreement with Jordan and the American conquest of Iraq (to the east), and the military superiority with respect to both Lebanon and Syria (to the north and north east) have all but rendered micro-territories increasingly irrelevant to the contemporary security discourse (Newman 1998a). Notwithstanding, Israel continues to use the territorial pawn as a key factor in its negotiations aimed at achieving conflict resolution.

65.2.3 Demographic Security

For many countries, the notion of demographic security relates to the pressures of rapid population growth on a limited resource base, the former outstripping the capabilities of the latter to provide the basic existential resources necessary for the increased population. In Israel and Palestine, notions of demographic security concern the demographic ratios between Jews and Arabs, Israelis and Palestinians, and the respective aspirations of each group to reach demographic majority and thus strengthen the political claims to territory and sovereignty. Israel is self defined as constituting a Jewish state in which eighty

1 For diverse analyses of the Separation fence/wall, see: David Makovsky: “A Defensible Fence: Fighting terror and enabling a two-state solution”, in: The Washington Institute for Near East Policy, April 2004: *The Wall in Palestine: Facts, Testimonies, Analysis and Call to Action*; The Palestinian Environmental NGO’s Network (PENGON), June 2003. Jerusalem: David Newman: “Barriers or bridges? On Borders, fences and Walls”, in: *Tikkun Magazine*, 18,6.

2 David Newman: “Boxing in Palestinians”, in: *Los Angeles Times*, 4 August 2004: The World Bank Report: *Disengagement, the Palestinian Economy and the Settlements*, 23 June 2004.

percent of the population are Jewish. Together with the Occupied Territories, the Jewish population constitute only 60 percent of the population, while the gap between the two national groups is rapidly closing, given the much faster natural growth rates of the Arab-Palestinian population. For many Israelis, it is the supreme desire to maintain Jewish demographic hegemony which results in their support of territorial separation and a two state solution to the conflict, rather than any altruistic belief in the rights of Palestinian self government and independence. Israeli governments have always supported policies which have encouraged natural growth amongst the Jewish population, as well as policies aimed at encouraging Jewish immigration from throughout the world as a means of retaining demographic superiority (Newman 1998b). The immigration of approximately one million people from the former Soviet Union during the 1990's (increasing the country's population by one fifth in a short space of time) is seen as a major contribution to the demographic notion of security. Israeli government opposition to the right of Palestinian refugee return to Israel is also seen as a central plank in the demography security discourse, even though the respective Israeli - Palestinian population ratios inside pre-1967 (sovereign) Israel are approximately 80:20 and have remained relatively stable (given rapid Arab population growth on the one hand, countered by waves of Jewish immigration on the other) throughout the fifty five years of the existence of the State of Israel.

65.3 Environmental Security in Israel and Palestine

Environmental issues have not occupied a prominent place in the Israeli public agenda. The redefinition of notions of security which have taken place throughout the world, to include energy, food, health, livelihood, rights or global environmental change (Brauch 2003, 2004, 2004a), are not considered part of the "security" discourse as such inside Israel, where the term 'security' retains a narrow and highly focused interpretation. Even in recent years when a new environmental lobby has begun to take shape, their concerns are not considered as being of major national importance.³ This is surprising given the amount of attention given to 'land' related issues in the public

discourse. But, as will be discussed below, this is due to the political, rather than the environmental, significance of land within collective thinking. In the words of Parag (2002) Israel remains an environmental laggard in comparison to most western countries.

65.3.1 The Public Discourse: Environmental Schizophrenia

Israelis could best be described as suffering from a form of environmental schizophrenia, in the sense that there is a large gap between the amount of environmental awareness and socialization instilled into the country's population (especially the younger generation) and that of actual environmental preservation practices. At the level of high school, notions of environment are considered to be of great importance. It is common practice in Israeli schools for children to go on annual school trips and hikes throughout the length and breadth of the country as part of a process of geographic and political socialization, as well as an educational process aimed at increasing environmental awareness.

But when it comes to practice, when these children grow up, they show scant regard for any form of environmental preservation. Despite the problem of water scarcity, Israelis continue to hose their cars in the middle of the summer, irrigate water consuming lawns in the middle of the desert, and to generally waste water as though there was no scarcity.

It is not just at the level of children that notions of environment and ecology are disseminated. Israel boasts some of the world's leading research institutes dealing with issues of arid environments, water scarcity, and climatic change. The Desert Research Institute at Sdeh Boker in the Negev Desert has become one of the leading centres of global research in this field, while the Israeli Water Commission is a global leader in developing and implementing plans for desalination. The country clearly does not lack the necessary expertise or knowledge in dealing with the human security constraints imposed by the environmental realities.

On the face of it, Israel has many environmental agencies and environmental conflicts are gradually becoming part of the public discourse (De Shalit/Talias 1994; Vogel 1998). The Environmental Protection Service (EPS) was created in 1973 which, in turn, eventually gave birth to the Ministry of the Environment in 1988. To date, there are 142 designated nature reserves and 44 national parks spanning some 3,500 square kilometres, including sites of natural her-

3 For a list of Israeli environmental agencies and NGOs at: <http://www.israelemb.org/envlist.htm>.

itage, Mediterranean forests, marine landscapes, sand dunes, freshwater landscapes, desert and crater landscapes, oases, as well as sites of historical and archaeological heritage (Gabbay 2002).

But despite their formal status, the environmental and green lobby in Israel is relatively weak. With the exception of the Public and State Institutions (such as the Society for the Protection of Nature or the Jewish National Fund - both of which also have clear political agendas aimed at land reclamation and control, justifying policies of afforestation and fencing) real grass roots environmental lobby groups have only been founded since the 1990's.⁴ These are relatively small and their effective influence is very limited. The Ministry of Environment is a small, resource starved ministry. The Minister is usually appointed from amongst the junior members of the government. Ministers appointed to this position often see it as no more than a jumping point to a more 'senior' job in the future and, with few exceptions, have little expertise or interest in the particular job.⁵

The Ministry of Environment does have a seat on the regional and national planning commissions and often raises objections to planned developments on environmental grounds. All major infrastructural and regional planning proposals must be accompanied by an environmental impact survey. In most cases however, and despite the raising of objections on the part of the environmental lobby, the development agencies and other economic interests create the sort of coalitions with other government ministry representatives which enables them to go ahead with projects despite the damage that may be caused to the environment. The environmental agencies do not have any veto power in the planning commissions - they have a single vote like all other public Ministries and Agencies and, as such, are normally outvoted by development oriented agencies.

A good example of the environment - development dilemma in Israel has been the construction of the new north to south Trans-Israel highway. From the moment that the plans were announced in the early 1990's, the environmental agencies joined forces in an attempt to prevent its construction. They argued that the construction of this major highway would destroy some of Israel's few remaining areas of open space and cause ecological havoc to localized nature and water resources.⁶ The environmental

lobby further argued that rather than relieve congestion on the existing roads, the construction of the new road would bring in its wake an even further increase in the number of cars on the road. Despite these objections, the government and its associated planning agencies approved the project, albeit with some minor modifications taking into account some of the major environmental issues.

Another recent example has been the construction of Israel's new national airport, 'Natbag 2000'. This major infrastructural project was the subject of a number of environmental impact surveys. In 2002, the airport development agency was obligated to construct a new sewage purification and treatment plant to go into operation once the airport was opened, as a means of dealing with all the additional environmental hazards and wastes which would result from the operation of this facility, but this had not been completed by the time of opening (in November 2004). Despite the objections from the environmental agencies, the opening of this major facility went ahead with a vague promise that the sewage system would be developed.⁷

How do we explain this gap between environmental socialization and awareness on the one hand, and the lack of good environmental practices on the other? On the one hand (as we will discuss below) notions of security are related to military and strategic issues. As such, notions of threat, as contrasted with notions of aesthetics, are not associated with the environment. Moreover, this is an increasingly laissez faire capitalist society in which notions of the common good are gradually taking second place to the objectives of economic development and venture capital. The latter agencies and private firms have much more, in terms of finance and power, to offer the decision makers than do the relatively young and inexperienced environmental lobbies and, as such, the latter groups are often unsuccessful in their attempts to prevent harmful construction projects from taking place.

4 Note 1, op.cit.

5 David Newman: "A most important ministry", in: *Jerusalem Post*, 21 July 1999.

6 See the web site of the Environmental NGO: Adam, Teva Vedin (Man, Nature and Law) at: <<http://www.iued.org.il/>>. See also: David L. Block: "Fighting the Trans-Israel Highway", in: *Tikkun Magazine*, May/June 2000.

7 Zohar Blumenkrantz: "Ministry threatens to block new airport terminal over sewage", in: *Haaretz Daily Newspaper*, 23 July 2004.

65.4 Geopolitics and Discourses of Water Security

Issues of environmental and military strategic security are interlinked through the water geopolitics of the region. Since the establishment of Israel in 1948, the country's population has grown tenfold from approximately six hundred thousand to over six million inhabitants. Moreover, the existing population has increasingly adopted western water consumption patterns, with more washing machines and dish washers, more cars to wash, more lawns to irrigate, while former traditional societies, such as the Bedouin communities who learnt to live within a framework of stringent water limitations for thousands of years, have also begun to adopt western consumption patterns. Against this backdrop of a huge increase in demand for water, the region has suffered a growing number of drought years, significantly reducing the available supply of water for domestic consumption purposes. The growing gap between supply and demand has brought the country to extreme crisis situations on a number of occasions during the past decade, with the Kineret reservoir falling below its red line, beyond which no more water is meant to be pumped out of the lake for fear of salinity and irreversible damage, while similar situations have been reported in each of the country's main underground water aquifers.

Given the nature of the political relations between Israel and her neighbours, the lack of sufficient water resources for basic consumption needs is perceived as constituting a major geopolitical source of tension and friction. In the eyes of some analysts, the struggle for water is as likely to cause regional conflict during the next decade as are the contentious issues of oil and/or religious fundamentalism (Allan 1992; Kliot 1994; Stauffer, 1996). Within the specific context of the Arab-Israel and the Israel-Palestine conflict, water has figured prominently as a source of geopolitical contention (Shapland 1997). With the exception of Egypt, water has been a source of friction and conflict between Israel and all of her neighbours, including Jordan, Syria, Lebanon, and the Palestinian Authority.

In the case of Jordan, issues related to water and the environment figures prominently in the peace treaty between the two countries.⁸ Israel agreed, despite its own water shortage, to transfer 50 million cubic metres of water per annum to Jordan, as well as

developing joint projects for research into the more efficient usage of scarce water resources in this region. In the case of Syria, the Yarmouk River, flowing into the Jordan River, has - in the past - constituted an issue of friction between riparian States. In 1965, Syria began a dam construction project on the Yarmouk which would effectively have completely ceased the flow of water over the border into the Jordan River. Israel responded by bombing the dam and stating that any attempt to interfere in the free flow of water would be interpreted as a legitimate *casus belli*. Israel's occupation of the Golan Heights in the June 1967 War enabled it to control some important water sources such as the Banias Springs, as well as other melt flow from Mount Hermon. Much of the informal negotiations which have taken place between Israeli and Syrian representatives over potential peace agreements in the future have dealt with the issue of water as a major topic, second only in importance to the military security arrangements.⁹

In the case of Lebanon, Israel's invasion of that country in 1982 was originally intended only to reach as far as the river Litani (although, in effect, the invasion went as far as Beirut). Following Israel's pull back from Beirut to the Litani, there were suggestions on the part of both Lebanon and Syria that Israel was planning to exploit the free flowing waters from this river and to divert some of them southwards through channels to Israel (Amery 1993). In the early twentieth century (1919-1920), when power in this region was transferred from the defeated Ottoman Empire to the British and French mandate authorities, the British government attempted to demarcate the boundary between the two along the River Litani so that they too would have access to these critical water resources - in a period when the nature of water scarcity vis-à-vis a relatively small local population was nowhere near as critical as it is today.

Control of water is also central to the Israeli-Palestinian negotiations over future territorial configurations and has been the subject of numerous publications (Elmusa 1993; Shuval 1996; Shapland 1997; Amery/Wolf 2000; Newman 2000; Allan 2003d; Dombrowski 2003). Numerous discussions have been held since the signing of the Oslo Accords in 1993 and 1995 in an attempt to reach an acceptable solution concerning the distribution of water resources

9 Some anti-withdrawal groups use the strategic importance of water to persuade the Israeli public and the government not to withdraw from this region. See at: <<http://www.golan.org.il/water.html>>.

8 See Israel-Jordan Peace Treaty, Annex IV - Environment.

between Israel and a future independent Palestinian State. These talks, held under the international auspices of the Canadian government as part of the multilateral peace talks (Kaye 2001), focused on the quotas which each side would be allowed to exploit from the underground water aquifers which underlie both Israel and parts of the West Bank. In the past, these underground water sources have proved to be a major point of contention, as Palestinians have accused the Israeli Administration of using this water for the purposes of settlement construction while, at the same time, refusing to allow them to drill new wells for the basic subsistence needs of their own growing towns and village.¹⁰ The international partners to the water negotiations attempted, unsuccessfully, to persuade both sides to develop joint control and management of this important trans-boundary resource in such a way that they would derive mutual benefit from the arrangement, coupled with the more efficient exploitation of this valuable scarce resource. The two sides would become inter-dependent on each other and thus less likely to enter into renewed conflict in the future, given the danger of destroying their own water infrastructure and not just that of the other side.

During the past two decades, there have been proposals aimed at importing water from the major water surplus country in the region, Turkey.¹¹ While the possibility of a land pipeline has been ruled out because it would have to run through Syria, the laying of a pipeline along the floor of the Mediterranean Sea was considered. This too was rejected on political grounds when it became clear at one stage that the Turkish government insisted on having a transit station for the transfer of water in the occupied zone of Northern Cyprus. Originally, it was assumed that the import of water would be cheaper for the consumer than the construction of desalination plants in Israel. However, given the improved and cheaper technology for powering the desalination plants, the Israeli government eventually authorized their con-

struction assuming a similar price per cubic metre of water as that of the imported water. But given their desire not to worsen relations with Turkey who had become an important regional and strategic ally, the Israeli government agreed to sign an agreement for the import of a limited amount of water at an undefined date in the future.

The politics of water inside Israel also plays a major role in the way that this resource is managed. Given the major focus on agriculture in the first decades of Statehood (partly due to the national expression of the “return to the ancient land” and partly because of the desire to be totally self-sufficient), water was provided to the agricultural sector at a greatly reduced cost. During the past decade, Israel has moved out of agricultural branches of production which require high water inputs, although the agricultural sector continues to lobby, quite effectively, for lower costs, resulting in some cases in considerable water wastage. Notwithstanding, the siege mentality which led Israel to insist on water and agricultural independence fifty years ago is no longer relevant in a globalized world with easy access to most markets and, as such, is becoming less prominent in the Israeli security discourse. This is particularly the case with respect to water heavy products, such as cotton and even the famous Israeli-Jaffa citrus orchards, a product which is now becoming less prominent throughout the world. At the same time, Israel was the pioneer in the development of trickle irrigation techniques which greatly reduced the amount of water necessary for agricultural production, as well as the use of brackish water for certain crops.

65.5 Environmental Security and the Israel-Palestine Conflict

The Israel-Palestine conflict impacts the environment both directly and indirectly. This is as true of the conflict itself as it is of the many attempts to bring about conflict resolution and move towards a lasting peace in the region. Peace and conflict resolution brings with it the opportunity to deal with a host of social, educational, and environmental issues which have largely been pushed aside in previous periods due to the priority given to the physical and military dimensions of the security discourse. However, the supremacy of the security and conflict as well as the peace and cooperation discourses means that large-scale developmental and infrastructural projects which are put forward as a means of either ensuring security or

10 For a full analysis of the geopolitics of the West Bank waters, see the United Nations University project: *Hydropolitics along the Jordan River: Scarce water and its impact on the Arab-Israeli conflict*, at: <<http://www.unu.edu/unupress/unupbooks/80859e/80859E01.htm>>.

11 See: Ayca Ariyork: “Turkish water to Israel?”, in: *Policywatch*, No. 782, August 2003, Washington Institute, at: <<http://www.washingtoninstitute.org/watch/policy-watch/policywatch2003/782.htm>>. See also: Herb Keiron: “Water import from Turkey improved”, in: *Jerusalem Post*, 4 January 2004.

promoting peace will have a strong chance of overriding any environment or ecological related objections which may arise as a result of their implementation.

65.5.1 Securitization Discourses and the 'National Interest'

One area in which the conflict plays an important role in either degrading or preserving the environment is the virtual monopoly of the defence and military establishment in determining land use and land zoning. According to Oren and Newman (2005) almost 50% of the land surface inside Israel (not including the Occupied Territories) is influenced, directly or indirectly, by the demands and priorities of the defence establishment. This ability to use the defence-securitization discourse as a 'national' discourse overriding all other civilian and economic development interests means that the defence establishment maintains a monopoly over almost all spatial development throughout the country (Baumer 1997; Yanai 2000; Oren 2002). The role of the army and the defence establishment in determining land use zoning and development in the 'name of security', or the role of investors and development agencies in promoting large-scale infrastructural projects in the 'name of peace', can have major impacts upon the local environment, some positive but many negative (Blacksell/Reynolds 1987; Soffer/Minghi 1986). Such plans are often pushed through at great speed, in certain instances even bypassing the normal planning and legislative processes as they are portrayed as serving national objectives. In certain cases, the reverse may be true.

In some cases, the military use of land - for the purposes of military camps, or the construction of the separation fence between Israel and the West Bank - can have a serious detrimental effect on the physical landscape and the ecological balance, and will automatically be opposed by the environmental lobby. In other cases, the army insistence on leaving land untouched for training purposes (especially non-vegetated open areas in the southern coastal sand dunes), prevents its alternative use and despoliation by economic developers.

The securitization discourse is also linked with a broader discourse of 'national interest', even where the specific purpose is not always directly related to matters of military security or defence. Two of the largest projects of the past decade which have been promoted by Israeli governments have been, respectively, the mass construction of housing in the 1990's

for the one million new immigrants from the former Soviet Union, and the construction of the separation fence separating Israel from the West Bank. In both cases, the use of the 'national imperative' and 'securitization' needs of the country, as well as the immediacy of the projects, have enabled the government to undertake emergency procedures which have bypassed the civilian Planning Authorities. This has had major implications with respect to the conversion of land uses between functions (particularly from rural and agricultural to housing, developmental and commercial), which otherwise would have taken a great deal of time, discussion, and bureaucracy within the statutory planning authorities.

The implementation of both national projects has had an immediate impact on the country's fragile environmental resources. In the case of the mass construction for the Russian immigrants, the then Minister of National Infrastructure (currently Prime Minister), Ariel Sharon, succeeded in gaining emergency powers for the construction of new housing developments without the need to get normal planning authorization from either the Israel Lands Authority or the statutory planning commissions on the grounds of 'national emergency requirements' - opening the door for land privatization in Israel (in a country where, for political reasons of land control, over 90 percent of the land has been State owned - a fact which may have prevented even greater environmental degradation in the past) (Alterman 2002). In the case of the rapid construction of the Separation fence, a large swathe of land was cleared of all previous usages, including the destruction of orchards and the conversion of agricultural lands into a brutal defensive landscape consisting of barbed wire fences, concrete walls, and patrol roads. The military and defence authorities are thus able to use the argument of 'national interest' as a means of promoting or opposing many projects relating to infrastructural development or land use, a power which is not possessed by any of the civilian planning agencies.

Despite the fact that the army is such a major user of land, there is no national masterplan, even taking into account different security and strategic scenarios ranging from conflict to peace, for the security land uses in their broadest sense. The Defence establishment works on an ad hoc basis, depending on specific needs (as self-defined within the system).

In most cases, any area of land deemed as necessary for defensive purposes - however defined - is not subject to the normal scrutiny or veto power of the civilian planning authorities. But in cases of civil-

ian development, planning permission has to be coordinated with the defence authorities and they have a veto power over all civilian related development if, as they often argue, such development is detrimental to the security interests of the State, without the need to elaborate precisely what these interests are. At the same time, all regional and national plans have to be submitted to the Defence Authorities prior to their being tabled before the relevant committees. At the local and regional levels, the Defence Ministry has automatic power of veto, while at the national level it is rare for decisions to be made which negate the Defence establishment position, with agreement over major developmental issues being reached at ministerial and cabinet level.

65.5.2 The Environmental Impact of Occupation

For as long as Israel continues to occupy the West Bank and Gaza Strip, she is responsible for the management of all civilian affairs, including the economic, social, governance, and environmental issues. But given the fact that even inside Israel proper, the environmental issues are largely neglected, the Civil Administration of the Military Government (the responsible authority for the Occupied Territories) paid scant attention to such matters. For their part, the Palestinian Authority which replaced the Military Government in parts of the region following the implementation of the Oslo Accords and partial transfer of power in the mid-1990's, was too involved in creating a new administration for any serious attention to be given to what was, and continues to be, perceived as issues of secondary importance, given the continued struggle for independence and self governance. Neither does the Palestinian Authority have the necessary expertise to deal with a host of environmental issues, ranging from landscape preservation, efficient use and conservation of scarce resources, particularly water, or the preparation of environmental and ecological surveys relevant to future development and construction plans for a new State which will have to improve housing conditions and absorb tens of thousands of returning refugees.

In their report on environmental degradation, Isaac and Ghanyem (2004) lay the blame for the extremely poor situation of the local environment directly on Israeli colonization policies.¹² The report attributes the depletion of water resources, continued desertification, deforestation and the uprooting of trees, and general pollution within the West Bank, as

a direct outcome of Israeli government policies aimed at ensuring physical security (through the construction of bypass roads or the uprooting of orchards along existing roads) or furthering settlement activity (through the transfer of green areas into construction sites, the exploitation of limited local water resources, and the disposal of industrial and domestic wastage without proper treatment facilities) (Foundation for Middle East Peace 1998).

The construction of Israeli settlements throughout the region has had a major impact on the local environment (Newman 1989; Isaac/Selby, 1996; Qumsieh 1998). In the first place, the settlements have taken up a large amount of open land. Given the western suburban nature of the Israeli settlements, population densities are much lower than amongst the neighbouring Palestinian villages and towns and, as such, the amount of land consumed per family for settlement purposes is exponentially greater than in the neighbouring communities (Newman 1996). This is accompanied by the preparation of access roads, security fences, and additional infrastructural capacity which eats into the available open land resources. There has also been much dispute over the water rights of the new settlements, in many cases tapping into local water sources which are already depleted and, ironically, from which some of the neighbouring Palestinian communities are forbidden the drilling of new wells because of the 'dangers to the aquifer' which will result from over exploitation of a scarce resource.

Israel has also used afforestation as an important political means of land control. The "return to the land" dimension of the state formation process has resulted in a great deal of reforestation throughout Israel and Palestine. But in many cases, the objective of turning the brown arid desert into a green landscape has been accompanied by a political objective of asserting control over land, or preventing the use of land by Arab settlements in empty or vacant areas. Cohen (1993) has shown how the politics of planting has also been implemented in frontier and border regions, both as a territorial demarcator and also as a means of preventing the use of this land by groups whom the State deems as undesirable. Ironically, much of the afforestation, especially in the southern and more arid parts of the country, has caused some

12 For an analysis of the environmental problems in Palestine (West Bank and Gaza Strip), see: PENA (Palestinian Environmental Authority): *Environmental Strategy Plan*, Ramallah/Gaza, October 1998.

long-term ecological damage, given the non-suitability of some of the tree types used for this purpose. The same happened in the Hula swamp lands in the north of Israel. A century of over-fertilization and over-working of this small area, for many years shown to visitors as a miracle of reclamation, has now reverted to its original swamp characteristics through restoration activities.¹³

65.5.3 The Environmental Threat of Peace

It is often assumed that the transition of a region from conflict to peace will, somehow automatically, have a positive spill over effect on a host of civilian issues, including greater attention to environmental protection and conservation. Conca and Dabelko (2002) note that the issue of environmental cooperation has gone almost unexplored as a means of peacemaking, even though it opens several effective channels, such as: enhancing trust, establishing habits of cooperation, lengthening the time horizons of decision makers, forging cooperative trans-societal linkages, and creating shared regional norms and identities. Post-conflict situations are often accompanied by a desire to undertake major construction and investment projects 'in the name of peace', replacing what was done in the past 'in the name of security', despite the fact that their rapid implementation does not always take into account the negative impact on the already depleted environmental resources.

The experience of Israel and Palestine in the first decade following the implementation of the Oslo Accords is a good example of these problems. The lack of coordination between the Israeli and Palestinian authorities, when many civilian authorities and functions were handed over from the Israeli military administration to the Palestinian Authority, even resulted in the exacerbation of some environmental problems. One would have assumed that in those areas which affect the quality of life of both peoples and which have no direct implications for the political process per se, such as the joint preservation of the local environment, it would have been easiest to create new modes of cooperation. Environmental spill over from those areas under control of the Palestinian Authority should have been an obvious area of cooperation.¹⁴ But here too, the nature and extent of

cooperation is seen by each side as part of a political one-upmanship. Complaints by one side to the other are couched in political terms, blaming the other side for negatively impacting the quality of life of their own citizens, and demanding, rather than suggesting, that solutions be found immediately. What could have been a focus for new cooperative modes of activity are transformed into part of the conflict, instead of being used as a means of overcoming bridges of animosity and mutual suspicions.

Of greatest significance has been the flow of untreated domestic and industrial waste from the West Bank into Israel. This brings problems of noxious elements and provides the breeding places for mosquitoes and other human irritants. The Israeli authorities accuse the Palestinian authorities of not dealing adequately with problems of waste disposal and treatment, using this as an example of the "inability" of the PA to manage its own affairs.¹⁵ For their part, the PA points to the interference of the Israeli military authorities in their attempts to create new infrastructural projects as well as the fact that they lack the necessary economic resources for putting such programmes into effect. The PA requests the assistance of international environmental agencies to deal with these problems, arguing that they do not have the expertise or the necessary resources.

Environmentalists are particularly concerned with the expected economic effects of a peace agreement. The short period following the signing of the Oslo Accords was enough to demonstrate the large number of capital venture projects - from both local and international investors - waiting to get through the door once a situation of political stability was to emerge. In particular, one can expect major housing and construction projects, as well as investment in large tourism resorts. These will be implemented in haste, with the full backing of both Israeli and Palestinian governments eager to reap the economic dividends of peace and with little, if any, environmental checks and balances. Thus the coming of peace will prove to be a major challenge for the environmental security of the inhabitants of the region who may find that one security threat (the military and the

13 Tamar Zohary and K. David Hambricht: "Lake Hula - Lake Agmon", in: *Jewish Virtual Library*, at: <http://www.jewishvirtuallibrary.org/jsource/Society_&_Culture/geo/Hula.html>.

14 At the time of writing, this author is directing a project on behalf of USIP (the United States Institute of Peace) examining the potential role of future Israel-Palestine borders as bridges and points of contact, with a particular focus on trans-boundary environmental cooperation.

15 David Newman: "The politics of mosquitos", in: *Jerusalem Post*, 3 July 1998.

defensive) has simply been replaced with a new one (the environmental and the ecological).

Most recently, the plans for the relocation of the evacuated Gaza Strip settlers has also run into environmental problems. The government has announced its plans to construct alternative housing on the Nizana sand dunes near the coastal town of Ashqelon. But this is opposed by the environmental lobbies which argue that this will result in the destruction of one of the last remaining open sand dune areas in the country. In this case too, the government is using arguments of 'political and national need' to dismiss these valid environmental arguments.¹⁶

Finally, there has also been concern with the attempts of some Israeli companies to move their development projects to neighbouring countries and thus bypass Israeli environmental laws. It was suggested that the much touted Red Sea - Dead Sea Canal be built entirely within Jordan as a means of avoiding any potential environmental opposition on the Israeli side of the border (Bromberg/Twite 2002)

Clearly there is a need for both the Israeli and the Palestinian populations to become more aware of the security dimensions of the environmental and ecological threat facing both populations on an equal basis. The discourse needs to be transformed from that of a 'problem' to that of a 'threat', from a mundane quality of life issue to one which, if not dealt with, can cause harm to the existing population. The move towards conflict resolution and an eventual peace agreement can be used as a means of changing the environmental security discourse, but only if it is a joint effort on the part of both populations, probably with the assistance of international environmental agencies and foreign governments who are actively involved in attempting to reach a lasting political solution. The peace discourse requires that basic perceptions of what constitutes "security" in this troubled region still have to undergo structural change.

65.6 Concluding Comments

This chapter has focused on the notions of environmental security facing Israeli and Palestinian populations. Other issues of 'soft' security, such as economic livelihood, access to health and housing etc; have not been addressed in this chapter although

they, too, suffer from the hegemonic discourse given to the military and defensive securitization discourse in Israel and Palestine. Notwithstanding, Israel's welfare state policies (although these are being threatened under the current move towards a *laissez faire* economy with a great deal of privatization along Thatcherist lines) posits these issues as constituting no more than a social or economic problem rather than a threat to the security and livelihood of the people. This is particularly the case with regard to the first world socio-economic conditions of the Israeli population, although less so with regard to the third world (and worsening) conditions of the Palestinian population. The latter problems are, in turn, directly related to the political conflict, the extent to which the Palestinians are able to exercise self government, find places of employment inside Israel (or are cut off from this market place due to separation barriers and security fears on the part of Israel) and are enabled to create their own civil society institutions. The human security issues facing the Palestinian population constitute basic needs and are much more directly related to the outcome of the political conflict than are those facing the Israeli population. That does not mean to say that there is no connection between "hard" and "soft" security issues for the Israeli population. There is a constant discourse concerning the distribution of the national budget between defence related and civil society (education, health, welfare) related issues in the public discourse, but this is a question of degree and quality of life for Israelis, while for Palestinians it is increasingly becoming a basic existential and hard core security issue. These non-environmental, but nevertheless 'soft', security issues also need to be addressed as part of the ongoing security debate in Israel and Palestine. Notwithstanding, the growing economic gap between the 'haves' and 'have-nots' in Israeli society, along with a significant increase in the public discourse concerning environmental issues, is creating public awareness to the severity of these problems. But they will never replace the 'hard core' military and defensive issue for as long as the Israel-Palestine conflict (and peace process) continues to determine the public agenda.

16 Nir Hasson, "State: Nitzanim homes wont harm dunes", in: *Haaretz*, 1 June 2005, at: < <http://www.haaretz.com/hasen/spages/582878.html> >

66 Security and Environment and the Israel-Palestine Conflict

Robin Twite¹

66.1 The Environment as a Political Issue

The long conflict between Israelis and Palestinians is fuelled by many different factors: the memory of past violence, disputes over land, opposing historical narratives, religious dogmatism, demographic fears about the increasing number of the 'other' (more especially on the Israeli side), to name but a few.

At the heart of the conflict is the struggle over land, which in its turn relates to security since each community wishes to ensure its safety by ensuring that it controls a viable geographic area and has access to natural assets such as water. On each side are those who believe that only by controlling as much land as possible can their future be secure. This attitude was neatly summed up in a car sticker which appeared in the late nineties when the Israeli government was about to hand over Hebron, aside from the enclave occupied by settlers in the centre of the city, to Palestinian control. It read, in Hebrew of course, 'Hebron is Tel Aviv' - and was meant to imply that if

Israel gave up voluntarily its control of any part of the 'Holy Land' it would not be long before the Palestinians would claim that they had a right to the whole of Israel. Israeli security, according to this view, depends upon holding on to as large an area of the land between the Jordan and the Mediterranean as is possible.

From the Palestinian side similar extreme views can be heard from the leadership of Hamas, denying the right of Israel to prevent the return of refugees who fled in 1948 and rejecting the recognition of Israel which had been agreed by Chairman Yasser Arafat and the PLO in the peace accords. According to such views the Land of Palestine is seen as being an integral part of the Moslem world, inalienable, and not to be negotiated whatever the realities on the ground.

In their on-going conflict extremists on both sides have made use of the environmental argument to persuade the wider public that they must avoid compromise and that their security, their very existence, is threatened by making concessions. Mutual suspicion is at the heart of these arguments and conflicting claims are purposely fuelled by statements in the media which serve to promote fear and hostility. In the minds of the more extreme on both sides 'they', the other party, the enemy, aim only to "destroy us, to take our land, to limit and corrupt our supply of fresh water, to deliberately poison the very air we 'breathe', as a correspondent observed in 2002 in the *Jerusalem Post*. The Israeli public, suffering as it does from the traumas imposed upon it by the history of the Jewish people and the many wars fought since the establishment of the State of Israel in 1948, is particularly susceptible to such reasoning.

There is no doubt that in Israel and in Palestine perceived threats to environmental security are exploited for political reasons. Exaggeration of the dangers which each side poses to the other's long-term environmental well-being is deliberately practised in order to secure short-term political gain. Just as in the

1 This article is based primarily upon personal experience as director of the environment and water programme at the Israel Palestine Center for Research and Information (IPCRI) in Jerusalem. The programme is designed to promote understanding and cooperation between Israelis and Palestinians on environmental issues and has been in existence for over a decade. It is financed by grants from the international community and private foundations and has involved organizing many seminars and conferences on specific issues as well as promoting joint research projects. In October 2004 a major academic conference on water problems in the region held in Turkey attracted about 200 participants from Israel, Jordan, Palestine, Turkey and the international community. The proceedings were published in 2005 by IPCRI and by *Springer* in a peer reviewed book edited by Shual and Dweik (2007). Working on these activities over a sustained period has given the author the chance to assess the causes of conflict and the opportunities for future cooperation.

world wide context, the threats of terrorist action is used to obtain public approval in the USA and elsewhere for actions which would not normally be accepted without demure since they diminish individual freedom. Making a bogeyman to frighten people can be a significant and powerful tool for political manipulation. This is not to say that there are not genuine threats to environmental security in the region, but that these can be, and sometimes are, deliberately over-emphasized by groups who care not so much about the environment as about seeing their cause succeed. It is worthwhile looking at the question of how real these fears are, where there is real cause for concern, and where there is not.²

66.2 Perceptions of Regional Dangers to Environmental Security

Both Israelis and Palestinians are afraid that their environment and quality of life is being, or could be, compromised by the action of the 'other'. There are certain concerns which are especially important for both sides. The two most evident today relate to water and the ways in which solid and hazardous waste are disposed of. In the last two years an additional adverse element has been added to the situation in the construction by Israel of the new 'separation fence' as it is known in Israel official terminology, or wall (as it is popularly known among Palestinians), being built between Israel and the Palestinian areas in the West Bank. The fact that the fence is largely built on Palestinian land has added yet more fear and suspicion to the relationship between the two communities. It is viewed quite differently by the two parties. It is seen as improving the security of the State by most Israelis, and by Palestinians as harmful to their quality of life, affecting the livelihood of those living near it, and damaging the environment for no good reason.

66.2.1 Water

The idea that a perceived enemy can control the supply of water to your home or to your farm, is deeply

worrying. This fear affects both Israelis and Palestinians. The fear of being deprived of water is an atavistic one. Israel has always been concerned that if it did not have control over its water sources, neighbouring states might cut the supply. These fears are given added point by the fact that so much of Israel's surface water reaches the country from sources in Syria and Lebanon, and its ground water from aquifers which it shares with the Palestinians. Israel's policies are designed to protect the status quo. The violence of the Israeli reaction when in 2002 the Lebanese government sought to divert for their own purposes part of the present flow of water from their country into the Jordan, showed how strong the drive to maintain control over water is. Fears of water contamination by terrorists are also taken very seriously. A special unit within the Israeli Defence establishment exists solely to guard against any attempt to introduce toxins into the water system or otherwise interfere with water supply. The work of this unit includes pioneering research designed to ensure that systems which have been attacked can be detoxified within a short period of time. Some Israeli experts undoubtedly believe that the failure of the Palestinian authorities to treat urban waste water (Israel treats over 65% of its urban waste water and plans to increase this figure dramatically over the next two years) derives not only from the difficulties experienced as a result of the on-going conflict, but from a deliberate intention to use the fact that untreated waste water can pollute the shared aquifer as a bargaining card. This contention is disputed by the Palestinians who claim they have done their best, but that violence and political tension have made it impossible to deal with the problem effectively. Whatever the truth of this, raw sewage still flows into the wadis of the West Bank and into the Mediterranean Sea from Gaza. This dispute about what is the real state of affairs is derives directly from the atmosphere of suspicion which exists between the two sides.

On the Palestinian side, fears that Israel will use its control over water supply to control them in the event of an emergency are always evident. This was demonstrated recently when an Israeli offer to build a desalination plant and supply water to the north of the West Bank was greeted suspiciously by Palestinians who were concerned that if such a plant operated under Israeli control, the Israelis might be able to "turn off the tap" if a confrontational situation should arise.

Palestinian suspicions about Israeli intentions are fed by their feeling that Israel is taking far too large a

2 This chapter is based on both personal observations of the author and the following scientific sources: Bulloch/Darwish, 1993; Curtin/Charrier 2004; Daibes 2003; Haavisto 2003: 535-562; Jägerskog 2003; National Research Council 1999; Twite 2003: 563-572; UNEP 2003c.

share of the water from the mountain aquifer which runs beneath the land upon which they live, as well as beneath Israel. They claim their human rights to the water are being infringed upon and though international law on this point is by no means clear, the fact is that there is among them an abiding sense of having been cheated out of something that belongs to them by right (see Dajani's chapter in this volume).

However, in spite of this somewhat forbidding situation, professionals in the field from both Israel and Palestine have recognised that they need to cooperate. While Israel has maintained control, the Israeli Water Authority has sought to ensure that water supply to the Palestinians is maintained, and allegations that cutting off water supply to Palestinian communities in order to bring them to heel has been a practice of the Israeli authorities have not been easy to prove. Though of course the violent conflict of the past five years has damaged infrastructure in the Palestinian areas (chap. 67 by Dajani).

The Joint Israeli/Palestinian Water Committee established after the Oslo Peace Accord still functions and handles day-to-day business of water supply and quality control. Mekorot, the Israeli company which acts as the executive arm of the Water Commission in supplying water to Palestinians, services water networks in many parts of Palestine in collaboration with Palestinian local authorities. These are positive realities on the ground.

Another encouraging fact is that though the Multilateral Initiative relating to environment which was initiated after Madrid has largely collapsed, the part of it which relates to water concerns is still active. The Multilateral Initiative was designed to provide a forum where representatives of the international community met with Israelis and Palestinians to undertake action which would help improve the situation with the help of outside donors. In the field of water management some useful, though relatively minor, things have been done (notably in the fields of training and the sharing of data)³.

It is also worth noting that shortly after the second intifada broke out in 2000, both the Israeli Water Commissioner and the Head of the Palestinian Water Authority signed a joint declaration asking all concerned in the violence to try to avoid damage to water installations. Plans outlined by the Israeli Water Commissioner at a conference in Stockholm in

August 2004 include the supply of desalinated water to the Palestinian Authority and encouraging the Authority to treat waste water from Palestinian towns to a level where it can be used to replace fresh water in order to meet almost all agricultural needs.

To sum up the reasons for conflict in the area of water rights, water supply and distribution are clear but there are some encouraging facts also in evidence. These, in effect, constitute a recognition that both sides have to work together whether they want to or not. But suspicion between the two sides runs deep. While professionals on both sides appear reasonably optimistic, the general public and politicians are sceptical and easily lend an ear to voices which warn against the intentions of the other side.

66.2.2 Solid and Hazardous Waste

All advanced societies today are concerned with the amount of waste they generate and what to do with it. Israel and Palestine, though at different stages of development, both face considerable problems in this area. In Israel the problem of solid waste disposal has been tackled with resolution over the last decade; almost all small dumps have been closed and replaced by large 'state-of-the-art' sites and a central facility for the disposal of hazardous waste created at Ramat Hovav in the Negev. But there remain problems. Not all hazardous waste reaches the central facility and little has been done to clear up the sites that are now closed, some of which are highly toxic. .

In the West Bank and Gaza the situation is deplorable. Of over two hundred and fifty unlicensed dumps in operation, many are a hazard to health. The Palestinian Authority, with the support of the World Bank, attempted to deal with this problem by planning for the construction of two large state-of-the-art facilities for storing waste, one near Jenin in the North of the West Bank and one near Hebron in the south. These were to have collected waste from large areas and in effect solved the problems of the north and south of the West Bank (though not of Jerusalem and its environs). In the event, the facility at Jenin was almost completed but its utilization has been prevented by the Intifada since 2000, while the one in Hebron was never even started because of disputes about finding a suitable site. Israeli interventions in this area have not been helpful since the proliferation of road blocks, limitations on the movement of trucks, and other factors of this kind have made it still more difficult for waste to be disposed of effectively.

3 Jacob Keidar: "Israeli/Palestinian Water Issues", paper for seminar of water problems in Israel and Palestine delivered at the Stockholm Water Week, August 2004.

Figure 66.1: The Security Fence Separating Israel and the West Bank. Photo © Gershon Baskin. Publication permission was granted.



In addition, hazardous waste is not properly recovered and dealt with. While all hazardous materials entering both Israel and the Palestinian Authority areas are monitored by Israel and the Palestinian Authority when they come into country and certificates issued, the ultimate fate of the hazardous material going to Palestinian recipients is not monitored. Arrangements envisaged under the Oslo Agreements for the treatment of waste material resulting from the use of such hazardous materials have not been carried out. Fortunately, the amount of hazardous material used by Palestinian factories and hospitals is relatively small, but failure to treat it poses an environmental threat both to water quality and to public health.

Palestinians also regularly claim that Israel has secretly buried some of its hazardous waste in the West Bank (chap. 67 by Dajani). It is undoubtedly true that there have been incidents in the last few years in which hazardous waste was transferred to West Bank locations, but there is no proof that this is government policy. It seems that this is the work of contractors anxious to avoid the costs of having the

waste destroyed at the Ramat Hovav facility, which is high.

Over and above the question of hazardous substances used in industrial processes or in hospitals, there remains the question never discussed openly in Israel but raised from time to time in Palestinian and other Arab media: the disposal of waste from the atomic facility at Dimona. Palestinians claim that there is a threat to their security and rumours circulate to the effect that such wastes have been buried secretly in the West Bank by Israeli contractors. There is, however, no way of knowing what the facts are in this case.

What is not in doubt is that the failure of the Israelis and Palestinians to work together on these issues regarding waste constitutes a threat to public health and to the quality of life of both communities, since diseases and noxious insects can readily travel from a Palestinian waste disposal site to Israeli communities, and practices like burning waste simply because there is nowhere to store it are harmful not only to the Palestinians living nearby but also to the wider community of both Palestinians and Israelis.

Figure 66.2: The Security Fence Separating Israel and the West Bank. Photo © Gershon Baskin. Publication permission was granted.



While in relation to water there are encouraging signs of cooperation, no such positive features can be currently perceived in relation to more far-reaching environmental cooperation, though there is talk of reviving the Environmental Technical Committee which was established as part of the Oslo agreements to help work on environmental problems and which ceased to function in 1998.

66.2.3 The Security Fence and its Environmental Implications

The security “fence” (only a small proportion of the “fence” is an actual wall and the rest a three meter high chain link barrier protected by ditches) is undoubtedly environmentally detrimental. There seems little doubt that it will adversely affect the flow of surface water, it takes up a great deal of land and it is visually repulsive. In addition large numbers of Palestinian farmers are cut off from their land by the wall and their freedom of movement to their land restricted... Arguments for its construction derive, of course, from the Israeli belief that it will help to prevent suicide bombers from crossing into Israel, and it

has to be remembered that about 1,000 Israelis have been killed by suicide bombers or other violence in the period from 2000 to 2004.

These arguments would be more convincing if the wall had not been built almost entirely on land which was part of the West Bank before 1967, so that it appears to be designed as a ‘land grab’. Israeli official sources claim that water supply has been maintained to Palestinian villages affected by the fence and that only 4 per cent of the wells supplying the West Bank will be cut off from the West Bank by the fence. They also claim that provisions have been made for farmers cut off from their land by the wall to cross the fence at special checkpoints (something Palestinians dispute), and that discussion taking place in January 2005 may result in substantial readjustments to the route to be taken by the fence so as to take account of Palestinian objections. Palestinian sources dispute most of this and more especially the account of the number of wells affected (see Dajani, *op.cit.*).

From an environmental point of view, the fence has nothing to recommend it. But from a security point of view Israel may well feel that it has already cut the number of attacks on its citizens by Palestini-

Figure 66.3: The Security Fence Separating Israel and the West Bank. Photo © Gershon Baskin. Publication permission was granted.



ans. There have been far fewer attacks in those areas where the fence is already completed. Israel has also shown a limited willingness to change the route in order to accommodate particular objections by specific Palestinian communities. But this is a case where the claims of security (as far as Israel is concerned) and the claims of the environment are in head-on collision. No effective solution to this problem is even remotely on the horizon at the time of writing, though a dramatic improvement in the general political climate could in the long run render the wall superfluous.

66.2.4 Mitigating the Adverse Effect of Potential or Actual Environmental Conflict in Israel and Palestine

While it is clear that environmental issues are adversarial in the region, opinions differ as to how far they might become the source of actual violent conflict. A variety of opinions have been expressed, but the majority opinion holds that it is not likely that the countries of the region would actually become involved in prolonged armed conflict because of dis-

putes over such things as water rights, and distribution, or the adverse effect of the security fence. There might be occasional incidents, but not more. However, whether or not actual violence results from environmental concerns and their perceived relationship to security, more can, and should be done to provide mechanisms for the diffusion of potentially dangerous disputes.

66.2.5 New Mechanisms for Conflict Management and Resolution

Given the amount of suspicion there is between Israelis and Palestinians, there is an acute need for mechanisms which will help the two sides work together on their problems. They need to have the feeling that their environmental interests are recognized by the other side as being of importance and are being given attention. It goes without saying that mechanisms alone will not be enough, an atmosphere of trust and cooperation has to be created, but structures and innovative ideas have their place in creating such an atmosphere.

66.2.6 Role of Non-Governmental Organizations (NGOs)

Given that official channels are rather limited in their ability to foster cooperation as a result of the overpowering nature of political dispute, NGOs in the region have a role to play in creating a more positive atmosphere. Effective NGO actions will foster cooperation and thus by easy stages to a greater sense of security among all those concerned. Over the period since the Oslo Agreements were signed, the work of NGOs such as FOEME (Friends of the Earth Middle East) and of IPCRI (the Israel Palestine Centre for Research and Information) which are directed jointly by Israelis and Palestinians (and in the case of FOEME, Jordanians) has had a positive effect on dialogue over environment between the two communities.

Friends of the Earth has stimulated a dialogue between regional stakeholders on the future of the Dead Sea which has done much to illustrate what the problems are in relation to the future of the Sea itself and the surrounding region. An innovative project on promoting water awareness among Palestinian and Israeli rural communities has also had some success. IPCRI has sought to supplement the work of the Joint Water Committee by creating a whole series of seminars and other activities involving water professionals, culminating in a four day academic conference on *Water for Life in the Middle East*, attended by some 180 participants from the region and outside it.⁴ In addition, IPCRI (in collaboration with the Consensus Building Institute in Boston, USA) has trained some twenty Israelis and Palestinians in the techniques of environmental mediation. Many of these are now working in the field. Such efforts cannot resolve problems or give security to the peoples of the region, but they can help create an atmosphere where concerns about security are talked about in a logical way, in a positive atmosphere, and without hysteria or extremist bias.

Just as significant as the work of these two organizations are collaborative research projects involving academics from both sides. These have been initiated by both Israeli and Palestinian NGOs and institutions of higher education, among them the Palestinian Hydrology Group, the Applied Research Institute in Bethlehem, the Truman Institute for Peace at the Hebrew University, and the Israeli based Arava Insti-

tute. All these have at various times brought together scientists and researchers from both Israel and Palestine in a framework which permits of genuine cooperation.

66.2.7 Involvement of Third Parties – Providing Appropriate Mechanisms to Facilitate Cooperation

The effective and long-term involvement of third parties could do much to ease tensions in the region. In 2002, the United Nations Environmental Programme (UNEP) undertook a study of the environmental problems of the West Bank and Gaza which it wished to serve as a basis for dialogue between the two sides. It included a long series of recommendations directed both at the Israeli government and the Palestinian Authority, designed to improve the effectiveness of their environmental policies and their ability to cooperate effectively with one another. Unhappily, this report fell on stony ground. Neither party has, as yet, taken any significant steps to implement its recommendations.

However, this report did serve as an example as to how, if both parties agree, an outside player can have potential significance. Other donors with influence in the region have also from time to time played a significant part in promoting cooperation. The 'behind the scenes' role of the U.S. Agency for International Development (USAID) in supporting the work of the Joint Water Committee is an instance of this.

In the long term the provision of a mechanism whereby representatives of United Nations (UN) organizations, donors, and international organizations such as the World Health Organization can serve on joint Israeli/Palestinian committees and help to find solutions to thorny problems, would be very advantageous to the long-term environmental security of the region.

Various ideas currently being discussed in environmental circles about creating an international body with the ability to adjudicate environmental disputes are also relevant in this context, though it is doubtful if at this time either side would be interested in outside mediation. This, however, could change if the general political climate were to improve. In a situation where lack of trust is perhaps the main obstacle to general security and environmental security, since neither side can change its attitudes because of deep-rooted distrust, third parties have much to offer.

4 See proceedings of the Conference published by IPCRI in 2005; Shuval/Dweik (2007).

The establishment of frameworks within which Israelis and Palestinians can meet on a regular basis to discuss problems and deal with them (perhaps with the participation of a third party as suggested above) would seem to be a necessary step. Joint bodies representing government, local authorities, and other stakeholders should be established to deal with such matters as hazardous waste disposal, management of shared aquifers, or protection of nature reserves, which are important to both societies. These would report to the appropriate ministries in the two countries and help to maintain a network of contacts and ensure that both sides were fully informed of the other's concerns.

It might also be worth considering the establishment of an Israeli/Palestinian Advisory Committee made up of individuals serving in their private capacities nominated by government and other stakeholders. The Advisory Committee could be provided with a small secretariat to monitor the progress of joint agreements and draw attention to issues which needed the intervention of both governments, if they are to be dealt with effectively. Such a body should be supported by an outside donor in order that it has a degree of independence from either government.

Another interesting suggestion is that the management of all the water resources of the region should be entrusted to an independent organization or even a private company which would include in its management structure both Israelis and Palestinians together with outside experts. Difficult as it is at present to see either side agreeing to something of this kind, the idea warrants further consideration.

Altogether the present situation where contacts between the two entities, Israel and Palestine, are so limited, demands an imaginative effort to break down barriers and introduce new mechanisms for thinking together about both immediate problems such as those posed by the security fence and long-term developments, such as global warming, which threaten all the people of the region.

66.3 Conclusion

Environmental security is a necessity for Israel, Palestine, and the neighbouring countries. This can only be achieved if they work together through appropriate mechanism on a long-term basis. These should permit both sides to express their views, share in decision-making, and help to implement them. They should also in due course allow for the participation

of Jordan representatives and those of other neighbouring countries. The region is too small for the environment to be managed on a strictly national basis with each national entity making its own decisions irrespective of what is being done elsewhere. Obtaining environmental security implies trust and can probably only be reached once the general political climate has somewhat improved, but planning should be done in advance so that when the situation permits action can be taken. All those involved should try to make sure that those who live in the region are provided with facts, not alarmist speculations designed to fuel conflict and serve direct political ends. The main outlines of the Israeli/Palestinian environmental conflict itself, the reasons for it, and the difficulty of dealing with it, are all clear. What is needed now is an equally clear concept as to what needs to be done in order to secure security and trust for the peoples of the region.

67 Conceptualization and Debate on Environmental and Human Security in Palestine

Mohammed S. Dajani Daoudi

67.1 Introduction

There has been an impressive range of academic studies on environment in Palestine as well as military, political, and economic security. However, the issue of environment and security has not been sufficiently seriously addressed by scholars and experts in the field. Although this chapter will focus primarily on the environmental security challenge, it will also analyse the related political environmental concerns. The Palestine National Authority (PNA) maintains that Palestinian environmental problems are primarily “due to violent Israeli occupation practices on the ground, including the confiscation of land, illegal settlement activities, the uprooting of trees, the destruction of Palestinian agricultural land, the use of Palestinian occupied lands by Israel as dumping ground for poisonous industrial waste, and the exhausting of water resources and the polluting of the water ground reservoirs by settlements”. This chapter argues that the PNA also bears a heavy responsibility for the poor environmental conditions in the Palestinian Territories. So far, not much has been done to link PNA environmental policy to security and environmental reconstruction¹.

In Rio in June 1992, the United Nations Conference on Environmental Development (UNCED) drew world attention to the need for regional as well as global cooperation to achieve sustainable development by stressing the inevitable link between national security and the environment. To bolster this link, governments are faced with the challenge of formulating proper policies and laws that would balance security with environmental concerns as called for in Agenda 21: “Integration of environmental and developmental

concerns and greater attention to them will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future.”

As a result of the escalation of violence in Palestine and Iraq, the Middle East region is now experiencing one of the most disturbing environmental turbulences in its modern history. As expected, the negative impact of those two conflicts on the environment is causing profound regional concern. Attracting wide public attention by the early 2000's, environmental security unmistakably has become a principal regional issue (UNEP 2003c).

67.2 Overview and Basic Data on Palestine

Palestine is located on the east coast of the Mediterranean Sea, west of Jordan and south of Lebanon. The territory of Palestine covers around 10,435 square miles of which 10,163 square miles is covered by land, and the rest is water: half of the Dead Sea, Huleh Lake which was dried by Israel, and the Lake of Tiberias or the Sea of Galilee. The 1967 Israeli occupation has divided Palestine into the West Bank and the Gaza Strip. The total area of the West Bank covers 5,820 km², while the Gaza Strip covers 365 km².

The West Bank is characterized by a great variation in elevations ranging between 1,020 metres above and 375 metres below sea level. The highest point is near Kherbet Khillan north of Hebron City and the lowest point is at the north-eastern tip of the Dead Sea. The West Bank is divided into four major regions: Nablus Mountains, Jerusalem Mountains, Hebron Mountains, and the Jordan Valley. The mountains extend over the length of the central part of the West Bank from Jenin in the north to Hebron in the south. The drainage and valley systems originate from

1 The chapter is also based on the following references: Bashir/Winkelstein 2004; Haavisto 2003; IPCRI 2001; MENA 1999, 2000; Oka 2003; PASSIA 2003; PEC DAR 2001, 2004; PWA 1996, 1999.

the mountain range and extend either eastwards or westwards (ARIJ 2001).

- The *Nablus Mountains* extend from Marj Ben Amer in the north to the Jerusalem Mountains in the south. The water divide separating the western and the eastern basins coincide with the summits of these two mountains. The elevation range between 750 and 800 metres, with Mount Ebal reaching 918 metres above sea level.
- The *Jerusalem Mountains* consist of three main groups, the hills of the eastern slopes (100 to 250 metres), central mountain crests (750 to 880 metres), and the hills of the western slopes (250 to 300 metres). The highest point is located between Deir Jarir and Silwad.
- The *Ramallah Mountains* include the eastern slopes, the mountain crests, and the western slopes (250 to 500 metres). The mountain crests from the watershed line separate the eastern and western slopes. Elevation ranges between 750 and 800 metres. The highest point in Ramallah district is 1,022 metres at Tel A'sour and the lowest elevation is 24 metres below sea level at the southeast corner of the district.
- The *Hebron Mountains* on the southern rim of the West Bank are located south of Jerusalem and extend to the Negev. They are 850 metres above sea level near Kherbit Khellan north of Hebron City, and the highest elevation of 1,011 metres is in the Halhul area. The eastern slopes where elevation drops from 1,011 to 100 metres characterize the eastern part of the district. Here, most built-up areas are located between 600 and 1,000 metres.
- On the eastern boundary of Palestine the *Jordan valley* is part of a long and deep depression of the earth's crust (Jordan Rift). The Jordan valley has a semi-tropical climate characterized by hot summers and warm winters. However, without access to water this region is desert-like.

The Gaza Strip is a foreshore plain gradually sloping westwards. In the north there are four ridges: the coastal ridge, the Gaza ridge, the el Muntar ridge and the Beit Hanoun ridge with elevations ranging between 20 to 90 metres (ARIJ 2001).

The political structure of Palestine is still in the process of development. Following the signing of the Declaration of Principles in 1993, the Palestinian Authority (PA) was established. According to the 1995 Oslo II Agreement, the control over the Palestinian areas is divided into three sectors: Sector A remains under Israeli control, Sector B falls under Palestinian

control, and Sector C is under joint control. This division has left its effect on the environmental security situation.

67.2.1 Environmental Strains, Threats, and Problems

Palestine has been suffering from severe environmental strains, threats and problems, among them the deterioration and pollution of groundwater resources, scarcity of water resources, the smallness of the land, rapid population growth, contamination of the aquifers from waste water, industrial and medical waste, landfills and hazardous waste, shortcomings in environmental legislation, soil erosion, and low level of public services on waste water and solid waste management (UNEP 2003c; Twite 2003).

Furthermore, Palestinian environmental protection and development has been subjected to two different, conflicting and incompatible practices and strategies - i.e. Israeli and Palestinian - that have resulted in further environmental deterioration. The persistent Israeli occupation had undermined to a great extent Palestinian efforts to tackle domestic environmental problems, at times creating new ones such as those caused by Israeli military action, building new or expanding old settlements, or those created by what the Israelis call the Separation Security Wall and the Palestinian vocabulary refers to as the Apartheid Wall. An advisory opinion was rendered on 9 July 2004 by the International Court of Justice on the "Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory." The Assembly noted the detrimental impact on Palestinian natural resources being caused by the unlawful construction of the wall by Israel inside the occupied Palestinian territory, including in and around East Jerusalem, and of its grave effect on the economic and social conditions of the Palestinian people. The outbreak of the *Al-Aqsa Intifada* in September 2000 and the subsequent Israeli re-occupation of the West Bank and the continued military operations in the Gaza Strip led to a serious deterioration in the political and economic conditions, leaving devastating effects on the environment.

The continuing violence and conflict in the Palestinian territories threaten the lives and livelihoods of the population. The United Nations World Food Programme conducted a vulnerability assessment in which it reported that an estimated 38 per cent of the population lacks sufficient food, while a further 26 per cent are at risk. In the Gaza Strip alone, food in-

security rates reached as high as 66 per cent in Rafah, 56 per cent in Jabalia, and 40 per cent in Khan Younis.

67.2.2 The Peace Process and the Environment

The Oslo I Accord of 1993 contains in Annex III a provision that both parties agree to establish an Israeli-Palestinian Committee on Economic Cooperation focusing, among other matters, on environmental issues such as water, energy, and industry. The two parties also agreed to develop an environmental protection plan, providing for joint and/or coordinated measures. According to the Oslo II Accord of 28 September 1995, issues related to water rights were to be negotiated in the permanent status negotiations. The Israeli-Palestinian Interim Agreement on the West Bank and the Gaza Strip, Appendix I, Article 40, Principle I, stipulates that "Israel recognizes the Palestinian water rights in the West Bank. These will be negotiated in the permanent status negotiations and settled in the Permanent Status Agreement relating to the various water sources." Under Article 12 of Annex I to the Accord, which deals specifically with environmental protection, the Israelis transferred powers and responsibilities to the Palestinian side to undertake limited environmental management activities in the West Bank and Gaza Strip.

The Oslo Accord divided the West Bank and Gaza Strip into three types of areas; A, B, and C. Areas A are under Palestinian control, areas B are under joint Palestinian and Israeli control, and areas C are under Israeli control. Israelis and Palestinians agreed to cooperate on the basis of mutual understanding and shared responsibility in virtually all areas of environmental protection. Both parties agreed, pursuant to their environmental and developmental policies, to the following;

- Prevent damage to the environment and take measures to ensure that activities in areas controlled or managed by one party do not cause environmental damage to areas controlled or managed by the other;
- Adopt, apply, and comply with internationally recognized environmental standards concerning emissions and effluents;
- Prevent uncontrolled discharge of waste water and effluents to water bodies and promote proper treatment of waste water, solid, and hazardous wastes;
- Ensure that a comprehensive environmental impact assessment (EIA) is conducted for all major

development programmers specified in the Accord;

- Take precautions to prevent water and soil pollution as well as other environmental safety hazards;
- Take measures to prevent noise, dust, and other disturbances from quarries.

To ensure effective collaboration on the environmental issues identified, the parties established a Joint Environmental Experts Committee (JEEC). However, the outbreak of the Al-Aqsa Intifada in September 2000 resulted in the suspension of all Palestinian-Israeli cooperation on environmental security. Since its establishment in 1994, the PNA gave little attention to the management of the environment and other similar issues such as waste water, domestic solid waste, industrial waste, hazardous waste, and noise and air pollution. Reports and studies on environmental protection funded by donors and prepared by international consultants assisted by local experts remained unfulfilled. In 1996, the Ministry of Planning and International Cooperation (MOPIC 1996, 1996a, 1996b, 1998, 1999), the agency then responsible for environmental planning within the Palestine National Authority (PNA), took the initiative to prepare an Emergency Natural Resources Protection Plan. This plan was the first step towards the protection of the natural and cultural environment in Palestine from environmentally harmful development projects and programmes. In October 1999, the Palestinian Ministry of Environmental Affairs published the Palestinian Environmental Strategy (PES). Its objective was "to identify and analyse the main environmental problems and their causes in Palestine, define environmental objectives and to introduce a series of prioritized measures that will lead to reaching these objectives." The study was intended to be "a first step towards establishing [a] healthy and clean environment for present and future generations." The PES distinguished nine environmental themes to be addressed in the coming decade:

1. Depletion of Water Resources;
2. Deterioration of Water Quality;
3. Depletion of Natural Resources;
4. Land Degradation;
5. Air and Noise Pollution;
6. Marine and Coastal Pollution;
7. Deterioration of Nature and Biodiversity;
8. Landscape and Aesthetic Distortion;
9. Threats to Cultural Heritage. In April 2000, the Ministerial Council approved the Palestinian Envi-

ronmental Assessment Policy as proposed by the Ministry of Environmental Affairs.

Article 1 lists the definitions of 18 major terms used in this policy, but not included among them is the term Environmental Security. The Palestinian Environmental National Authority (PENA), a centralized environmental authority responsible for environmental management in Palestine which succeeded the Ministry of Environmental Affairs, has been entrusted with the following tasks:

1. Preparing a national environmental policy and plan;
2. Setting environmental protection standards for air, water, and land;
3. Cooperating with other ministries and NGOs in the field of environmental protection;
4. Conducting international environmental linkages;
5. Setting environmental legislation and overseeing the enforcement of the legislation;
6. Establishing adequate monitoring networks (laboratories and monitoring stations) to collect information and to present this information to the public;
7. Conducting environmental impact assessment (EIA) studies for proposed projects before licensing;
8. Promoting environmental education and public awareness.

67.3 Environmental Threats to Palestinian National Security

In Palestine, environmental threats to national security may be classified in two major categories: a) as *domestic environmental security challenges*, such as water, solid waste mismanagement, waste water pollution, air and noise pollution, land misuse and land degradation; lack of environmental legislation and enforcement; and b) *External Environmental Security Threats*, including: i) Israeli military occupation, ii) Israeli settlements, iii) Israeli separation/apartheid wall, iv) uncontrolled chemical imports from Israel and releases of hazardous materials in Palestine, and v) illegal dumping of hazardous waste imported from Israel.

67.3.1 Domestic Environmental Security Threats

The West Bank and Gaza Strip are poor in natural resources. The only known natural resources are rocks,

sand, and minerals of the Dead Sea. The mineral resources in the West Bank and Gaza Strip are still undetermined. Only a few geological studies have been conducted. These resources are being exploited by the following activities:

1. Sand in Gaza is currently overexploited for building purposes.
2. Palestinians and Israelis in the West Bank carry out rock quarrying.
3. The Israelis are extracting the minerals of the Dead Sea extensively.

Palestinians cannot benefit from these natural resources due to restrictions imposed by Israel. The Dead Sea includes high concentrations of KCl, NaCl, MgCl₂, and Br₂. The diversion of water at the upper part of the Jordan River through the Israeli national carrier system has resulted in a drastic drop in the sea level by 15 metres since 1955 (Ecopeace 1997). The natural resources of the West Bank remain negatively affected by the Israeli Occupation. The systemic uprooting of trees, destruction of agricultural land, and confiscation and destruction of the water supply is devastating. The building of the separation or apartheid wall intensifies these problems in the surrounding areas and poses immediate and long-term destruction and degradation to the Palestinian environment and natural resources. [See the report prepared by the UN Economic and Social Council, and presented to the General Assembly on 24 May 2005, on the economic and social repercussions of the Israeli occupation on the living conditions of the Palestinian people in the occupied Palestinian territory, including Jerusalem.]

67.3.1.1 Water

The Middle East is one of the world's most water-stressed regions. This made water a politically highly sensitive issue in the Arab-Israeli conflict. Since its 1967 occupation of the West Bank and the Gaza Strip (OPT: Occupied Palestinian Territories), Israel has almost completely controlled the water available to the Palestinian population. According to the Oslo II Interim Agreement (Annex III, Appendix 1, Article 40), Israel has recognized Palestinian water rights in the West Bank, however, it has not implemented that agreement and continues to deprive Palestinians of their fair share of water. The main sources of water available to Israelis and Palestinians are (i) the Jordan River and (ii) groundwater underlying the occupied West Bank and coastal areas.

The impact on the water supplies for the areas around the apartheid wall is a serious concern. Many water wells are lost for communities near the wall. In villages around Qalqiliya and Tulkarem the Palestinian Hydrology Group (PHG) has listed 30 wells lost in the first phase of the apartheid wall. Those 30 wells have a total discharge of 4 MCM/year. These groundwater wells are located in the Western Groundwater Basin and were drilled prior to 1967. As a result, Palestinians stand to lose nearly 18 per cent of their share of the Western Groundwater Basin (PENGON, 2002).

Water Consumption. The average (renewable) quantity of fresh water available in Israel and the OPT per year is slightly over 2.4 billion cubic metres. Israel allocates approximately 90 per cent of this amount to itself, leaving the Palestinian population just over 10 per cent. If water resources were divided into equal per capita shares, Palestinians would receive approximately 45 per cent. As a result of these severe Israeli restrictions on the Palestinian water supplies, each of the approximately 3.3 million Palestinians living in the OPT receives less than 100 litres per capita per day. This is far less than the 150 litres per day recommended by the World Health Organization as the minimum per capita water need. The average Israeli uses 353 litres of water per day, 3.5 times the water Israel allows the Palestinians. Israeli settlers living illegally in the OPT use up to nine times as much provided to Palestinians. This discrimination by Israel violates the human right to water as recognized by the United Nations. The low water consumption affects the sewage quality. This results in a strong waste water in terms of Biochemical Oxygen Demand (BOD) and suspended solids. The BOD of raw sewage in the West Bank averages 600 mg/l. Sewage networks serve approximately 25 per cent and 45 per cent of the population of the West Bank and Gaza Strip respectively (PWA 1999). Sewage networks are mainly found in major Palestinian cities, but parts of the networks are poorly designed and suffer from leakage.

Israeli Control of Water. For nearly four decades of its military occupation, Israel has assumed near complete control over all Palestinian water sources, thus depriving Palestinians of their right to control their own natural resources. Discriminatory measures adopted by the Israeli occupation authorities include:

a.) **Restricting Drilling of New Palestinian Water Wells or Pumping Existing Wells.** Israel's control over Palestinian water resources has resulted in the destruction or closure of hundreds of Palestinian

wells and sharp restrictions on pumping existing wells. According to the Palestinian Water Authority, Palestinians were allowed to dig only 13 wells between 1967 and 1996, less than the number of wells which dried up during the same period due to Israel's refusal to deepen or rehabilitate existing wells (B'Tselem 2000). Even the Oslo II Interim Agreement was insufficient to maintain the per capita water allocations to Palestinians, as the additional water was insufficient to keep pace with the growth of the Palestinian population.

b.) **Restricting Palestinian Access to Water Sources.** Lands adjacent to the Jordan River were declared 'closed military zones' and Palestinian farmers could no longer use the area for irrigation. Areas with freshwater springs were classified as 'nature reserves' where access is limited or requires payment (B'Tselem 2000). In addition, illegal Israeli settlements are provided running water by connecting the Israeli National Water Carrier, while Israel refuses to provide running water to many villages on whose land such settlements are built.

c.) **Palestinian Water Rights.** Under international laws relating to belligerent occupation, Israel as an occupier to the West Bank and Gaza Strip has an obligation to use Palestinian water resources only to the extent necessary for the maintenance of its military occupation. It is not permitted to appropriate the water of the occupied territory for the use of its own civilians, much less for illegal settlers. Israel has done precisely this, in violation of its obligations under international law.

67.3.1.2 Solid Waste Mismanagement

Solid waste includes waste from household, medical, and industrial activities that is the responsibility of municipalities, village councils, village communities or UNRWA in the refugee camps. Solid waste has accumulated inside Palestinian cities and towns due to the closure of many landfill sites serving cities and population centres, and the prevention of waste disposal teams from reaching these landfills. For example, the Northern Gaza landfill and Gaza City landfill were closed and access prohibited. The roads, highways, and fields are littered with uncollected garbage containers, plastic bags, empty bottles, paper tissues, and other refuse revealing a widespread lack of environmental awareness and concern. Solid waste is dumped everywhere, sewage streams are flowing in many areas and air pollution from burning of solid waste, quarries, and vehicles is evident. Due to the absence of efficient collection systems and lack of law

enforcement, solid waste is dumped everywhere. None of the dumping sites assigned by municipalities are fenced, lined or monitored. The violent conflict resulted in a stop of many solid waste projects especially of landfill construction projects, including the Ramallah and Bethlehem/Hebron landfill projects. In 2005, 25 per cent of the population of the West Bank has no solid waste collection or management programme. But all towns and villages in the Gaza Strip have storage and collection systems, and most of the solid excluding the Northern district, waste is disposed of in a satisfactory manner (Coad 1997).

Household Solid Waste. It is estimated that 2,600 tons of domestic waste is generated daily in the West Bank and Gaza Strip in addition to 450 tons of domestic waste generated by the 350,000 Israeli settlers living in the West Bank and in the Gaza Strip. Currently, dumping in open area and open burning are the most common methods of disposal. Evidence also shows that much of the solid waste generated by settlers is being disposed of on Palestinian land, in addition to the illegally transferring of toxic waste generated inside Israel into the West Bank (ARIJ 2001). Appraisal of waste from Palestinian communities has shown that the majority of waste is organic material, mostly food waste. Also, plastic bags are used and disposed of frequently. Paper makes up a relatively small portion, most is cardboard and newspaper. Most disposal sites are unplanned and unmanaged open dumps with little consideration being given to their proximity to people, agriculture, or water resources. Solid waste burned at these sites causes serious air pollution.

Medical Waste. Infectious waste, toxic chemicals, drugs, flammables, and sharp edged waste generated from hospitals and medical centres are disposed of along with municipal garbage in open dumps without treatment and burned in the open air. There has been a noticeable increase in the quantity of medical waste as a result of large numbers of dead and injured people in hospitals due to the increase in armed conflict.

Industrial Waste. The industrial sector in the West Bank and Gaza Strip is still undeveloped so the existing industries are mainly of small to medium scale. These industries are found within residential and agricultural areas, as well as in industrial areas. Environmental conditions in the existing industrial zones are poor. Several problems are associated with these areas such as improper disposal of solid waste. Industrial waste management programmes for hazardous waste do not exist in the West Bank. Industrial solid waste

is managed together with municipal waste. Open burning of solid waste is common, thus many dangerous materials, such as PVC, are burned and emissions, which may contain dioxins, are released into the air. In the Gaza City dumping site, a special section has been built to receive inorganic hazardous waste and biological hazards (Coad 1997).

Hazardous Waste. Several incidents of dumping hazardous waste in the OPT occurred:

- The dumping of unknown substances and wastes in underground trenches in area C under Israeli control similar to what happened near Gosh Qatif on the Palestinian beach and in Hebron. These substances and wastes could not have been identified as their sites lie within military controlled areas.
- The dumping of unknown waste in Palestinian landfill sites and the opening of random dump sites for settlements on Palestinian land on the beaches of Khan Younis and Deir Albalah in the Gaza Strip.

Many of these smuggled waste materials are various forms of paint waste and the containers have 'Fire' and 'Poison' signs on them. The waste contains cyanide compounds and after laboratory tests it was proven to have a high percentage of heavy metal content or was polluted with them (Environmental Quality Authority 2003).

Agricultural Waste. Various kinds of agro-chemicals (fertilizers, pesticides) are applied in the West Bank and in the Gaza Strip. The total quantity of pesticides used in agriculture in the West Bank and Gaza Strip in 95/96 growing season was 454 tons. Fertilizers also remain as a major source of groundwater contamination associated with agricultural practices. The total quantity of chemical fertilizers used in the West Bank and Gaza Strip is estimated to be 49,420 tons in the 1995/96 growing season (ARIJ 2001).

Recycling Solid Waste. Currently a small fraction of solid waste is recycled, mainly steel scrap and glass. Waste pickers can be found in the dumping sites, especially at locations where Israelis dump their waste (Coad 1997). Although the majority of the domestic solid waste is of organic origin, composting of waste is still not practised on a large scale.

67.3.1.3 Waste water Pollution

Waste water generated from Palestinian cities, villages, and Israeli settlements is a primary source of pollution. Such waste water is discharged untreated into

open areas or through cesspits. Israeli shelling of waste water collection and treatment stations in many Palestinian cities in the West Bank and Gaza has caused deterioration to those facilities. The waste water treatment station in Gaza has been subject to repeated shelling that caused drastic damage to the buildings and the carrier line. The electric control tableaux of the pumps have been damaged, and much effluent has run out, causing a decrease in the efficiency of the treatment station and an increase in the pollution of the effluent that consequently increases the pollution of sea water. Similarly, Beit Hanoun sewer station has been subject to bombardment and the sweeping away of its constructions.

Israeli siege and bombardment of Tul-Karem, Jenin in the West Bank, and Beit Hanoun in Gaza has resulted in the Palestinian inability to reach treatment stations to carry out the necessary maintenance. Israel also bans the entry of spare parts to Palestinian areas. Israelis also discharge dangerous waste water from Israel to Palestinian areas. On 26 March 2001, the eastern areas of Gaza and north governorates were flooded with huge quantities of waste water discharged from an Israeli waste water reservoir. Sample analysis has revealed the existence of microbiological pollution to agricultural land, and henceforth, the transmission of pollution to humans. The Ministry of Environmental Affairs has published a detailed report regarding this incident.

Israeli military operations have caused the cessation of waste water projects, especially of the waste water project in Khan Younis City in Gaza, in addition to the destruction of several local networks due to bombardments and sweeping away activities (Environmental Quality Authority 2003). There are six treatment plants in the West Bank and Gaza Strip, three of them are located in Ramallah, Jenin and Tulkarm, and the rest are found in Beit Lahia, Jabalia, Gaza and Rafah in the Gaza Strip. They are not functional, and most of them are overloaded, underdesigned, or suffer mechanical failure. One new waste water treatment plant is currently under construction in Salfit and another new one in Al-Bireh is operational now. The pressure from waste water on the West Bank is intensified by the large amount of raw waste water disposed by Israeli settlements in the West Bank. Waste water from settlements is either disposed through cesspits or collected in sewage networks which open into the surrounding Palestinian land.

Industrial and Hazardous Waste Water. According to Article 12 of the Oslo II Agreement of September 1995 all hazardous waste, if separated, should be exported

for treatment and disposal in Israel at costs ranging from US\$ 300 to US\$ 1,000 per cubic metre. Although the industrial sector is still undeveloped in the West Bank and Gaza Strip, leather tanning, metal finishing (including electroplating), chemicals, and olive oil pressing are major sources producing industrial and hazardous liquid waste. There are 19 leather tanneries in the West Bank, of which ten are located in the Hebron and the rest in the Nablus and Jerusalem districts. Waste water from tanneries includes heavy metals, such as chromium, arsenic, and sulphide. The generated waste water is discharged freely into the nearby valleys without treatment.

Waste water generated from the olive oil mills is also hazardous as it contains dangerous chemicals. There are around 300 olive mills located in the West Bank. These mills work only for a limited period of time and dispose of their waste without treatment. The quantity varies from year to year depending on the amount of olives produced (ARIJ 2001). Only one facility is built to accept hazardous waste from the whole West Bank and Gaza Strip. Due to the lack of proper infrastructure, incomplete regulations, standards, and enforcement, all types of wastes are released untreated into the environment.

Although Israel has signed the Basel Convention on control and transport of toxic and hazardous wastes and materials across borders, Israel does not abide by the provision of the Convention and smuggles these hazardous materials into the OPT. Many cases were reported in different places in the Gaza Strip and the West Bank where settlers were responsible for smuggling toxic and hazardous materials from settlements into the Palestinian Territories (PNA 2002).

67.3.1.4 Air and Noise Pollution

Air Pollution. The air quality in the Palestinian Territories is subjected to continuous deterioration. The increasing population in the West Bank and in the Gaza Strip, and the expansion of industrial activities, are key factors in the deterioration of the air quality. The main sources of air pollution are as follows:

- **Vehicle emissions:** Although the number of vehicles in the West Bank is low, approximately 60 per cent of the cars were made between 1980 and 1990, and only 10 per cent between 1990 and 1996 (ARIJ 1996). Unleaded gasoline is not used widely.
- **Quarries and stone cutting:** Large amounts of particulate materials and dust are produced from quarries and stone cutting facilities as many of

them are located near residential areas. Quarries are mainly located in the Bethlehem, Hebron, and Nablus districts. Particulate materials are harmful to human health, especially the respiratory system.

- **Burning of waste:** The unregulated burning of municipal solid waste in open fields or containers in local streets emits a variety of hazardous pollutants into the air.
- **Industry:** The industrial sector in the West Bank and the Gaza Strip is not developed. Yet some industries are polluting the air through their emissions, such as metal factories and bakeries which consume used motor oil as fuel, and the pottery industries mainly located in the Hebron district which use old tyres as a source of energy. Moreover, large amounts of toxic gases such as CO and CO₂ are emitted into the atmosphere from the charcoal industry, which is mainly found in the Jenin district.

Transboundary Air Pollution. Air pollution from Tel Aviv and other urban areas is carried to the West Bank by the western winds. Studies showed that NO_x generated from the traffic at Tel Aviv is found as ozone in Bethlehem, Jerusalem, and Nablus (ARIJ 2001).

Noise Pollution. Sources of noise in the West Bank and Gaza Strip are mainly traffic and motor vehicles, construction of roads, buildings, and industrial activities, in addition to the noise resulting from Israeli military aircraft and military training activities. Noise can become a significant nuisance, disturbing the normal daily activities of the people.

67.3.1.5 Land Misuse and Land Degradation

Land Misuse. Careful management of land use in the West Bank and Gaza Strip is critical. The limited natural resources and the Israeli measures of land confiscation and settlement construction impose a challenge to those working in this field. In the West Bank there are 580 Palestinian built-up areas, mainly located in the mountainous area while Israeli settlements occupy the Jordan Valley, near the Green Line, and around Jerusalem. In the Gaza Strip there are 42 Palestinian built-up areas spread over 4,694 hectares, along with 8 refugee camps hosting 250,604 refugees (PCBS 1997). Israeli settlements were located in the southwest and north of Gaza.

Land Degradation. Land degradation includes the deterioration of the soil quality by contamination, salinization, and erosion. Soils of the West Bank are exposed to many sources of pollution that deteriorate their quality. These sources include irrigation with

salty water, extensive use of pesticides and fertilizers, uncontrolled dumping of industrial and domestic solid waste and waste water. In addition, the lack of water for irrigation leads to an increase in soil salinity. These sources have detrimental effects on soil properties since they contain high concentrations of heavy metals, nitrates, phosphorus, and salts which accumulate in the exposed soil (UNEP 2003f).

Marble and Stone Cutting. The marble and stone cutting industry is a main pillar of the Palestinian national industries in the Palestinian Territories, particularly in the Hebron region where there are more than 360 plants, each representing an environmental hazard to both humans and wildlife. However, the environmental hazards have become more serious with time and thus threaten the lives of thousands, particularly of children.

67.3.1.6 Lack of Environmental Legislation and Enforcement

Although the Palestinian Environmental Law was finally approved on 18 December 1999, a month later, in January 2000, an Environmental Strategy was released. But in early 2005 still no effective implementation of any legislation or regulatory programme for environmental protection and security has existed in Palestine.

67.3.2 External Environmental Security Threats

67.3.2.1 Israeli Military Occupation

Since the Israeli military occupation of the West Bank and Gaza in June 1967, the Israeli government has adopted several acts that resulted in environmental security threats. Israeli military occupation activities have caused the death of thousands of birds and animals through the destruction of hedges and farms. The losses in livestock were:

- Destruction of 158 poultry farms;
- Destruction of 89 animal hedges;
- Killing of 1.5 million birds;
- Destruction of 7,000 beehives;
- Death of 3,990 sheep and goats, and 653 cows;
- Death of many domestic and wild birds in the cities and villages.

The other indirect negative effects have been:

- Difficulty of obtaining fodder, and medicine for animals;

- Difficulty of extending agricultural service such as the veterinary service and agricultural extension service (Environmental Quality Authority 2003).

The size of damage in livestock and in the agricultural sectors throughout the Palestinian Governorates has been severe. The reports of the Palestinian Ministry of Environmental Affairs indicate that the excessive use of weapons and dangerous chemicals has forced animals to leave Palestinian lands. Bird-watchers have noticed a remarkable disappearance or decline in the number of migratory birds passing the area. Municipalities have reported that Israeli army units have opened fire deliberately against domestic animals, leaving their corpses to rot, adding more disasters to the Palestinian environment.

67.3.2.2 Israeli Settlements

Israeli settlements destroy the territorial integrity of Palestine and limit the possibility for urban and economic development, by the seizure of land and by blocking the physical expansion of Palestinian villages and towns. They also undermine Palestinian economic development by restricting movement and impeding the flow of commerce and workers from one Palestinian area to another, and contribute to the increased rate of violence against Palestinians.

There are over 150 illegal Israeli settlements with more than 400,000 settlers in the West Bank, and until August 2005 in the Gaza Strip, and their expansion in the West Bank has been accelerating. In 2003 the Israeli Central Bureau of Statistics recorded a 35 per cent increase in new settlement building (Kay 2004). Some of the effects on environmental conditions are:

1. Precluding the Palestinian people from using their groundwater reservoir because these settlements are constructed on their land.
2. Contaminating groundwater by discharging waste water into the areas of sand dunes and valleys where the best quality water is available.
3. Burying the solid waste of these settlements unsafely, causing leakage of pollutant substances into the groundwater.
4. Erecting sewage-processing stations over the best quality groundwater reservoir.
5. Drawing the high quality water from the OPT to Israel through these settlements.

Some of the pollution sources relating to the Israeli settlements include:

Waste water. The partially processed waste water runs from the Israeli settlements into valleys and agricul-

tural lands. As a result, waste water leaks into the groundwater through soil causing contamination in groundwater and the environment (PNIC 2001).

Smuggling Hazardous Substances into the Palestinian Territories. The smuggling operations of hazardous substances are carried out across the borders and from settlements causing a real danger to the environment and public health in the West Bank and in the Gaza Strip. These hazardous substances include the following: fuel, diesel, bromine, hydrochloric acid, ammonia, chlorine, etc. Under any weather and with the help of winds, such substances can be easily transmitted to the Palestinian Territories.

Illegal Burial of Hazardous Wastes Smuggled from Israel. Israel buries a great deal of solid wastes coming from its settlements close to Arab villages. These solid wastes cause serious harm to the environment and public health (PNIC 2001).

67.3.2.3 Israeli Separation/Apartheid Wall

Construction of the wall uprooted tens of thousands of trees that play a major role in preserving the environment and ecological balance of the area. These trees, most notably the olive tree, are also a basic part of the Palestinian landscape, culture, and heritage.

The footprint (the area of the wall and the associated landmass on either side) is enormous. In the first phase of construction the area lost as a direct result of the wall is about 11,500 dunums. The footprint of the entire wall as proposed could reach about 35,000 dunums. Construction of such a massive structure and the disturbance of such a large land mass will have significant impact on the ecology of the area (PENGON 2002).

The wall will cause changes in the microclimate which will also have its affect on the flora and fauna in the area. Migratory patterns of some species are interrupted and flight patterns of certain bird species will be interrupted. The wall is interrupting surface water patterns and has continued affects on the surface water quantity and quality of the area as well as groundwater levels.

Furthermore, the presence of the wall will have severe long-term environmental effects. As a result of the habitat loss, the micro-ecology of the area is impacted and weeds, pests, and pathogens are expected to be thriving in the wall vicinity. These species then spread to adjacent areas becoming a problem for native species, and as a result diminish the native diversity of the ecosystem. The wall will create displacement factors that will affect animal distribution and

Table 67.1: Total agricultural areas in dunums, annual production in tons, and value in US\$ in the eastern part of Israel's segregation zone. **Source:** ARIJ, Agriculture & Biodiversity Research Unit, 2003.

Crops	Area (Dunum)			Production (Dunum)			Value in US\$
	Rain fed	Irrigated	Total	Rain fed	Irrigated	Total	
Fruit trees	47,611	3,402	51,013	10,261	6,820	17,081	4,125,653
Vegetables	7,468	14,341	21,809	3,831	58,510	62,341	80,770,142
Crops	198,274	1,585	199,858	51,551	4,496	56,047	7,208,169
Total (A)	253,353	19,327	272,680	65,644	69,826	135,470	92,103,963
West Bank (B)	1,544,877	114,978	1,659,855	377,447	755,605	1,133,051	487,237,000
% (A/B)	16.4	16.8	16.4	17.4	9.2	12.0	18.9

movement patterns, and some populations will be fragmented. Habitat fragmentation of both flora and fauna reduce genetic diversity. The remaining small populations are then vulnerable to all problems associated with rarity: genetic deterioration from inbreeding and random drift in gene frequencies, and environmental catastrophes.

As a result of the long-term existence of the wall populations of resident species and groundwater will be impacted. Groundwater and surface water quality and quantity will be reduced. Native flora and fauna populations will be reduced and some species are expected to disappear completely from the area of the wall.

The wall segregation zone endangers the agricultural sector as well as other Palestinian economical and natural resources. The Palestinian communities located inside the segregation zone are mainly agricultural communities. Agricultural activities comprise the main source of income for Palestinian citizens living in these communities.

Israel's segregation wall continues to devour and trap the Palestinian agricultural land; 224.87 km² of the West Bank lands were razed to construct phase one of the wall which extends from the village of Salem in the North of the West Bank to Al Qanna colony near Masha village in the Qalqilia district, whereas 869.74 km² of land were confiscated to continue the construction of the wall in the second phase. 81.17 km² of the Palestinian built-up areas are isolated inside *ghettos* by this segregation process. On the other hand, 99.53 km² of the land is reserved for the exclusive use of Jewish settlements.

The Israeli segregation zone entraps agricultural lands in different locations throughout the West Bank, extending to considerable depths at several points. The agricultural sector and the Palestinian food security situation suffer huge losses due to this segregation process, as the agricultural production

was sharply reduced. Meanwhile, many Palestinians are unable to reach their agricultural fields or market their agricultural products.

The eastern part of the Israeli segregation zone endangers the Palestinian lands located in the Jordan Valley agro-ecological region, as well as the eastern part of the eastern slopes agro-ecological region along the West Bank. The Jordan Valley agro-ecological region is a semitropical area, characterized by hot summers and warm winters. Irrigated agriculture is the dominant cropping pattern in the valley and prevails in the areas where water resources are available. The eastern slopes region is a semi-dry area characterized by dry-land cultivation. Approximately 80 per cent of the Palestinian range lands are located in the eastern slopes.

The total area of the endangered agricultural lands in the eastern part of the segregation zone is about 272,680 dunums. About 7.1 per cent of the endangered agriculture areas are irrigated, while 92.9 per cent are considered as rain-fed lands. The annual agricultural production reaches 135,470 tons. Accordingly, 12.0 per cent of the Palestinian agricultural production with an economic value of US\$ 92.1 million will be threatened due to this Israeli segregation zone. The following table illustrates the total agricultural areas threatened, annual production in tons and value in US\$ in the eastern part of the anticipated segregation zone.

67.3.2.4 Uncontrolled Chemical Imports from Israel and Release of Hazardous Materials in Palestine

Releases of hazardous materials in Palestine and across the border in Israel from industries and chemicals including: petroleum, hazardous waste, chlorine, paint, pesticides, foam, etc. pose risks to human health and the environment in Palestine. Release of hazardous material across the border in Israel em-

nates from the industrial areas of Haifa Bay, Ramat Hovav, Petah Tekva, Ashdod, and Ashkelon. Three of those industrial areas (all but Haifa Bay), plus the industrial area of Ashkelon, can be considered relatively close to the West Bank and/or the Gaza Strip.

67.3.2.5 Illegal Dumping of Hazardous Waste

Illegal dumping of hazardous waste imported from Israel has frequently occurred. It has proven difficult to return such imports to their source in Israel. Imported drums were found at different locations, including Jenin, Qalqilia, the north beach of Gaza, and in Hebron.

and the occupied Syrian Golan. In the resolution, the Assembly recognized the right of the Palestinian people to claim restitution as a result of any exploitation, damage, loss or depletion of, or endangerment to their natural resources, and expressed the hope that the issue would be dealt with in the framework of the final status negotiations between the Palestinian and Israeli sides.

67.4 Conclusions

Collecting, recording, and documenting data on environmental pollution in the Palestinian territories is extremely important for combating and overcoming such hazards. Considering the growing population and very scarce resources in Palestine, environmental security will be one of the most important key policies for formulating a future Palestinian national development strategy. The major problem facing the Palestinian Authority is the presence of many polluting industries in Palestinian regions which are neither subject to Israeli nor Palestinian jurisdiction. Thus, the Palestinian Authority has no control over them to limit the environmental dangers they represent. No doubt, without reaching a comprehensive, lasting peace between the Palestinians and the Israelis, it will be very hard for the tough environmental problems to be resolved and the challenges to be met.

Occupation, policies of closure and curfews, lack of awareness on the Palestinian side, and many other factors all have had significant negative environmental impacts. In the current phase of the conflict, the absence of even minimal cooperation is worsening the situation on a daily basis, with impacts not only on the environment but also on human health. Hence, both parties should pursue parallel attempts to address environmental protection along with reaching a peaceful resolution to the conflict.

In its resolution 59/251 of 22 December 2004, the General Assembly reaffirmed the inalienable rights of the Palestinian people and the population of the occupied Syrian Golan over their natural resources, including land and water; and called upon Israel, the occupying power, not to exploit, damage, cause loss or depletion of or endanger the natural resources in the occupied Palestinian Territory, including Jerusalem

68 Environmental Scarcity, Insecurity and Conflict: The Cases of Uganda, Rwanda, Ethiopia and Burundi

Mersie Ejigu¹

68.1 Introduction

Upon independence from colonialism about four decades ago, many Africans thought that the post colonial period would be a period of reconstruction and development; prosperity, peace and stability; and indeed a period of cooperation and mutual respect among various ethnic and religious groups. However, what we have witnessed and are witnessing today is an increase in the number of conflicts. Africa's conflicts have left a trail of destruction of life, property and most importantly 'hope'.

A change in the nature and characteristics of these violent conflicts can also be observed. As elsewhere, contemporary African conflicts, for example, Darfur in Sudan, Somalia, Cote d'Ivoire, Congo Democratic Republic, Liberia, Sierra Leone, Ethiopia, and Uganda are not interstate but intrastate. Some of these wars are fought in capital cities and are difficult to guess where and when they will erupt. Wide ranging groups including local communities, religious and other social groups, countries, United Nations organizations and international community, in general are involved and all have different interest.

Conflicts are driven by a variety of motives with a wide range of contributing factors: ideology, access to resources, deprivation, ethnicity, religion, greed, political power, etc. In natural resource dependent economies, like Africa, many of these conflicts are related to

the use and management of natural resources, in particular land.

Because land is the primary source of livelihoods for the majority of the population, land /environmental degradation easily threatens the people's socioeconomic existence. This in turn means more insecurity and more tension. Environmental insecurity arises not from the loss of extreme scarcity of environmental resources but more from the perceived and actual threat (individual and community levels) arising from that scarcity.

There is an emerging global consensus that there is significant positive correlation between environmental insecurity and armed conflict. Many scholars, however, caution that the link between environment and conflict is never direct, because wide ranging factors, for example, governance, socio-economic situation, culture, level of technology, and property rights impact heavily on the environment-conflict link. Governance has perhaps the most vital factor because government policies and institutions heavily influence the behavior of resource users and determines how, when, and why a natural resource is used. Further, as contemporary history shows it is rather unlikely for environmental insecurity to lead to conflict in countries where there is democratic and sound governance. Indeed, it is where there is governance deficit and state failure that there is prevalence of environment induced actual or potential violent conflict.

To contribute to the understanding of the environment and conflict link, the *Partnership for African Environmental Sustainability* (PAES), with funding from the European Union, launched the project, "Integrating environmental security concerns in national development policies." Its primary objective was to study the role of environmental insecurity in triggering, amplifying and causing armed conflicts through, among other things, capturing community perceptions, and thereby influence development policy decision-making and peace negotiation processes.

1 The author was team leader of the Partnership for African Environmental Sustainability (PAES) project cofunded by the European Commission: Project B7-6200/00-15/dev/env, Integrating Environmental Security Concerns in Development Policy in Africa that studies the link between environmental security and armed conflict in Burundi, Ethiopia, Rwanda, and Uganda. This chapter is a summary of the study: *Environmental Security and Conflict: The Quest for Sustainable Peace and Development in Africa*, March 2004.

The Study covered Uganda, Rwanda, Ethiopia and Burundi. These four countries represent countries with a recent history of internal conflicts and heightened environmental insecurity characterized by high population density, pervasive poverty, heavy dependence of the population on natural resources for livelihoods and survival; severe land degradation and a recent history of internal violent conflicts.

To discuss the findings of the study, PAES organized a symposium, "Environmental security, Poverty, and Conflict: Toward Sustainable Peace and Development" in September 2003 at the International Conference Centre in Kampala, Uganda where over fifty senior government officials, experts and media representatives participated. The ideas that transpired at the symposium have enriched the findings of the study.

68.2 Changing Nature and Characteristics of Conflicts: Environmental Security as a Paradigm for Understanding and Managing Conflicts

In the 1950's and 1960's, most wars in Africa were associated with the struggle against colonization. Since then, armed conflicts have increased in number and frequency (McNeely 1998; Myers 1996; Renner 2002), and have left a trail of mass destruction of life, property, and financial resources. Three times as many people - 110 million - fell victim to war in this century as in all the wars from the first century AD to 1899 (<<http://www.gsreport.com/articles/arto00167.html>>). Since World War II, more than 160 wars have been recorded (McNeely 1998). About 70 per cent of all war casualties since World War II have been civilians, rising to more than 90 per cent in the 1990's and Africa alone has experienced more than 30 wars since 1970 (Myers 1996) and some of these, including those in Somalia, Ethiopia, Eritrea, Sudan, Chad, Angola, Uganda, DRC, and Mozambique, have been prolonged. In addition, more than 200 coups or attempted coups have been experienced since 1950 (Renner 1996). In 2003, for example, some 17 of Africa's 53 countries were involved in armed conflicts that resulted in more than 3 million refugees and displaced people. "Only 2 out of 27 armed conflicts in 26 locations around the world were external conflicts" (SIPRI 2001). Today's armed conflicts are complex, unstructured, and difficult to predict, often fought by multiple actors with multiple interests, involve civilian population, and most victims are women

and children (SIPRI 2001; McNeely 1998; Myers 1996; Renner 1996). Timberlake (1988) went further and argued that "every civil war in Africa has had a 'drought' or a 'famine' as a cause or triggering factor." In many parts of Africa, there are cases of conflicts over natural resources covering wide-ranging ecological zones. For example, the conflict in Somalia, which made the country stateless, is the continuation of a 100-year-old movement of major Somali clans southward into agricultural areas from nomadic grazing areas that have been becoming more and more overpopulated (Hutchison 1991). The Rwandan genocide that claimed the lives of close to one million people is attributed to competition over declining farm holdings between Hutus and Tutsis. In Rwanda, the average farm size has declined from 2 ha to 0.7 ha per family over the past four decades, and this is believed to be the root cause of armed conflicts between the two groups, and hence the civil wars fought in Rwanda since 1959 (Bächler 1996). In Zimbabwe, at the time of independence in 1980, 45 per cent (mostly fertile soils) of the agricultural land were in the hands of white farmers, who were only 1 per cent of the country's population, leaving masses of the natives to cultivate the remaining largely infertile land. Faced with intense domestic political pressure, Zimbabwe's President Robert Mugabe instituted the Land Reform Policy that led the natives to illegally confiscate the whites' farms (Mukaro 2003), sparking off state-community and community-community conflicts in the country.

In most African countries, including Uganda, Rwanda, Ethiopia, and Burundi, which this study covered, land occupies a central place in the cultural and political history, social organization, and economics. Most grievances, family and societal disputes, court cases, and conflicts are associated with scarcity of arable land (Diamond 2005; Homer Dixon 1994; Ejigu 2004). But reversing environmental degradation or investing in natural resource management has seldom been in the centre of conflict prevention and resolution agenda of the international community.

On 15 July 1999, the BBC reported based on the findings of the Stockholm International Peace Research Institute (SIPRI): "large-scale trafficking in light weapons has been singled out as a major cause of the wars being waged in large parts of Africa." This large-scale trafficking of light weapons implies that there is an effective demand for such weapons. But the question is why do low-income societies invest in guns when they do not have sufficient resources to feed themselves? Why do people think that owning a gun

will give them a sense of security, not saving the money?

68.3 Conceptual Framework and Study Methodology

The notion of environmental security enables us to understand changes in the environment in light of their potential to trigger, amplify, and or cause violent conflict. It also helps us to understand how war impacts environmental change and also how we can use sound environmental management as a tool for conflict resolution and building enduring peace. Although we often come across terms like 'land conflicts,' 'timber or diamond conflicts,' it is important to note that neither the abundance nor the lack of access to nor the misuse of these two resources would automatically result in societal conflict. It is rather the perceived or actual feeling of threat, insecurity, and hopelessness arising from deprivation that could trigger and cause conflict. Even in this case, individuals and communities adopt complex strategies to cope with environmental stress. Conflict erupts after all coping strategies are exhausted and when public policy and institutions fail to make timely and substantive interventions to guarantee socioeconomic well-being, law and order, job opportunities, and hope.

When we talk about security or insecurity, our primary concern is the security of human beings² as individuals and communities. Individuals and communities are said to be secured when they are free from threats, conflict, hunger, disease, deprivation, and poverty. The attainment of security, or the lack of it, is a product of the interactions of many factors that affect us, for example, the biophysical situation, economic policies and conditions, population and settlement, political system and institutions, and culture. We can be secured, if the economic, social, political policies are right and are well functioning to guarantee our wellbeing. Effective governance, sound environmental policy, is critical to sustainable management of land and forests and to the attainment of political stability.

It is widely recognized that land/ environmental degradation is a result of individual and/or collective decisions made regarding land use in response to changes in public policy, markets conditions, and pop-

ulation growth. Responses at the individual level may take the form of changes in land use, management practices, and investment. At the community level, responses may include changing the size of commons, the rules governing uses and transfer of common resources, as well as the distribution of benefits. These changes in resource conditions affect productivity and livelihoods. Individuals, among other things, may respond through migrating either in search of cultivable land to other rural areas (rural-rural migration) or in search of income (rural-urban migration). Population migrations, often under conditions of weak governance, failed policies and states, lead to violent conflict (Homer-Dixon 1994, Homer-Dixon/Percival 1996; Percival/ Homer-Dixon 1996). A good public policy has the potential to avert impending conflicts through creating incentives to invest in land, promoting and enforcing sustainable use of resources, strengthening institutions to innovate, supplying new technologies, and in creating conditions for dialogue and participatory development. On the other hand, wrong policies create conditions for land and forest conflicts to erupt, and can subject a country to a period of political and socio-economic instability.

Social and economic instability and conflict in turn damage the environment causing insecurity. The two-way relationship between the environment and conflict is rather complex and non-linear influenced by a host of policy, institutional, cultural, and economic factors. Some scholars, for example, Gleick argues that environment related threats to human security are real and what is needed is not a redefinition of security, but rather a better understanding of the links between environmental and resource problems and international behavior and security (Gleick 1991).

Uganda, Rwanda, Ethiopia, and Burundi, share important common processes that help to link environment scarcity and insecurity to poverty and conflict. Population has significantly increased. The size of farmlands has become smaller. The quality of soils and fresh water has deteriorated. Degradation of natural resources, particularly renewable resources, is widespread as evident from loss of forest, soil, and water resources. These resources are increasingly scarce because of diminished supplies, increased population-induced demands, and inequality in distribution. The economic returns to these resources are low and falling as evident from diminishing productivity, declining livelihood, and impoverishment. Population mobility in response to scarcity and impoverishment is common. Policy, institutional, and technological deficiencies are prevalent in all countries.

2 The *Human Development Report* of UNDP (1994) listed seven main threats to human security; see the chapter by Abdus Sabur in this volume.

In studying the link between environmental insecurity and conflict (potential and actual) the four country study considered two ecosystems: agricultural land (farm and grazing) and fresh water. Agricultural land as a percentage of total land accounts in Ethiopia (31 per cent), Uganda (43 per cent), Rwanda (66 per cent), and Burundi (86 per cent). The recent estimates of ERS/USDA show that Ethiopia has nearly 20 per cent of its total land in the category of 'good soils and climate', which compares with 36 per cent for Rwanda. About 22 per cent of the land in Uganda is covered by fertile soils, 43 per cent with soil of fair productivity, and 33 per cent of soils are of low productivity (NEMA 2001).

The study commenced with the hypothesis that environmental insecurity potentially translates into environmentally-induced conflicts, and a transition from competition for scarce resources to environmentally induced conflicts occurs under unique sets of conditions: (i) population growth and pressure on resources; (ii) restricted mobility of labour or large-scale influx of population; (iii) socio-economic and ethnic heterogeneity related to inequality; (iv) distribution of finite resources or the wealth created from these resources; (v) low technological innovations to mitigate loss of productivity of resource; (vi) weak institutional arrangement to economize and allocate scarce resources; (v) environmental goods and services to competing claimants; (vi) failed state, democracy and public policy.

A simple conceptual framework was developed and a set of indicators identified. Data was obtained from three sources: literature review, data from governments, NGOs and international agencies; and primary (household surveys and community group-focused discussions). Field studies were designed and carried out to capture community perception and test the hypothesis that environmental insecurity causes, amplifies, and/or triggers armed conflict. The field surveys consisted of a rapid rural survey of 480 households in Ethiopia and Uganda; and 240 households in Burundi and Rwanda in selected conflict and land degradation affected provinces and districts. Community group discussions were also conducted to verify information collected at the household level. The field survey has been generally consistent with data at the national level obtained from secondary sources.

68.4 1.4 Key Findings of the Study

68.4.1 1.4.1 Pervasive Environmental Insecurity

The findings of the study highlighted the strong evidence of severe and significant environmental insecurity that exists in all the four countries. Key indicators included:

- a.) **Farm size is small and declining.** The overall trend in all case countries is towards declining farm size. In the case of Rwanda, there was little land available for agricultural expansion by the late 1980's, while the number of people placing demands on existing cropland increased. Hence, land scarcity is manifested both in declining farm-size and failure to produce enough food for subsistence.
- b.) **Incidence of land fragmentation:** The evidence from Uganda demonstrates intensity of land fragmentation, which tends to be high in land-scarce areas. At the root of the explanations are population concentration and agro-ecological conditions (nature of soils and rainfall regimes). Land fragmentation is practiced in areas where even small plots remain economical to operate in the eyes of the subsistence farmers.
- c.) **Increased cultivation intensity:** As land becomes scarce relative to labour, farmers use more labour per unit of land or cultivation intensity increases. Such practice is common in the densely populated highlands of Burundi, Rwanda, and Ethiopia.
- d.) **Growing landlessness:** Because of scarcity of land, there are a sizable number of farmers who seek but are unable to access land. For example, there are probably as many as 15 to 20 per cent of the farm population without 'official' landholdings in Ethiopia and Rwanda (Ejigu 2004).
- e.) **Grazing land is in short supply:** Grazing lands are overcrowded during the rainy season. Farmers respond to scarcity of grazing land by reducing the number of animals they keep and in some cases they change from cattle to smaller ruminants (sheep and goat) to enhance drought resistance, flexibility in grazing requirements, and ease of converting into cash. In Burundi, pasturelands are contracting because of conversion to crop farming. In Rwanda, shortage of grazing land is also acute with over 65 per cent of respondents reporting lack of land for grazing.
- f.) A new tenure arrangement is emerging with rising informal land transactions. Generally, customary

land tenure systems dominate in Burundi, Rwanda, and Uganda and inheritance is the primary means of acquiring land. In Uganda survey sites, the percentages of farmers with land through customary system range between 72 per cent in Sango Bay and 99 per cent in the Kabale and Ntungamo site. The evidence from Rwanda shows a shift in mode of land access in response to land scarcity with acquiring land through lease and purchases becoming more common. While administrative based land allocation is the principal venue for land acquisition in Ethiopia, access to land through informal land transactions, particularly rental land markets, are gaining importance. The current evidence indicates as many as 15–30 per cent of farm households in different parts of the country transact land through informal land markets. Because of growing scarcity of arable land, renting in land is tighter than renting out land. The evidence from Ethiopia points that land rental rate is on the rise. Second, farmers who lease out land also demand cash deposits or advance payment, which is beyond the reach of the majority of farmers. Third, access to land favours farmers with farm skills and experience.

68.4.2 Poverty, Environmental Degradation, and Conflict are linked: Burden of Coping Falls Heavily on the Poor

The evidence from these four countries shows that environment and poverty are closely linked. First, the majority of the population is dependent on natural resources for their livelihoods, particularly on agriculture. Second, the natural resource base is shrinking (i.e. forest cover, grazing land, arable agricultural land, and water resources). Third, incidence of poverty tends to be greater in ecologically fragile marginal agricultural areas with few routes to escape poverty. For example, mapping of poverty by geographical area for Ethiopia shows poverty to be lower in villages with adequate and stable rainfall, moderate population density, and high market access. Fourth, while in general rural households are constrained to protect downside fluctuations in food consumption by limited income substitutions, unfavourable terms of exchange in market place, and weak community and public support systems; the burden of coping is unequal and falls heavily on those with a low income and asset base. In Rwanda, a new category called 'very poor' has emerged, where the links between poverty, food insecurity, and land degradation have been

gravely exacerbated by war, as in the case of the 1994 civil war.

68.4.3 Water Stress and Scarcity is Increasing

The study countries are increasingly facing water stress since the demand for water is growing rapidly relative to supply of water resources. Getting access to water sources is more limited in rural than urban areas. This is partly due to the pattern of population settlement relative to water sources as population is largely settled in high-lying areas while the water sources are found in low-lying springs. On the other hand, demands for water are increasing due to population growth and development requirements. Scarcity of water poses potential threat of conflict among riparian countries without established enforceable institutional arrangement governing allocation and uses.

68.4.4 Households Often Fully Exhaust Their Coping Strategies Prior to Migration

Households have developed multiple coping strategies. For example, in Ethiopia, when subsistence farming fails them, households move into lower-return occupations: (i) sale of collected environmental goods such as firewood and charcoal; (ii) collection of dried dung; (iii) attaching child labour as herder with wealthy households or rearing animals for others in exchange for consuming their products such as milk; (iv) casual wage labour in rural towns; (v) petty trading; (vi) renting out land for lack of complementary inputs; and (vii) income transfers including relief aid. In Uganda, however, renting land is the key coping strategy. Migration is a coping strategy of a last resort.

68.4.5 Mobility of Population is a Major Mechanism for Easing Pressure on Land through Migrating to Areas with Low Population Density

Migration provides a way to mitigate climatic risk across space, which is a common practice among pastoral population in arid and semi-arid environments. Migration is also a common coping mechanism in time of food crisis. Most cases of migration in the four case countries are from rural to rural areas. In the 1994 population census in Ethiopia, for example, rural to rural migration accounted for 48.9 per cent of total migrants followed by rural-urban (24.8 per cent), urban-urban (18.9 per cent) and urban-rural (7.3 per cent). Migratory movements from overpopulated re-

gions to the fragile ecological areas are also noted in Rwanda and Burundi after independence, which is marked by considerable population mobility. The majority of rural households in Burundi do not live in their places of birth. In Uganda, five major migration streams (of at least 50,000 migrants) involving massive migration have been experienced: Bushenyi to Mbarara, Kabale to Kabarole, Kabale to Mbarara, Mpigi to Kampala, and Tororo to Iganga. Four of the five major streams of massive migrations in Uganda were from rural to rural areas, an indication of real or impending environmental insecurity at the source (Kabale, Tororo and Bushenyi).

68.5 Environmental Insecurity and Conflict: Key Evidence

Disputes and conflicts over scarce natural resources are highly prevalent in case countries. The evidence so far points that these disputes and conflicts, in the majority of cases, are related to competition over access, use, and transfer of scarce natural resources. For example, the majority of the land users in the Ethiopian sites relate to these conflicts to scarcity of land resources, particularly farmland scarcity in the upper elevation communities and grazing land in the low lying communities where farmers-cum-herders are more dependent on extensive livestock. Whilst armed conflicts do not figure prominent in the community-based rankings, there are cases of disputes and conflicts. And more than 77 per cent of conflicts and disputes in each of the five study areas were over land (both arable and pasture). In the four countries, different types of environment insecurity-induced conflicts exist, although a country may not experience all of them.

68.5.1 Cultivator-Cultivator Conflicts

These are associated with pressure on farmland and common property resources (grazing land, community forests, and water points). There are several cases of competition over agricultural land caused by inter-generational transfer, division of common pool resources, settlement of non-indigenous population, and claim on original land by returnee migrants.

- **Conflicts over inheritance:** This is the principal source of disputes between fathers and sons and between the young and the old that threatens the stability of rural communities in Ethiopia under existing land tenure system. In Uganda, the study

found that most court cases, both criminal and civil, to be land related disputes arising from children fighting over ownership of small land with their fathers. In cases where land is inherited, there is a greater likelihood of societal conflict as inherited land is more disputed than rented or purchased.

- **Conflicts over individualizing the commons:** Common lands such as hillsides and marginal areas are distributed to individuals in some regions of Ethiopia as a way to ease the problem of landlessness and promote regeneration of degraded lands, since each individual will be responsible for his/her plot. But the scheme has sparked conflict among users, and between the community and the local government.
- **Returnees and claims to original (or, ancestral) land:** After the fall of the military government in the early 1990's in Ethiopia, there were a great number of refugee returnees from neighbouring countries, demobilized soldiers, and returnees from the major resettlement programme of the 1980's to their places of origin in the northern highlands. The settlers returned to their homes in increasing waves; small in the early years and then increased appreciably towards the end of the decade, and grew to huge proportions by the time of the fall of the military government. Upon the return of these settlers, many of them found that their land was allocated to others and there was very little land to distribute. Some communities were forced to parcel up marginal, often grazing land to give to returnees, while in other communities returnees were left empty-handed. Many returnees did not have any means of livelihood and thus survived by 'harvesting' and marketing forest and common-property resources.

68.5.2 Herder-Cultivator Conflicts

These are conflicts between pastoralists and cultivators over access to pasture and water resources. Such conflicts are common in the 'cattle corridor' of Uganda, which extends from the southwest to Karamoja in the northeast including Mabarara, Rakai and Katakwi districts. A well-publicized example is the conflicts in the Katakwi-Karamoja region in North-east Uganda. There are also other current conflict spots in Uganda involving pastoralists and cultivators: The Nyabushoze pastoralists in Mbarara district face severe land degradation and scarcity, and those who move out to places like Teso face conflict with the lo-

cal population. The Bahiima and Banyarwanda pastoralists, who lost their traditional grazing land in former government ranches, have moved into the Teso region in pursuance of water and grazing land but face armed resistance by the Iteso people. The fear of violence necessitated the government to deploy soldiers to protect the safety of the migrant herders. The classic example of cultivator herder conflict is the historical and contemporary conflicts between agriculturalist Hutus and pastoral Tutsis in Rwanda and Burundi. Tutsi is not exactly the name of an ethnic group: historically it meant 'people who own cattle', and Hutu meant 'people who farm'. But these conflicts have taken over time multi-dimensions within the Lakes Region, explained in the main report and the country case studies.

68.5.3 Herder-Herder Conflicts

There are numerous cases of inter-community conflicts between different pastoralist societies living adjacent to each other. The most significant conflicts in the Ethiopian cases occur in the Awash River basin, which cuts across different ethnic groups. There have recently been frequent clashes between the Afar and the Issa Somali, between the Afar and the Kereyu, and the Issa and the Borana, to mention only the most significant. The Afar and Issa conflict may be taken as a good example of an ecological conflict driven by water. Within each herder community there are conflicts over access to resources, especially of grazing land and water.

68.5.4 State-Cultivator and Herder Conflicts

Conflicts between state and farmers including both cultivators and herders are pervasive in Ethiopia since the 1960's. During the Haile Selassie regime, such conflicts were triggered by the government's decision to individualize the commons. During the Dergue (1974-1991) and Woyane (1991-???) regimes, state-cultivator conflicts became more prevalent in the aftermath of the 1975 land reform that prohibited land transfer other than through the state functionaries. Land is state owned and qualified farmers have access through local state functionaries. Hence conflicts arise between these functionaries and farmers over access, use, and transfer of government-owned land. The conflicts over the water of the Awash basin in Ethiopia is partly the making of the successive governments' effort to develop large-scale commercial agriculture that by and large has failed to take into ac-

count the needs and interest of the pastoral communities inhabiting the Basin.

In Uganda, there are cases of conflicts arising from encroachment of government-controlled protected areas. For example, there was massive eviction of the Bakiga, who had settled in the Mpokya/Kibale Forest areas in Uganda in 1993; Mt. Elgon National Park in 2000, and other protected areas, which include Mgahinga, Mt. Rwenziri, and Queen Elizabeth National Parks. The Karamojong in Uganda are against the gazetting of most of their fertile land and, in response, they encroach on pasture and water in Teso and Lango. The Mbale conflict is due to the encroachment of public domain. The encroachers are not ready to leave the forest but negotiations are still ongoing. The Kibaale and Kyenjojo conflicts have become hot political issues and time bombs waiting to explode. The Bakiga community was settled by government due to land scarcity in Kabale in the 1960's and the growing economic and political power of the Bakiga has incensed the Banyoro. Violent clashes and loss of lives have been reported leading to deployment of the national army and other security agencies in the area.

68.6 Contributing Factors to Environmental Insecurity-Induced Armed Conflicts

The degree and intensity of environmental insecurity-induced conflicts are contingent on other contributing factors.

68.6.1 Failed State and Policy

A defining characteristic of weak governance is the inability of government to establish viable institutions that can address people's needs and minimize social conflicts. Competent judicial institutions can mitigate conflicts arising over scarce natural resources. Varieties of these arrangements exist in the country studies. In addition, there are regional based organizations designed to prevent conflict over shared resources such as shared river basins. The likelihood of armed conflict is enhanced where groups organized around social cleavage (e.g. ethnicity or religion) perceive or experience governance deficit. Environmental scarcities and loss of livelihoods provide an *opportunity* for opportunistic political forces to mobilize people into violent acts. Extremist forces were able to exploit the historical ethnic cleavages and animosities, for exam-

ple, in Rwanda to mobilize a very large part of the majority group of the population against the minority group in the 1994 civil war in Rwanda.

The likelihood of environmental insecurity-induced conflicts increases in countries where traditional institutions and systems are undermined. In all four countries, there are established indigenous institutional arrangements for managing conflicts in the study countries. These arrangements involve at the simplest level the intervention of elders, leaders of community-based support networks (e.g. *idir* or *qire* in Ethiopia and the *ubushingantabe* in Burundi, *gacaca* in Rwanda) religious leaders or prominent personalities. The decisions handed down by traditional peacemakers do not have the force of law but only the force of tradition and community sanction, and yet they are as binding as the formal decisions of the law.

68.6.2 Scarcity-induced Migration

Population mobility and settlement tend to raise a likelihood of resource conflicts in most of the study areas. For example, the conflicts between the Bakiga and indigenous Banyoro and Batooro in the Kibaale and Kyenjojo Districts, and the Bahima/Banyarwanda pastoralists in northeast Uganda are resisted by the recipient indigenous communities what has often caused ethnic tensions. The study found that there has been increased migration especially by the pastoralist communities in search of water and pasture (grazing land), which has often attracted hostile reactions from host communities. The latest case being the attempted migration of Bahiima herders to Teso (2002), which has attracted hostile reception threatening to result in violence if the migrants do not move.

The Rwanda and Burundi studies take a different perspective on environmental migration and conflict links. Resource scarcity in the Rwandan situation propels stronger groups/communities to resort to resource capture. Resource capture by powerful groups within communities has the effect of shifting resource distribution in their favour and thereby subjecting the remaining population to resource scarcity. In an environment whereby few privileged individuals and/or groups grab most of the environmental resources at the expense of the weak majority may lead to a situation that results in large migration of poorer and weaker groups into ecologically fragile regions that subsequently become degraded and causing serious pressures on livelihood security, thus creating room for conflict.

68.6.3 Societal Heterogeneity

Large-scale migration may lead to conflict more likely where there exists social cleavage between migrants and indigenous population. The Uganda study underscores that the major link between environmental insecurity and conflict occurs mainly through environmental-induced migration into communities with different ethnic makeup. Conflict arises between heterogeneous communities differentiated by ethnicity and at times by livelihood strategies (e.g. conflict between pastoralists and cultivators). In many cases, ethnicity was used as a cover for environmentally-induced conflicts. Conflict entrepreneurs have used ethnicity to gain and maintain political power and thereby access to scarce resources. In Rwanda and Burundi, the pre-colonial differences between the Hutu and Tutsi deepened during the colonial period. The post-colonial governments in both countries further polarized the ethnic divide to control political power and resources. The Burundi report highlighted that the conflicts in Burundi are not between the Hutu and Tutsi masses, but conflicts between elites from both ethnic groups in their competition for economic and political power.

68.6.4 Economic and Political Ascendancy

Societal heterogeneity as a contributing factor gains more strength where the migrant people assume economic and political power in their place of settlement. For example, the indigenous Oromo people in southwest Ethiopia resented the Wolloye migrants as the latter assumed local administrative and political powers and penetrated into the traditional settlement areas of the Oromo population.

The Uganda study underscores the fact that underlying resource conflicts are increasing the economic and political position of the immigrant population, such as the conflict between the Bakiga migrants and indigenous Banyoro and Batooro. It is indeed scarcity that induces conflict, particularly where it is fuelled by tribalism and quest for political power. These ethnic groups have been living together in peace since the 1950's. But, with decline in land availability, economic ascendancy of the Bakiga, and their quest for political power migrant, ethnic clashes are more pronounced now. The loss of political power by the indigenous Banyoro in the 2002 local election, for example, sparked ethnic conflict.

68.7 Conclusions

The evidence from the case studies, including community surveys gathered from the four country studies, confirms the widely held view that environmental insecurity plays a significant role in causing, triggering, and aggravating armed conflicts. There are clear indications that environmental scarcity in the context of high population pressure, low institutional and technology response, and poverty is bound to induce armed conflict between communities. The probability of conflict increases, where environmental insecurity induces population mobility particularly towards heterogeneous communities (e.g. ethnic, culture, etc.); and where these migrants tend to dominate economic and political spheres, the recipient communities become aggravated and propensity to conflict mounts. Conflicts are almost certain where a weak state fails to deliver law and order, provide transparent and accountable administration, implement unbiased and fair policy, and institute effective mechanisms to address and resolve grievances and disputes. On the other hand, nurturing of social ties and economic integration neutralizes forces that tend towards armed conflict.

Poverty, economic deprivation, and vulnerability create conditions of environmental insecurity to lead to violent conflict. It is not the general level of poverty that causes conflict, *per se*. Rather, it is the consequence of poverty and the control of scarce resources that results in increased economic deprivation, pushing the poor onto marginal areas, and heightened social despair and uncertainty of the future. To explain conflict, what matters is thus not being poor today but the perception of future threat of their livelihoods and growing poverty. When people are under threat of environmental insecurity, they are prone to manipulation by warlords or conflict entrepreneurs for engaging them into conflicts for political ends. Or, the poor may be pushed onto marginal areas by powerful groups.

The good news is that conflict prevention and resolution processes and programmes can bring sustainable peace if anchored in combating environmental degradation, increased investment in natural resource recovery, and sound environmental management. Therefore, integrating environmental security concerns in development policy is a vital tool for attaining sustainable peace and development that needs to be promoted at the national and regional levels.

There is a move towards decentralization in all four countries. This process means setting a process

of broadening participation of stakeholders, aligning development priorities to needs, greater control and management of resources including scarce natural resources, and mitigating conflicts. A distinct feature of the decentralization is the increasing space for participation of indigenous institutions and promotion of private sector investment. Regional sub-groupings and organizations have also been strengthened and the capacity to enforce agreed policies enhanced as seen in the incident in Togo in early 2005, where the military appointed interim leader was forced to resign. Africa, thus, can hope for economic recovery, growth, technological transformation, and sustainable peace.

69 Environmental Security in Sub-Sahara Africa: Global and Regional Environmental Security Concepts and Debates Revisited

Sam Moyo

69.1 Introduction¹

Environmental security is a major concern in world affairs. However, the concept has not yet been coherently defined, together with its threats, and policy responsibilities (Brauch 2005, 2005a). Few countries have an official definition of environmental security that unifies thought and action. Major international organizations (UNEP, WHO, UNDP) have no agreed definition to guide policy. However, other organizations, such as NATO list environmental security among their priorities. The definition of the term is clustered around two central concepts: repairing damage to environment for human life support and for the moral value of the environment itself; and preventing damage to the environment from attacks and other forms of human abuse. Environmental security threats often involve transborder and/or global impacts that would require international cooperation. Nation-states acting alone can not provide environmental security. International organizations lack the capacity to address the threats. The weight of decision power rests with national governments. As a result, national sovereignty can come in conflict with actions necessary to insure environmental security.

Environmental security is sometimes confused with sustainable development. Although both are mutually reinforcing concepts and directions for policy, they mean different things. Sustainable development focuses on environmentally sound socio-economic development, while environmental security focuses on preventing conflict related to environmental factors. Environmental insecurity generally occurs as a cumulative result of high population growth, decline in quantity and quality of renewable resources and the lack or unequal access to these resources. As popula-

tion grows, given existing technology, the available land per capita is reduced to smaller and smaller sizes. Community and household characteristics in addition to land use system dynamics condition the nature of these changes. Buzan (1983) defined environmental security as the capacity to live harmoniously with nature or to maintain a sustainable environment. Mohamed Salih (1994) put forward two perspectives on environmental security. The first one relates to the capacity of individuals and groups to meet their basic needs from a sustainable environment. According to the second perspective, environmental insecurity involves serious consequences for social, economic, political and physical security. Following these arguments, the traditional conception of security must be reconfigured to include non-military threats, such as human rights abuses, outbreaks of diseases, resource scarcity and environmental degradation (Moyo/Tevera 2000).

Environmental security is considered an integral part of human security. Human security refers to a state of human conditions free from threat of hunger, poverty, and armed conflict at the individual, group, community, country, region, and global levels. A society or community becomes environmentally insecure when severe environment scarcity arises and becomes a threat to national, community and individual welfare and survival under conditions of failed ecological stability, increased vulnerability to livelihood and survival, and heightened risk of armed conflict. Environmental insecurity is a collective expression of these manifestations (or, risks) that is particularly real where institutions and governance fail to prevent and resolve conflicts. Conflict here refers to disputes and clashes that arise from claims and command over agricultural land and fresh water resources, and the distribution of induced conflicts between two or more societal groups or communities as well as between states and sub-national groups that involve the use of arms. Conflict areas refer to places where there is potential (crisis stage) or actual conflict.

1 The author would like to thank Ndabezinhle Nyoni of AIAS for the research assistance provided in writing this chapter

69.2 Social and Economic Dimensions of Environmental Security

Several studies have emphasized the high dependency on natural resources by most African economies.² Increasing demand for resources for both local and export markets, as well as escalating competition for the control of natural resources, have been a source of insecurity and have increased the incidence of environmental conflicts.

69.2.1 Water

Water stress and scarcity are widely felt in many sub-Saharan African countries, although only few cases of actual conflicts over water have been reported. Some studies have shown that countries are increasingly facing water stress since the demand for water is growing rapidly relative to supply of water resources. Getting access to water sources is more limited in rural than in urban areas. This is partly due to the pattern of population settlement relative to water sources as population is largely population settlement in high-lying areas while the water sources are found in low-lying springs. On the other hand, demand for water is increasing due to population growth and development requirements. Scarcity of water poses potential threat of conflict among riparian countries (Rwanda, Uganda, Sudan, DRC, Tanzania, Zambia, Mozambique and Zimbabwe) without established enforceable institutional arrangements governing allocation and uses. While states are more likely to fight over non-renewable than renewable resources, river water is more likely to stimulate an interstate resource war. Water is a critical resource for personal and national survival, and since river water flows from one area to another, one country's access can be affected by another country's actions (figure 69.1).

The boundaries of 11 southern African countries lie across fifteen river basins and straddle five lakes. It therefore follows that cooperation is built upon the mutual interest of the riparian states. Given that water is a shared resource, with most river systems, which constitute the biggest source of surface water flowing through more than one country, the resource is a constant source of potential tension. For example, coun-

tries upstream may not only pollute the water, but as a political measure may threaten to dam the river as a means of coercive diplomacy (see chap. 50 by: Ashton/Turton; chap. 51 by Kipping; chap. 52 by Borghese; and chap. 53 by Lindemann).

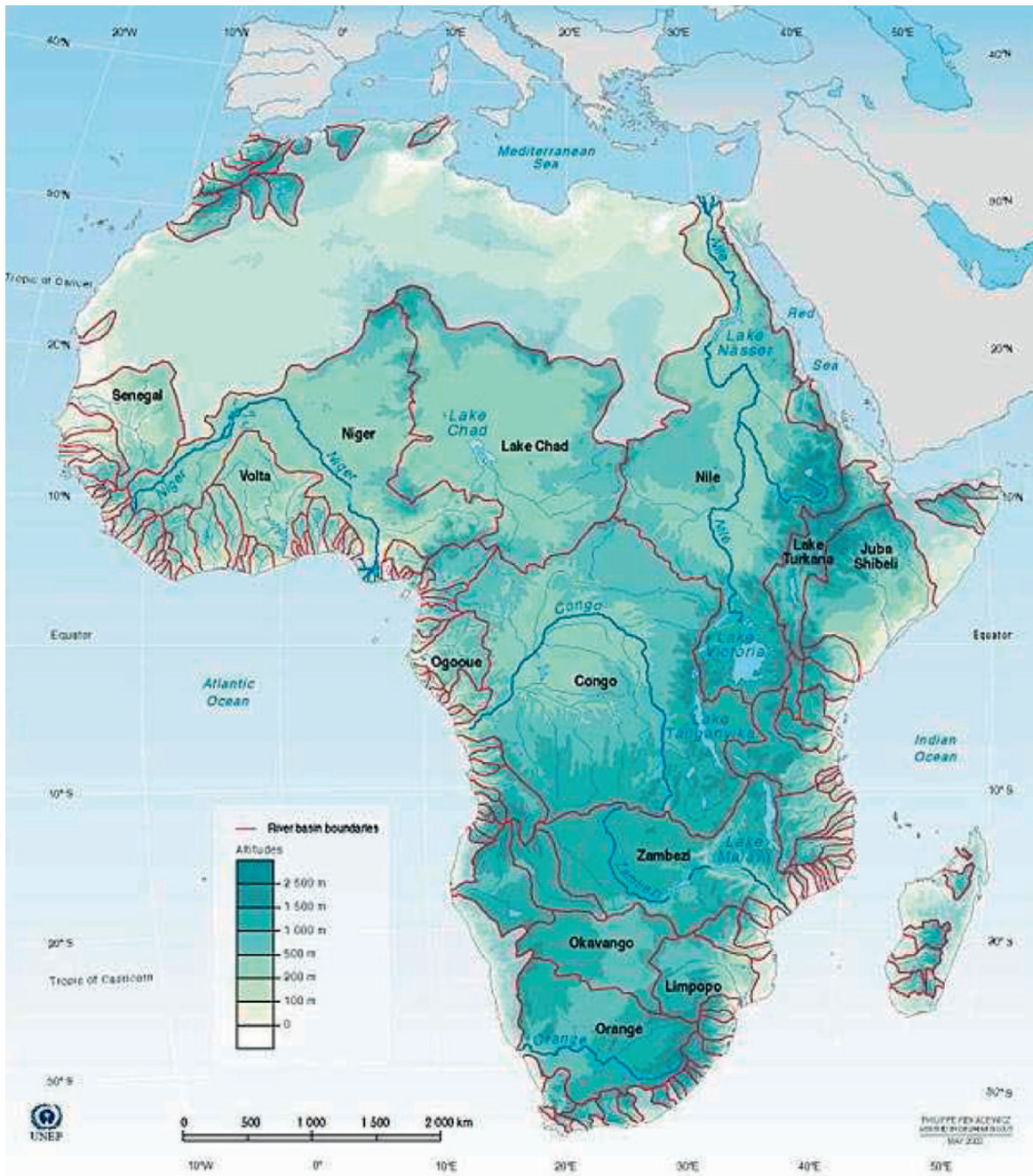
Water scarcity is increasingly being recognized throughout the world as a threat to human security. The growing water scarcity in Africa, mainly arising from unequal distribution of fresh water resources is a major issue of concern (figure 69.2). Thirty percent of the total runoff from Africa originates from a single river basin, the Congo (figure 69.1). As population increases and the amount of available water remain constant, the maximum per capita demand that a country supports obviously decreases correspondingly. Africa's population grows at 3.3 per cent per annum. With this phenomenal rise, water requirements for energy generation, domestic use, agricultural intensification and industrial production increases as well. The over exploitation of water by some privileged sectors might result in acute shortage. Increasing competition can potentially destroy the existing social arrangements and mutual tolerance and lead to ethnic and social dichotomies. Currently 14 of the 53 nations of Africa are subject to water stress or scarcity and by 2025 almost half (25) of the continent is expected to be under water stress or scarcity (UNEP 2002c, figure 69.3) The main conflicts in Africa during the next 25 years could be over water, as countries fight for access to scarce resources, and that potential 'water wars' are likely in areas where rivers and lakes are shared by more than one country. In this regard, the Nile (DRC, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda), Niger, Volta and Zambezi basins (Mozambique, Zimbabwe, Zambia) could be cited as possible flashpoints

Environmental-induced conflicts occur between states arising over sharing common resources such as trans-boundary waters. Conflict in a country can also spill-over into neighbouring countries such as large refugee flows. As the case of the Nile basin shows, the upstream riparian countries do not benefit as much as Egypt and Sudan. As the Nile water becomes scarce and the capacity of the upstream countries (or, the needs) increases, conflict is bound to arise unless a mechanism is in place dealing with sharing water resources, utilization and management, and distribution of benefits (chap. 48 by Adly/Ahmed and chap. 49 by Kameri-Mbote/Kindiki).

There are eight riparian countries that share the waters of the Zambezi basin. The following are issues that are potential sources of conflict: (a) increasing

2 See: Scoones/Chibudu/Chikura/Jeranyama/Machak/Machanja/Mavedzenge/Mombeshora/Mudhara/Mudziwo/Murimbarimba/Zirereza (1996); Mortimore (1998); Tevera/Moyo (2000); Campbell/Jeffrey/Kozanayi/Luckert/Mutamba/Zindi (2002).

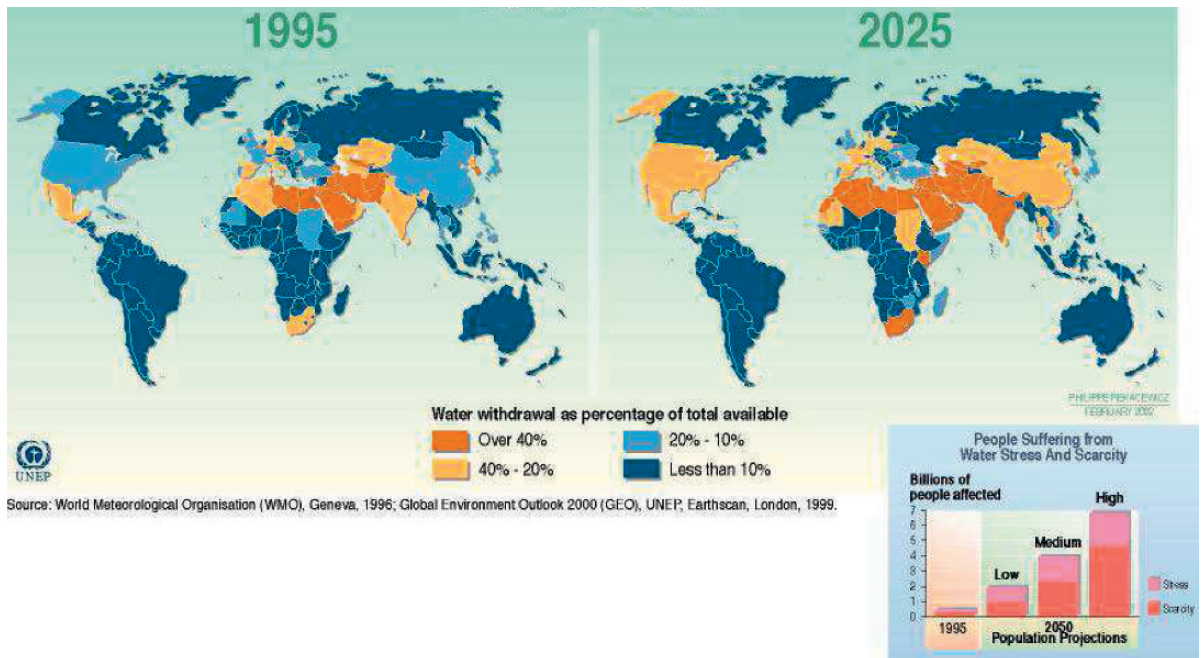
Figure 69.1: Major River Basins of Africa. **Source:** UNEP-GRIP, Vital Graphics, at: <<http://www.unep.org/vitalwater/03.htm#04>>. Permission was obtained from Philippe Rekacewicz, UNEP-Arendal.



scarcity of water in the riparian countries and unequal demand for Zambezi waters; (b) declining water quality associated with pollution; (c) management of catchments areas and flows of water (e.g. low lying countries such as Mozambique are subject to flooding in time of good rain); (d) equitable sharing of benefits; and (e) threat from unequal economic and military strength between countries. SADC has consid-

ered how best to address these issues but it has to build confidence and trust among the countries (chap. 50 by Ashton/Turton and chap. 53 by Lindemann).

Figure 69.2: Fresh Water Stress in 2000 and Projection for 2025. **Source:** UNEP-GRIP, Vital Graphics, at: <<http://www.unep.org/vitalwater/25-waterstress-world.htm>>. Permission was obtained from Philippe Rekacewicz, UNEP-Arendal.



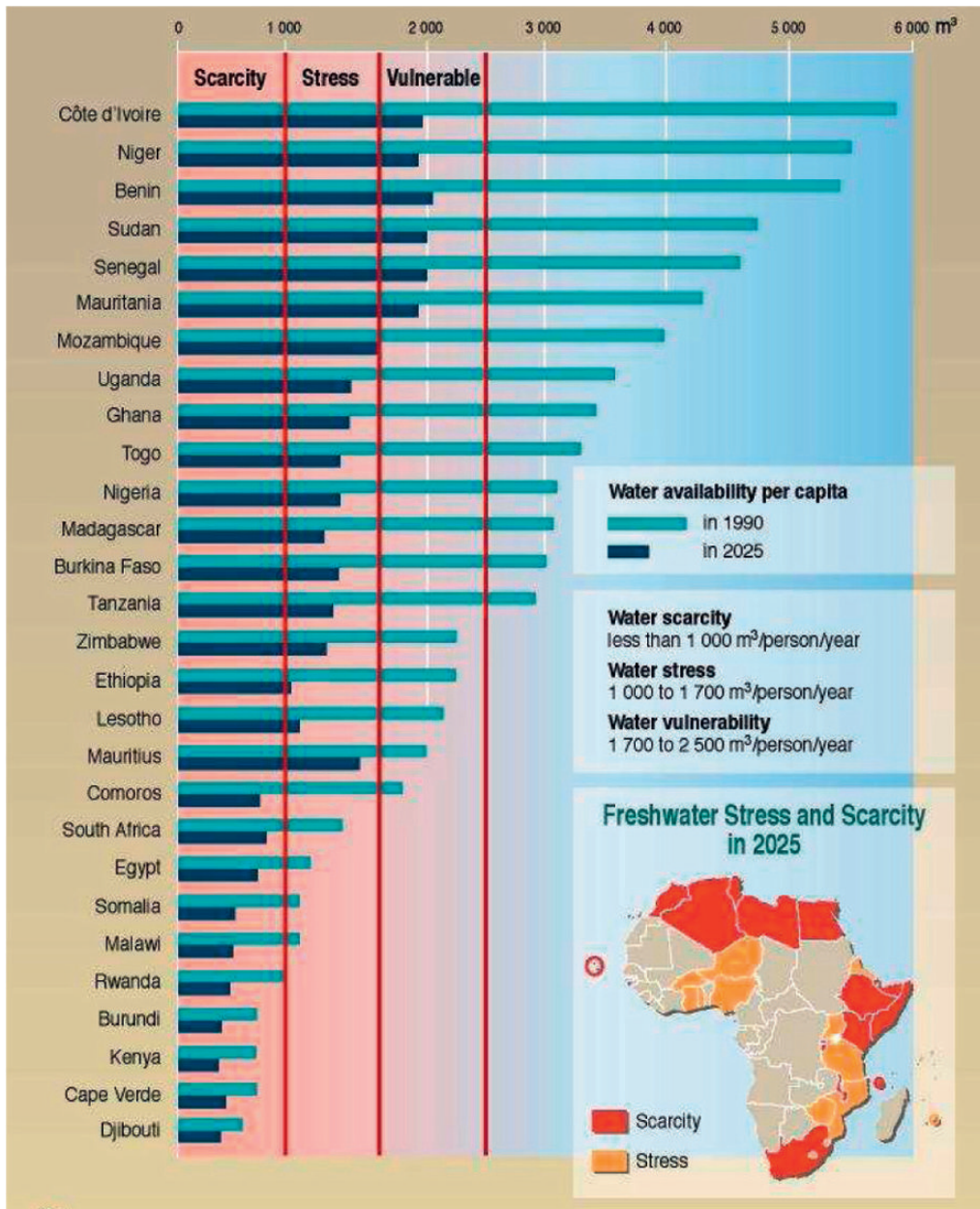
69.2.2 Land

Africa accounts for 20 per cent of the world's land mass (2,963,313,000 hectares), about 66 per cent of Africa is classified as arid or semi-arid, and the region experiences extreme variability in rainfall. Approximately 22 per cent of Africa's land area is under forests (650 million hectares), 43 per cent is classified as extreme deserts (1,274 million hectares), and only 21 per cent (630 million hectares) is suitable for cultivation (UNEP 2002). In 1999, it was estimated that about 200 million hectares (32 per cent of the suitable area) were under cultivation while some 30 per cent of the total land area (892 million hectares) was being used as permanent pasture (UNEP 2002c). Since the 1970's, Africa has seen massive soil erosion and degradation of other renewable resources that created millions of environmental refugees. According to a United Nations Environment Programme (UNEP 2000) report, an estimated 500 million ha of land, including some 65 per cent of agricultural land has been affected by soil degradation since the 1950's. Only in the last two decades, Africa has lost about 50 million ha of tropical forest. This in turn triggered large scale cross border migrations, an increased flow of rural migrants to cities, and a breakdown of the social, economic, and cultural fabric of rural societies.

Many ethnic conflicts over socio-economic dominance in Africa are structured by unequal control over land and natural resources, since they are key sources of livelihood and wealth, and of the means to pay for education and hence to attain non-agricultural employment. Land conflicts vary among countries depending on specific histories of land concentration, the farming systems and political economic structures that sustain resource inequalities. The land question as a source of ethnic and racial differences and dominance has tended to be underplayed in sub-Saharan Africa outside of former settler colonies (Zimbabwe, RSA, Namibia), even though it tends to be a common problem in many countries, including in relatively stable economies and democracies.

Colonial and post-independence land policies tended to partition national economies into ethno-regional enclaves of unequal growth, where land and resources concentration occurred alongside marginalized regions. Land conflicts take the shape of 'ethnic' struggles among pastoralist groups competing for the control of grazing lands and water supplies, especially during droughts (Flintan/Tamrat 2002). Such land conflicts (e.g. Ethiopia) escalated following the demarcation of boundaries which fragmented pastoral groups and impeded cross border movements which essentially undermined the viability of customary land

Figure 69.3: Water Availability and Water Stress in Africa in 2000 and 2005. **Source:** UNEP-GRIP, Vital Graphics, at: < <http://www.grida.no/climate/vitalafrica/english/15.htm>>. Permission was obtained from Philippe Rekacewicz, UNEP-Arendal.

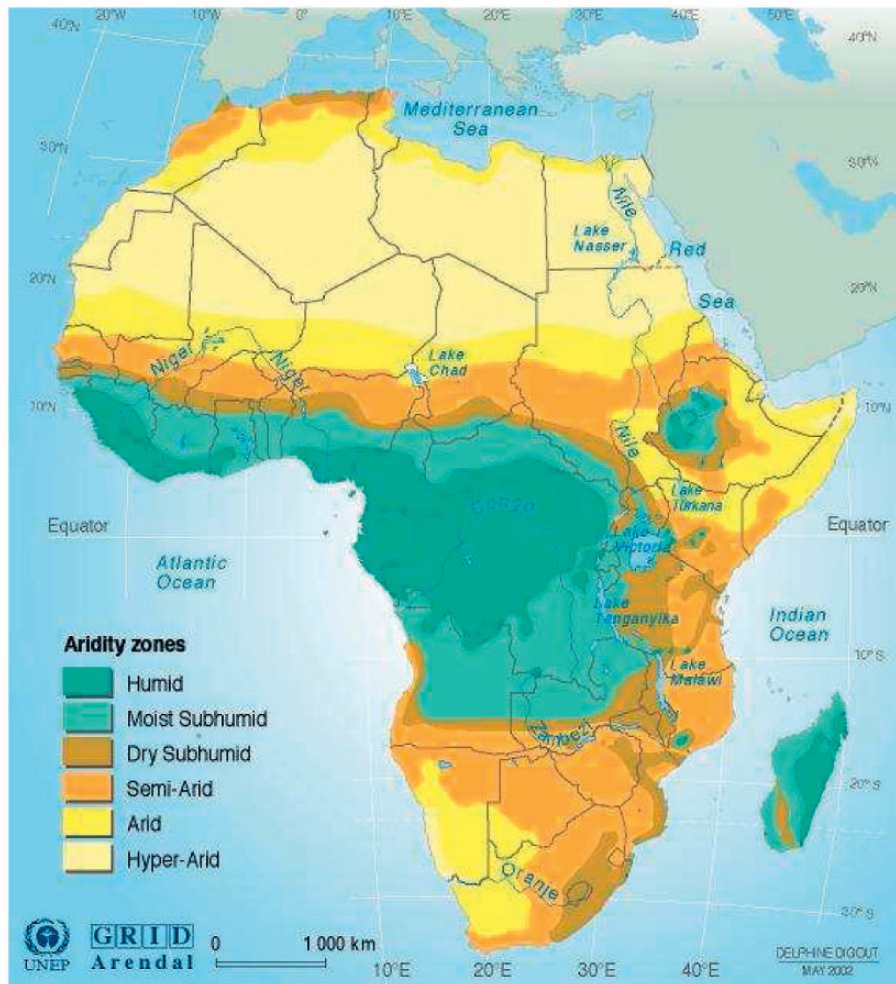


and resource-use systems (Flintan/Tamrat 2002). Territorially based ethnic clashes reign over local citizenship as conferring rights to such land (e.g. Ivory Coast). Minority groups have suffered substantially. Land distributional conflicts affecting some ethnic groups, especially minority ‘indigenous’ groups (such as the San/Bushmen in Botswana; Herero in Namibia) are common in some countries, especially where post-independence land expropriations by the

state have facilitated or led to the reallocation of land to local elites and foreign capital.

Land based ethnic conflicts in much of Africa are derived from increasing land concentration (Moyo 2004) among the elites (in Nigeria, Uganda, Kenya, Zambia, Mozambique, etc.) and the conflictual relationship over the power of the state vis-à-vis that of customary law authorities to allocate land. In formal law (in Ivory Coast and Burkina Faso) where the ‘tra-

Figure 69.4: Aridity Zones in Africa. **Source:** UNEP-GRID, Vital Graphics, at: <<http://www.grida.no/climate/vitalafrica/english/25.htm>>. Permission was obtained from UNEP-GRID-Arendal.



ditional chiefs' are granted the right to mediate 'customary rights', this is most often limited solely to the right to cultivate (Delville 1999). This contradicts fundamental aspects of customary land tenure regimes, wherein the authorities responsible for land allocation also play a role in regulating local land-use systems (Delville 1999). But although the state has taken over the absolute right of land allocation, these local authorities usually remain legitimate in the eyes of the community and continue to enjoy considerable political power over land management systems (Delville 1999). The right of eminent domain and the power to allocate land rights are fundamental to customary systems and the power of local authorities, hence pre-colonial states using their right of conquest, tended to allocate land to their clients or servants (Delville 1999). Thus, territorially based ethnic clashes over land are common in various countries.

State control over land allocation and concession procedures by both the colonial and independent African governments, tends to be delegated to elected rural councils (in Senegal), through various forms of land allocation procedures (Delville 1999); leading to conflicts between formal law and customary land rights. This has especially afflicted French-speaking West Africa. Since the territorial distributions of local 'traditional' authorities are generally based upon lineage and clan social structures with particular ethnic identities, such land conflicts tend therefore to assume an explicit or implicit ethnic character.

But land conflicts also reflect wider resource based conflicts, including competition for grazing and water resources, as well as disputes over community territorial land and district borders, especially because in large parts of sub-Saharan Africa land use is dominated by pastoralism which is the only economic and

social livelihood in various countries. The causes of land conflict in non-settler Africa include: the grabbing and sale of communal land and favouritism in its allocation; partisan roles of security agents in mediating conflicts; the squatting in communal land; the commercialization of cattle rustling and competition over natural resources such as pastures, water and livestock; human and wildlife land use conflicts. Historical colonial alliances over the control of land underlie some of these conflicts, as the alliance between the British administrators and the Yao elite in Malawi, who were chosen as the instrument for indirect rule, demonstrates (Vail/White 1989). Land conflicts also have an international dimension which arises from the growing tendencies for land to be concessioned and sold to foreign companies, through investment agreements in agriculture, tourism, forestry and urban land investments.

The legacy of settler colonial land expropriation remains the source of extreme land conflicts in Africa. Racial inequality in the control of or access to land in Africa has been most extreme in Zimbabwe, Namibia, South Africa and Kenya, and led to radical land reforms in Mozambique (1976) and Zimbabwe (since 2000). The proportions of land held by racial minorities ranged from 87 per cent in South Africa in 1994 to 50 per cent and 30 per cent in Zimbabwe in 1980 and 1999. The Government of Zimbabwe (GoZ) resorted to compulsory land acquisition methods since 1997, but faced legal challenges from landowners, and failed to get British finance (on grounds of colonial responsibility) for speedier land acquisition. This radical approach was accompanied by violence and reduced agricultural production.

In spite of an orderly official land redistribution process in South Africa, land policy and conflict over land have been driven since the late 1980's by illegal land occupations which affected all its major cities and involved close to three million 'squatters' in shanty peri-urban township (Sihlongonyane 2005). The murder of 100's of white farmers each year reflects a deep-seated land conflict in South Africa, given that only 3 per cent of the land was redistributed by 2004, with a 40 per cent unemployment rate.

Recent attempts to confront the historical land expropriation and contemporary land-based inequities and discriminatory legislation and institutions, have generated renewed racial conflict. Land-related conflicts today increasingly arise from social initiatives to forcibly repossess rights to land and embedded natural resources. The greatest threat to security in SSA rests on unequal land ownership patterns in countries

where poor people's livelihoods depend on farming. Formal employment is unable to absorb the numerous unemployed, land-short, landless and homeless (Moyo 2004a; Tevera/Moyo 2000).

Land and natural resources conflicts revolve around five major issues. *First* among these is the general scarcity of land which forces villagers to occupy land perceived as vacant. *Secondly*, political issues have a tendency to encourage illegal settlements among villagers in return for political favours. *Thirdly*, communities also choose to dishonour boundaries in pursuit of their survival strategies. *Fourthly*, the marginalization of certain social groups forces them to defy certain rules and regulations. *Lastly*, armed conflict often results in the destruction of the environment. In addition, there are several types of environment induced conflicts in the countries in East Africa (Sudan, Rwanda, Uganda and Ethiopia). There are conflicts between farmer and pastoralist; among farmers; among pastoralists; between the state and pastoralists; between the state and cultivator and between different state cultivators.

In the majority of cases conflicts are related to competition over access, use and transfer of scarce natural resources. These conflicts arise over intergenerational transfer of land, sharing common resources (i.e., common grazing and water resources), migrants encroaching in indigenous land, and claims over ancestral land. Shrinkage of natural resources thus means less resource available for livelihood and survival, or less land available for intergenerational transfer, decreased likelihood of getting access to those who seek to acquire land or resource capture by powerful groups and marginalizing the weak or shrinkage of expansive territory necessary for extensive mobile pastoral population. These different conditions or manifestations of scarcity could lead to disputes and armed conflicts. The majority of land users relate conflicts to scarcity of agricultural land. Disputes and conflicts over scarce natural resources are highly prevalent in the East African countries (especially in Rwanda, Uganda, Burundi and Ethiopia; chap. 68 by Ejigu).

Conflicts have occurred or have the potential to occur where property rights are not responsive to scarcity of resources in a way that allows equitable access, efficient use and security of tenure. Inequitable distribution of resources where powerful groups marginalize the weak could in particular be a source of grievance and conflict. The cases of Rwanda and Burundi demonstrate issues of persistence, such as inequality in land ownership, squeezing of the poor onto marginal areas, and resettling the returnee refugees.

Also where governance deficit manifests itself in a variety of ways such as absence or weak central authority to enforce law and order, control by interest groups and biased policy, absence of transparent rules of law and enforcement, inadequate institutional and legal framework, and deficiency in capacity (i.e., manpower, finance and broad-based political support) conflicts are apparent. Environment induced conflicts become highly politicized over time, as shown in pastoral communities in the Awash Basin of Ethiopia, and the Hutu-Tutsi conflicts in the Great Lakes region. And, as in the case of Ethiopia in 1991-1992, environmental conflicts have a tendency to escalate during times of political or authority vacuum.

69.2.2.1 Land Tenure and Land Use

In Southern Africa, colonial policies on land tenure and access influenced patterns of land use and management in many ways. For example, legislation creating national parks and forest reserves was passed, leaving peasant farmers with little land and forcing them to turn to intensive production in either cultivated areas or grazing areas (Annersten 1989 cited by UNEP 2002c). Traditional communal land tenure was perceived as insecure and hence land was either leased from the state or privatized. The inequitable distribution of land in countries like Namibia, South Africa, Malawi and Zimbabwe has contributed to the declining state of resources in these countries, thereby creating the conditions that lead to food insecurity. Emerging informal land tenure arrangement is a key indicator of environmental insecurity. Informal land transactions, particularly, underground rental land markets are gaining importance (e.g. in Ethiopia).

Land tenure and land-use conflicts have the potential to undermine both environmental stability and food security. These forms of conflict are prevalent across and between land tenure categories. Whilst conflicts are normal in society (Widstrand 1980), their management is a major challenge. Investment in institutional development for local level conflict management is often the missing dimension in development policies. There are undoubtedly 'tenure hot spots' where, if the rights of the more vulnerable members of society are to be protected, change must not be allowed to take place in a legal and administrative vacuum (Adams/Sibanda/Turner 1999). For Zimbabwe Moyo (1995) describes how competing and ineffective attempts by both government and NGOs were frustrated by weak local administration and disingenuous central government interventions, and failed to resolve land tenure problems in the absence of constitu-

tional and legal principles governing land in the communal areas.

Studies in South Africa demonstrate the increasing breakdown of customary management arrangements and the often dysfunctional mixture of old and new institutions and practices (Adams/Sibanda/Turner 1999). People are often uncertain about the nature of their rights and confused about the extent to which institutions and laws affect them. Matters are further clouded by local and national political conflicts over land management roles in the communal areas and by continuing corruption.

At the micro level, peasants use various strategies to press for their land demands. Some of the main peasant strategies that have been used include 'poaching' of natural resources, fence cutting, illegal settlement/land occupations and resistance to development projects. Such strategies have tended to target various forms of state lands, particularly forests and national parks, and communal areas, as well as privately owned lands. In the case of Zimbabwe, land occupations have targeted various land tenure categories over the last two decades, including white owned 'commercial land' and state land (Moyo 2000, 2001).

Given the tendency for small-scale farmers or peasants to be largely concentrated in marginal land areas, and to have the least access to water infrastructures and investment finance, it is not surprising that their land uses are extremely vulnerable environmentally. It is in these peasant lands that land use regulation is coercive rather than based on incentives. Land-use patterns in Africa are very much restricted by the agro-ecological potentials of the land, as well as the underdevelopment of irrigation resources and the low levels of finance available for and applied to farm technologies. These land use patterns reflect environmental vulnerability and the technological backwardness of African farming, and the framework within which the peasantry is marginalized.

Smallholder agricultural development schemes are notorious for the coercive and discriminatory regulation of land uses applied to them. Since land held under freehold tenure systems and by the state tends to be the least regulated while customary tenure systems, under which most of the indigenous people in Africa live, attract numerous coercive and top-down land-use regulations (Shivji/Moyo/Ncube/Gunby 1998). However, since these customary tenure regimes are important electoral constituencies and they also tend to be physically remote from the reach of an increasingly withdrawing state, the direct regulation of their land uses cannot be extensively implemented. The coloni-

alists seem to have been able to enforce many such regulations with greater vigour than post independence governments have been able to do.

Land use patterns in Africa have tended to develop in close relationship with coercive land use regulations. Dirigiste land use regulations tend not only to determine which commodities are to be produced but also the timing and methods of production. In this respect, land use regulations themselves have been part of the problem of food insecurity at both national and household levels, given their promotion and prohibition of so-called 'cash' (and export) crops over domestic food crops, in keeping macro-economic incentives and agricultural support services directed at promoting these land use patterns.

The extension of these short term and external oriented land use regulations and policies on degradation, towards the more intensive extraction of forest, biodiversity and wildlife resources largely for export markets, has led to greater land use extensification in Sub-Saharan Africa, and led to a diminishing land and resource base available to the peasantry. Such processes have themselves not only extended the scale and scope of environmental degradation, but has also reinforced unequal patterns of access to land through the enclosure of vast tracts of lands by the state and elites. The effect here again has been the marginalizing large rural populations from access to natural resources for their basic consumption and livelihoods.

It is this inequality in access to land and natural resources, as well as misguided land use regulation, which underlies much of the land degradation in Sub-Saharan Africa, rather than the neo-Malthusian demographic determination thesis, in which increasing demographic pressures on land lead to natural resources degradation. Ineffective agricultural and economic policies entrenched by misguided short-term domestic elite interests and the external manipulation of global agricultural and financial markets structure the land question of distorted land use regulation and misguided production incentives.

In most of Sub-Saharan Africa, land use regulations and planning frameworks have been an ideological tool for maintaining the unequal distribution of land and inequitable security of tenure. The regulation of land use, usually rationalized on the basis of the need to protect legitimate public interest, is often unevenly applied to different tenure systems, and through this to different classes of landowners and land-use systems.

69.2.3 Natural Resources

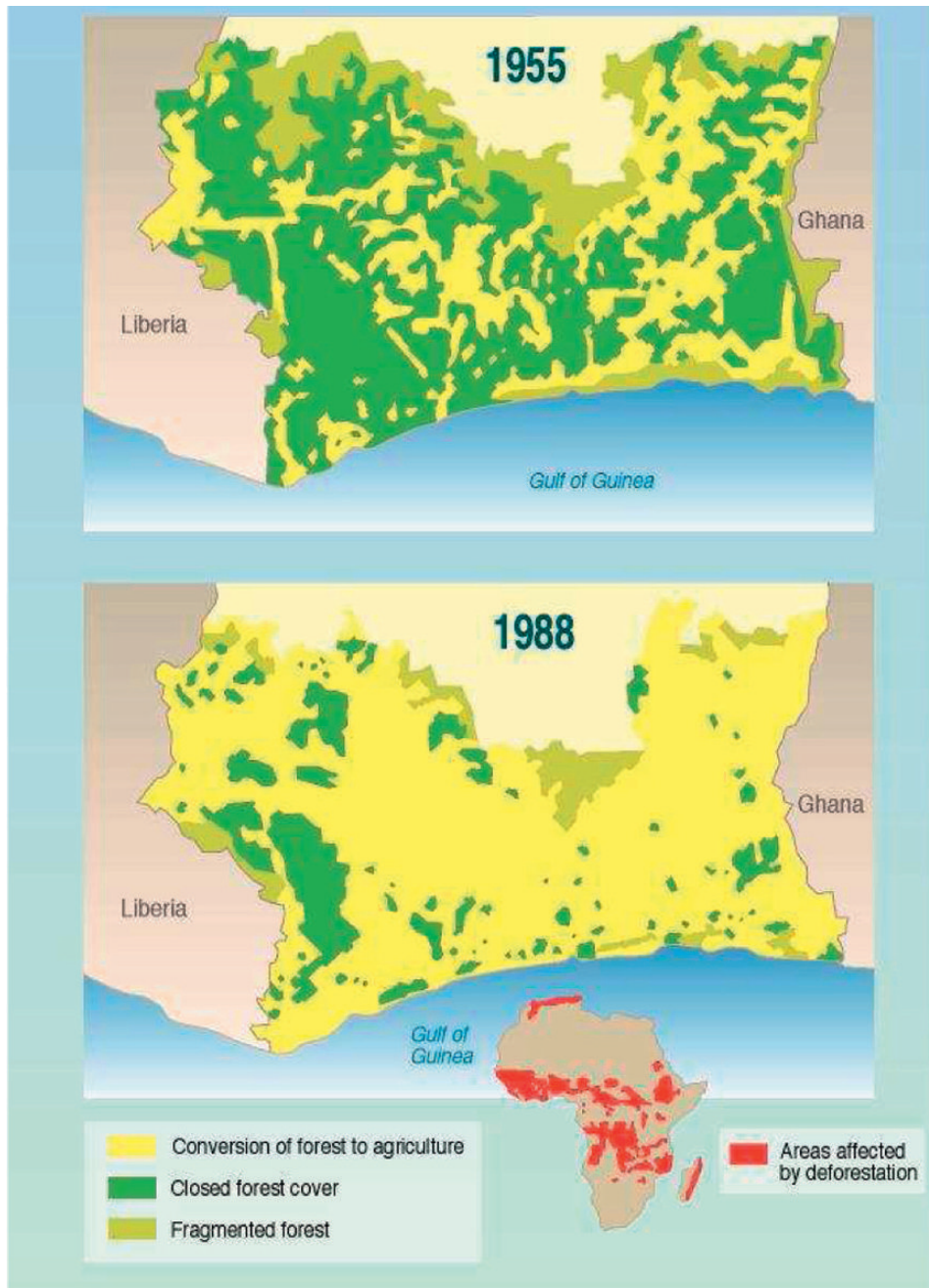
There are several processes that are contributing to the degradation of forests in Africa. Firstly, the international corporations undertaking commercial logging operations are a major cause of deforestation. Gabon, Cameroon, the Central African Republic, Congo Kinshasa, Congo-Brazzaville and Equatorial Guinea represent the main countries whetting the appetites of transnational forest companies, after almost all West African forests have been depleted.

The structural adjustment and other free market policies forced on African countries by the *International Monetary Fund* (IMF), *World Bank* (WB), and *World Trade Organization* (WTO) have provided greater incentives for unsustainable exploitation of natural resources. In Cameroon, state claims to property over all trees and plantations have provoked conflicts over land tenure between the government and local communities. Also, the establishment of large-scale oil palm plantations in Cameroon has often resulted in the expropriation of the land of neighbouring villages without adequate compensation. Cameroonian law states that peasants do not own the land by customary right, and hence expropriation by the state does not require compensation.

Settlement of game reserves and forest reserves is also extensive in a country like Uganda. In Côte d'Ivoire, conflicts also assume various dimensions (figure 69.5). The defining factors in the Ivorian situation include migrant labour, ethnic issues and the development of illegal land markets. The incidence of civil wars in countries like Angola, Rwanda, Burundi and Mozambique has also contributed to the destruction of forests. After the 1994 genocide in Rwanda, the massive return of refugees led to the destruction of existing woody areas, and the quasi-anarchical takeover of protected zones, namely the Akagera National Park and Gishwati Forest Reserve. Estimates are that 15,000 hectares of plantation were destroyed while another 35,000 hectares were damaged. The pressure on the existing forest resources also accelerated as the energy needs of orphanages, prisons, schools and tea factories had to be met.

The unsustainable exploitation of forests in most of Africa emanates from the fact that, after independence, governments maintained parts of the unjust provisions which had been imposed in legislation by colonial governments, including those referring to the appropriation of community forests by the state. Current governments can, therefore, still legally open up forests for exploitation by transnational companies in-

Figure 69.5: Deforestation in Africa. **Source:** UNEP-GRIP, Vital Graphics, at: <<http://www.grida.no/climate/vitalafrica/english/07.htm>>. Permission was obtained from Philippe Rekacewicz, UNEP-Arendal.



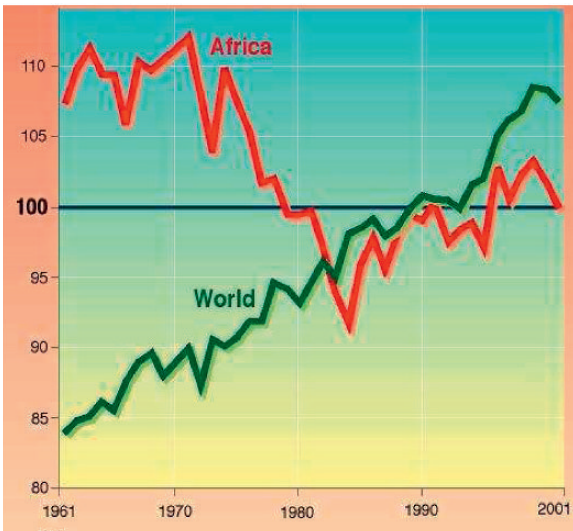
stead of making them available to local communities. Inappropriate land tenure policies have, therefore, resulted in various forms of economic, environmental and social impacts (Ouedraogo/Toulmin 1999). For example economic impacts involve loss of livelihoods and increasing poverty, environmental impacts include lack of investment in land improvement, while

social conflicts manifest themselves in deterioration of community cohesion and rising levels of conflict.

Most environmental resources tend to be transboundary in nature both in terms of distribution and demand, and as such the potential for inciting international conflicts over such resources is high. For example, the once ready international market for elephant products often led to armed conflicts between poach-

ers and wildlife patrol units, particularly within the Zambezi Basin. Despite brave fights by both state and private security agents to contain poaching, serious wildlife losses were incurred. For example, mainly Zambian poachers killed 380 black rhinos in Zimbabwe between 1980 and 1987; further endangering the already threatened species and spawning tension between the two neighbours.

Figure 69.6: Food Production in Africa and the World. Food Production Index, Net per Capita (PIN base 1989-1991). **Source:** UNEP-GRIP, Vital Graphics, at: <<http://www.grida.no/climate/vitalafrica/english/26.htm>>. Permission was obtained from Philippe Rekacewicz, UNEP-Arendal.



The net effect of land and natural resource conflicts is the destabilization of food production, degradation of the environment and, in the case of armed conflicts, creation of open access conditions for natural resources. Attainment of environmental security is never possible in the absence of appropriate conflict management strategies.

69.2.4 Minerals

Socio-economic dominance has also arisen from wider economic processes in which ethnicity has tended to be co-opted, if not institutionalized. Structural shifts in the livelihoods and occupations of Africans, during colonial and post-colonial periods arose from fundamental economic and resource policy interventions centred on land expropriation, the enclosure of mining and regional enclaves and the creation of corridors of transport infrastructures. These had

regional dimensions that served to segment opportunity along the geographic distribution of ethnic groups.

The expansion of colonial era trade, however, led to attempts by coastal inhabitants in West Africa in particular to mobilize themselves as privileged intermediaries between the Europeans and the African clientele of the hinterland. This led to a social differentiation of an ethno-regional character and to conflict between the ethnic communities in towns where individuals of different origins met, as well as between coastal and northern regions. Thus the West African coast divided the southern groups from northern savannah/pastoralist social formations. In Kenya where colonial land alienation deprived mainly the Kikuyu, some of them instead of opting for squatter settlement, became petty traders, and seeking new and better markets, spread throughout the country, especially in new urban centres and along the railway lines. This ethnic dispersal into business influence attracted resentment from local communities leading to the crystallization of ethnicity (Peacenet-Kenya 2001).

Efforts to transform agriculture in Nigeria since the mid 1970's focused on elites in various regional enclaves, to the exclusion of some ethno-regional populations, especially remote peasant social formations in general. Regional variations in natural resource and land endowments, infrastructures and social services fomented unequal ethnic distribution of socio-economic opportunity, creating ideological grounds for ethnic deterministic thought in explaining inclusion and exclusion in spite of the class and external factors (Egwu 1998).

The ethnic and racial basis of socio-economic dominance and conflict in Africa also derives from patterns of external control of minerals and commerce in Africa's uneven enclave economy. Africa has witnessed much more broadly based struggles between 'foreign' and indigenous elites and business people over wealth accumulation and dominance, through competition for land, minerals and commercial activity, during and after colonialization. After independence marginalized indigenous businessmen gained access to opportunities in national markets, which they rapidly monopolized (Egwu 1998), using ethnic mobilization strategies.

The struggle to control commerce in Africa has for long been predominantly a racially shaped conflict as indigenes compete with Asians, Lebanese, Whites and Arabs. The notable cases of such include, former settler colonies, Tanzania, Sierra Leone, Sudan and southern Africa. This has led to extreme measures to

bring balance. However, reverse racially based discrimination based upon a broad concept of affirmative action has been experienced in Africa. Extreme actions in Uganda, for instance resulted in the deportation of Asians and expropriation of their properties in 1972. Malawi practices racial discrimination in land tenure against the 'Asians'.

In a variety of African countries state based control and distribution of mineral resources and related rents and services have been a major strategy used to mobilize socio-economic and political dominance, and a key source of ethno-regional wealth differentials and struggles over resource control. Countries affected by this include: Nigeria, Cameroon, Angola, Sudan, DRC, Sierra Leone and South Africa. The exploitation of oil became the major source of post-independence conflict in Sudan, as the government controls the oilfields within a unitary state created against southerners (Goldsmith/Abura/Switzer 2002).

The worst ethnic conflicts over socio-economic dominance seem to occur in those African countries and within those regions of high mineral potential. For instance, in the DRC, Kivu province, "... which have been under rebel control during 1998–2002, ranks among the most productive regions in Africa. ... became the target of extensive, though illegal, natural resource exploitation within the framework of a wider conflict system involving a myriad of actors and interest" (Moyroud/Katunga 2002). Ethnic and interstate conflicts and war dominate this region. Nigeria's delta region is in this sense a key conflict zone.

Dominant discourses instead focus on 'internalist' perspectives, which argue that African ethnic primordial tendencies are central to the socio-political implosion and conflict in Africa. While internal mobilization of ethnic dominance has been critical, external resource extraction has been critical in countries such as the DRC, Liberia, Rhodesia, Nigeria, Sierra Leone, Mozambique and Angola. Whereas ethnic clashes (among Tutsi, Rwanda refugees, Hutus) were not new to the Kivus region of the DRC, sub-regional or neighbouring state interventions (by Rwanda and Uganda) have shaped ethnic dominance patterns there, using regional armed confrontation (Moyroud/Katunga 2002). Thus, internal-external alliances have provided a framework for the emergence of socio-economic dominance structures founded on ethno-regional politicization and foreign resource extraction and trade.

69.3 Other Resources Issues

Population growth is a major cause of environmental instability in Africa as a whole. More than 70 per cent of the population in Eastern Africa is rural, depending mostly on subsistence agriculture. In Ethiopia for example, 95 per cent of agricultural output is generated by small-scale farmers who use traditional farming practices (UNEP 2002c). High variability of rainfall, increasing population and the resultant high demand for food are forcing farmers to expand the area under cultivation into more and more marginal areas.

The need to increase food production to enable increased food consumption has become more desperate as the demands of an increasing population have failed to be met. As a result, marginal land has been brought into production (cultivation or grazing); commercial operations continue to use fertilizers and chemicals for increased productivity while fallow periods have been reduced. Although such activities are designed to increase productivity, they can result in exhaustion of production capacity of the land which manifests itself in declining yields of the land, vegetation and soil degradation and, in some cases, desertification. Climatic variability and change, and inappropriate land use or land tenure policies add to the pressures magnify the impact.

The high fragility of Africa's environment tends to compromise food production and leaves a majority of the poor vulnerable. For example, the mountainous and hilly area which covers much of Burundi, Rwanda, and Uganda leaves insufficient arable land to support the high population densities of these countries. There is some extensive cultivation in Burundi, Rwanda and Uganda, with the area cultivated standing at 42 per cent, 35 per cent and 45 per cent respectively.

In many cases, ethnicity was used as a cover for environment-induced conflicts. Conflict entrepreneurs have used ethnicity to gain and maintain political power and thereby access to scarce resources. In Rwanda and Burundi, for example, the differences between the Hutu and Tutsi deepened during the colonial period. The post-colonial governments in both countries further polarized the ethnic divide in order to control political power and resources. The Burundi study highlighted that the conflicts in Burundi are not between the Hutu and Tutsi masses, but between elites of the two ethnic groups in their competition for economic and political power (Musabe/Bikwemu 2004).

In all the cases where there is violent conflict, there is an element of population mobility. The examples from Ethiopia and Uganda demonstrate the cases where migrant population encroaches on scarce resources of indigenous inhabitants and thereby denying access to customary sources of livelihoods (e.g., access to hunting and forest resources). For example, the conflicts between the Bakiga and indigenous Banyoro and Batooro in Kibaale and Kyenjojo Districts, and Bahima/Banyarwanda pastoralists in northeast Uganda are resistance by the recipient indigenous communities, often causing some ethnic tensions. The Rwanda and Burundi studies (Musabe/Bikwemu 2004) take a different perspective on environment-migration and conflict links, where resource scarcity propels stronger groups/communities to resort to resource capture. Resource capture by powerful groups within communities has the effect of shifting resource distribution in their favour and thereby subjecting the remaining population to resource scarcity. This results in large migration of poorer and weaker groups into ecologically fragile regions that subsequently become degraded and causing serious pressures on livelihood security, thus creating opportunity for conflict.

Large-scale migration translates onto conflict more likely where there are social cleavage between migrants and indigenous population. The Uganda study (Mugisha 2004), in particular, underscores the major link between environmental insecurity and conflict occurs mainly through environmental induced migration into communities with different ethnic make-up. Conflict arises between heterogeneous communities differentiated by ethnicity and at times by livelihood strategies (e.g., conflict between pastoralists and cultivators). When migrants, for example, are perceived the source of deprivation and despair, particularly where there is societal heterogeneity, grievances give way to conflict. The Uganda study underscores the fact that underlying resource conflicts is increasing economic and political power of the immigrant population such as the conflict between the Bakiga migrants and indigenous Banyoro and Batooro.

Poverty, economic deprivation and vulnerability create conditions of environmental insecurity to lead to violent conflict. Poverty is widespread in all the case countries. Incidence of poverty tends to be greater in ecologically fragile marginal agricultural areas with few routes to escape poverty. For example, mapping of poverty by geographical area in Ethiopia shows poverty tends to be lower in villages with adequate and stable rainfall, moderate population den-

sity, and high market access. The worst villages are characterized by poor topography and soils, low and variable rainfall, high population density and poor market access.

As regards the link between poverty and conflict, it is not the general level of poverty that causes conflict, *per se*. Rather, it is the poverty consequence of control of scarce resources that results in increased economic deprivation, pushing the poor onto marginal areas, and heightened social despair and uncertainty of the future. What matters to explain conflict is thus not being poor today but the perception of future threat of their livelihoods and growing poverty. When people are under threat of environmental insecurity, they are prone to manipulation by warlords or conflict entrepreneurs for engaging them into conflicts for political end. Or, the poor maybe pushed onto marginal areas by powerful groups. Whilst recognizing poverty as a consequence of environmental degradation, it is also the cause of land degradation. The causality is not thus one way.

The poor often degrade their natural resources, which are their basic livelihoods. It is not, however, inherent in the poor to degrade their natural resources. The poor are bound to degrade natural resources, for example, under conditions of insecurity of tenure, lack of access to technology to improve productivity, perception of high risk and uncertainty over livelihoods and survival, and poor access to credit to smooth consumption. Or, the poor may be pushed onto marginal areas by powerful groups as the evidence from Rwanda and Zimbabwe indicates. When incentives are right and constraints are relaxed, the poor invest their own time and resources to conserve and improve their natural resources. Whether the land degrading behaviour of the poor is due to lack of knowledge or other factors needs to be understood for effective policy intervention.

The burden of poverty as a consequence of environment degradation falls heavily on women, who are dependent on natural resources to provide family subsistence. Addressing the poverty and environmental links eases the burden on women and consequently on welfare of families.

Focusing on sustained pro-poor development process is necessary to de-link the positive relation between poverty and environmental degradation. Broad based and diversified economic growth lessens the burden on natural resources through shifting population into other livelihoods. As the Ethiopia PRSP demonstrates, environment as a priority area is main-

streamed with strengthened regulatory and institutional capacity (Teklu/Tegene/Rahmato 2003).

Evidence is strong that environmental insecurity contributes to migrations, declining agricultural productivity, and weakening of the legitimacy of governments, hence serving as an underlying yet strong cause of intrastate conflicts. Some scholars argue that sub-national and persistent conflicts took the form of ethnic clashes due to environmentally induced population movements and civil strife stemming from environmental scarcity that affected economic productivity and therefore livelihoods, elite interests, and state capacity to confront these challenges. It is thus believed that the notion of environmental security may offer an alternative paradigm and analytical framework to address both the causes and consequences of political instability in Africa.

There is also wide recognition that the linkages between environmental factors and security are frequently indirect and difficult to identify with certainty. Studies that attempted to verify empirically the causal relationships between environmental variables and violent conflict have shown that environmental factors, while contributing to the likelihood of conflict, are extremely difficult to isolate as sole causal variables. Indeed, environmental and resource factors, though vital, cannot be considered in isolation from geography, history, and socioeconomic and cultural variables. Therefore, the issue of environmental change, security, and development must be dealt with holistically taking cognizance of the crucial role that economic, social, political and cultural policies play

69.4 Environmental Security in the SADC Regional Perspectives

Sustainable environmental management and nature resources trade are critical areas of regional cooperation towards achieving a balanced socio-economic development and security. The economies of the *sub-Saharan Africa* (SSA) region are extremely dependent on natural resources both through their international commodity exports orientation and because 70 per cent of their population's livelihood dependence on natural resource exploitation and consumption (Moyo/Tevera 2000). Increased demand for resource for both local and export markets as well as escalating competition for the control of natural resources have been a source of insecurity and have increased the incidence of environmental conflicts in the SSA. Environmental security problems in the region such as nat-

ural resource conflicts and environmental change arise from multiple processes which manifest at various spatial and sectoral levels. These include conflicts at the inter-state and intra-state levels, the class and racial levels and at the local level. The changing power relations driven largely by class and race based inequitable control over natural resources, which have a specific historical basis, govern the emerging patterns of environmental insecurity and conflict in the region.

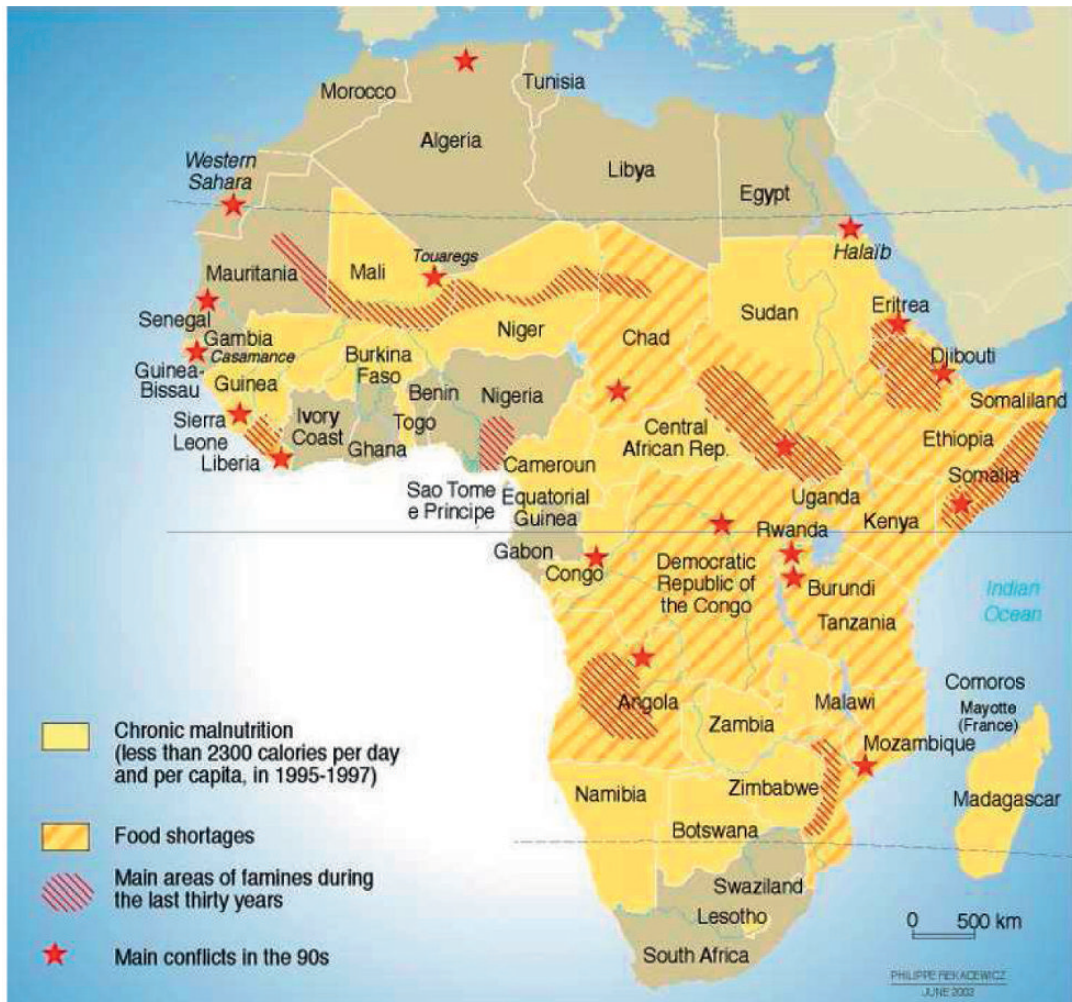
The key environmental problems which underlie and define environmental security in the SSA include:

- The resurgence of unresolved historical claims over national boundaries and land including the natural resources which are embedded in them;
- Conflict over the definition, security and realization of rights to land, water and other natural resources; and
- Conflicting authority and relations of governance between the state and civil society groupings.

These problems span the local, national and inter-state levels of governance. The issue of environmental security has become pivotal in regional co-operation. The legacy of regional destabilization and civil war and the recent market oriented development within a globalized framework has had several negative and positive environmental consequences in the SADC region. The region is experiencing various national and cross-border environmental problems such as natural resources degradation and pollution, growing inter-state and private competition and conflict over the control of and use of natural resources. National and regional struggles to control natural resources have become central to political stability, economic development and environmental sustainability. However, mainstream research in economic policy studies, international relations and environmental research have underplayed the emerging and potential regional conflicts over natural resources. A case in point is Angola where, during the past decades, there have been intrastate conflicts over a variety of natural resources, especially minerals.

For the semi-arid SADC region, the locus of growing struggles over natural resources is water. The exponential increase in current and future national and regional demand for water resources for domestic, urban, industrial and agricultural development has already created several conflicts (chap. 50 by Ashton/Turton; chap. 53 by Lindemann). The rapid expansion of the tourist industry and export markets based upon natural resources such as wildlife, forest products and consumptive biodiversity is a more recent arena of po-

Figure 69.7: Food Shortages, chronic malnutrition, famines and conflicts in Africa during the 1990's. **Source:** UNEP-GRIP, Vital Graphics, at: <<http://www.grida.no/climate/vitalafrica/english/27.htm>>. Permission was obtained from Philippe Rekacewicz, UNEP-Arendal.



tential trans-boundary source of conflict given the growing regional competition to capture global markets. Land resources, which in most countries were alienated from indigenous people during the colonial era, continue to be inequitably distributed and dominated by a few land owners, while the pressures for privatizing communal lands escalates. Even the exploitation of hydro and coal power for energy has been concentrated among a few industries, as have been the benefits of nature conservation and natural resources trade.

The movement of people in transborder areas generates environmental insecurity and conflict over natural resources. Involuntary migration of peoples across numerous SADC region borders (Malawi, South Africa, Zambia, Zimbabwe, Tanzania, Swaziland, and Botswana) due to conflicts in Angola, Mo-

zambique, Rhodesia and South Africa over decades not only dislocated peoples and local governance systems, but they also increased the damage to various fragile ecological systems, thereby causing environmental insecurity (Singh 1995). Economic depression and drought in some SADC regions have escalated migration to South Africa (Dateline Southern Africa 1996), causing the resurgence of xenophobic nationalism, as migrants claim shares of natural and socio-economic resources. Illegal cross-border poaching and trade in natural resources have now become crucial strategies for capital accumulation by the elites and for the survival of the poor, resulting in growing armed grabbing and protection of such resources.

SADC countries now openly compete for and appear prepared to wage war over, shared natural resources. Tapping the Zambezi waters is the dream of

most riparian states, although only a few of them can muster resources to tap this water for energy or large scale consumptive purposes. Some border resources, such as the Sidhudhu Island, are being fiercely contested by Botswana and Namibia. The attempt by some states to use natural resources which are wholly within their borders, such as the damming of key tributaries (e.g. in Botswana and Namibia), can be expected to have trans-boundary ecological and economical effects. During 1998/99 there were armed interventions in Lesotho and the Democratic Republic of Congo (DRC), partly over the control of water resources.

SADC states are increasingly experiencing various trans-boundary environmental processes such as river channel siltation and the pollution of water and air by cross-border industrial and agricultural activities. This raises critical intellectual and policy questions about the future of national sovereignty given that ecological systems transcend national boundaries. To what degree could SADC regional supra-state institutions assume custodianship of key natural resources and regulate the potential environmentally negative trans-boundary effects of trade and development, while expanding the benefits from their exploitation.

National sovereignty continues to be circumscribed by the increased globalization of natural resources management. Cross-border investments from abroad and within the SADC region, especially in sectors such as tourism, transport corridors, sea ports, agriculture and mining have increased the foreign control of land and natural resources. Given the limited local benefits of such land transfers and the increasing concentration of land ownership by a few national elites, there is growing nationalistic resentment against a trend often perceived as territorial and natural resources recolonization, especially where governments have facilitated such land transfers, through legislative change (Zambia, Mozambique and Tanzania) or through bilateral agreements to settle large scale white South African farmers (Zambia, Mozambique). South African capital has, for instance, moved towards the control of pristine land and other natural resources in several SADC countries, especially Zambia and Mozambique. Trans-boundary solid waste problems arising from increased trade, since the demise of apartheid and the launching of economic liberalization programmes in various countries in the region, are also a potential source of regional environmental security.

The proliferation of global conventions and aid conditionality also raises queries over national sovereignty in natural resources management, while bring-

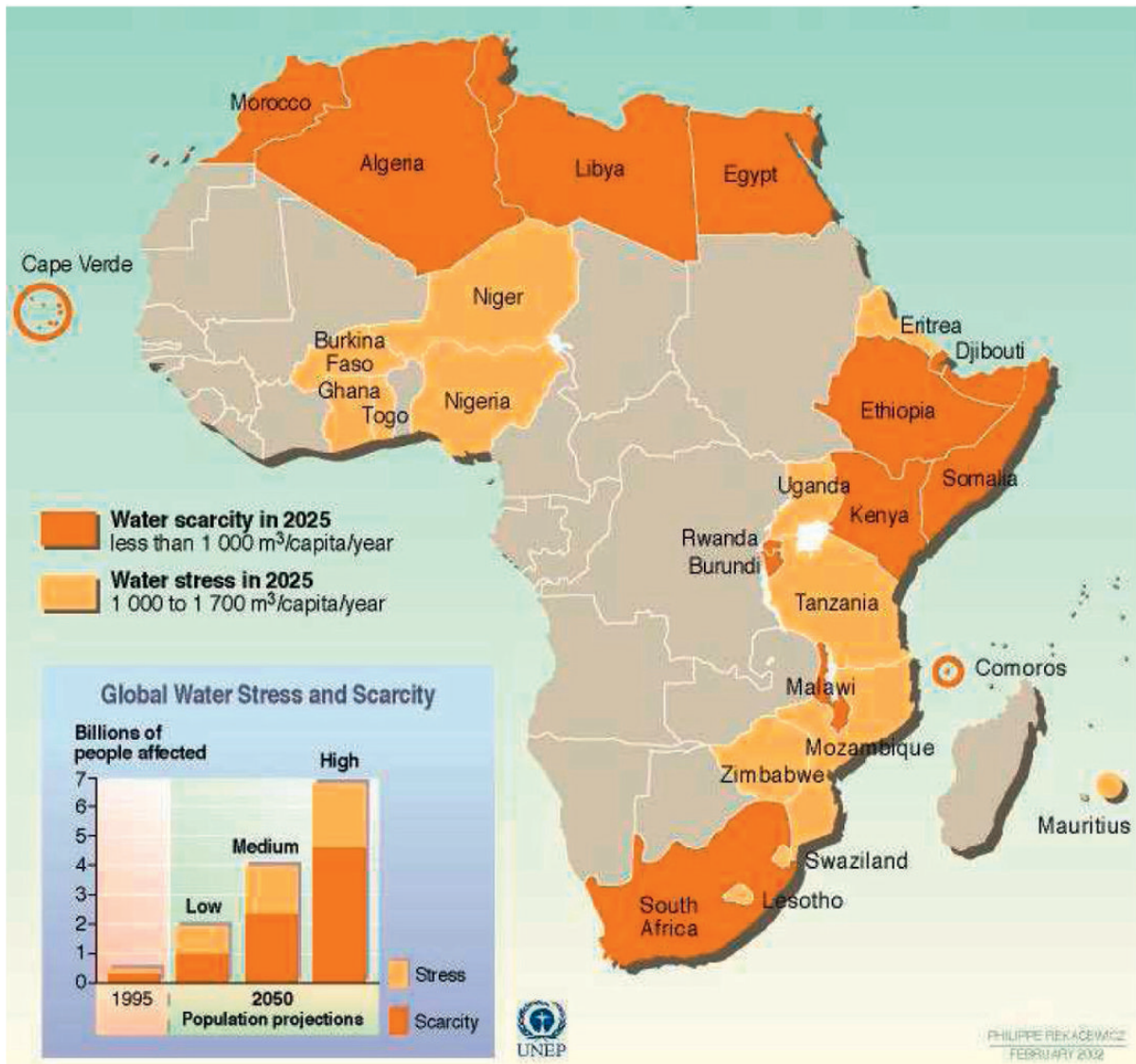
ing in new prospects for regional environmental policy co-ordination. For instance, the CITES which regulates the exploitation of elephants through the ivory trade ban, became a crucial rallying point for regional environmental policy formation in the SADC region. Similarly, the UNCED conventions on Climate Change, Biodiversity and Desertification resulted in increased forms of policy co-operation among SADC states, through struggles to influence global environmental planning and development assistance.

Multi-lateral and bilateral institutions have increased their funding of such regional co-operation efforts in recognition of their importance. Various environmental scientific exchanges and joint inter-state management of large-scale natural resources such as cross-border parks are being planned, as the SADC states seek economies of scale in natural resource management and market development. These efforts are perceived to bring both positive and unequal benefits among participating states, and are thus a potential source of conflict and environmental insecurity.

There is need to promote the development of regional approaches to regulate inter-state natural resources management, monitor and anticipate potential environmental insecurity and conflict. The potential for regional approaches is emphasized by the emerging treaty-making tradition. For instance, recent macro-economic reforms among the SADC have resulted in increased policy harmonization as well as the adoption of specific sectoral co-operation protocols such as the one on water resources. SADC treaty-making and policy co-ordination are, however, not yet adequately established, especially on the resolution of security matters and internal and internal conflict.

However, the emerging regional politics or international relations of environmental security, collective natural resources development and SADC level policy formation, and the evolving social forces which influence the diverse environmental interests in the region are not yet well researched. These need intensive examination from an integrative perspective addressing the environmental and socio-economic plight of the region's 185 million people. The current environmental research focus is on regional eco-tourism, cross-border formal trade in natural resources and large scale conservation strategies which affect the interests of the elite and state structures. An appropriate conceptual and methodological framework for understanding the SADC region's environmental security and development is essential for the achievement of balanced, equitable and sustainable development.

Figure 69.8: Freshwater Stress and Scarcity in Africa by 2025. **Source:** UNEP-GRIP, Vital Graphics, at: <http://www.unep.org/vitalwater/25-waterstress-africa.htm>. Permission was obtained from Philippe Rekacewicz, UNEP-Arendal.



69.5 External and Global Dimensions of Environmental Security in Africa

The external forces of concern in the genesis and reproduction of socio-economic dominance can be found in both 'Northern' state governance interventions and economic interactions with Africa as well as in Africa sub-regional or neighbouring states interventions in various African states. The latter process is most prominent in some countries such as the DRC, Liberia, Rhodesia, Nigeria, Mozambique, Angola etc

where inter-state conflict has been extreme, while the former is more generalized in Africa, albeit more prominent in the mineral resource rich African states. But different sets of issues, interest and events define the incidence and character of the external forces which shape the problems of ethnic dominance, exclusion and conflict.

For example, whereas ethnic clashes were not new to the Kivus region of the DRC, sub-regional or neighbouring state interventions prolonged the armed conflict (Moyroud/Katunga 2002). Thus, "during the early 1990's a number of clashes had occurred along

the eastern border between Zaire, Rwanda, Burundi and Uganda, primarily between communities of Tutsi origin (Banyamulenge) resident in the DRC and local communities of other ethnic origins but the DRC internal conflict dynamics were reinforced by the influx of the large number of Rwandan refugees and armed Hutus, exacerbating tension between Hutus and Tutsis of south of Kivu” (Moyroud/Katunga 2002). Many localized conflicts between various communities (such as Hema/Lendu/Ngiti in the Orientale province) also emerged, and the announced restrictions on the people of Tutsi descent – who had lived in the DRC for generations – acted as a major triggering event and provided the opportunity to recruit an armed rebel movement that galvanized the Tutsis and other groups in opposition to Mobutu’s unpopular government in Kinshasa (Moyroud/Katunga 2002).

Rwandan military forces prominently provided aid and direction to the rebellion that included Tutsis and other discontent groups, given that its primary objective was to enter the eastern DRC and eliminate Interharamwe and ex-FAR forces (Moyroud/Katunga 2002). While the conflict in the DRC was originally focused on the east, it developed into a national war which overthrew Mobutu and then in 1998 to fighting in the northern, eastern and western parts of the DRC, between the Congolese forces under Laurent Kabila and several rebel factions (Moyroud/Katunga 2002).

This escalation and regionalization of conflict and polarization in the Central Africa region became a source of ethnic and inter-state mobilization of dominance over access and use of mineral and other resources. The rebels’ stated case was corruption, cronyism and nepotism in Kabila’s regime, but the relation between Kabila and the governments of Rwanda and Uganda had turned sour over the ostensible persistence of Interharamwe rebel movements in the Eastern Congo, and the loss of entrenched resource exploitation opportunities by these neighbours and foreign Northern governments. By the late 1990, the DRC however had acquired a new balance of power divided into zones of external in military control and resource exploitations (Moyroud/Katunga 2002). Countries which supported the DRC (Angola and Zimbabwe in particular) became part of this national partition. This strategy of internal-external alliances provided a framework for a socio-economic dominance structure founded on ethno-regional politicization and foreign resource extraction and trade. The sources of the overall Great Lakes conflict are structural and relate to external interests.

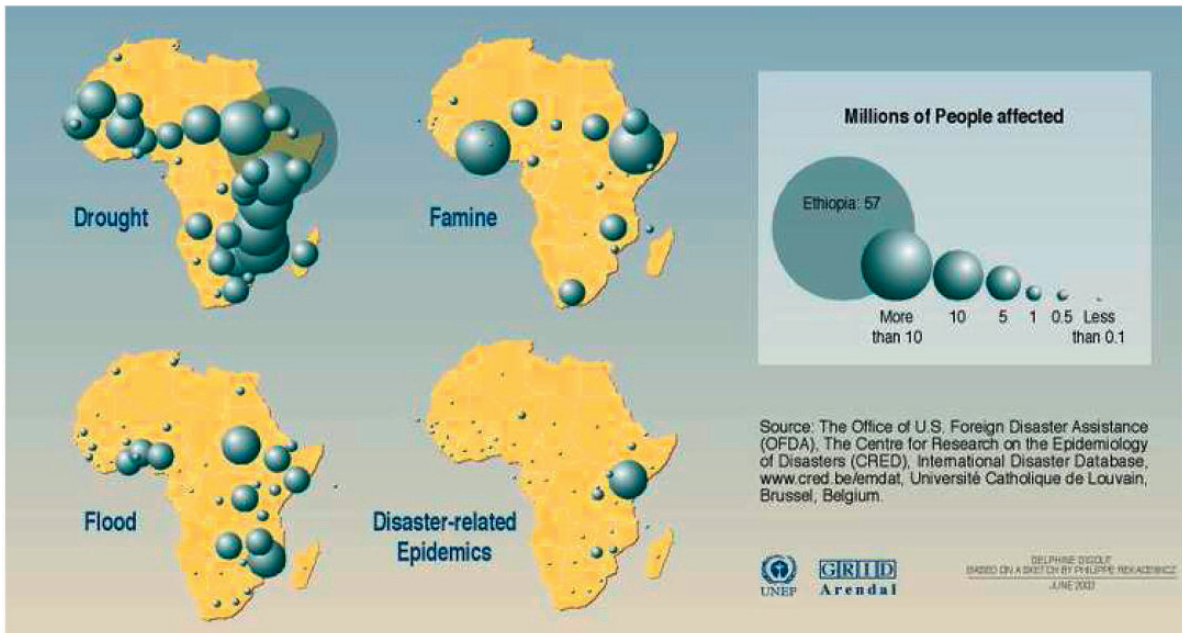
In particular the external demand for coltan – a combination of Columbium-tantalite, 80 per cent of the reserves of which are found in the DRC (which forms of the basis of high-tech global commodity chain) – has become one of the driving forces behind the war in the DRC and the presence of rival militias (Moyroud/Katunga 2002). Countries such as Angola, Sierra Leone and Liberia have seen the mobilization by ethnically based groups of rebellions, which have been financed by mineral and resources exploitation (diamonds, timber etc), and in which international trade has been critical.

69.6 NGO’s and Social Movements in Environmental Security

Repressive land use regulations are commonplace in Africa because these are driven by state and NGO-led environmental ideologies, which drive current eco-imperialist approaches to issues of environmental degradation, conservation and sustainability as eco-imperialism (Kirkby/Moyo 2001). In these frameworks global interests create the environmental regimes, under a project of ecological modernization labelled sustainable development. Nature is preserved as national parks and biosphere reserves or debt for nature carbon sinks created apparently for the benefit of the third world, but the benefits primarily accrue to first world interests, specifically elites and multinational corporations. This is achieved with and through the compliance of local elites and in many cases at the cost of excluded and dispossessed people. Many responses to deforestation, desertification, soil erosion and biodiversity loss are within this mode, characterized by top-down hierarchical, neo-colonial systems and in some cases these totalitarian systems are best described as eco-fascist (Kirkby/Moyo 2001).

Similarly, Southern African environmental discourses tend to regard land husbandry by blacks as intrinsically poor, implying that the environment will collapse if land is redistributed. The perception is that only whites value and nurture the environment, while agronomic practices of blacks, such as intercropping, are thought to destroy the soil. Thus the ‘conventional’ settler-introduced system of agriculture – planting crops in straight lines, and using advanced technology and chemicals, which again, the blacks are thought to be incapable of using – are considered superior systems. However, recent research has disproved these notions.

Figure 69.9: People Affected by Natural Disasters in Africa. **Source:** UNEP-GRIP, Vital Graphics, at: <<http://www.grida.no/climate/vitalafrica/english/08.htm>>. Permission was obtained from Philippe Rekacewicz, UNEP-Arendal.



Yet, indigenous technical knowledge promoted by liberal environmental non-governmental organizations (NGOs) seems to suffer from a lack of real agronomic alternatives that can take blacks in communal areas beyond current community-based natural resources projects that do not improve the standards of living of the majority. The common middle-class perception is that the poor degrade land while the white large-scale commercial sector uses land efficiently. This belief underlies the excessive focus of NGO schemes on 'protecting' land and 'educating' the peasantry on sustainable land use, rather than on advocacy for land redistribution.

Generally, NGOs have been and remain a reactionary force on land reform, rather than an agenda-setting movement. NGOs can be conceived as a new mechanism for promoting the so-called indirect rule system, in which they increasingly substitute for local state and traditional authority in organizing communities in the co-management of state and donor-initiated development projects. This tendency begs further questions in the debate on the nature of NGOs, and on their ability to champion the rights of indigenous people with regard to their land and with regard to improving standards of living (Mamdani 1996).

NGOs are at the root of the further alienation (transfer) of natural resources and monopolistic control of tourism by white minority companies in alli-

ance with regional and multinational corporations (Moyo 2000). In countries such as Mozambique, Namibia and South Africa, white individuals, companies and regional mega-tourism ventures have expropriated land at the coastal zones. In the past, racial discrimination meant that blacks could not have access to holiday resorts. More importantly, the cost of coastal prime land for tourism development was made artificially high to deny access to blacks. Fighting for access to beaches and fishing rights on oceans was therefore central to the liberation struggles in those countries that were not landlocked.

The project of subjugating blacks is underpinned by the discourses on environmental aestheticism (ecoculture, ecotourism), which now claim to preserve primordial black cultures as part of the image of the African wilderness. Thus, ecotourism allocates monies to trickle into landless black communities, while the bulk of the benefits of land control rest with external financiers and safari operators. Furthermore, through the so-called transboundary 'peace parks'³ involving two or more countries, global capital has found an avenue for land expropriation in the context of foreign direct investment.

In Namibia, Zimbabwe and South Africa many of the black, white and foreign elites tend to allocate to themselves large tracts of land for commercial farming or tourism and, in addition, lobby the state for fa-

vourable tourism policies (Moyo 2000). The marginalization of the majority of the people tends to create political conflicts with those minority groups who seek to control such benefits. The political and economic consequences of these problems in the region are broadly the same: poverty, enforced high population density in customary lands, land degradation, lack of resources to invest in adequate land management and political uncertainty.

69.7 Conclusions and Implications

Without greater measures to insure environmental security, continued population and economic growth will diminish natural life support systems leading to migration and conflict. With half the world clustering into urban environments, natural disasters and global environmental change affect greater numbers of people who are dependent on civil systems for water, power, transportation, food, and other manufactured systems.

Low cost and relatively simple methods - compared to nuclear weapons - for environmental destruction increase the opportunities for even small terrorist groups to destabilize large populations. Military operations and training also have environmental impacts that threaten their own troops as well as having potential long-term impacts on civilian populations. As a result, the environment is now considered in terms of human security and viewed much more urgent and important a future challenge than conventional and nuclear war.

69.7.1 Recommendations⁴

- Integrating environmental insecurity concerns in development policy (Putting in place an integrated management of environmental risks including con-

flicts, natural and man-made disasters and health risks; and putting in place a national sustainable development strategy);

- Strengthening and developing state capacity;
- Policies that promote equitable access to natural resources merit priority consideration;
- Outlawing ethnicization and promoting sound environmental management;
- Sound population policy;
- Putting in place supportive macroeconomic policies;
- Sound management of decentralization;
- Developing gender insightful natural resources management policies;
- Strengthening traditional or local level conflict management mechanisms;
- Development of internal migration policy and legal framework;
- Promoting the environmental security agenda at the level of NEPAD.

3 Since the late 1990's, environmental NGOs and private firms have promoted 'transboundary' natural resource conservancies involving large tracts of land within the borders of Zimbabwe, Mozambique and South Africa (10,000,000 hectares) To enhance large-scale tourism focusing on the freely roaming large mammals. This entails excising lands from local communities and state parks for private exploitation. Because most rebel movements (for example, the Resistencia Nacional Moçambicana/RENAMO, of Mozambique) had used these woodlands for armed incursions during the 1980's and 1990's, these new woodland conservancies were dubbed peace parks, and a foundation with that name was formed.

4 For more details on the recommendations: see Partnership for African Environmental Sustainability (PAES), the symposium on Environmental Insecurity, Poverty and Conflict: Towards Sustainable Peace and Development took place at the Nile Hotel International Conference Centre, Kampala, Uganda, 23-24 September 2003.

70 The Brazilian Amazon in an Environmental Security and Social Conflict Framework

Alexander López

70.1 Introduction: The Argument

This chapter offers an overview of the key historical factors influencing the contemporary Brazilian Amazon that responds to a dynamic that has emerged since the discovery and colonial period combining two myths of the richness of the Amazon basin, and of its open and unexploited space. This is essential for understanding the environmental security and social conflict approach to this region (70.2). Then this chapter analyses the dynamic link between environmental factors and security and social conflicts as a result of continuous interactions between systemic (Amazon) and supra-systemic factors (70.4). These interactions explain why environmental matters have been politicized (70.6) and to a certain extent militarized (70.7). This chapter attempts to explain why social conflicts are mainly a product of two systemic constraints of a misallocation of resources and of skewed land distribution (70.8). Thus, in most cases environmental change is no direct source of social conflicts, but an important aggravating factor through its side-effects. Finally, in the Brazilian Amazon in most situations environmental scarcity is no key factor for social conflicts, rather in the northern state of Roraima abundance is crucial (70.9). Thus, the environmental scarcity hypothesis¹ claiming the more natural resources are available in the system, the less likely conflicts are among its components must be revised.

1 This thesis was presented by Thomas Homer-Dixon (1999, 2000, 2001; Homer-Dixon/Blitt 1998; chap. 20 by Homer-Dixon/Deligiannis) who argues that environmental scarcities will have profound social consequences – contributing to insurrections, ethnic clashes, and other forms of civil violence, especially in the developing world. However, the claim that resource stress is a *necessary* cause of violence has been refuted with reference to cases of violence not preceded by resource stress (Bann/Collier 2003; Peluso/Watts 2001).

70.2 Discovery, Occupation and National Integration of the Amazon

The Amazon and its affluents is the largest river system on earth that transports one fifth of all fresh water to the oceans. The Brazilian Amazon covers almost 5 million km², or 55 per cent of Brazil's territory. It contains one third of the earth's remaining tropical forest and a very high biological diversity. It also has an outstanding cultural diversity with indigenous groups, peasant communities, Caboclos², miners, forest dwellers, etc. The Brazilian Amazon is not flat nor entirely covered by rainforest; many areas are grassland (*campo*), upland savannah (*cerrado*), and annually flooded wetlands (*várzea*).³ Its population is primarily urban.

The occupation of the Amazon by outsiders began in 1500 with the expedition by Vicente Yanez Pinzón who only reached the mouth of the Amazon, which he named Santa Maria de la Mar Dulce (freshwater sea). The European impact began at the end of the 15th century, with the interest of Spanish and Portuguese navigators to explore the New World. The first expedition (1541–1542) was by Francisco de Orellana and described by Gaspar De Carvajal in: *Do Novo Descobrimiento do Famoso Rio Grande das Amazonas*. Its purpose was to find the country of cinnamon what was then a lucrative commodity for trade.

The colonial period is marked by Portuguese domination and the impact of the Pombal era on its management, with the military, the merchant, and the mis-

2 They are the local people along the Amazon river, too often illiterate, and dependant on a hard exploitation of the natural resources to survive.

3 Approximately 60 per cent of the Brazilian Amazon are covered by tropical rain forest, grassland and savannahs occupy another 35 percent. Finally, a very small area is composed of flooded wetlands.

sionary as key actors. The military assured control over the area by building forts, the merchants integrated the region into the royal economy by exploiting some forest products, and the missionaries controlled the labour force (basically Indians).

With the treaty of Madrid, after 1750 a new period began aiming to preserve the area conquered by Spain and Portugal. Under the principle of *uti possedetis*⁴, Spain granted to Portugal the Amazon up to the mouth of the Madeira River. This period marked the beginning promotion of an agrarian rural class able to control social tensions in the region supporting the colonial powers. A first attempt to ‘modernize’ the Amazon was carried out during the so-called Pombalina era that began in 1750 with the appointment of José de Carvalho e Mello, Marquis de Pombal, as secretary of Foreign Affairs and War by King José I of Portugal (Messias 1995: 25).

This led to major modifications in Portuguese colonial policy for the Amazon that included taking control of social relations by expelling the Jesuits, and appointing lay directors responsible for allocating Amerindian labour to colonist and colonial authorities, the so-called directorates. This made Indian labour available to civil authorities in villages, thus replacing Jesuit missions, and promoted the economic expansion of the Amazon, using the crown as a sponsor. Pombal founded the *Companhia Grão Pará e Maranhão*, a semi-state company promoting foreign investment, giving incentives and offering military protection for investors, especially during the transport of products produced in the region (Messias 1995: 25). The economic integration concept emerged from the Pombal project, and was developed further almost 200 years later by the military governments when the *Superintendencia do Desenvolvimento da Amazonia* (SUDAM) was set up. Although widespread European contacts with the Amazon occurred during the 16th and 17th centuries, only in the late 19th century the exploitation of rubber reached significant levels and became a driver of the Amazonian economy.

The occupation and national integration of the Amazon has been a major objective of Brazilian governments since the 1930’s when the region was considered as an empty space started by the four times president Getúlio Vargas (1930–1934; 1934–1937; 1937–1945 and 1951–1954) who announced in 1940

that the Brazilian government was planning to open up and to occupy the Amazon region.⁵ As the first Brazilian president he travelled throughout the Amazon and established the *Estado Novo*.⁶ Vargas supported the ‘nationalist developmentalism’ based on concepts by the economists Prebisch and Celso Furtado of the *United Nations Commission for Latin America* (CEPAL). These ‘structuralists’ saw the state as the engine of development and argued that the formula of their conservative rivals would condemn the country to perpetual underdevelopment (Schneider 1989: 171). With Vargas the integration of the Amazon into the rest of Brazil started with a state-led development of its economy with road construction and economic incentives for investments. To implement this objective in 1953 the *Superintendencia for the Economic Valorization of the Amazon* (SPVEA) was set up.

The geopolitical interest to populate the Amazon was developed later under the military regime by General Golbery do Couto e Silva (1964). In his view Brazil needed “to inundate the Amazon forest with civilization” (cited by Schmink/Wood 1992, quoting Hecht/Cockburn 1989). A basic problem of its economy was the manpower shortage during the Pombal period and the rubber boom. While General Golbery responded to this concern there were other important issues, such as protecting Brazil’s international borders, and the need to promote immigration and colonization in those empty spaces.

70.3 Military Years: Security and Economic Growth

During the last decades the Amazon basin has been defined as a huge homogeneous flat region of humid tropical forest, as a demographic vacuum, a world’s reserved ‘El Dorado’, and as an empty space. Since the 1930’s most of programmes for the Amazon basin were based on these assumptions. Concerns for economic growth and national integration were very high during the military years, as reflected in the following

4 A concept of international law that defines borders of newly sovereign states on the basis of their previous administrative frontiers.

5 President Vargas defined the Amazon as an empty space in a speech in Manaus in 1940 when the Amazon was seen as a network of demographic islands connected by rivers running through an uninhabited forest.

6 The *Estado Novo* can be characterized by being highly centralized and authoritarian as well. Moreover, the state would use the powerful institution of patronage to effectively control the organized labour into a system of State tutelage and control.

activities: *Operation Amazônia* (1964); the first *Amazonian Development Plan* (1972); the second *Amazonian Development Plan* (1975) formulating *Polamazonia*; and the third *Amazonian Development Plan* (1980) including *Polonoroeste* and the *Great Carajás Programme* (PGC).

The military regime linked the economic approach with a geopolitical one by combining security (human occupation, extension of territorial control) with economic growth. As a matter of high priority they used the state apparatus to promote development and to assure control over the country. In 1964 president Castelo Branco stated that the “Amazonian occupation would proceed as though it was a strategically conducted war” (Hecht 1984: 370). The state should maintain a central role in promoting greater efficiency in regional planning by trying to improve the role of private enterprises in Amazonian development. The government would provide the infrastructure and funding for economic growth, while entrepreneurs would basically carry out the task of regional development. The main areas sponsored by the military were agriculture, livestock, mining and metallurgy.

The military government established the development agencies, among them the *Superintendência do Desenvolvimento da Amazônia* (SUDAM) that replaced SPVEA, and a regional Development Bank, named the Amazon Bank (BASA). “Operation Amazônia” was the first plan of SUDAM that was oriented at “establishing development poles, self-sustaining population groups especially in frontier areas, encouraging immigration, providing incentives to private capital, infrastructure development, and research on the potential of natural resources” (Mahar 1979: 11).

This strategy implemented developmentalist ideas whose core goals were capital accumulation, extra-regional investment, and large economic projects. Manaus and Araguaia-Tocantins were considered as basic areas for investment; the former for industry and a new free trade zone, and the latter for cattle ranching. This policy of promoting livestock, industry, and crops tried to free the Amazon from its dependence on extractive commerce.

Operation Amazônia introduced generous fiscal incentives basically through SUDAM and the Amazon Bank (BASA). According to Hall (1997) from 1971 to 1987, US\$ 5.15 billions were used for incentives and subsidies particularly for large ranchers. These fiscal incentives were described by several authors as the major force behind deforestation promoting the expansion of cattle ranching, which resulted in environ-

mental degradation. Due to these incentives the land became the main factor of dispute among social actors. Thus, the variable resource allocation is significant for understanding the frequency and intensity of social conflict in the Amazon.

For livestock in the Amazon, “between 1959 and 1973 the World Bank lent Brazil an estimated amount of US\$ 839.2 million, plus US\$ 1,004 million in counterpart funds, for small-scale livestock projects. The largest allocation of these funds occurred between 1966 and 1970” (McCleary 1990: 13). The subsidies for cattle ranching exceeded those for industry and agro-industry. While “there were only 4 ranches that received SUDAM incentives in 1966, the number had increased to 162 in 1969” (Hall 1989: 7). It was defended in the 1960s and 1970s that Brazil had the conditions to become a leading beef exporter. The World Bank endorsed this idea by giving a credit line for the sector. In the Amazon the economic advantages of investment in livestock were clear: land was perceived as promising, plentiful and inexpensive, subject to rapid capital gains, and requiring only a minimal workforce. Industrial development was hampered by shortages of skilled labour, limited local markets, lack of credits, and competition from extraregional industry.

This interrelationship between economic growth and security caused an incompatibility between two opposing priorities. On one hand, there was an emphasis on private property, incentives for capital accumulation, and promotion of livestock and agricultural projects. On the other hand, there were the provisions for state intervention to reduce poverty and to make land available to those who worked for it. This contradiction partially explains the so-called land question.

Here the expression ‘land question’ is used because land reform has been the hottest issue in contemporary Amazon. The military dealt with the land question by allocating plots of land to settlers in the Amazon as the immediate answer to poverty and unemployment in Brazil, above all in the north-east. Among the misconceptions that stopped land reform was the misunderstanding of the basic character of the extractive nature of its economy, which made it difficult to define property rights compatible with bureaucratic procedures.⁷ Land property was determined by the effective use, thus both large and small holders clear as much as they can to assure the principle of *uti posseditis*. This tradition of land rights comes from the pre-independence period, when small and large producers were permitted to establish legal access to land based on habitual occupation and/or

effective cultivation. There was a misallocation of land to small farmers in the sense that most of the Amazonian soils are not suitable for agriculture because of their deficiency in inorganic nutrients such as nitrogen and phosphorus. As in the Amazon basin land seems to be plentiful compared with capital and workforce, the bureaucratic structure tends to use land extensively as the cheapest production factor. This contradiction (leading to the agrarian question) contributed to social tension and conflicts, thus also contributing to the militarization of the land issue.

70.4 Amazon: Result of Systemic and Supra-systemic Interactions

The systemic perspective, based on the assumption that 'the whole is more than the sum of its parts', implies that current events in the Brazilian Amazon cannot be understood by looking solely at the subsystems (federal Amazonian states) but by observing the web of relationships linking subsystems, the system, and the suprasystem. Since its discovery the Amazon has been characterized by an externally oriented model, for which the Pombal period, the rubber boom, and the developmentalism strategy are good examples.

During the military period since 1964 strong links were established with foreign capital. The Brazilian market was open to public and private enterprises and the government obtained foreign credits, especially from the World Bank and the *Interamerican Development Bank* (IDB) for mega-projects, such as the Trans-Amazon highway, the *Polonoroeste Programme*, the *Greater Carajás Programme* and hydroelectric projects.⁸ These programmes led to heavy immigration, an invasion of the Indian land and a high rate of deforestation.

7 It can be argued that the economic history of the Brazilian Amazon has been shaped by extractivism. Thus, forest products (cacao, rubber, spices) were important since the colonial period. Extractivism was not limited to forest products. The extraction of minerals (gold, diamonds etc.) has been of great importance. Fishing has always been important, and the major source of protein for the local population.

8 The World Bank co-funded the Trans-Amazon highway. For the *Polonoroeste* the World Bank provided a US\$350 million credit for the highway through Rondônia and Mato Grosso. In 1986 the World Bank approved a US\$500 million power sector loan to *Eletrobás* (Brazilian state electricity company). For the *Greater Carajás Programme* the World Bank approved US\$300 million.

The discussion of environmental security and social conflicts in the Brazilian Amazon and the particular contribution of environmental change will be placed in a systems perspective because:

- a.) The Brazilian Amazon as an ecogeographical entity constitutes an open system.
- b.) The Brazilian Amazon is not a homogeneous, but a highly complex open system.
- c.) Therefore, no single component can exist entirely separate. Rather, each component somehow affects and is affected by all other components.⁹
- d.) The behaviour of the social groups in the study area are strongly influenced by the components of the Brazilian Amazon. Thus, to a certain extent one can understand the dynamics of *garimpeiros*, *fazendeiros*, Indians, *caboclos*, *posseiros*, *sem terra*, etc. by looking at the relationship between the system and the subsystems, as well as the type of structure resulting from their interrelation.
- e.) The governments have been subject to intense influences from the suprasystem. The international sphere has influenced the environmental variable positively and negatively.

Traditionally many external factors have influenced the Amazon. Lately, most influences are related to the protection of the Amazonian forest, indigenous communities and the idea of establishing Amazonia as a global common (even though it is a shared natural resource), based on the argument that the Amazon is crucial for the global environment. There are also influences from the system to the suprasystem due to the transboundary externalities of environmental change. Therefore, the issue of Amazonian management is an international political one. At the international level its management has implications for climate change and biodiversity. On these global issues the international community bases its claims on the management and preservation of the Brazilian rainforest.

Brazil responded to these international influences by stressing its sovereignty over the Amazon, but accepting some global environmental standards and the importance of international co-operation. The government stressed its rights and responsibilities, the principle of national sovereignty and national security for the management of the Amazon basin thus linking environmental management with security.

9 This can be explained for the *Polonoroeste* project where huge colonization schemes were among the basic causes for the disastrous failure of this project in Rondônia.

70.5 Sovereignty in the Brazilian Amazon

In 1989, José Sarney declared “the Amazon is ours”, because “it is situated in our territory”¹⁰ as a clear expression of sovereignty. Several actors, especially NGOs, have challenged Brazilian sovereignty over the Amazon rainforest on ecological grounds as its importance extends beyond Brazil because the Amazon rainforest flows across the borderlines of the sovereign Brazilian space and that it shared by nine nation-states. The territorial political space does often not coincide with that of ecosystems that ignore geopolitical boundaries. Thus, sovereignty conceived in its traditional meaning as rule over a fixed territory becomes problematic.

The Brazilian Amazon shows that in the environmental arena sovereignty no longer serves as the source of a state’s freedom to manage natural resources as they please without caring for international standards. Sovereignty no longer enables states to exert effective supremacy over what occurs in their territories. Sovereignty involves the state in one aspect of a transnational process, e.g. on multinational investment, the global ecology, drug dealers etc. Thus, sovereignty is less a territorially defined barrier than a bargaining resource for politics characterized by complex transnational networks (Keohane 1995: 176–77).¹¹

For two reasons the the military is preoccupied with the Amazon. The first refers to the physical space, and the second to the international valuation of that physical space. Both are different but interrelated. The borders of the Brazilian Amazon stretch to 16.500 km. The Amazonian region extends to 10.948 km, four times the distance from Madrid to St. Peter-

sburg and the equivalent of approximately 70 per cent of Brazil’s international borders (Dreifuss 1998: 15). This is accompanied by a low population density, poor communications, and mineral resources. These factors make the Brazilian Amazon very vulnerable.

The second reason is reflected in the constant reaffirmation of Brazilian territorial integrity, unity and sovereignty. These concepts have a special meaning for the Amazonian region. Over the past 180 years international agencies, countries and individuals have intervened in the management of the Brazilian Amazon. In 1989 Al Gore was quoted as saying, “contrary to what Brazilians think, the Amazon is not theirs, but belongs to all of us”. Francois Mitterand stated that Brazil needs to accept a “relative sovereignty” over the Amazon. In 1992 Mikhail Gorbachev argued that Brazil should delegate parts of its rights over Amazonia to a competent international organism (Chagas 1997, quoted by Dreifuss 1998: 18).¹² In the military perspective, the preservation of territorial integrity and unity is constantly reasserted as crucial. For the armed forces, “sovereignty is preserved as long as possession and jurisdiction over the territory is guaranteed, along with its indivisibility and the possibility of political actions that aim to preserve our vital interests.” They have argued that the flexibilization of the concept of sovereignty cannot cross this limit.¹³

70.6 Internationalization of the Brazilian Amazon

Repeatedly Brazil has been asked to assume its responsibility vis-à-vis the international community. This so-called internationalization of the Amazon has been perceived as a real threat in Brazilian circles. Thus, in 1991 the congressional commission of inquiry on the internationalization of the Amazon was established and asked to investigate the existence of clandestine airports and the activities of religious missions in parts of Roraima supposedly provoked the internationalization of the Amazon. In its final report the CPI stressed the development model and the mineral riches. Many denunciations were couched as an Anglo-American neo-imperialist conspiracy where the environment served as a pretext for the new interna-

10 See: “Brazil angrily unveils plans for the Amazon”, in: *Washington Post*, 7 April 1989.

11 Conca (1994a) summarizes the sovereignty discussion pointing to two perspectives. The first argues that there is erosion and weakening of sovereignty and that sovereignty and ecology are at odds because ecosystem and environmental processes do not respect state borders, thus, sovereignty itself becomes a key institution of a global-scale environmental destruction. The second claims that international processes, and in particular, the emergence of multilateral institutions for environmental protection, do not erode state sovereignty and may even strengthen it. By placing states at the centre of institutional responses and strengthening their capacity to act collectively, the menu of choices available to states is being expanded not restricted (Conca 1994a: 702).

12 Carlos Chagas: “Querén Internacionalizar a Nossa Amazônia”, in: *Manchete* (Rio de Janeiro), 5 July 1997.

13 See: *O Brasil e suas Forças Armadas* (Brasília: Estado-Maior das Forças Armadas. Presidência da República, 1996): 19.

tional order and where NGOs played a leading role (Kolk 1996: 121). Feeling threatened by environmental issues and their consequences for the state in crucial economic areas, sovereignty and nationalist claims increased. The environment replaced the east-west conflict in the view of the military for domestic purposes.

The Brazilian preoccupation with the internationalization of the Amazon can be seen in three responses: a) the programme of debt-for-nature swaps, b) the *Calha Norte* project, and c) in the *Nossa Natureza* programme. The United States, France and the Netherlands put forward a proposal for debt-for-nature swaps, where a portion of Brazil's foreign debt would be exchanged for conservation projects. With his new policy (*Nossa Natureza*) Sarney rejected the programme as an infringement of national sovereignty and he stated that "there is no international capital which can buy even one metre of Amazon soil". The worries were that debt-for nature swaps could lead to the creation of a large Amazon reserve to protect the environment, but also to a future internationalization and exploitation of minerals by international forces under the pretext of the environment.

The *Calha Norte* project aimed to intensify the military presence in the northern Amazon. During the transition from the military to civilian government, it was justified by several reasons. One was the possibility of a binational Yanomani Indian park, and that such a park along the Venezuelan-Brazilian border could evolve into an independent indigenous state, manipulated from abroad. The *Nossa Natureza* programme was to diffuse international pressure with regard to the rate of deforestation, the murder of Chico Mendes and the Indian manifestation in Altamira. The centrepiece of the proposal was a five-year US \$ 100 million programme for an agro-ecological zoning of the Amazon. This programme "our nature" had a nationalistic connotation reassuring Brazilian sovereignty over the Amazon.

70.7 Militarizing the Amazon or Greening the Military?

The involvement of the military in environmental matters was not only evident during the military regime, but also in the subsequent civilian period. The traditional preoccupation with national integration was increasingly overlain by concerns that Brazilian sovereignty over the Amazon was challenged, and this became the dominant theme in Sarney's response to international criticism. After the military regime the

Secretariat for National Defence (SADEM) was created which co-ordinated *Nossa Natureza*. President Collor integrated SADEM into the *Secretariat for Strategic Affairs* (SAE 1997) as the Department for Special Programmes. Another department for macro-strategies co-ordinated the *Ecological-Economic Zoning* (ZEE). SAE was given an important role in the preparation of environmental policy (Kolk 1996: 110). The former *Environment Secretariat* (SEMA) and the *Forestry Institute* (IBDF) were combined as the unified environmental agency (IBAMA). This was nominally under the Ministry of the Interior, but operating with financial autonomy under the leadership of Sarney's former press spokesman Fernando Mesquita.

A recent example of military participation in designing and co-ordinating environmental policies is the establishment of the *Protection System for Amazonia* (SIPAM), and the *Surveillance System for the Amazon* (SIVAM). The SIPAM has three regional bases (Portho Velho, Manaus, Belém), and general headquarters in Brasilia. Under SIPAM the SIVAM is operated as a civilian-military project within SAE. The principal aim of SIVAM is to effectively implement the SIPAM, thus providing the Brazilian government with necessary information for sustainable development, especially on control of land occupation and use, surveillance and control of borders, identification of illegal activities, and economic and ecological zoning. The infrastructure consists of a remote sensing network, which includes eight meteorological and environmental satellites, five sensor-equipped Embraer ERJ 145 aircraft for *aerial early warning* (AEW) that can obtain images through the dense forest cover and provide information on the quality of the soil. It includes three Embraer 145 RS planes for remote sensing, and twenty radar stations co-ordinated by Cindacta, which already controlled air traffic (Dreifuss 1998: 28–29).¹⁴ SIVAM was placed into the sovereignty discourse. Raytheon and the Brazilian authorities stated that among the principal benefits Brazil will gain from SIVAM is the capacity control the area and to promote the integration of communities among themselves and with the ecosystem, guaranteeing Brazilian sovereignty in the Amazon forever.

Thus, the environmental discussion on the Brazilian Amazon has been large framed in the security context. The defender of national integrity and independ-

14 Information given by Coronel Antonio Faria, Secretaria de Assuntos Estratégicos, conference at 4th *National Encounter of Strategies Studies*, Unicamp, Campinas, 10–15 May 1998.

ence has reacted with scepticism to notions of transboundary effects of environmental change in the Amazon.

Despite its scepticism, the military avoided a position of open confrontation on the environmental management of the Amazon. They are actively participating in this process through their influence in SIVAM and in the elaboration of the *Macro-Zoneamento Ecológico-Econômico da Amazonia*. A document from 1995 stated that through SAE environmental worries and needs, and a wealth of natural resources (biodiversity, water, minerals) are emphasized without diminishing the importance of the national frontier.

The combination of these factors could result in a change of paradigm from frontier development to sustainable development. This was partly stressed in a statement by the Chief of Staff of the Army, General Gleuber Vieira: "the new mission is co-operating with socio-economic development."¹⁵ But it remains to be seen if the framing Amazonian policies in a security framework will mean a 'militarization of environmental policies' in the Amazon or whether it will produce a 'greening of the army apparatus' (López 1999).

70.8 Environment and Security: Politicization, Militarization and Securitization of the Brazilian Amazon

Up to now in the Brazilian Amazon environmental issues has been politicized and to a certain extent militarized. In the Brazilian Amazon security has become a comprehensive concept, but it cannot be argued that the environmental sector has been fully securitized.

70.8.1 Politicization of the Environment

Environmental issues in the Brazilian Amazon have been politicized due to a strong relationship between public spending, infrastructure development and environmental policies. An issue is politicized when it becomes part of public policy, requiring government decision and resource allocation (Buzan/Wæver/de Wilde 1998). In this region such processes can be easily perceived. Brazilian governments since Getulio Var-

gas have undertaken great efforts to oversee its development. Several state agencies have been created, substantial resources have been allocated, and large-scale projects have been undertaken. Examples are the creation of the *Bank of Amazonia* (BASA), the *Northern Brazil Electricity Board* (ELECTRONORTE), the *National Indian Foundation* (FUNAI) and the *Ministry of the Environment, Water Resources and Legal Amazon* (MMA). In addition, large amounts of resources have been allocated through the *Superintendency for the Development of the Amazon* (SUDAM), and the *Investment Fund for Amazônia* (FINAM).

70.8.2 Militarization of Environmental Issues

In the Brazilian Amazon environmental issues have to certain extent been militarized. An issue is militarized if that issue is part of the ordinary tasks and/or duties carried out by the military apparatus, irrespective whether emergency actions have been taken to face a given threat. The Amazon has been a concern for the armed forces. The most important agency for Amazonian development (SUDAM) is a direct product of the military regime. In most agencies dealing with the management of the Amazon there is some military involvement. Several presidents of the *National Indian Foundation* have come from the army, and the military has always been involved in environmental and indigenous policies in the Amazon.

In 1985, the *National Security Council* (CSN) took over the task of demarcation of Indian lands. In 1988 the CSN managed the *Project for the Protection of the Environment and the Indigenous Communities* (PMACI). The *Indian Missionary Council* (CIMI) criticized the military intervention on Indian lands, and during the 1990's the *Indian Council of Roraima* (CIR) denounced several times that the Army assumed exclusive powers over the Raposa/Serra do Sol Indian Area along the Brazil-Venezuela border whose demarcation process was stopped due to political and military pressure. The main concern by the army seems to be that the demarcation could put the sovereignty of Brazil at risk, because the Macuxi, Ingariko, Wapixana, and Taurepang Indians could claim their independence.

In all most important projects in the Amazon (e.g. in the *Calha Norte*) the military was involved. The *Secretariat for Strategic Affairs* (SAE) was involved in designing and implementing environmental policies, it co-ordinated the Ecological-Economic Zoning and implemented the Surveillance System of the Amazon re-

15 General Gleuber Viera, chief of staff of the army, in his conference at the 4th National Encounter of Strategic Studies, Unicamp, Campinas. 10-15, May 1998.

gion (SIVAM). All these examples illustrated the extensive military involvement in the management of the Brazilian Amazon.

70.8.3 Toward a Comprehensive Security Concept in the Amazon

This case shows that we also witness a process of declining military threats in developing countries. Brazil has borders with all other South American countries (except Ecuador and Chile), but its concerns are less related to potential problems with other countries in border regions or to a potential invasion from a neighbouring country. This does not mean that the borders are irrelevant for security matters. In the Amazon borders are still a reference point in military terms mainly because they are perceived by the army as vulnerable areas, due to low population. For instance, Tabatinga with only 28,000 inhabitants is the most important town on the Colombian border.

But there have been recently many declarations by army officials that in the Brazilian Amazon security have become a comprehensive concept. According to the *Secretariat for Strategic Affairs* (SAE 1997) the targets to be reached by 2020 are the full and sustainable utilization of national territory and maritime space. In the SAE's view contemporary geopolitical thinking focuses on necessary political and scientific definitions of realistic parameters for sustainable development of both the Amazonian border and region. The issues that have been included in this comprehensive concept reflect such new threats as environmental protection, controlling drug trafficking, halting smuggling of timber, rare minerals and biodiversity, controlling and supervising the use of land, fighting forest fires and illegal mining, surveillance and border control, etc (Dreifuss 2000). Significant resources that have been allocated by the government to the Amazon are presently used to mitigate the impact of or threats by drug traffic, land conflicts, and environmental disruption.

In the Brazilian Amazon military threats are no longer seen as the only and most important ones. Military and political experiences in the region have highlighted that the Amazon is one of the most sensitive areas of Brazil, and that its defence cannot be reduced to military dimensions. General Gleuber Vieira, a former chief of the Brazilian army, has argued that the armed forces have an additional target, or mission, of "co-operating with socio-economic development" (cited by Dreifuss 2000: 213). For SIVAM an important shift in the perception of threats can be ob-

served. SIVAM concentrates on these 'new' types of threats such as environmental change (deforestation, fires), identification of illegal activities (drug trafficking, gold smuggling) and land conflicts (land occupation and use).

70.9 Resource Scarcity vs. Abundance in the Brazilian Amazon

Under certain circumstances there is a connection between environmental factors and violent conflicts. For the Brazilian Amazon environmental change in most cases is no direct source of social conflicts, but an important aggravating factor of conflicts acting through its side-effects. In the Brazilian Amazon in most situations environmental scarcity is no key factor producing social conflicts. Thus, the hypothesis that the more natural resources are available in a system, the less likely conflicts are among its components, must be revised.

Social conflicts are defined as social action carried out by actors sharing a social framework which constitutes its system. Thus, social action is a goal-oriented behaviour, but it also defines a sort of social group identity. This is because the ideas, interests, etc. that define individuals become the basis for collective actions that engage participants in a dispute. One can see opposing interests and, therefore, potential for conflicts. Thus, whenever the term social conflict is used it will be within this framework, meaning the condition under which one social group (e.g. miners) is engaged in conscious opposition to one or more social groups (e.g. Indians), because they are pursuing incompatible goals (land integrity vs. mineral exploitation), and when this opposition is accompanied by violent behaviour (Dougherty/Pfaltzgraff 1990: 187).

The Amazon shows that a conflict occurs when one party's claim to or use of one given good negatively affects the interests of some other party, and when no alternative seems to exist that will satisfy the aspirations of those parties involved with divergent interests or values. This situation may occur due to the lack of a good to meet the basic needs of the parties involved (*basic scarcity*), or, as in Roraima when ample supply of valuable goods (gold) induces competition over access to or use of that good. This latter case explains the conflicts between indigenous population and *garimpeiros* in Roraima, where most conflicts are not generated by scarcity, but rather by the richness of the subsoil.

When such conflicts exist, they are especially severe if one or all parties have rigid aspirations they regard as legitimate and when the disputed object has a high market or user value for the parties involved. This is the case of conflict over mineral resources in Indian lands. In summary, the emergence of conflicts in the Amazon as a whole may depend more on access to resources, and its intensity could be more related to the market and user value of that resource than on environmental scarcity. As the case of Roraima has shown, the abundance-scarcity debate and its influence on conflict formation are linked to the possibility of access of interested parties. This has materialized through the invasion of Indian lands by small gold prospectors and the subsequent conflict of interest over the exploitation of gold and other minerals, as for example in Roraima the Yanomani reserve and the Raposa Serra-do Sol area. Thus, conflicts do emerge because the claim made by one party such as *garimpeiros* to use or exploit a given good, such as gold, must negatively affect the interests of another party, in Roraima the Yanomani and Makuxi. The above does not necessarily mean that in Roraima the goods or services provided by the environment are not enough for those who want or need it. Rather it refers to a situation where the richness of the subsoil and the environmental change produced by the exploitation of such resources negatively affects one party. This is being aggravated by rigid aspiration of both parties and the market value of the good in question.

Finally, the role of scarcity must be distinguished at different levels. While in the Amazon as a whole there is no environmental scarcity, at a local level the situation is often very different. There are several scenarios where scarcity is evident, notably in the southern Amazon, as in the southern part of Pará, the eastern border of Pará with Maranhão, the northern part of Tocantins, and a large part of Rondônia present several scarcity scenarios. However, other parts of the Brazilian Amazon such as the northern part of the Amazon (Roraima and Amapá) face a very low level of environmental disruption and almost no scarcity in terms of forest, water, and other natural resources. Thus, in analyzing scarcity one must be aware of the problem of scale.

70.9.1 Role of Environmental Change in the Brazilian Amazon?

Environmental change should be understood as a large-scale natural or human-induced destabilizing in-

terference in the environment. The focus is on environmental change rather than on environmental scarcity. Besides the definition of environmental conflicts a second aspect must be revised. It is insufficient to argue that the environment plays a role as has been argued in other studies, notably Homer-Dixon's (1999, 2000/2001) work. For analytical purposes environmental change must be placed as an interactive source generating social conflicts, and how and with what other sources environmental change interacts to generate social conflicts. Two roles must be distinguished: trigger and aggravator.

A trigger of a conflict is a proximate cause where a factor triggers the system beyond a critical threshold. If environmental change acts as a trigger, the process of environmental change must be acute. For instance, a strong drought, an enormous flood, or a high degree of deforestation would have to take place. A claim that environmental change is an aggravator suggests that the factor interacts with other factors to produce conflicts. Most cases in the Brazilian Amazon can be placed within this framework. There is empirical evidence that environmental change can act as an aggravator. For instance in terms of soil, the low ecological carrying capacity of the Amazon basin, especially in the tropical *terra firme* soil, brings about specific limitations to colonization and agro-pastoral activities. Thus, the rapid decline in agricultural production on colonized soil inhibits capital accumulation, settlement stability and consequently the construction of stable social relations. This situation causes permanent migration, accompanied by further deforestation resulting in most cases in open conflicts on access to land-resources.

Another example is open conflicts as a result of forest depletion in the Brazilian Amazon. Ranching activities and the process of deforestation has had a direct effect on the lives of the forest-dwellers. The most evident conflict has been the expropriation of the customary lands of forest peoples. This situation has to do with the surviving strategies of several groups such as Indians, rubber trappers, nut collectors, and *Quilombos*, whose way of living is strongly related to nature, and their social organization is based on the communal use of natural resources. This way of living is in opposition to the private exploitation of these resources by miners, large landowners, mining companies, and logging enterprises, etc. The most well-known case related to open conflicts due to forest depletion has been the assassination of Chico Mendes, the former president of the Rubber Trappers Union.

70.9.2 Contribution of Environmental Change to Social Conflicts

The contribution of environmental change to social conflicts in the Brazilian Amazon may be understood as indirect and/or interactive. This means that social conflicts are understood partially as the outcome of the social and environmental side effects of environmental change. Here the process of environmental change in relation to other variables can produce either social conflicts or widen the scope of existing conflicts. In the Brazilian Amazon this would mean that deforestation, pollution from mining activities, and flooding in connection with other sources will produce social conflicts and/or contribute to social conflicts by introducing more entropy to a system that is already in turbulence. However, what is going to be more important in the final analysis is to see what specific role environmental change as an independent variable is going to play, for instance as a trigger or aggravator. As a trigger environmental change basically releases accumulated non-environmental social pressures, and as an aggravating factor environmental change adds to other factors producing conflicts.

71 Politics of Environment in the Caucasus Conflict Zone: From Nationalizing Politics to Conflict Resolution

Vicken Cheterian

71.1 Introduction

This chapter argues that for the past two decades environmental politics was part of a nationalizing project in the Caucasus. It reviews the conditions for the emergence of environmentalist movements in the Soviet Union, and why they lost the leadership of independent politics to nationalist forces. It also addresses the security dilemma that led to a series of violent ethno-territorial conflicts in the Caucasus, which have undermined regional security and stability. It argues that environmental politics continue to remain expressions of national projects, and as such unsuitable neither for addressing regional environmental concerns, nor for solving complex security problems. It concludes by looking at newly emerging environmental movements that carry the potential of separating environmental politics from nationalizing projects, and create the necessary conditions for environmental cooperation on the regional level. To conclude, the example of the rise and fall of environmentalist movements in the Caucasus and other post-Soviet republics should make international organization highly cautious about rapid transplantation of value-charged projects, which could take another life of its own under new socio-political conditions and in societies having a plurality of historic trajectories.

Political reforms under Mikhail Gorbachev's *glasnost* had created new conditions under which various ideological currents could compete to mobilize a population that was denied independent political activism for decades. Environmental movements were the first to mobilize street demonstrations with thousand of participants in the various regions of the Soviet Union, including in the South Caucasus.¹ Soon after-

wards, national movements in the republics, and democratic forces in the centre, overshadowed the green movements and took over the leadership of rapidly developing mass movements, pushing environmental politics into a long eclipse. In recent years, environmental politics has made a comeback to the South Caucasus. The work of international organizations, a newly emerging environmental consciousness in the capitals, and the utilization of environmental concerns on a regional level by ruling administrations, has reintroduced environmental politics into public discourse after an absence of a decade and a half. In this context, it is important to see the conditions in which environmental politics rose and collapsed, its association with other political currents and ideas, to appreciate the political underpinnings of the new environmentalists, and their place in the newly emerging political landscape.

The question remains to be seen whether the new interest towards the environment will help emerge a larger and independent green political movement, after the failure of environmentalists of the perestroika generation. Another unknown is to see how the emergence of a new movement will change the political construct of the South Caucasus, and have an impact on the security problems that the region inherited at the moment of the collapse of the Soviet Union. Yet, those various groups invoking the environment have different motivations and seek separate objectives. While for international initiatives like the *Environment and Security Initiative* (EnvSec, box 71.1), the declared objectives are to understand the overlap between environmental problems and regional security, in order to bring concrete solutions to environmental problems, and thus building trust on a regional, and political level, national governments, local environmental groups, and established green parties, each seek different objectives while evoking the environment (figure 71.1).

1 During the Soviet period, the region was known as 'Transcaucasus', and since independence the three independent republics of Armenia, Azerbaijan, and Georgia are referred to as the 'South Caucasus'.

Box 71.1: EnvSec activities with a specific focus on the Southern Caucasus. **Source:** EnvSec; at: <<http://www.envsec.org/about.php>> and <<http://www.envsec.org/southcauc/index.php#maps>>. Published with permission of EnvSec.

The *Environment and Security Initiative* (EnvSec) seeks to facilitate a process whereby key public decision-makers in *South Eastern and Eastern Europe, Central Asia* and the *Caucasus* are able to motivate action to advance and protect peace and the environment at the same time. ... It works to assess and address environmental problems, which threaten or are perceived to threaten security, societal stability and peace, human health and/or sustainable livelihoods, within and across national borders in conflict prone regions. The Initiative collaborates closely with governments, particularly foreign, defence and environment ministries, national experts and NGOs. ... EnvSec has carried out assessments and published reports ..., for understanding the linkages between environment and security in the political and socio-economic reality of these three regions. The Initiative develops and implements work programmes aimed at reducing tensions and solving the problems identified. Through extensive regional consultations and multi-stakeholder participation the initiative seeks to:

- Identify environment and conflict hotspots by carrying out desk and field assessments
- Present the results of the assessments in graphically rich maps, reports and web site and draw the attention of politicians and people to situations and hot spots where risks are high
- Help societies to deal with priority issues by raising awareness, building capacities and strengthening institutions
- Support concrete action and catalyse specific solutions for the identified security-relevant environmental problems on the ground

These challenges are being tackled with a combination of political, socio-economic and environmental insights as well as the capacity and skills of the six partners. EnvSec also collaborates with think tanks and research institutes to increase the understanding of the interdependency of natural resources, socio-economic development and political stability.

EnvSec was established in 2003 by the *United Nations Environment Programme* (UNEP), the *United Nations Development Programme* (UNDP), and the *Organization for Security and Co-operation in Europe* (OSCE). The *North Atlantic Treaty Organization* (NATO) became an associate member of the Initiative in 2004, through its Public Diplomacy Division. From 2006 onwards the Initiative is strengthened with two new members: the *United Nations Economic Commission for Europe* (UNECE); and the *Regional Environment Center for Central and Eastern Europe* (REC).

EnvSec is governed by a Management Board, which consists of representatives of the partner agencies. The EnvSec activities are co-ordinated by the EnvSec Secretariat consisting of two bodies: (i) a coordination unit comprised of a Coordination Officer and Regional Desk Officers from the partner organizations, and (ii) an administrative unit hosted by UNDP Regional Centre for Europe and the CIS. An Advisory Board

comprised of donors, national government focal points from recipient countries and other stakeholders provides scientific and policy advice for the Initiative through annual meetings.

EnvSec in the Southern Caucasus

The Southern Caucasus ... has seen multiple inter-state and ethnic conflicts in its recent past, some of them escalating to full-scale warfare. In this context, the lack of regional cooperation threatens to exacerbate environmental issues, themselves a source of potential conflict in the region. Among the environmental concerns identified by EnvSec in the Southern Caucasus are the management of shared natural resources (not least in the Kura-Araks river basin which covers a large part of the region), pollution from ageing industries and irrigation networks, and uncontrolled growth of capital cities. Disagreements about real or perceived environmental threats, such as those related to the environmental conditions of the 'frozen conflict' zones, Metzamor nuclear power plant or the Baku-Tbilisi-Ceyhan trans-regional pipeline further complicate the picture. On the positive side there are quite a few opportunities to foster cooperation between the countries in the environmental field.

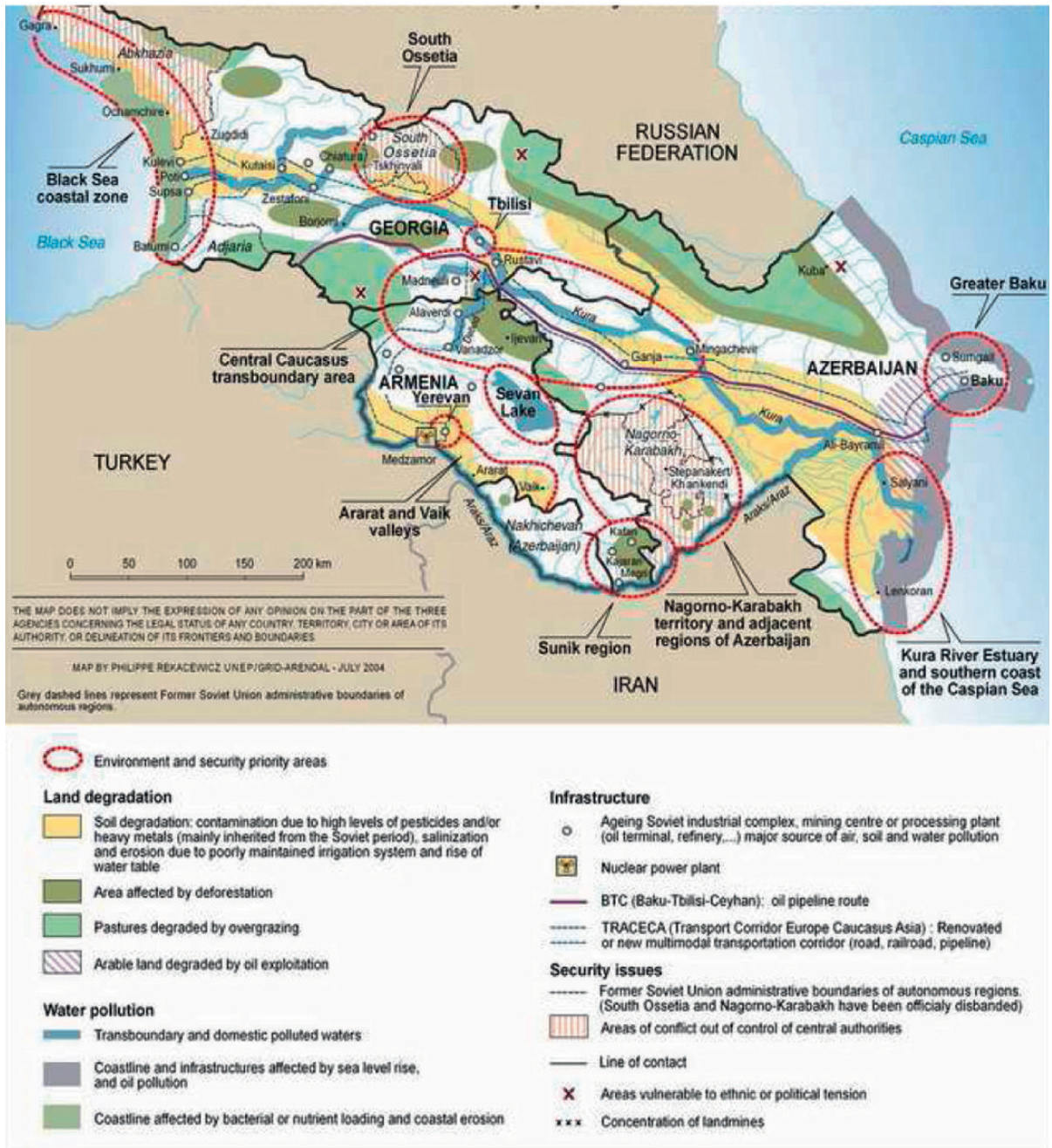
The EnvSec assessment of environment and security linkages in the Southern Caucasus was presented at the Ministerial meeting of EECCA [Eastern Europe, Caucasus and Central Asia]^{a)} countries in Tbilisi on 22 October 2004. EnvSec has identified the frozen conflict zones in South Ossetia, Nagorno-Karabakh, and Abkhazia as areas where more detailed assessment can help facilitate a broader understanding of current environmental challenges. EnvSec has supported monitoring and management of the Kura-Araks river basin, strategic environmental assessments, the establishment of public environmental information centres ('Aarhus centres'), and media training. In the view of reducing tensions in mountainous areas and promoting cooperation for protection and sustainable management, EnvSec also supports transboundary cooperation on the protection of the Caucasus mountains. The process of negotiating a legal framework will proceed, and it is closely linked to a similar mountain protection project in South Eastern Europe.

Internet sources on EnvSec activities in the Southern Caucasus

EnvSec Publications may be downloaded at: <<http://www.envsec.org/southcauc/index.php#pub>>. EnvSec Projects on the Southern Caucasus; at: <<http://www.envsec.org/southcauc/index.php#proj>>. EnvSec maps on Southern Caucasus; at: <<http://www.envsec.org/southcauc/index.php#maps>>.

a.) The 12 EECCA countries are: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, the Kyrgyz Republic, Moldova, the Russian Federation, Tadjikistan, Turkmenistan, Ukraine and Uzbekistan. For the: *EECCA Environment Strategy - Information Tool on Partnerships*, see at: <<http://www.eecca.net/index.php?gdzie=home>>.

Figure 71.1: Environment and Security Priority Areas in the Southern Caucasus. **Source:** EnvSec; at: <<http://www.envsec.org/southcauc/maps/priorities.jpg>>. Published with permission of EnvSec.



71.2 Environmentalists and Nationalists in the Caucasus

Three political currents can be distinguished among Soviet dissidents in the South Caucasus: a) environmentalists who were relatively tolerated by the authorities, b) human rights groups who received a strong

impetus after the signing of the Helsinki Final Act (1975),² and c) groups struggling for national rights. The national groups embraced a large panorama including intellectuals fighting against linguistic assimilation and groups calling for national independence, such as the United National Party in Armenia (Mouradian 1990: 256). While distinguishing these currents,

there was a very important overlap among them, as the same group or individual used one discourse for one audience and a different one when the audience changed. For example, Zviad Gamsakhurdia,³ a leading Georgian dissident and co-founder of Georgian Helsinki Group, tended to use a human rights discourse when addressing external audiences (Russian, Western), and a nationalist one while addressing the Georgian public. Similarly, the line separating nationalist dissidents and environmentalist activists was not always clear-cut.

But among the several competing ideological currents it was the nationalist movements that eventually succeeded in monopolizing the new political space. For Mark Beissinger, who has studied nationalist mobilization during perestroika and afterwards, the reason why nationalism – emerging from a tide of larger movements – became the dominant force should be explained by an “interaction between pre-existing structural conditions, institutional constraints, and even specific processes” (Beissinger 2002: 49, 79).

To put it another way, to understand why nationalism became the main ideological framework to challenge Soviet order a look at the institutions and structures created by the Soviets is useful, which had both structures for mobilization (e.g. the Karabakh movement started with debates within the regional Soviet of Mountainous Karabakh Autonomous Region), and the legitimacy it enjoyed within the societies.

Another interpretation about the failure of the environmentalists (or human rights movements) to lead the emerging mass movements in the late 1980’s is that those two currents addressed specific issues, and not radical social transformation. When the Soviet Union was about to collapse, there was a need, a public demand to substitute the heavily centralized state system with something different, and here the nationalist movements were better equipped, since they pro-

posed an alternative model of statehood and state ideology, legitimized both by past historic references, but mainly legitimized by the Soviet administrative ethno-territorial divisions. Therefore the small nationalist groups found themselves on the top of a potent popular movement which soon became the leading political current mobilizing the masses, and leading them simultaneously towards national independence (decolonization) and systemic transformation (privatization of the economy and socio-economic ‘transition’).

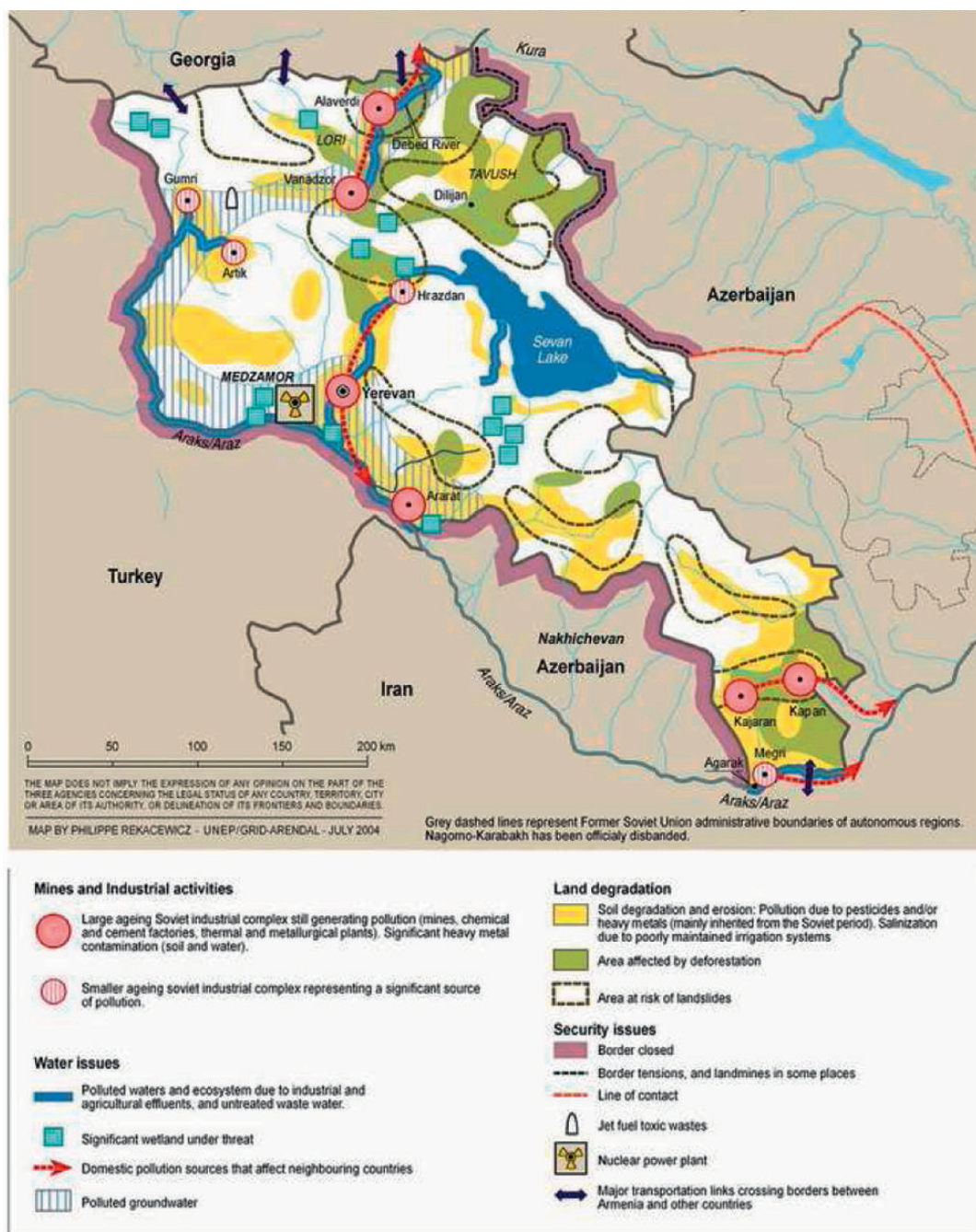
The short prominence of the environmentalists in the mid 1980’s was the result of the activism of environmentalists for several decades, who walked on a tightrope between what was tolerated by the ruling party, and between organizing independent political initiatives that went against the logic of party monopoly in politics. The rapid modernization in the Soviet Union clashed with the alarming degradation of the natural environment. Small dissident groups composed of urban educated circles such as scientists, teachers and artists, opposed industrial projects as early as in Khrushchev era. The mobilization of Russian environmentalists against industrial projects on the shores of Lake Baikal starting from 1966 found echo among the Soviet intelligentsia. In the same period, in the Armenian capital Yerevan scientists and various representatives of the intelligentsia mobilized to save Lake Sevan from drying up. From 1949 to 1962, in the years when the water of Sevan was heavily utilized, the lake dropped by one meter per year, or, in other words, the lake volume dropped from 58 billion cubic meters to 33 billion cm. In those years the level of Sevan had dropped by 18.5 metres as a result of the utilization of its waters to generate hydroelectric power (Sovedagan Hayasdan 1987: 84). This mobilization recorded a victory: Soviet authorities eventually agreed to reduce the utilization of the water from this lake and in 1981 the Soviet authorities built a 49 km tunnel to divert Arpa River to flow into the lake to stabilize Sevan and later to increase its level by 6 meters. Since 2002, and due to heavy snowfall and better utilization of its resources, the level of Sevan has increased by another 2.4 meters (figure 71.2).

Without doubting the sincere concerns for the fate of the Sevan and the fears about the dramatic consequences its shrinking or even disappearance could have caused, nevertheless there was an overlap between environmental concerns and national sentiments. The Armenian intelligentsia had limited possibilities to express its opposition to the confiscation of its national sovereignty by the Soviet central authorities. In this context, the mobilization for the defence

2 “The Final Act of the Conference on Security and Cooperation in Europe”, known also as Helsinki Final Act, or Helsinki Accords, was signed on 1 August 1975 in Helsinki by the USSR, USA, Canada, and 32 European states. Its inclusion of “Respect for human rights and fundamental freedoms” led to the creation of human rights groups in various Soviet cities. See: <http://www.osce.org/documents/mcs/1975/08/4044_en.pdf>.

3 Zviad Gamsakhurdia later became the first freely elected president of Georgia (1991-1992), but an armed opposition overthrew his rule in early 1992, opening the way for the return of Eduard Shevardnadze to lead Georgia. Gamsakhurdia died in mysterious circumstances in Western Georgia in late 1993.

Figure 71.2: National environment and security issues in Armenia. **Source:** EnvSec; at: <<http://www.envsec.org/southcauc/maps/armenia.jpg>>. Published with permission of EnvSec.



of Lake Sevan can be understood not just as a movement opposing industrial projects that had catastrophic consequences on the ecosystem of the lake, but also as an expression of dissent from a national group against the arbitrary rule of the authorities of a vast empire. The success of this and similar movements legitimized the expression of environmental

concerns, and created a space where the public discussion was tolerated by officials.

In the early years of Gorbachev's perestroika, the environmental issue was added to the agenda after the Chernobyl nuclear accident in April 1986 (chap. 61 by Sergunin). Besides debates on the risk of nuclear power, articles criticizing the management of the envi-

ronment appeared in various papers, both central and in the republics. The authors – often governmental health officials – revealed the content of official studies, described the interrelationship between the intensive use of pesticides, emissions, radiation, and the increase of childhood mortality.⁴ Once such articles were tolerated, at least their authors were not arrested by the secret police, the militants took a step further and started organizing public action.

The first independent street demonstrations in Armenia, Azerbaijan and Georgia were on environmental issues. In 1987 several thousand people demonstrated demanding the closing down of the Metamor nuclear plant, located at only 25 kilometres from the Armenian capital, which got a sense of urgency after the Chernobyl catastrophe. Others gathered in Yerevan demanding the closing down of the Nairit synthetic rubber plant in the southern industrial quarter of the city.

In 1988, in neighbouring Georgia the intelligentsia mobilized against the Caucasian Mountain Railway project, that aimed to link the north Caucasus with the south⁵, by piercing eleven tunnels, constructing eighty-five bridges, and extending 300 kilometres through the Caucasus range (Gayan 2004: 424). Here, the national concerns were even more apparent: the Georgian protesters opposed not only the distortion of the mountain landscape, but also feared that such a project would bring large numbers of foreign (mainly Russian) workers to isolated mountain communities, further destabilizing the tense inter-ethnic relations in the republic (figure 71.3).

In the same year, in Soviet Azerbaijan the first mass demonstration, which took place in November 1988, was to protest alleged plans of the authorities in Nagorno Karabakh, an Autonomous Region with ethnic Armenian majority but situated within Soviet Azerbaijan, to cut down the forest of Topkhana near the town of Shushi/Shusha, for the construction of an aluminium plant (figure 71.4).

Was the topkhana demonstration about the environment? Here are the recollections of one Azerbaijani journalist:

... I asked my parents what had happened. ‘Topkhana,’ they said. ‘Armenians were cutting down Topkhana.’ No further explanation was needed. Any Azerbaijani could understand everything with that one word. Topkhana is a forest. A large old forest in a State Preserve. It has grand oak trees which have been standing, they say, for more than 300 years old. But it’s more than that. The forest is associated with the entire region around Topkhana, especially the vicinity of Shusha, which symbolizes the best, the noblest and the highest level of our culture. We’re so proud of the level of civilization that has emerged from that region – the depth of thoughts and dimensions of beauty. It’s the birthplace of so many cultural giants – artists, writers, poets, playwrights, musicians, composers, and intellectuals. And so the land has become sacred to us. Historically, we are psychically and emotionally attached. So those demonstrations about Topkhana were not really about trees or ecology at all. The issues penetrated so much deeper; outsiders had challenged our authority over our own resources – both physical and cultural.⁶

The overlap between national concerns and environmental claims is striking. A tree is not a tree, and the land is a symbol of the nation, and not part of a natural habitat to preserve. The enemy is not polluting modernization, but the other, the ‘foreigner’ laying claim on the territory of ‘our nation’. And as the authorities had shown tolerance towards environmental dissidence, green movements succeeded in mobilizing all those forces who were opposing the Soviet officialdom, and who found refuge among the ranks of the environmental movements. But soon, the successes recorded by environmental demands – the railway project in Georgia was shelved few weeks after the start of street demonstrations – only helped to radicalize the emerging mass movement. This radicalization shifted not only the focus of the emerging mass movement but also transformed its nature further away from environmental concerns, or at least discourse. In this sense, environmentalist movements can be seen as the precursors of the national movements that mobilized hundreds of thousands in the streets of the three capitals. Or, to put it in another way, the environmentalist movements can be seen as part of the “nationalizing stances”, in the words of Roger Brubaker (1996: 63–64), which on the ground of the weakening Soviet state advanced the national project. The environmental movement in the South Caucasus

4 Yasin Aslan and Elizabeth Fuller, “Azerbaijani Press Discusses Link between Ecological Problems and Health Defects”, in: *Report on the USSR*, 4 August 1989: 20–21.

5 This project aimed at having a rail connection in the central part of the Caucasus. Two other rail links exist, the one to the east on the Caspian coast, and the second to the west on the Black Sea coast.

6 See Azar Panahli: “When a Tree isn’t a Tree, The Topkhana Demonstration of 1988”, in: *Azerbaijan International*, Baku, 2,3 (Autumn 1994); at: <http://www.azer.com/aiweb/categories/magazine/23_folder/23_articles/23_demonstrations.html> (12 February 2008).

Figure 71.3: National environment and security issues in Georgia. **Source:** EnvSec; at: <<http://www.envsec.org/southcauc/maps/georgia.jpg>>. Permission was granted by EnvSec.



did not defend the *environment* per se, but the land, the air, the mountain, the lake, the forest of the *nation*. They did not oppose the modernizing, industrializing policies of the Soviet Union because they de-

manded a cleaner air and water and sustainable usage of resources, but wanted to replace the Soviet by the national.

Figure 71.4: National environment and security issues in Azerbaijan. **Source:** EnvSec; at: <<http://www.envsec.org/southcauc/maps/azerbaijan.jpg>>. Permission was granted by EnvSec.



71.3 Popular Nationalism and the Security Dilemma in the South Caucasus

The reforms initiated from above weakened the Communist Party structures in the Soviet Union, and espe-

cially in the national republics. As the Soviet state was collapsing, its legitimate heir in the eyes of the international community was the union republics based on national principles. Yet, not all emerging national movements coincided with the territorial divisions of the union republics, creating clashes within as well as

across those borders. In the Caucasus, five conflicts tore the region apart, three of them in the southern part. The main reason of those conflicts was essentially in the national revolutions that overthrew the Soviet administration in the republics, thus bringing a new generation of radical politicians to power. The second major reason was the clash between the various national movements that mobilized to take over the space left behind by the exit of the Soviet Union from history.

The irreconcilable fraction of the dissidents against the Soviet system was composed of nationalist intelligentsia. Their main subjects of struggle in Soviet times were the defence of the national language and culture, which sometimes took mass expressions as in Georgia in 1978 (Carrère d'Encausse 1978: 218) when a project for the reform of the constitution aimed at making Russian the official language in the republic. The more radical forces among the national movements called for secession from the Soviet Union. Here too the nationalist discourse directed towards the interior often overlapped with the human right discourse directed to the outside audience. Yet, a harsh repression that followed paralysed their network and exiled their leaders, opening the space for the emergence of environmental opposition movements.

In the late 1980's activists coming from the nationalist dissident groups succeeded in overtaking the environmentalists and taking control of the newly mobilizing mass movement. As the national movements filled the main squares of Yerevan and Tbilisi, the budding environmental movements were left under a complete eclipse, overtaken by accelerated history where new concerns and the rapidly radicalizing political agenda of national independence overtook the quest for closing down sources of pollution. The strength of the national movements was visible to all: they succeeded in mobilizing hundreds of thousands in strikes and demonstrations which paralysed the Soviet state. The timid attempts of the Red Army to repress the mass demonstrations, such as in Tbilisi in April 1989, or in Baku in January 1990, helped only to further de-legitimize the Soviet institutions, and further strengthen nationalist demands to self-determination and sovereignty of the nation. There was a new sense of strength about the power of the nation mixed with anxiety and uncertainty about the coming backlash, leading to the conclusion that only an independent nationhood could guarantee the security of its people.

The success of the nationalist movements should be found in the nature of the Soviet state itself. The Soviet ideology claimed that its administrative subunits were "national in form and socialist in content", yet the Soviet policies of ethnically defined territorial administrations in which one ethnic group was privileged further strengthened national consciousness, and sharpened inter-ethnic rivalry. The Soviet experiment paradoxically developed ethnic-territorial entities with national intelligentsia (Suny 1993: 84-126), while repressing not only nationalist expression, but also sovereignty of the entities it developed.

In the late perestroika period (1988-1991) the nationalist movements in the Caucasus were fighting on two fronts. First, they were struggling against the double-headed Communist Party (the central authorities in Moscow and the authorities in the republics) to replace them by taking over political power. After an initial attempt at repression, the local Communist Parties in Armenia, Azerbaijan and Georgia were replaced by the representatives of the national movements. This transfer of power occurred without violence in Armenia and Georgia, where the election of Levon Ter-Petrossian was recognized by the old nomenklatura who gave up power peacefully. In Georgia the election of Zviad Gamsakhurdia led to an initial transfer of power, but later a vast coalition of nationalists, armed groups and former Communists toppled the new president and brought back to power the former Soviet foreign minister Eduard Shevardnadze. Although the civil war to topple Gamsakhurdia did not last more than two months, its wounds are still visible within the Georgian society. In Azerbaijan, the struggle between the Communist nomenklatura and the emerging nationalist opposition led to clashes in Baku in 1992, and the overthrow of the former Communist boss Ayaz Mutalibov, and the election of a former dissident Abulfaz Elchibey to head the state. A year of economic collapse and military defeats in Karabakh weakened Elchibey, and an armed rebellion led to the return to power of Heidar Aliiev, the long-time leader of Soviet Azerbaijan.

Next to fighting the Soviet order to take power, rival nationalist movements were often in competition, leading to clashes to control land and people. This triangular struggle turned the Caucasus into the major battlefield of the collapsing Soviet Empire.

The first nationalist mobilization was around the Karabakh issue, an autonomous region with an Armenian majority, but placed within Azerbaijan by the Soviets (Donabédian/Mutafian 1991). The refusal of Moscow to change the status quo, anti-Armenian po-

groms in Azerbaijani cities, population transfers between Armenia and Azerbaijan, and the growing clashes between armed village committees in the Karabakh area increasingly degenerated the situation into a civil war. The end of the USSR transformed the nature of those conflicts. Initially considered 'internal affairs' of the Soviet Union, starting from 1992 the Karabakh conflict has pitted the two newly independent states of Armenia and Azerbaijan against each other in an undeclared war. At the time of signing a cease-fire in May 1994, Azerbaijan had lost control over the autonomous region, and several regions surrounding it, to Armenian forces.

In Georgia, the rise of Georgian nationalism led to new fears among the third of the population, composed of ethnic and linguistic minorities. The Georgian national movement and their struggle against Moscow, for example, raised fears among the autonomous entities in Georgia inhabited by non-Georgian ethnic groups, such as the Abkhaz and the Ossets (figure 71.3). For Georgian nationalists like Zviad Gamsakhurdia, any political expression coming from those entities was the result of a plot from the Soviets to destroy the will of the Georgians to national independence, cutting all possibilities of negotiations. Three regions in Soviet Georgia enjoyed autonomous status of different degrees, including South Ossetia, Abkhazia, and Ajaria. Minority groups feared that Georgian nationalism, and breaking-away from the USSR, would diminish or even whip-out the autonomous status they enjoyed. As a result, nationalist movements emerged in those regions, leading to armed clashes first in South Ossetia in 1989, and when a cease-fire arrangement was reached there in summer 1992, Georgian Armed forces entered Abkhazia provoking a thirteen month long war, before being defeated.

The outcome of those wars was the emergence of three 'black holes' in the South Caucasus: Karabakh, South Ossetia, and Abkhazia are de facto state yet remain unrecognized entities (Cheterian 2001: 30-42). The specificity of those conflicts is that the smaller entities emerged as victorious in the military conflicts pitting them against larger national groups. This could be explained by a number of factors: the power struggle in Tbilisi and Baku providing the chance for military victories for the minority groups, and the weakness of the newly developing independent states and their incapacity to mobilize forces for those wars.

71.4 New States, Unrecognized States, and Security

Initially, the new national leadership in power was sensitive towards the environmental problems left behind by the Soviet system, and tried to address them. In Armenia, for example, the Metzamor nuclear power plant was shut down, following the double shocks of Chernobyl in 1986, and the earthquake that hit northern Armenia in 1988. Yet, within few years the concerns of both the ruling elites and the public changed rapidly. The conflicts and their victims, the refugees and the internally displaced peoples (1.4 million in the South Caucasus out of a total population of 16 million), the collapse of the planned economy, the economic blockades, the energy crisis in Armenia and Georgia, the dramatic fall in the living standards, all those problems engendered by the collapse of the Soviet system pushed environmental concerns into oblivion. In 1994 five years after being shut down, the Metzamor nuclear plant was reactivated, and no one went to demonstrate against it.

The post-Soviet Caucasus emerged as a major region of instability. The appearance of unrecognized, but de facto independent states of Karabakh, Abkhazia, and South Ossetia, with disciplined armed forces, political leadership, and territories under their control, continues the high tension. Although cease-fire agreements were reached in these three conflicts, several hundred victims are recorded yearly as a result of land mines and sniper fire on the warfronts. Villages, towns, agricultural land and various infrastructure systems remain abandoned in the frontline areas, while large military forces preserve a delicate balance of power. The relative calm has seen major exceptions as well, when clashes in Abkhazia in May 1998 and October 2001, and in South Ossetia in summer 2004 increased fears of another cycle of violence.

A second source of regional instability is the result of social polarization in each of the three republics. As a result of massive privatization of the Soviet inheritance, there has been a social stratification unseen in generations. A small minority which dominated the state structure has succeeded in increasing its wealth, while the vast majority of the population saw its former living standards fall dramatically. The political manipulations of the elite such as during the key elections has further alienated the population, and at times ignited revolts, such as in Georgia in November 2003. The monetarization of social relations has transformed the former social traditions and values, and

has created a fertile ground for the emergence of radical, religious-inspired movements.

A third source of regional instability has been great power competition to dominate this geopolitically relevant region, and access to natural resources. The South Caucasus is the only geographic link between the Caspian Sea and the steppes of Central Asia beyond it, and Western markets, without passing neither through Russia nor Iran. With growing uncertainty in the Middle East and the rise in global consumption of oil, the relevance of Caspian hydrocarbon resources to international politics has increased (Cheterian 1997; Dekmejian/Simonian 2003). While Washington is trying to connect the newly independent republics of the Caucasus and Central Asia to Western economic interests, by promoting such projects as the Baku-Ceyhan pipeline linking the offshore Caspian resources with the Turkish Mediterranean terminal, Moscow is trying to regain its lost influence in the region by developing an integrated energetic system, under the domination of Russian companies. Although this power competition did not yet spill-over into resource wars, it nevertheless increased the tensions over the existing cracks of the regional security architecture (Aydin/Kaptanoglu 2008; chap. 30 by Winrow).

While the Caucasus region remains a highly volatile zone, its source of instability between the late 1980's, and since the mid-1990's should be distinguished: while in the time of the Soviet collapse it was popular nationalism that challenged the existing order that led to mass violence, since the mid-1990's the source of instability comes from the dominant state structures which bears in itself the nationalizing project as state ideology, and tries to impose itself from above. There are numerous examples to support the state-sponsored nationalizing project: in Georgia with the coming of Mikheil Saakashvili to power as a result of the Rose Revolution of 2003, official calls for the 'reunification' of Georgia by force if necessary became part of regular official discourse. In the Azerbaijani exclave of Nakhichevan, several hundred soldiers destroyed an ancient Armenian cemetery at Jugha in a matter of few days in December 2005, destroying several hundred *khachkars* or cross-stones traditionally used by Armenians as tombstones.⁷ The nationalizing state could not bear the existence of its arch-rival over its own territory, even in the form of a century-old cemetery. When national independence was achieved, and ceasefire arrangements were reached on the fronts of Karabakh and Abkhazia, popular nationalism lost its mobilizing edge. Current nationalism is

state-sponsored nationalism, unlike the nationalism of the 1980's which was a revolutionary nationalism.

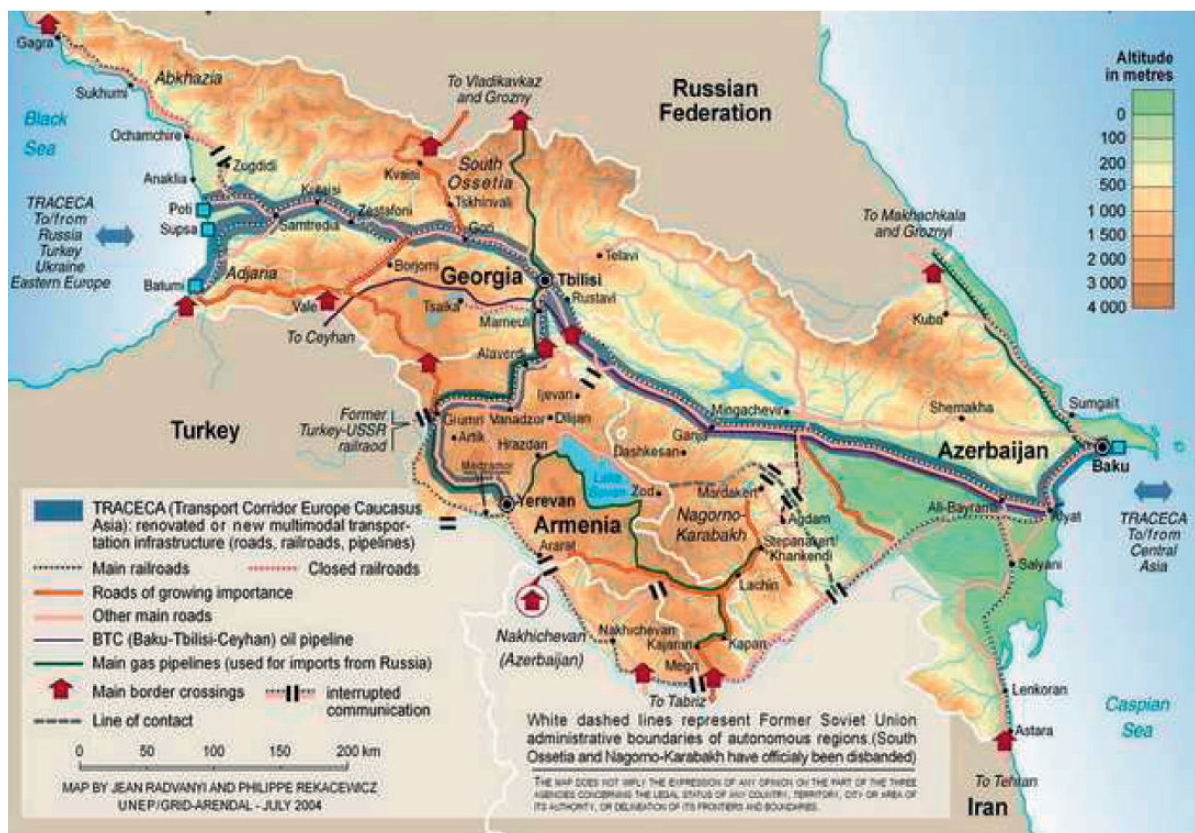
71.5 Environment and Conflict Transformation

The development of the Caspian offshore hydrocarbon production dominated the agenda of the Caucasus starting from the second half of the 1990's, and enhanced the international economic interest for this region. The signing of the 'Deal of the Century' on September 1994 between the Azerbaijani government and a consortium of Western oil companies led by the British Petroleum, with a total capital of nearly 8 billion US\$, transformed the nature of the political struggle in the Caucasus, and created direct American and European interests in the region. The struggle over the control of the territories took a new form: In the second half of the 1990's Baku substituted its military efforts to regain control over Karabakh with an 'oil diplomacy' in which it distributed contracts to exploit Caspian offshore oil in exchange for diplomatic support to pressure Armenia on the Karabakh issue. While the multi-billion Western investments brought the Caucasus and the adjacent Caspian region into international attention - and great power rivalry dubbed as the 'new great game' by the mass media - neither oil interests nor diplomatic initiatives brought any substantial change on the warfronts or the security problems of the South Caucasus.

Yet, Caspian hydrocarbon development had major effects on the political developments in the South Caucasus. First, it froze the existing conflicts. Any new military initiative would endanger investment and construction projects. Second, the starting of massive oil exports will pump millions of petrodollars to Azerbaijan, and indirectly to its neighbouring regions, thus alleviating the pressing socio-economic problems, that were so acute that they eclipsed other issues. Lastly, the involvement of Western capital in the projects of exploitation and transportation of Caspian oil ignited an important campaign mainly in the UK about the threats of pipeline construction on the environment⁸, and thus brought a new interest both lo-

7 Stephen Castle, "Azerbaijan 'flattened' sacred Armenian site", in: *The Independent*, London, 30 May 2006; at: <<http://www.independent.co.uk/news/europe/azerbaijan-flattened-sacred-armenian-site-480272.html>>; see also Sarah Pickman, "Tragedy on the Araxes", in: *Archaeology*, 30 June, 2006; at: <<http://www.archaeology.org/online/features/djulfa/index.html>>.

Figure 71.5: Transportation and communication links in Southern Caucasia **Source:** EnvSec; at: <<http://www.envsec.org/southcauc/maps/transports.jpg>>. Permission was granted by EnvSec.



cally and internationally on the state of the environment in the South Caucasus (figure 71.5).

The new interest in the South Caucasus for environmental issues should be divided into two groups. The first is the continuation of the nationalizing project described above. In the Soviet times, the overlap between nationalism and environmentalism was carried out by the Soviet era semi-dissident intelligentsia, but today this project is carried out by state officials, or political groupings that are the direct heirs of the Soviet environmentalists-turned-nationalists.

The examples are numerous. Recently, Georgian authorities have complained about forests cut in South Ossetia and Abkhazia. Such claims have a different emotional undertone compared to complaints about cutting down of forests in other regions of Georgia, currently under the control of the Georgian central government. Azerbaijani authorities have similarly complained to international organizations about reports saying that radioactive material is being kept

in occupied Azerbaijani regions of Fizuli, Aghdam, Lachin, and Ghubati.⁹ In a similar direction, the Azerbaijani authorities accused the Karabakh Armenian de facto government of deliberately destroying 60 square kilometres of forests in territories occupied by Karabakh Armenians. Azerbaijani authorities have also complained that Armenia is deliberately polluting the Arax River. For example in 2006, the Azerbaijani Ministry of Ecology and Natural Resources complained that due to military exercises the Armenian armed forces used chemical materials which is “extremely dangerous for the environment” and that “the environmental situation in the Araz [Arax] River is worse and added that five of the 21 species of fish have gone extinct in the river as a result of contamination by Armenia in the past 10–15 years.”¹⁰

8 See for example: “Baku Ceyhan Campaign”, at: <<http://www.bakuceyhan.org.uk/about.htm>>.

9 Yashar Aliyev: “Letter dated 12 November 2003 from the Permanent Representative of Azerbaijan to the United Nations addressed to the Secretary General”, United Nations, General Assembly, Security Council, document number A/58/594-S/2003/1090; at: <http://www.mfa.gov.az/eng/armenian_aggression/conseq.pdf> (23 May 2006).

Another example of instrumentalization of environmental concerns for the sake of national foreign policy objectives could be brought from the Caspian Sea. In May 2007 Mr. Oleg Mitvol, deputy director of the Federal Service for the Oversight of Natural Resources of Russia, raised concern over the environmental damage caused by the international oil consortium active in the Caspian Sea. During an OSCE Economic and Environmental Forum held in Prague, and said that more than ten thousand seals died in 2007 alone. He added that Russian “scientists believe that these [seal] deaths are caused by oil production”.¹¹ The northern part of the Caspian Sea in western Kazakhstan, the home of the Caspian seals (*Phoca caspica*), was a natural resort during the Soviet times, but since the emergence of the newly independent states it became a major zone of oil production.

How much Russian concerns are limited to the environment of the Caspian basin? The overlap with other foreign policy concerns can be made here: Russia opposed the construction of a Caspian underwater pipeline as part of the Nabucco project to transport Central Asian natural gas to European markets, without passing through Russian territory. This project is in direct competition with a Russian-sponsored ‘Southern Stream’ pipeline, which aims to transport Central Asian as well as Russian gas to Europe though another underwater pipeline, this time crossing the Black Sea. Turkey has equally referred to ‘environmental concerns’ to oppose the exportation of Caspian oil through Russia and then via the Bosphorus by super tankers, and instead insisted on the construction of the 1,760 km long *Baku-Tbilisi-Ceyhan* (BTC) pipeline. Once again, the ‘environment’ as part of the concern was little more than an alibi, if one looks that serious concerns about the construction of the BTC pipeline were simply disregarded by the same authorities in Ankara.

It would be naïve to regard such ‘concerns’ as a newly emerging environmental sensitivity among the officialdom in the South Caucasus or in its neighbouring capitals.¹² It would be closer to reality and to the record of this region’s politicians to describe these new concerns on the state of the environment outside the control of their respective governments as part of

the on-going struggle for domination of the territory, its resources and population, a new form of continuation of the conflicts that erupted with the rise of the nationalist movements, or the geopolitical competition over the Caspian energy resources that followed.

More interesting is the mobilization, albeit very diffuse, against new industrial projects. As mentioned above, the Baku-Ceyhan pipeline construction attracted much attention. Opposition against the pipeline was strong in Georgia, where the Green Alternative NGO launched a campaign against its construction. Its activism, including a court case against Baku-Ceyhan, found large public sympathy. The pipeline crossed the Borjomi region, and environmentalist fear any spill as a result of corrosion would cause much harm to the protected forests of the area, and to the Borjomi mineral water sources, a major Georgia export. Movements of protest also erupted in the Armenian capital Yerevan, against the illegal cutting of trees in various parks of the capital, to use the space for construction. Several demonstrations were organized in the city jointly by NGO activists and students. Cutting trees is a highly symbolic issue in Armenia, because the forest cover areas has already shrunk from 13 per cent of the general surface in late Soviet times, to 9 per cent currently. Public indignation has grown in recent years as local officials have continued the destruction of the remaining forests for exportation and private profit.

Demonstrations against cutting of trees and forests in Armenia, and against the pipeline project in Georgia are new in their nature. They do not oppose the project of the ‘other’ on the land of the ‘nation’ but oppose deals and policy options made by the leadership of the newly independent states. Will such isolated outbursts lead to the birth of a new movement? The emergence of an environmental consciousness independent from the national project remains a precondition for addressing the side effects of new in-

10 “Azeri Ministry Says Armenia polluting Environment in Occupied Lands”, in: *Ayna*, Baku, 13 May 2006. English translation in: *BBC Monitoring*, 13 May 2006.

11 Jeffery Donovan, “Caspian: Russia Urges OSCE to Probe Energy Firms”, in: *Radio Free Europe/Radio Liberty*, Prague, 22 May 2007.

12 The politicization of environmental concerns was highly evident in the case of the ‘fires’ in Karabakh and territories surrounding it under the occupation of Armenian forces. Azerbaijani officials considered these fires as deliberate Armenian acts, but when the special envoy of OSCE to Karabakh, Andrzej Kasprzyk, following a detailed study, failed to accuse the Armenians of being responsible of those ‘fires’ he came under heavy pressure from the Azerbaijani authorities. See: Shahin Abbasov and Khadija Ismailova: “Azerbaijan Targets OSCE Special Representative for Criticism”, in: *Eurasia Insight*, 28 August 2006; at: <<http://www.eurasia-net.org/departments/insight/articles/eavo82806.shtml>>.

dustrial projects, and for looking at the environment in a broader context, surpassing the border of the nation.

The precondition of the development of an autonomous environmentalist movement is its dissociation from the nationalizing project in case they intend to become an independent political force, and not just an appendix of nationalist forces in power. Environmentalists need to distinguish themselves from the ruling powers which are nourished by nationalist ideology in order to be able to address both past and more recent environmental ills. Such a movement could simultaneously create bridges within the fractured Caucasus, but also beyond by associating with global values and social movements, and succeed bringing a new view to the security problems plaguing the Caucasus from the moment of the Soviet collapse. While outside interventions such as the EnvSec initiative could stimulate some groups or transport certain ideas, an autonomous environmentalist movement in the Caucasus can only emerge if it spreads its roots in the local, poor soil, and it will only emerge if it finds a role to play in the local historic narrative.

72 Environmental Security in the Asia-Pacific Region: Contrasting Problems, Places, and Prospects

Jon Barnett

72.1 Introduction

Other chapters in this volume have explored the diverse terrain of alternative dimensions of security beyond conventional security issues. In this larger landscape, diverse social groups – ranging from the global community (*common security*) to individuals (*human security*) – can all be construed as *insecure* either chronically, or at certain points in time, from various risks. Things that people value – such as sufficient food, economic opportunities, political freedoms, personal safety, environmental services, and good health – can be at risk, and can be seen as sectoral components of (in)security (UNDP 1994). Various processes put at risk the things that people value, including violent conflict, economic fluctuations, persecution, and environmental change.

As this book has ably demonstrated, the alternative security agenda is therefore vast and broad. Within this pantheon of issues, places, and processes, this chapter outlines environmental security issues in the Asia-Pacific region. It therefore ‘limits’ itself to one major sectoral component of security – the environment – and one region – Asia-Pacific. It begins by defining what it means by security and environmental security (72.2), which is then followed by a brief background to the Asia-Pacific region (72.3). Next, the chapter reviews some of the major environmental security issues in the region (72.4). It then discusses two key case studies of environmental insecurity in the region which relate to both the smallest atoll countries of Kiribati, the Marshall Islands, Tokelau and Tuvalu (72.5), and China as the largest country in the region (72.6). These two cases provide a useful contrast and reveal much about the diverse nature of environmental insecurity in the region (72.7). The chapter concludes that environmental insecurity in the region is caused by economic rather than demographic changes (72.8).

72.2 Security and the Environment

‘Security’ is the condition of being protected from or not exposed to danger. It is “the assurance people have that they will continue to enjoy those things that are most important to their survival and well-being” (Soroos 1997: 236). Security can be likened to vulnerability in that assessments of security (should) entail: the identification of risks, the identification of entities exposed to risks, the assessment of options to respond to risks (either by mitigating the risk, or by adapting to or recovering from the risk event), and assessments of net outcomes once response options have been deployed (Alwang/Siegel/Jorgensen 2001). There is some utility in applying this vulnerability approach to national security issues, even if such orthodox security assessments are rarely so formulaic.

There is widespread agreement that individuals and groups are vulnerable to various forms of environmental change, giving rise to the concept of ‘environmental security’. The publication of *Our Common Future* (Brundtland Commission) in 1987 marked the beginning of the official use of the term ‘environmental security’, although there is no agreed definition of it (Dalby 2002). To do so first requires defining environmental *insecurity*, which is taken here to mean “the vulnerability of individuals and groups to critical adverse effects caused directly or indirectly by environmental change” (after Barnett 2001: 17). Environmental security is therefore taken here to mean “the ability of individuals and groups to avoid or adapt to environmental change without critical adverse effects” (after Barnett 2001: 129). “Critical adverse effects” here means changes to which individuals and groups cannot adapt so that their livelihoods are substantially negatively affected. Examples of environmental insecurity include: desertification as a cause of migration from pastoral homelands in the Sahel (Franke/Chasin 1980); water scarcity and pollution causing morbidity and economic collapse in the

Figure 72.1: The Asia-Pacific Region.

Aral Sea (Weinthal 2002); and violence (in part) in response to the environmental impacts of the Panguna mine on Bougainville (Böge 1999).

72.3 The Asia-Pacific Region

There is no clear agreement on which countries comprise 'the Asia-Pacific' region. For the purposes of this chapter the region is taken to include the countries of Eastern Asia (excluding Myanmar and North Korea) and the Pacific Islands, as shown in table 72.1 (although this is based on membership of the Asian Development Bank, which excludes a number of the Pacific Island countries and territories such as American Samoa, the Northern Marianas, French Polynesia, Guam, New Caledonia, Niue, Pitcairn Island, Tokelau, and Wallis and Futuna).

The combined population of the countries shown in table 72.1 is 1.86 billion, or approximately 30% of the world's population. Countries and territories range in size from one of the world's smallest sovereign states in Tuvalu with 11,000 people living on approximately 26 km² of land, to the world's most populous country of China which has a population of 1.3 billion living on approximately 9.3 million km² of land.

Population growth has long been considered to be a significant cause of environmental insecurity (Myers 1987; Ehrlich/Ehrlich 1991), although this has been powerfully contested for just as long (Conca 1994b; Deudney 1991; Hartmann 1998). Growth rates vary markedly throughout the region, with negative growth rates in the Cook Islands and East Timor (a temporary effect of violence in 1999), and relatively slow growth rates in China, the Federated States of Micronesia, Samoa, Taiwan, and Tonga. However,

Table 72.1: Selected Indicators on the Asia-Pacific Region. **Source:** ADB (2004).

Country / Territory	Population (2003) ('000)	Average Annual population Growth Rate (1995-2000) %	Gross National Income / capita (US\$) (2002)	Gross Domestic Product Growth Rate (2002) in %	Percentage of Population Below US\$1 (PPP) / day
Cambodia	13,800	4.1	300	5.5	34.1
China PR	1,292,300	0.9	960	8.0	16.6
Cook Islands	18	-1.5	5,570	3.9	—
Federated States of Micronesia	108	0.2	1,970	0.9	5.0
Fiji Islands	832	1.1	2,130	4.1	25.0
Indonesia	215,000	1.2	710	3.7	7.5
Kiribati	89	1.7	960	0.9	38.0
Korea Republic	47,900	0.8	9,930	7.0	<2.0
Lao PDR	5,700	2.1	310	5.9	39.0
Malaysia	25,000	2.6	3,540	4.1	0.2
Marshall Islands	59	2.1	2,380	4.0	20.0
Nauru	13	1.8	—	—	—
Palau	20	2.1	6820	—	—
Papua New Guinea	5,620	4.9	530	2.0	24.6
Philippines	81,100	2.2	1030	4.4	15.5
Samoa	179	0.8	1430	1.5	5.5
Singapore	4,200	2.6	20,690	2.2	—
Solomon Islands	504	3.7	580	-2.1	—
Taiwan	22,600	0.8	12,930	3.6	—
Thailand	64,000	1.0	2,000	5.4	1.9
Timor-Leste	794	-2.6	520	2.8	—
Tonga	101	0.6	1,440	1.6	4.0
Tuvalu	11	1.9	1,380	1.2	17.2
Vanuatu	208	2.6	1,070	-2.8	40.0
Viet Nam	80,900	1.5	430	7.1	13.1

demographic momentum is important: for example, while China's population growth rate is low (0.9% per annum), it is nevertheless likely to add a further 200 million people by the year 2050; whereas in the Solomon Islands, which has a high population growth rate (3.7% per annum), a doubling of the population will add an extra 500,000 people. Of course, in both these cases, and throughout the region, the effects of population growth on environmental insecurity are wholly contingent on the ability of social-ecological systems to sustain larger numbers of people. This makes it impossible to make generalizations about the environmental security risks of

population growth in specific countries, and for the region as a whole.

In terms of both the way human activities affect environmental change, and the way environmental change affects people, more significant factors than population growth are levels of economic development and poverty. Table 72.1 shows some basic indicators of poverty and economic growth. The Asia-Pacific region contains some very wealthy countries such as South Korea, Singapore, and Taiwan, whose growth has been achieved by rapid growth in industrial production and services. There are many countries pursuing this path to growth, most notably

Table 72.2: Population Change for Selected Asia-Pacific Countries. **Source:** UN (2004a).

Country /Territory	1950	2000	2050	2100
	Population (thousands)			
Cambodia	4,346	13,147	29,567	34,409
China PR	554,760	1,275,215	1,395,182	1,181,496
Fiji Islands	289	814	969	889
French Polynesia	61	233	355	339
Indonesia	79,538	211,559	293,797	272,807
Korea Republic	18,859	46,835	46,418	37,250
Lao PDR	1,755	5,279	11,448	12,782
Malaysia	6,110	23,001	39,551	39,622
Micronesia, Fed. States	32	107	158	174
Papua New Guinea	1,798	5,334	11,110	12,429
Philippines	19,996	75,711	126,965	128,798
Samoa	82	173	254	295
Singapore	1,022	4,016	4,538	3,586
Solomon Islands	90	437	1,071	1,188
Thailand	19,626	60,925	77,079	70,351
Timor-Leste	433	702	1,433	1,460
Tonga	47	101	122	123
Vanuatu	48	197	435	481
Viet Nam	27,367	78,137	117,693	110,152

China, but also Indonesia, Thailand, and Vietnam. However, the majority of countries, including Cambodia, East Timor, Laos, Papua New Guinea, the Solomon Islands, and Vanuatu, are not yet developing in this way, and poverty in these countries remains high.

72.4 An Overview of Environmental Insecurity in the Asia-Pacific Region

The nature of economic development throughout the region causes environmental problems. For example, in the formerly centrally-planned East Asian economies of Cambodia, the Lao People's Democratic Republic (Lao PDR), and Vietnam, transitions towards more market-oriented systems of economic organization have been underway since 1979 (St. John 1997; Bilskie/Arnold 2002). In Cambodia and Lao PDR the aftermath of conflict and economic transition has resulted in increased foreign investment in resource extraction. In Cambodia, the most identifiable environmental impact of this has been large-scale exploi-

tation of forests due to commercial logging (Le Billion 2000). However, increased harvesting for fuel wood and agricultural encroachment, possibly in response to changed land tenure policies, have also taken their toll on forests (Kingdom of Cambodia 2002). The degradation of forests is not just Cambodia's most pressing environmental problem, it is also arguably its most pressing development problem (Le Billion 2000). Forestry has also intensified in Lao PDR, although the major source of private foreign investment has been in hydropower developments along the Mekong River (Bakker 1999). Indeed, across the region rates of deforestation are high (Dauvergne 2002; Elliott 2003; Haque 2001), and this is associated with human insecurity and political unrest in Melanesia (ACF 2002; Dauvergne 1998; Kabutaulaka 2001; Liloqula/Pollard 2000; Matthew/Gaulin 2001; Scheyvens/Lagisa 1998).

Vietnam's transition has not led to intensive development of a single resource as it has in Lao PDR (water) and Cambodia (forests), instead it has increased industrial production and so increased energy use and associated pollution (Tuan 1997). Adger (2000) reports that in Vietnam the state has prioritized in-

creased agricultural production and economic growth ahead of environmental sustainability. A range of agricultural reform policies, including increasing security of land tenure and the decollectivization of farming, has seen a privatization of agricultural production which has increased productivity but affected a decline in collective actions to maintain common property resources (Adger 1999; Gomiero/Pettenella/Trieu/Paoletti 2000). Increasing income inequality as a result of transition has created a class of low income people dependent on natural resources for their livelihoods, leading them to increase resource use to accumulate wealth (Adger 1999; Gomiero/Pettenella/Trieu/Paoletti 2000).

Transformations in agricultural production are also occurring elsewhere in Southeast Asia, and in many places have been a cause of deforestation and population displacement (de Koninck/Dery 1997). Migration has led to conflict - which can at times be violent - over land and resources in immigrant communities (Koczburski/Curry 2004; Peluso/Harwell 2001). Agricultural intensification has resulted in more intense use of fertilizers and pesticides, leading to soil and water contamination (Elliott 2003). Approximately 20% of Asia's land area suffers from some form of land degradation (WRI 1992). Increasing use of coastal and marine resources is leading to should it be intensification of marine pollution and deterioration of fish stocks clearing of mangroves, and degradation of coastal environments (Elliott 2003; Haque 2001). In Thailand, for example, aquaculture has destroyed 87% of mangrove stands (Seager 1995) and has marginalized many coastal residents (Stonich/Vandergeest 2001); and 65% of South Korea's coastal wetlands are at risk due to planned coastal reclamation developments (Haque 2001).

Associated with industrial expansion in many countries has come increasing demands for energy and water, with consequences for environmental insecurity. Throughout the early 1990's regional energy demand grew at 4.7% per annum, and while this slowed after the 1997 Asian financial crisis, forecasts show that energy demand is likely to outstrip economic growth rates in the future (Saha 2003). The need to fuel growing demand led to proposals to develop nuclear power in Indonesia, the environmental risks of which have been characterized as security issues (Barnett 1997) which arguably outweigh the environmental problems associated with development of conventional sources of energy (Saha 2003). The environmental and social consequences of this rapid increase in energy supply and demand are numerous,

including urban air pollution, acid rain, and growing emissions of greenhouse gases (Haque 2001). Growing demand for water has led to more intense use of water resources, leading to political stress in the case of transboundary basins such as the Mekong (discussed below), and constraints on production, impacts on human health, and the risk of large-scale migration in the case of China (discussed below).

Throughout the region most of the poorest people are those who are most dependent on natural resources to sustain their livelihoods because they have little income with which they can purchase their basic needs. Thus people in rural and remote areas are vulnerable to changes in resource abundance due to violent conflicts and hazardous events such as cyclones and droughts. They are also considered to be the most vulnerable to climate change (Bohle/Downing/Watts 1994; Kates 2000; Lal/Harasawa/Murdiyaso 2001). Their low levels of income also mean that their livelihoods are highly sensitive to economic changes that can result in unemployment, rising commodity prices, and the introduction of fees for previously free public goods such as education and health care. Under such circumstances people tend to increase the use of natural resources to augment declining purchasing power (Kessler/Van Dorp 1998; Opschoor/Jongma 1996; Reed 1996). However, responsibility for large-scale environmental changes and resulting insecurities rests more with the agents of development within and beyond a country rather than with the poor (Barnett 2001).

Associated with agricultural and industrial transformation has come increasing urbanization in the Asia-Pacific region. There are seven cities in East Asia with more than 10 million people (Elliott 2004). Urban air pollution exceeds World Health Organization standards in many of these cities (Elliott 2004). In the Pacific Islands urbanization is increasingly a cause of environmental insecurity (Cocklin/Keen 2002). In many parts of the urban Pacific water supply and water contamination impact on human security, waste disposal systems are poor, and so morbidity levels are relatively higher than in rural areas (Cocklin/Keen 2000; UNEP 1999).

There have been and remain significant violent conflicts in the Asia-Pacific region since 1945 and these have exacerbated environmental insecurity in many countries. Notable in terms of recognized environmental impacts are the Indochina wars that killed and maimed millions of people, caused massive damage to infrastructure, involved large-scale use of defoliants and landmines, and have left large amounts of

Table 72.3: Some Selected Environmental Problems For Selected Countries In The Asia-Pacific Region. **Source:** Compiled by the author.

Country /Territory	Problem(s)	Ostensible Cause
Cambodia	Deforestation	Logging, fuel wood collection, agricultural expansion
China PR	Water scarcity and pollution	Industrialization, agricultural intensification
	Air pollution	Industrialization
Cook Islands	Cyclones	Climate variability
Fiji Islands	Cyclones	Climate variability
	Soil loss	Agriculture
French Polynesia	Land loss	Nuclear testing
Indonesia	Deforestation	Logging, agricultural expansion, fires
	Air pollution	Fires, industrialization
Kiribati	Coastal erosion	Sea-level rise
	Water pollution	Waste disposal, sea-level rise
Korea Republic	Coastal degradation	Coastal reclamation
Lao PDR	River flow	Hydropower
Malaysia	Air pollution	Fires, industrialization
Marshall Islands	Coastal erosion	Sea-level rise
	Water pollution	Waste disposal, sea-level rise
	Land loss	Nuclear and missile testing
Nauru	Soil loss	Phosphate mining
Niue	Cyclones	Climate variability
Papua New Guinea	Deforestation	Logging
	Water pollution	Mining
	Cyclones / drought	Climate variability
Samoa	Cyclones	Climate variability
Singapore	Air pollution	Fires, industrialization
Solomon Islands	Deforestation	Logging
Thailand	Coastal degradation	Aquaculture
Timor-Leste	Soil erosion	Fuel wood harvesting
	Drought	Climate variability
Tonga	Coastal erosion	Sea-level rise
Tuvalu	Coastal erosion	Sea-level rise
	Water pollution	Waste disposal, sea-level rise
Vanuatu	Cyclones	Climate variability
Viet Nam	Air pollution	Industrialization
	Land degradation	Agricultural intensification

unexploded ordnance throughout Cambodia, Lao PDR, and Vietnam (Westing 1976, 1980a). However, there have been violent conflicts in many countries since 1945, including in China, East Timor, Fiji, Indo-

nesia, the Korean Peninsula, Malaysia, Papua New Guinea, the Philippines, the Solomon Islands, and Thailand. Violent conflict continues in Indonesia, Lao PDR, the Philippines, and Thailand (HIIK

2004). In many ways the ability of these countries to avoid critical environmental problems is hampered by the effects of warfare. In East Timor, for example, violent conflict has led to significant demographic changes, large-scale damage to public infrastructure, minimal bureaucratic capacity, no environmental policies, an unskilled workforce, a small private sector, a lack of experience with democracy and self-rule, and very high levels of absolute poverty – all of which create substantial environmental problems and in many ways reduce capacity to manage them (Barnett 2006; Nevins 2003; Saldanha 2001; Sandlund/Bryceson/de Carvalho/Rio/da Silva/Silva 2001).

So, there are a diverse range of environmental and resource issues occurring at a range of scales in the Asia-Pacific region that can and have been understood as security problems. Some of these have distinct transboundary characteristics. There are at least five transboundary environment and resources problems that have at various times been framed as security issues. First, the regional security implications of dam construction, increased demands for water, and works to improve navigation on the Mekong River have been considered to be a point of contestation between the six countries within the Mekong River Basin (Cambodia, China, Lao PDR, Myanmar, Thailand, and Vietnam) (Dupont 2001; Jacobs 2002; Toset/Gleditsch/Hegre 2000). Changes in water use upstream have also created conflict among local communities downstream (Hirsch/Wyatt 2004). The Mekong River Commission is the pre-eminent organization entrusted with the coordination of water in the basin; however its membership does not include China, which controls the upper reaches of the catchments (Jacobs 2002; see Affeltranger in this volume).

Second, there is ongoing concern about territorial claims to the Spratley Islands in the South China Sea, the value of which is not just their strategic significance, but also because ownership of them confers access to reserves to maritime and sea-bed resources (Denoon/Brams 2001; Klare 2001; Magno 1997). Potential conflicts over maritime boundaries exist in the Pacific Islands region as well (Anthony 1991), and also between Australia, East Timor, and Indonesia (McBeth 2004; Mercer 2004). However, the motive for contending maritime claims has rather more to do with access to resources than it has with environmental issues *per se*.

The third transboundary environmental security issue is the problem of air pollution which Haque (2001) argues is a source of tension among North East Asian countries. This issue has received in-

creased attention since the 1997 forest fires in the Sumatra and Kalimantan regions of Indonesia, which caused a large smoke haze that had widespread health, environmental, and economic impacts. The cost to Singapore's economy, for example, has been estimated to be between US\$ 163–286 million (cited in Quah 2002: 429). The fires were the result of seasonal burning to clear land for cultivation, however, in the context of logging, and the severe El Niño drought in 1997, the usual haze was significantly intensified as many fires burned out of control. Regional cooperation is seen as being critical to solve the problem, and while some modest steps have been taken in this direction, on balance little seems to have been achieved (Bin Jaafar 1999; Elliott 2003; Quah 2002). The fourth transboundary problem – climate change – also concerns atmospheric pollution, the security risks of this to Pacific atoll countries is discussed later in this chapter.

The fifth major transboundary environmental security problem is the long-standing issue of nuclear testing in the Pacific Ocean (Firth/von Strokirch 1997). The issue has been less contentious since the cessation of French nuclear tests in 1995, but the very significant longer-term health and environmental risks posed by these most recent tests and by earlier US and British tests still remain (Anderson 1995). In the Marshall Islands, United States nuclear tests have rendered whole islands uninhabitable, and have affected large-scale forced migration within the country (Kuletz 2001; Seager 1993).

In terms of these regional environmental problems, regional organizations have been called upon to develop solutions as part of both a common and comprehensive security approach. In South East Asia the pre-eminent regional organization in this regard is the *Association of South East Asian Nations* (ASEAN), and it has been increasingly addressing environmental concerns, albeit with limited success (Elliott 2003; Haque 2001). Dokken (2001) has argued that framing regional environmental problems as security issues is a desirable strategy to raise awareness of the dangers of latent environmental conflicts. In the South Pacific the Pacific Islands Forum is the most important regional security institution (McDougall 2002). The Forum has long been concerned about environmental risks to national and human security and its annual communiqués have frequently referred to climate change as a security problem. *The South Pacific Regional Environmental Programme* (SPREP) is the region's pre-eminent environmental organization, although it faces difficulties working

across the wide diversity of social and environmental systems in the region (Turnbull 2003).

As a way to provide some insight into the specific causes and risks of environmental insecurity in the region two case studies will now be discussed: the issue of climate change in Pacific Island atoll countries, and the problem of water scarcity and pollution in China.

72.5 Climate Change and Environmental Insecurity in Pacific Island Atoll Countries

Atolls are rings of coral reef which enclose a lagoon. Around the rim of the reef there are often low islets called *motu* which are made of materials washed up from the reef (Nunn 1994). Motu have an average height above sea level of approximately two metres. Three Pacific Island Countries - Kiribati, the Marshall Islands, and Tuvalu, and one dependent territory - Tokelau - are comprised entirely of atolls.

The Pacific atoll countries have high population densities, ranging up to 32,000 people/km² at Ebeye in the Marshall Islands (Purdie 1999: 74). Population growth is generally high. The gross domestic product of all four countries is low, and land-based agriculture is limited to a few crops. Kiribati and Tuvalu are official 'Least Developed Countries' (LDC) in the United Nations system, and Tokelau would certainly qualify for this category were it independent.

In addition to their high population densities, minimal agricultural production, low elevation, and small economies, the Pacific atoll countries have some common environmental problems that increase their vulnerability to global warming. Principal among these problems is the quantity and quality of fresh water. Water resources are restricted to a narrow lens of subterranean freshwater and rain storage tanks. Groundwater resources are susceptible to contamination from solid and human wastes including oil and insecticides, and from salt water (UNEP 1999a). Freshwater lenses are rapidly depleted in times of low rainfall. Coastal erosion is also a problem. Safe disposal of solid and biological waste disposal is difficult as there are no 'safe' places to dispose of wastes on highly populated atolls with porous soils and sensitive reefs. Wastes contaminate fresh water, pollute coastal waters, and cause deterioration of reefs.

The Intergovernmental Panel on Climate Change has stated that "emissions of greenhouse gases and aerosols due to human activities continue to alter the

atmosphere in ways that are expected to affect climate," and that "global average temperature and sea level are projected to rise" (IPCC 2001d: 3-8). Climate scenarios suggests mean sea levels are likely to rise by between 9 and 88 cm by the year 2100, a rate at least twice as fast as that experienced over the past 100 years (IPCC 2001). A 32 cm rise in sea level is considered to have serious implications for the continued viability of ecological and social systems on low-lying coral atolls (Pearce 2000). The costs of adapting to sea level rise are in many cases prohibitive, with one study estimating the cost of protecting the main commercial and government area of the Marshall Islands (the Jaroj-Wulka-Telap area on Majuro) to be up to 4 times Gross Domestic Product (Holthus 1992). It is not surprising then, that in his rating of susceptibility to damage from climate change Pernetta (1990: 23) lists only the atoll countries as 'Category A', saying that they may be "devastated" by climate change.

An increase in global mean surface air temperature of between 1.4 and 5.8 °C by 2100 is also described by the scenarios (IPCC 2001). It is expected that there will be only small changes in mean annual rainfall across the region, but the intensity of rainfall events is expected to increase by some 20-30% over tropical oceans (Jones/Henne-sy/Page/Walsh/Whetton 1999). This suggests that flooding events may increase in frequency and intensity in the future, particularly when combined with rising sea levels and more intense storms and storm surges. If they occur, these changes in precipitation will place considerably greater stress on water resources in the region, including more frequent droughts, and may enhance the spread of vector borne diseases such as malaria and dengue fever (Nurse/Sem 2001). While not proven to be a function of climate change, it is noteworthy that there have been more frequent and intense El-Niño events since the 1970's (IPCC 2001). A severe El Niño in 1997/8 led to a severe drought in the Marshall Islands.

These changes in climate may have negative impacts on agriculture in atoll countries. Agricultural production is vulnerable to heat stress, changes in precipitation and soil moisture, incursion of saline water from rising sea levels, and increased damage from extreme events. Food security in the region may therefore become less predictable, particularly if coastal zones are degraded, artisanal fisheries are affected, and climate-induced changes in atmosphere-ocean regimes affect seasonal abundance and distribution of deep-water fisheries (McLean/Tysban

2001). In conjunction with the likely increased spread of vector borne diseases and more frequent and severe extreme events, this greater food insecurity is likely to degrade human health in the region.

Climate change is likely to cause increases in sea-surface temperature. This poses risks to atoll formation because coral reefs are highly sensitive to sudden changes in sea surface temperature, which tends to result in large-scale bleaching episodes (Hoegh-Guldberg/Hoegh-Guldberg/Stout/Cesar/Timmerman 2000). So, if reefs fail to grow and sea levels rise, coastal erosion on atolls will increase, flooding events will increase, freshwater reserves will become increasingly contaminated, and food from agriculture will substantially decrease. Ultimately these factors may mean that some atolls are unable to sustain present numbers of people.

Climate change is also expected to have substantial impacts on the economies of atoll countries. The World Bank (2000) estimates that by 2050 Tarawa atoll in Kiribati could face an annual damages bill of US\$ 8–16 million (some 13–27% of current Kiribati GDP), with up to US\$ 430 million of fixed capital at risk from inundation. In the Marshall Islands just one area – the Jaroj-Wulka-Telap area at Majuro – is both the commercial and government centre of the country, housing some 15,000 people, the government, water and power plants, two ports, a hospital and a community college; and so severe erosion or storm damage there would have massive repercussions for the country as a whole (Holthus 1992). So, the socio-economic impacts of global warming may be “so profound that they dwarf any strategic issue currently confronting a major peacetime economy” (Hoegh-Guldberg/Hoegh-Guldberg/Stout/Cesar/Timmerman 2000: 4).

Climate change may mean that atoll environments are unable to sustain human habitation (Barnett/Adger 2003). It is therefore a security issue for atoll countries. As a global problem with serious implications for atoll-people, the environmental security dynamic of climate change includes global, regional, national, and local levels of action. Actions to reduce the level of greenhouse gas emissions and to adapt to changes are security responses as much as they are sustainable development measures. Atoll countries have sought to mitigate against the problem through lobbying for reductions in greenhouse emissions at meetings of the United Nations Framework Convention on Climate Change (UNFCCC). They are also preparing to adapt to the impacts of climate change. In both respects, the efficacy of these actions may be limited: the atoll countries have some moral power in

UNFCCC negotiations, but not enough to overcome the economic concerns of high greenhouse gas emitting countries; and the range of adaptation options available to them is constrained by both the physical properties of their islands and the lack of financial capital available to implement strategies.

72.6 Water and Environmental Insecurity in China

Water is arguably China’s most critical natural resource. In addition to problems with flooding, in some places water is scarce, and in many places water is polluted. The problem of water scarcity has attracted considerable attention from the international community. Its effects on domestic food security and subsequently world food markets have been popularized by Brown (1995, 2004a), and there is concern in the United States that China’s water problems may be a cause of mass migration (Economy 2004; Haque 2001), violence (Economy 1999; Wang 2003), and political instability (Economy 2004).

China’s water problems are the result of interlocking changes that have occurred as a consequence of economic reforms begun in 1978. This economic transition has involved the marketization of production and distribution systems. This began with decentralized state control in rural areas which allowed farmers to expand their incomes through the intensification of agricultural production (Blaikie 1985; Muldavin 2002). This included increased consumption of irrigation water, particularly in the north of China, leading to increased withdrawals of both surface and ground water. For example, the area of irrigated land in the Yellow River basin increased more than nine times between 1950 and 2000, accounting for much of the 39% increase in water use in China’s north between 1980 and 1993 (Heilig 1999; Cai/Rosengrant 2004).

Fertilizer use also increased by as much as 260% between 1980 and 2002 (FAOSTAT 2004), and this has been a significant cause of increased water pollution. Intensification of production also led to a threefold increase in the area of land under permanent crops between 1978 and 2002 (FAOSTAT 2004). Because farming is not the most profitable activity in China, the low rate of returns relative to other investment options has constrained investments in sustainable water use.

Between 1980 and 2003 total production of cereals increased by 39%, and there was a fourfold in-

crease in the production of meat and vegetables (FAOSTAT 2004). This increased agricultural production seems to have been achieved with little increase in water; between 1980 and 1997 agricultural water use increased by between 1.2% to 4% (UNDP 2002; Mei 1999). Between 1980 and 1997 agriculture's share of all Chinese water use decreased from 88% to 72% (Mei 1999). These data therefore suggest that the water scarcity problem may be largely a product of the growth of industrial and urban uses which are consuming an increasing share of available water resources, and demanding yet more (Nyberg/Rozelle 1999; Yang/Zehnder 2001; Bellier/Zhou 2003).

In 1978, at the start of transition, China's urban population was officially 80 million (Wang/Webber/Zhu 2002a). According to the UNDP (2004) this had increased more than sixfold to 490 million by 2002 - a rate of increase far in excess of national population growth. This growth has contributed to water scarcity problems in China because, as more and more people live within cities and become more affluent, they consume and demand more water. Urban use has been the fastest growing sector of water use in China, with municipal uses of water increasing by 10.1% per annum throughout the 1990's (Economy 2004). Income growth has been rapid in both rural and urban areas, but relatively more rapid in cities (Wang/Webber/Zhu 2002a), including a sixteenfold increase in per capita GDP in Shanghai between 1978 and 2002 (Economy 2004). As incomes continue to rise there has been a decline in the proportion of cereals being consumed, and an increase in consumption and production of more expensive, higher quality food products, especially animal products (Heilig 1999; Tian/Chudleigh 1999). Increasing production of meat has entailed increased production of feed grains, so that between 1991 and 1996, the production of coarse feed grain increased more than any other cereal (Tian/Chudleigh 1999). These urban-driven changes in demand and supply are important for water use since fruits, vegetables, nuts, dairy products, and meat are *less* water efficient (they use more water per calorie delivered) than either wheat or corn.

Transition led to large-scale industrialization throughout China. By 1997 over 85% of Chinese exports were manufactured goods, up from 50% in 1980 (Wang/Webber/Zhu 2002b). China is now the world's 5th largest exporting country and 6th largest importing country (WTO 2003). Industrialisation developed most intensely in the coastal and southern provinces where both the area under cultivation and

agricultural output declined, and industrial water use increased by as much 200% (Heilig 1999). Nationwide, industrial uses of water doubled between 1980 and 1997 (UNDP 2002), and throughout the 1990's industry's water demand grew at 5.4% per annum (Economy 2004). These industrial uses have contributed to the increased demand for water, and also to water pollution. In particular, the more than 500,000 rural Township and Village Enterprises seem to be exempt in both policy and practice from environmental regulation, and their emissions are not monitored, even though they are thought to be responsible for approximately half of all pollution in China (Economy 2004; Vermeer 1998).

In the regions where industrialization has been most rapid there have been the largest declines in allocation of labour, land, and finance for agricultural purposes. This shift of capital away from agriculture occurred rapidly in the southern and coastal regions that have the most abundant water resources and are the most suitable for agricultural production. This has in turn caused some shift in the location of agricultural production to the drier north of China. These areas are not able to meet the gap in supply created by reduced production in the south without extensive use of irrigation and fertilizers, leading to overdrawing of ground water and excessive water pollution. As a result, water use for irrigation in the northeast of the country increased by 39% between 1980 and 1993 (Heilig 1999). Agriculture in the North China Plain is now nearly totally dependent on irrigation, and the volume of water used for irrigation on the Plain exceeds rainfall by some 200-300% (Zhen/Routray 2002). There is much evidence to suggest that irrigation on the North China Plain is unsustainable (Nyberg /Rozelle, 1999; Zhen/Routray, 2002). For example, the water table is reported to be falling by as much as 1 m/year (World Bank 2002a), and may have dropped 20 m in some areas and up to 70 m in others (Foster/Garduno/Evans/Olson/Tian/Zhang/Weizhen/Han 2004; Varis/Vakkilainen 2001).

The majority of rural people in the north of China are dependant on agriculture for their livelihoods. Household incomes are low with generally few alternative opportunities for income generation (Barnett/Webber/Wang/Finlayson/Dickinson 2005). The implications of changes in farmers' entitlements to useable water (a function of quantity, cost, and water quality) may be profound as they may trigger large-scale rural-urban migration (Economy 2004). There are also risks, however, in the widely advocated solution of water pricing which, given that hun-

dreds of millions of rural people in northern China depend on water for their livelihoods, may drive many from the land and into the cities (Webber/Barnett/Wang/Finlayson/Dickinson 2005).

As a consequence of these changes China faces serious water problems. Over half of China's 300 cities experienced water shortages in the 1990's and of these 108 cities are considered to have serious water shortages (Qi/Guodong/Masao 1999). Most of these are located in the North of the country. These shortages extend to urban electricity plants and factories, many of which have experienced temporary closures due to water shortages (Qi/Guodong/Masao 1999). The estimated cost of lost production in cities due to water shortages is reported to be US\$ 11 billion per annum (WRI 1999). At the ends of many rivers, including most famously the Yellow River, water no longer flows for significant periods throughout the year (Lohmar/Wang/Rozelle/Huang/Dawe 2003; Jun 2004). Many lakes are also contracting due to excessive water withdrawals (Smil 1997).

The UNDP (2002) has described water pollution in China as 'lethal'. Over 80% of China's rivers have some degree of contamination, and most cities' water supplies have serious water contamination problems (Qi/Guodong/Masao 1999). China's 2002 *State of the Environment Report* reports that in 2002, 70% of the 741 river sections monitored in China's seven major river basins were unfit for human contact (pollution levels at or above Grade IV standard) (SEPA 2002). Less than one quarter of China's largest 27 cities have water quality that meet national standards, and more than 90% of sampled sections of urban rivers contain water that is unsuitable for human contact (UNDP 2002, WRI 1999). As a consequence more than 700 million people in China drink water that is harmful to their health, and there is increasing evidence that the incidence of cancers is associated with pollution of drinking water (Banister 1998, UNDP 2002, WRI 1999). The costs of the health impacts of water pollution have been valued at US\$ 3.9 billion (World Bank 1997).

The security risks that water pollution and scarcity pose to people, and perhaps the Chinese state itself, stem entirely from economic development which arose out of a set of incremental policy experiments that proved to be wildly successful in economic terms, but which seem to be far less successful in environmental terms. The development of policy to manage these problems has been far slower than the rate of change in water use and pollution (World Bank 2002a).

72.7 Discussion

The cases of climate risks to Pacific Island atoll countries, and water scarcity and pollution in China, reveal much about the diverse nature of environmental insecurity. For small countries like the Pacific atoll countries, the risks posed by climate change are largely due to global emissions of greenhouse gases to which these countries contribute almost nothing. So, apart from local environmental problems that slightly reduce the capacity of ecosystems to adapt to climate change (and these endogenous problems are not worse than, and indeed may be far less than occurs in most other countries), the risks posed to these countries are overwhelmingly external in origin.

In the case of China, the risks to people, the economy, and possibly even political stability created by water scarcity and pollution are almost entirely internal in origin. To the extent that China is seeking to grow its economy and alleviate poverty through exports of manufactured goods (a not unusual development strategy that has proved highly successful for all the OECD countries), there is some external dimension to this problem. Nevertheless, for the most part the causes of China's water problems are its internal policies to promote growth and the responses of entrepreneurs to these policies. Of course the physical geography of both these very small low-lying atoll countries, and China where water is abundant in the south and east but increasingly scarce to the north and the west, are also important determinants of risk.

In terms of response options too there are marked differences between the atoll countries and China. Given the largely exogenous nature of the risks to the atoll countries, the most effective response will be the reduction of greenhouse gases to reduce the rate of climate change. Therefore the atoll countries have been very active in negotiations at meetings of the United Nations Framework Convention on Climate Change. The second response option for atoll countries is preparing to adapt to the effects of climate change through promoting sustainable development. To this end some degree of external assistance is required, and so these countries have been active in regional and global negotiations on assistance for adaptation. In China, because the cause of water problems is largely endogenous, solutions must come from within the country. The principal option is enhanced governance of water resources, including improving legislation and management institutions. However, systems for environmental policy-making

and implementation in China are not well developed, and despite gradual improvements much more needs to be done (Economy 2004; UNDP 2002; Vermeer 1998; World Bank 2002a).

Table 72.4: Contrasting Climate Change and Atoll Countries with Water Problems in China.
Source: Compiled by the author.

	Atoll Countries	China
Problem	Climate Change and Sea-Level Rise	Water Scarcity and Pollution
Major Cause	<u>External in origin</u> Greenhouse Gas Emissions	<u>Internal in origin</u> Industrialization
Minor Cause	<u>Internal in origin</u> Pollution and use of ecosystems	<u>External in origin</u> Global economic integration
Primary Solution	<u>External in origin</u> Reductions in Greenhouse Gas Emissions	<u>Internal in origin</u> Improved governance of water resources
Secondary Solution	<u>Internal in origin</u> Progress towards sustainable use of ecosystems	<u>External in origin</u> Integration of environmental considerations into trade rules

The nature of the risks and effectiveness of response options determines the extent to which people and institutions in both the atoll countries and China are insecure (vulnerable to) from environmental change. The prognosis for the atoll countries is less promising than for China. In the atoll countries the slow rate of progress on reducing emissions of greenhouse gases, and the generally limited range of adaptation options suggest that environmental insecurity from climate change remains high. In China, the risk and the re-

sponse options are within the purview of the State, and seem tractable (Heilig 1999; Smil 1997; Yang/Zhender 2001). Yet failure to respond effectively may mean deteriorating living standards for many millions of people, large-scale migration, and increased risks to regime security.

72.8 Conclusions

This chapter has outlined a wide range of environmental security issues in the Asia-Pacific, and discussed two cases in some depth. Given that the Asia-Pacific region contains some 30 % of the world's population living in very different socio-ecological contexts, it is not surprising that environmental security issues differ widely throughout the region. Environmental insecurity in the region is caused by economic rather than demographic changes; for while population continues to grow in many countries, the larger drivers of change are economic developments that lead to, among other things, greenhouse gas emissions, overuse and pollution of water, deforestation, and air pollution.

Solutions therefore lie in constraining the externalities of economic development, through, among other processes: improved land use planning at national and local levels, reducing the rate of greenhouse gas emissions through the use of sustainable energy technologies, adoption of cleaner production technologies, adoption of sustainable harvest targets, and reducing consumption in developed countries. Failure to address environmental problems through these and other methods may, and in some cases is already causing widespread and significant impacts on people's livelihoods.

73 Security at the Poles: The Arctic and Antarctic

Gunhild Hoogensen

Caution should be exercised about labeling every form of pollution or human-induced scarcity as a threat to security. But if the most serious warnings about global warming turn out to be correct, mankind faces a security problem on par with great-power war.

Nils Petter Gleditsch (2003: 477)

73.1 Introduction

Environmental security is a concept that has been, and continues to be, subject to controversy. Should environmental issues be ‘securitized’? If so, in which cases? Security pertains, even amongst many critical security studies scholars, to immediate threats that requires urgent action, and such immediacy is often not clear and present when it comes to the environment: “The environmental sector displays more clearly than any other the propensity for dramatic securitizing moves but with comparatively little successful securitization effects” (Buzan/Wæver/deWilde 1998: 74). Since environmental threats seem to be largely gradual, and therefore do not require immediate action, ‘urgency’ is often added to the environmental security recipe through the possibility of conflict. Homer-Dixon’s (1991; 1994; Homer-Dixon/Schwartz/Deligiannis 2000; chap. 20 by Homer-Dixon/Deligiannis) argument that under certain conditions of environmental scarcity, the likelihood of conflict increases, is now well known, as are the critiques (Gleditsch 1998). But these arguments do not address the relevance of environmental security that does not raise the immediate possibility of conflict. Additionally, environmental security has been problematic in that 1. the traditional machinery of security (the military) has largely been exempt from environmental considerations and been a source of environmental degradation; 2. ‘securing’ today’s North American lifestyles is largely contrary to the goals of ‘securing’ the environment; 3. development (i.e. ‘modernity’) appears to work against environmental protection; and 4. current modernization practices are not sustainable, and therefore a possible threat to environmental security (Krause/Wil-

liams 2003). One of the central problems with the environmental security debate is the tension between economic development and the environment. Both are relevant to the widened security agenda, but are pitted against one another, with little available in the way of a solution.

Against this background of controversy and scepticism, this chapter will discuss the nature of environmental security, and its relevance in two regions that are relatively peaceful and pristine – the Arctic and Antarctic. The overarching question is whether or not the concept of environmental security is relevant and useful here, and if so, in what way? In this chapter the author will argue that the concept is relevant but context dependent.

The security of the Arctic and Antarctic are deeply connected to the environment, both with regard to the impacts of humans on the environment, but also the subsequent impacts of the environment upon humans. Despite these regions being on the ‘outskirts’ of our usual social focus, these regions matter to the rest of the world: the environmental linkages between the polar climates and the rest of the planet are extremely complex and non-linear (SCAR 2005b), and the Arctic and Antarctic influence climate over a large part of the globe (IPCC 2001e; ACIA 2004). In both the Arctic and Antarctic (but more so in the Arctic) it becomes very clear that the ‘categories’ we use to identify security, from military to human security, are very fluid, and very closely linked to each other. Economic security cannot be completely isolated, for example, from environmental security or political security. This chapter will focus on the impacts of climate change and how this phenomenon has and con-

tinues to impact the many security dynamics of the Arctic and Antarctic.

The chapter will first present a brief discussion of environmental security (73.2), followed by a description of the regions (73.3). Both regions may be cold, but have little in common socially and politically. A discussion will follow on the impacts of climate change on these regions (73.4 and 73.5), as well as their ways in which environmental security is relevant to each, (73.6).

73.2 Environmental Security

In/security is about the expression of vulnerabilities and sources of fear (negative security), and of capabilities and enabling (positive security) – people, societies, groups have been able to ensure their security by a variety of means, to ensure that life continues, and make sure a good life can be found (Bajpai 2004; Hoogensen 2005c; 2008). The debate centres explicitly on the identification of threats, but also implicitly on assumptions about who (or what) provides security and who or what causes the threat (though not always adequately). Most conceptions of security assume that the state is the main, if not sole, provider of security, regardless of the security referent (global society, state, society or individual). The cause of the threat is an ‘other’, an ‘enemy’. The identification of threats and provision of security is based on the need to protect human values; if what we value is threatened, we wish to take steps to eradicate the threat (McSweeney 1999). Recognizing the role values play in the security debate is especially important when discussing environmental security, which is often down-played, or less-valued (particularly in comparison to other threats, such as large scale conflict). How we value the environment plays a large role in the efficacy of an environmental security concept.

Environmental security is illustrative of the complexity of the security debate, as it is relevant to not one, but a multiple of referents and ‘security providers’ (global society, the state, the individual) but often with varying agendas and meanings. In the polar regions all three referents are crucial and relevant; from individuals and societies, to states, and international regimes and organizations – all are significant to both the identification of threats as well as securing the environment for generations to come (both within and outside the regions). It is also this same multiplicity of actors who are often the cause of environmental threats (IPCC 2007f).

The development of the concept environmental security demonstrates the importance of the various referents. Discussions about global environmental threats largely began with the United Nations Conference on the Human Environment in 1972 (Buzan/Wæver/deWilde 1998). The term environmental security was popularized in the Brundtland Commission (1987) report *Our Common Future*. At that time the term largely reflected traditional security definitions, in that linkages were made between the environment and large scale warfare, particularly nuclear war. It also highlighted the extent of environmental degradation and devastation that would be and is caused due to other weapons of mass destruction, and the arms culture (WCED 1987: 19). Additional attempts at widening security to include, among other things, the environment have followed (Ullman 1983; Mathews 1989). There has been movement beyond such a tight link with traditional security interests, but there is no agreed upon definition of ‘environmental security’ (Moss 2003; Brauch 2003). Many of the operational definitions of environmental security have not moved far beyond the state focus¹, where environmental security is largely a tool of the state – a concept employed by the military, and potentially used as a justification for the continued exploitation of resources to ‘secure’ the North’s consumerist lifestyle (Dalby 1997, 2008).

However, an ‘exploitative’ focus is not a given at the state or inter-state level. The 2004 Hague Conference on Environment, Security and Sustainable Development claimed that it was very important to link the environment to security, particularly as global actors continue to fail to meet the challenges of increasing ecological problems, particularly climate change (Spencer 2004). The creation of global environmental regimes and organizations such as the *United Nations Environment Programme* (UNEP), the *Intergovernmental Panel on Climate Change* (IPCC), the *United*

1 U.S. Department of State, 2001: “What is environmental security?”, in: U.S. Department of State (Ed.): *Environmental Security Threat Report* (Washington, D.C.: U.S. Department of State); at: <<http://www.state.gov/p/eur/rls/rpt/2001/5882.htm>> (23 May 2006). Although the 2007 Presidential State of the Union Address in the United States was noted for its ‘recognition’ of climate change and environmental issues, it nevertheless framed this recognition in terms of securing resources for the United States, and reducing energy dependence upon foreign sources. See: <<http://www.whitehouse.gov/news/releases/2007/01/20070123-2.html>> (24 January 2007): 1.

Nations Framework Convention on Climate Change (UNFCCC), among others, demonstrate the increasing value of the environment and commitment of global actors to the issue. The move is also towards an ‘ecological’ security that identifies ecosystems and ecological processes as the security referent (Barnett 2001; Barnett/Matthew/O’Brien 2008).

Examining environmental security in relation to human security (Brauch 2005, 2005a; Rechkemmer 2006), and giving it a stronger ecological security orientation, moves the concept away from its state-based roots, and reflects mounting concerns about environmental degradation, and the importance of human relationships to the environment, including not only state and international actors, but individuals/communities (Reay 2006). This approach speaks to the security of multiple referents, the actors which cause the insecurity, and reflects the importance of values in our determination of security. As such, environmental security is connected to our ‘security of expectations’ recognized by Jeremy Bentham as a central condition of human well-being, reflecting the human need to rely upon the continued existence of that which we value (Hoogensen 2005b). When security of expectations decreases, as it does due to the unpredictability of climate change, the threat must be met. Arctic societies are attempting to do just that, but need the awareness of states and the international community to contribute to their own attempts to adjust, mitigate, and prevent changes that might cause irreparable harm.

73.3 The Arctic and Antarctic Regions

The Arctic and Antarctic are unique as regions, climatically, socially, and politically. While the Arctic region is a shared territory between eight sovereign nations (Russia, Canada, USA, Norway, Sweden, Denmark (Greenland), Finland and Iceland), Antarctica is an international territory that recognizes no territorial claims by any state, agreed upon through the Antarctic Treaty that came into force in 1961. However conflicts continue between claiming nations such as Chile and the UK, and Chile and Argentina (Buzan/Wæver 2003; Sicker 2002). Antarctica is additionally a continent surrounded by water (Southern Ocean), enclosed by the southern sixtieth parallel (Sicker 2002). The Arctic however, is unique as it is not composed of eight complete states; almost all of the eight states that govern the Arctic are partially located outside of the Arctic region and have their political centres far to

the south of the region (Young/Einarsson 2004). The Arctic is composed of a part of each of the eight (with the exception of Iceland). It is also predominantly an ocean, surrounded by land (Verhaag 2003). This is not a typical definition of a region, which is traditionally determined by state boundaries (Hoogensen 2005a; Buzan/Wæver 2003). In fact, because the Arctic is not defined by state boundaries, there is little agreement on what the boundaries of the Arctic actually are (Verhaag 2003; ACIA 2004; Young/Einarsson 2004). The “lines” often used to define the Arctic include the Arctic Circle (defined by the latitudinal point where the sun does not come above the horizon at winter solstice and does not fall below the horizon during summer solstice), the latitude of 60°N, treelines, the extent of permafrost and sea ice, climatic boundaries, and internal political jurisdictions (for example, Nunavut, Northwest Territories, Nenets autonomous region, etc). For the purposes of this chapter the boundaries of the Arctic as proposed by the *Arctic Human Development Report* (AHDR) and the *Arctic Monitoring and Assessment Programme* (AMAP) will apply.² The region of the Antarctic is here defined as the Antarctic continent, the Southern Ocean south of the Antarctic convergence (approx. 58°S), and the sub-Antarctic islands.³

Both regions are, relatively speaking, very cold, although Antarctica is considerably colder than the Arctic, and far less habitable for humans (Verhaag 2003). These colder temperatures have given way to some dominating stereotypes of the regions as cold, barren, generally lifeless (besides a smattering of Inuit and polar bears), and just generally “a desolate hinterland of little international relevance” (Young 1989, in: Verhaag 2003). This view has and continues to negate not only the diversity of life in these regions and particularly the far North, but also the cultural heritages, resilience, and experiences of various and different Arctic

2 The AHDR uses the AMAP definition of Arctic boundaries with a few differences pertaining to jurisdictional and administrative boundaries. Thus the Arctic in this case includes Alaska, Canada north of 60°N and including northern Quebec and Labrador, Greenland, Faroe Islands, Iceland, the northern parts of Sweden, Norway and Finland, and northern Russia (Murmansk Oblast, Nenets, Yamalo-Nenets, Taimyr, and Chukotka autonomous regions, Vorkuta city, Norilsk, Igrska and the areas of Sakha Republic closest to the boundaries of the Arctic Circle). AHDR, 17–18.

3 This definition of the Antarctic region is taken from the definition provided in *Climate Change 2001* (IPCC 2001).

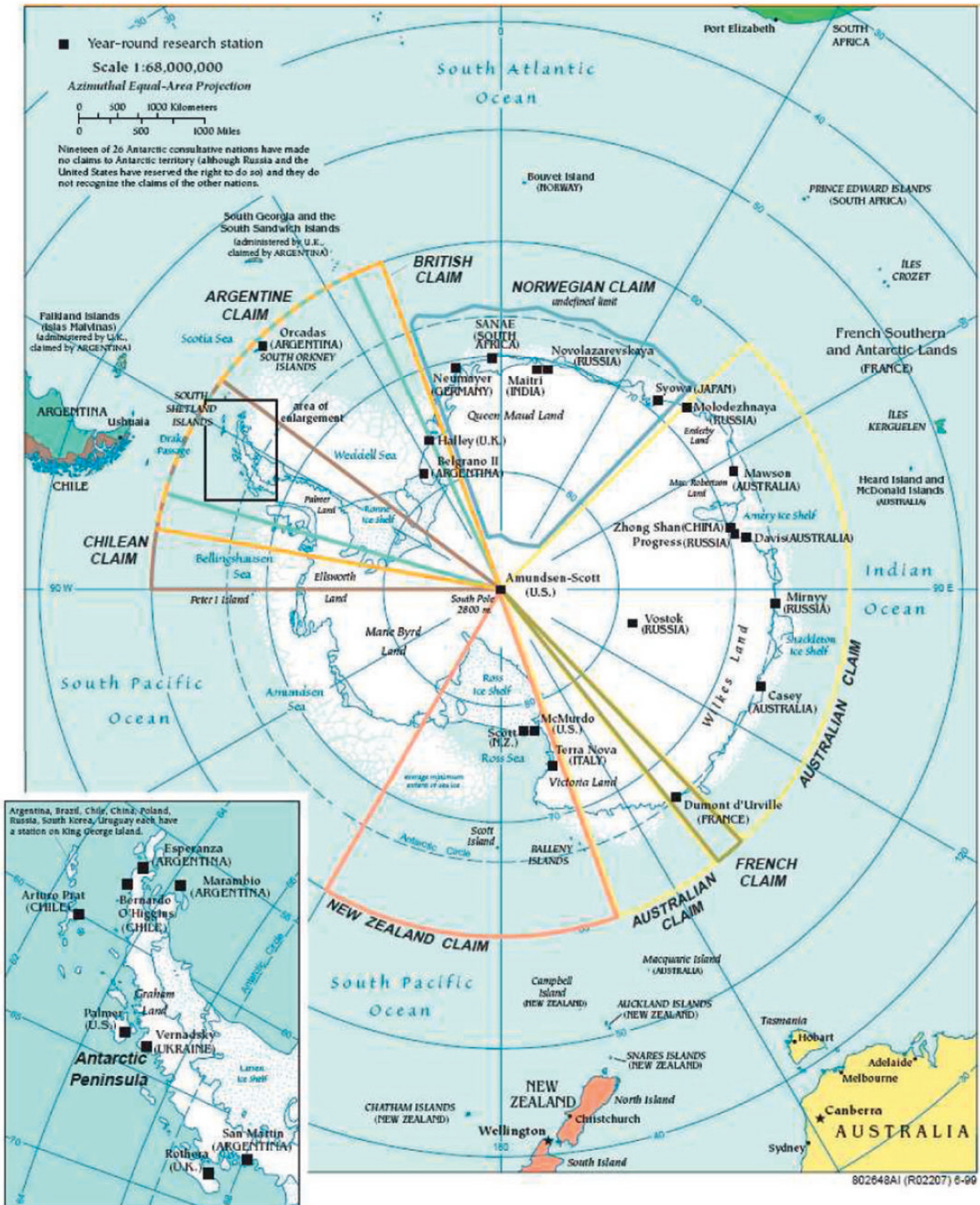
Figure 73.1: Map of the Arctic Region. **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/islands_oceans_poles/arctic_ref802647_1999.jpg>. This map is in the public domain and is used here to roughly illustrate the region. However, see also the AMAP and AHDR maps which depict more recent manifestations of the 'boundaries' of the Arctic.



peoples. The temperatures in the Arctic in fact vary a great deal; the Norwegian Arctic is considerably warmer, at least on the coast due to the Gulf Stream,

than the Canadian or Russian Arctic. This in turn has affected the levels and types of habitation in the Arctic.

Figure 73.2: Map of the Antarctic Region. **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection; at: < http://www.lib.utexas.edu/maps/islands_oceans_poles/antarctic_ref802648_1999.pdf>. This map is in the public domain.



The stereotypical view of the poles as cold and largely uninhabited has also distorted perceptions about how many people live in these regions, and

have often led to a conflation of the two - the poles are identical. They are not however. In total, and ranging in density across the eight Arctic nations, over 4

million people live in the region (Bogoyavlenskii/Siggner 2004). The distribution of indigenous and non-indigenous peoples varies widely across the Arctic; in the Canadian Arctic for example, Nunavut is composed of 85 per cent Inuit, whereas the Yukon Territory is 75 per cent non-indigenous (AHDR 2004). Across the whole of the Arctic, non-indigenous peoples number in the majority (ibid). There are no indigenous inhabitants in the Antarctic, however it is “populated” by permanent and summer staff at research stations, ranging from approximately 4000 in the summer, to 1000 in the winter.

Both the Arctic and Antarctic are rich in natural resources; Antarctica in marine and wildlife, minerals, oil and gas, as well as fresh water (over 70 per cent of the Earth’s fresh water is in Antarctica), and the Arctic in marine and wildlife, on and off-shore oil reserves, and coal (Joyner 1987; Verhaag 2003).

73.4 Climate Change and Security in the Arctic

Of all the environmental issues that have emerged in the past few decades, global climate change is the most serious, and the most difficult to manage. Climate does not just affect people directly: it also affects all other environmental and ecological processes, including many that we might not recognize as related to climate (Dessler/Parson 2006: 1–2). Climate change is similarly of such a scope that it warrants urgent attention and securitization (Barnett 2001: 118).

The Polar Regions, particularly the Arctic, make for a clear case study of the effects of climate change. The impacts of climate change are most profoundly felt in the Polar Regions, particularly the Arctic (Gabrielsen/Winter 2005; ACIA 2004; IPCC 2001e). The warming temperatures are already impacting wildlife as well as Arctic human communities, and will have increasing effects on energy, marine life and activities, transport, fisheries, and culture. Arctic peoples have been used to change in the past, whereby adaptation, flexibility and building capabilities and capacities has always been a part of Arctic life (ACIA 2004); communities by and large ensured their own (positive) security according to their needs. The problem now is that various factors, particularly environmental, are changing so fast that it is very difficult for communities to adapt quickly enough. We therefore need increased awareness about environmental insecurity of the Arctic to be able to provide what is now

needed for adaptation, mitigation, prevention, and rectification, if possible. The Antarctic additionally provides an interesting comparison for dealing with diverse pressures.⁴

Security considerations in the Arctic have been traditionally dominated by national security agendas focused on territorial integrity of the state through political and military means. Insofar as the traditional security approach has affected the Arctic, it has been, for example, an early warning zone for incoming missiles (between the USA and the Soviet Union), or as in the case of Iceland and Greenland, ‘stepping stones’ of security between Europe and North America (Solheim 1994). In fact, if the Arctic had any meaning to security at all during the Cold War, it was as a military ‘theatre’ for the USA and Soviet Union and their nuclear arsenals, as well as nuclear targets (Heininen 2004). It additionally served well as a region for testing weapons as well as conduct military training, including in Norway, which was the only NATO nation sharing a land border with the Soviet Union (Heininen 2004). The relevance of traditional security to the Arctic can be seen in the renewed interest in oil extraction and export from the Barents region, whereby Russia and Norway are still in dispute over the demarcation of territorial waters which has a significant impact on access to the estimated vast oil reserves; it is to this region that the USA is increasingly looking as a source of oil to reduce its dependency upon the Middle East, seeing the dispute between Norway and Russian as a ‘security issue’.⁵

Although the military and political aspects of security are still considered relevant in the Arctic context, a broader sense of security issues is beginning to dominate, particularly with regard to the environment: climate change, the extraction of natural resources (primarily oil), the increase in persistent organic pollutants, and the preservation of the Arctic ecosystem (Verhaag 2003). These are not divorced however from the military legacy as a large degree of the environmental problems now experienced in the Arctic

4 The ways in which Arctic communities are trying to adapt to rapid change in the region is the subject of a number of new international research projects, in particular connected to the upcoming *International Polar Year (IPY) 2007–2008*. These projects are meant to fill a knowledge gap on how communities are and will be able to provide security for themselves in increasingly unpredictable environments.

5 “Gas fuels new cold war in the Arctic”, in: *Scotland on Sunday* (4 June 2006); at: <<http://news.scotsman.com/international.cfm?id=824612006>>, 31 March 2007: 1.

stem from previous military activities, particularly regarding nuclear waste (Heininen 2004; MFA 2005; chap. 61 by Sergunin).

Traditional, state-based approaches have not addressed environmental security with a more human, societal, or ecological focus. A more multidimensional environmental security focus is required, reflected already to some degree through the international treaty system established for the Antarctic. (Joyner 1987; Verhaag 2003; SCAR 2005a, 2005b). The ACIA notes that global temperatures are increasing at unprecedented rates in the Arctic (ACIA 2004), which has now been even further emphasized by the Fourth IPCC Assessment Report (2007). The key findings of the ACIA indicate that the Arctic is warming much more quickly than originally thought, with greater impacts than originally predicted. What this means is that the Arctic is now predicted to warm between 4–7°C in the next century, thereby increasing the current rate of sea ice and glacier melt, increasing Arctic precipitation and reducing seasonal variation (shorter, warmer winters), and increasing insect outbreaks, forest fires, and invasion of non-indigenous species, all of which will impact on humans and wildlife alike, including the erosion of cultural and social identity of many Arctic people.

The Arctic ice is, in many respects, the “canary in the mine” that serves as a warning of what we can expect with climate change (Gabrielsen/Winther 2005: 45). Models that have been instrumental in the creation of the ACIA demonstrate that changes in the ice will not become significantly noticeable before the year 2020, but then show very rapid ice melt thereafter, indicating that most of the Barents Sea will be ice free by 2050, and by 2075 the “entire area between northern Novaja Zemlja, Frans Josef Land and Svalbard will be, practically speaking, ice free year-round” (Gabrielsen/Winther). The sea ice is critical to both wild and human life, and the effects of climate change on the sea ice will impact on Arctic eco and social systems with threats and challenges never before faced in the region (Gabrielsen/Winther).

One of the important indicators we can look at to see the effects of climate change is the rate of toxin transfer in the region. Decades of research has already taken place with regard to the impacts of *persistent organic pollutants* (POPs), mercury and lead on Arctic wildlife, and more recently Arctic scientists have put human communities in focus (Gabrielsen 2003; AMAP 2002a; AMAP 2002b). In little less than twenty years, an increasing amount of contaminants have reached the Arctic from non-Arctic sources,

through atmospheric as well as water (oceans and rivers) transport systems. These toxins are transferred to the Arctic at increasing rates as the sea ice melts.

The absence of ice increases the ocean drift, bringing environmental toxins such as *persistent organic pollutants* (POPs) and *Polychlorinated biphenyls* (PCBs) to the Arctic even more quickly than before. These toxins enter the marine ecosystem through biomagnification (increasing toxicity as one moves up the food chain) and bioaccumulation (increasing toxicity as the animals get older) (AMAP 2002a). The toxins are not soluble in water but are very soluble in fat, and are thus retained in the fat stores of animals and humans. As the sea ice continues to melt, the animals dependent upon the ice for survival and hunting begin to starve and live off of their own fat stores. The toxins are then released into the animal systems, usually during critical times of pregnancy and nursing. Thus far the only immediate solution is to reduce marine food source intake, upon which many Arctic communities rely.

POPs have been linked to increases in breast cancer, impacts on reproductive health, and transfer to children through breast milk (AMAP 2002a). For example, children and pregnant women in Norway are additionally warned against eating particular products containing cod livers that would not have undergone processing for cleaning of pollutants. Sockeye salmon are returning to their spawning grounds in Canada and Alaska and transporting higher and higher levels of contaminants such as methyl-mercury, and higher levels of mercury have been reported in the Russian Arctic. Higher levels of mercury have been identified in maternal blood and hair samples as well as cord blood in northern Quebec mothers (Gabrielsen 2003). In general, there are noticeable trends of increased toxicity in human systems in the Arctic regions.

Research efforts are currently underway to investigate the possibility of pollutants causing mixed gender in men living in North Norway, as has already been noted in polar bears. A number of polluting chemicals emanating from agriculture and industry mimic sex hormones such as estrogens and are known as *endocrine disrupting chemicals* (EDC).⁶ Research has already documented that pollutants exported from southern regions have resulted in low sperm counts and poor sperm quality amongst men living in northern regions. Further investigations are being made

6 “Skal lete etter miljøgifter i finnmarkinger” (Looking for toxins in Finnmarkers) *Nordlys* (09 July 2004): 6–7.

into the possibility that these chemicals are causing testicular cancer as well. The health of the ecosystem, impacted as greatly as it is by climate change, is integrally linked to the culture of many indigenous and non-indigenous peoples in the Arctic. Environmental exploitation without any sense of sustainability threatens Arctic lifestyles and well-being by wreaking havoc on cultural, ethnic and national identities and security.

73.5 Climate Change and Security in Antarctica

The Antarctic is a region under dispute; however, the territorial claims waged upon it have been frozen through the introduction of the Antarctic Treaty.⁷ Various traditional security interests have been mitigated through this treaty, disallowing military activity and making the region a nuclear-free zone, and it holds in abeyance any territorial claims (Verhaag 2003). Despite its mineral wealth and the creation of the 1988 Antarctic Minerals Convention spurred on by the 1973 OPEC oil crisis (which would have allowed for mining and oil extraction), the UN declared the Antarctic a natural reserve (1998 Madrid Protocol), and prohibited mining activities for the next 50 years (Firth 2005). For the time being then, the Antarctic is solely used for peaceful and scientific purposes.

The Antarctic has not yet experienced significant warming across the region (IPCC 2007). There continues to be, as stated in the previous IPCC (2001e) report, no significant change in Antarctic sea ice, although the 2001 report did indicate a significant warming trend at that time. Despite these slower changes however, climate change has had an already significant impact on the biodiversity of Antarctic life. According to the *Scientific Committee on Antarctic Research* (SCAR), the increased human traffic to Antarctica has caused “considerable damage by way of local species extinctions and wholesale alteration of ecosystems” (SCAR 2005a: 3). The incidence of invasive species has drastically increased to Antarctica and the sub-Antarctic islands. This has largely been due to human traffic – coming in through clothing, baggage, attached to fresh vegetables, hulls of ships, anchor chains and in ballast water (SCAR 2005a: 3). Due to “increases in temperatures over the past 50 years, the usual climatic barriers have been less effectual against

colonization of invasive species introduced by human activity (SCAR 2005a: 3). Though protected as a natural reserve through the Antarctic treaty, peace and nature have led to a different type of economic activity. Access to Antarctica has increased so much so that tourist numbers have increased four fold since 1992 (reaching over 24,000 tourists by the 2001–2002 season), add to that the numbers of researchers (over 4,000 in 2001–2002), and the numbers of ships arriving from all over the world (60 ships from approximately 30 cities from around the world) (SCAR 2005a). Human contact is threatening the very region of the world that humans have decided to protect.

Ice core samples taken on Antarctica have demonstrated that climate has always changed, however, they also demonstrate that human activity has increased levels of greenhouse gases at unprecedented rates.⁸ The implications of ice melt on Antarctica are significant, as the ice sheets contain vast reserves of water and would contribute to global sea rise, and measurements of sea ice is considered to be a ‘very sensitive indicator’ for climate change.⁹ Current research anticipates modest rises in temperatures over the next 50 years on Antarctica, but due to the lack of long-term data (little is known beyond the past 50 years) it is very difficult to know if and how climate is changing on the continent (IPCC 2001b).¹⁰ Where reported warming has had an impact is on the Antarctic Peninsula which has experienced the highest rise in temperature in the whole of the Southern Hemisphere, and which has been attributed to the melting of the Wordie Ice Shelf and part of the Larsen Ice Shelf.

One of the greatest potential impacts of climate change and the Antarctic upon the rest of the world will thus be through its sea ice, which plays a critical role in the development of ocean circulation, salinity and temperature change, as well as sea levels. Human reliance (expectation) on the oceans plays an enormous role in economies, food access, health, lifestyles, cultures and identities, making events in seem-

7 The original signatories were the UK, South Africa, Belgium, Japan, USA, Norway, France, New Zealand, the USSR, Argentina, Australia and Chile.

8 BAS [British Antarctic Survey], 2005: Climate Change at: <http://www.antarctica.ac.uk/Key_Topics/Climate_Change/index.html> (7 October 2005).

9 BAS [British Antarctic Survey], 2005: *Antarctic climate change ñ a position statement* at: <http://www.antarctica.ac.uk/Key_Topics/Climate_Change/Climate_Change_Position.html> (7 October 2005).

10 BAS [British Antarctic Survey], 2005: *Antarctic climate change ñ a position statement* at: <http://www.antarctica.ac.uk/Key_Topics/Climate_Change/Climate_Change_Position.html> (7 October 2005).

ingly far reaches of the earth (like the Antarctic with its negligible human population) become relevant to more populated communities. The Southern Ocean surrounding Antarctica has had, and will continue to have, effects on the development of global fisheries for example. With changes in temperature some fisheries will disappear while others will likely develop (although not necessarily within the same regions), impacting on the distribution and value of particular stocks, as well as “increase or decrease local economies by hundreds of millions of dollars annually” (IPCC 2001b). The krill fishery in the Southern ocean for example is documented to be affected by the sea ice position, such that the further south the position of sea ice (due to melting), the lower the production of krill (IPCC 2001b: 817–818).

Although climate changes in the Antarctic are predicted to be considerably slower than in the Arctic, these changes could initiate “millennial scale processes with the potential to cause irreversible impacts on ice sheets, global ocean circulation, and sea level rise” (IPCC 2001b: 831). The Antarctic therefore needs attention and protection. What is interesting is that those nations which are interested in the Arctic have been well aware of these needs of this special region for a significantly long time, and have acted to protect the region.

The Antarctic Treaty System, in force since 23 June 1961, was enacted to ensure “in the interests of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord”¹¹ The treaty system also includes later agreements such as the Protocol on Environmental Protection to the Antarctic Treaty, the Convention for the Conservation of Antarctic Seals and the *Convention on the Conservation of Antarctic Marine Living Resources* (CCAMLR), as well as the Convention on the Regulation of Antarctic Mineral Resource Activities (which has not been ratified). The parties to these agreements have agreed to give up “some sovereignty” on Antarctica in exchange for protecting the natural and scientific wealth of the region (Verhaag 2003: 577). Being protected as a natural reserve, the Antarctic constitutes the operationalization of a global, environmental security framework.

73.6 Concluding Remarks

This chapter has provided just a small snapshot of some of the environmental security issues in the specific contexts of the Arctic and Antarctic as they pertain to climate change. Of course, these two regions differ considerably from one another; the Antarctic is not experiencing the equivalent and alarming climate change of the Arctic, nor does it have the same effect on vulnerable populations. However, climate change is having an impact on the region, and these changes are predicted to become more significant over time, which will have not only regional but global effects. Environmental change at the poles is not relevant just to those in close proximity to these regions – in this respect these regions, and particular the Arctic, is indeed a ‘canary in the mine’. The effects of climate change here are and will continue to impact other parts of the world. “One of the most identifiable visual impacts of climate change in Europe can be observed in the cryosphere through the retreat of glaciers, snow cover and Arctic sea ice. ... In Europe a large number of all catastrophic events since 1980 are attributable to weather and climate extremes: floods, storms and droughts/heatwaves” (EEA 2004: 4–5).

But is this still a security issue? A traditional definition of security would suggest no, due to the relative gradual nature of the change. Some have argued the case of ‘abrupt climate change’ scenarios, arguing for why climate change would constitute a security issue, framing the issue again more traditionally in terms of an immediate threat (Schwartz/Randall 2003). Access to and conflict over resources are highlighted, with models suggesting mass migration from the European Arctic (Scandinavia) southward, leading to various conflict scenarios (Schwartz/Randall 2003). Such ‘abrupt’ scenarios are not impossible, but not substantiated by current scientific evidence. However, though climate change will most likely continue to be relatively gradual, its affects are significantly noticed, and the threat of change, instead of being abrupt, will be long-term and sustaining. Our ‘security of expectations’ is affected by the forthcoming changes, as what we value both locally and globally could very well disappear and significantly alter human and ecological systems, demonstrated by the experiences in the Arctic now, not just with increased food toxicity as discussed here, but the impacts of the changing environment on the changing access to resources (oil and gas, fisheries, animal husbandry), and on societies (increasing rates of disease, suicides, migration).

11 See at: <http://www.scar.org/treaty/at_text.html>, 13 November 2006: 1.

The increasing global attention being given to climate change additionally demonstrates the value placed on the environment, by individuals, states and the international community. These are also, however, the primary actors driving this change and causing the threat (IPCC 2007f). Placed at odds with each other are different values - the environment versus economic security. Political conditions amongst claimant states in the Antarctic made it possible for the value of the environment to stand above others, rejecting (for now) the potential for considerable mineral development and creating environmental security in the region. The situation has been different in the Arctic, however, as the context is so different with diverse populations, sovereign states, and weather conditions. The toxins entering the Arctic come largely from industrial efforts to the south (which have little hint of ceasing), and resource opportunities that are opening up in the Arctic due to climate change only increase the pressures for economic exploitation (with not all of the eight Arctic states applying environmental regulations in similar ways, if at all). The nature of environmental security assumes additional roles for all security actors to contribute to the creation of environmental security: not just agreements between states are needed, but actions on the parts of societies, firms, and individuals. For example, NGOs were instrumental in the overturning of the Minerals Convention for the Antarctic, and public opinion in a variety of regions is increasing momentum and pressure on local groups and authorities to reduce carbon emissions and waste. Environmental security at the poles is dependent upon adaptation, mitigation and future prevention, all of which is connected to human activity and the desire to effect positive, less harmful change, both for the present and future generations.

74 Human Security Concepts in Policy and Science

Hans Günter Brauch

Security ... means safety from the constant threat of hunger, disease, crime and repression. It also means protection from sudden and hurtful disruption in the pattern of our daily lives – whether in our homes, in our jobs, in our communities or in our environment.

Human Development Report 1994: New Dimensions of Human Security (UNDP 1994: 3).

Human security complements state security, enhances human rights and strengthens human development. It seeks to protect people against a broad range of threats to individuals and communities and, further, to empower them to act on their own behalf. And it seeks to forge a global alliance to strengthen the institutional policies that link individuals and the state – and the state with a global world. Human security thus brings together the human elements of security, of rights, of development.

The Commission on Human Security's definition of human security: to protect the vital core of all human lives in ways that enhance human freedoms and human fulfilment. Human security means protecting fundamental freedoms – freedoms that are the essence of life. It means protecting people from critical (severe) and pervasive (widespread) threats and situations. It means using processes that build on people's strengths and aspirations. It means creating political, social, environmental, economic, military and cultural systems that together give people the building blocks of survival, livelihood and dignity.

Human Security Commission: *Human Security Now* (CHS 2003: 2,4).

143. We stress the right of people to live in freedom and dignity, free from poverty and despair. We recognize that all individuals, in particular vulnerable people, are entitled to freedom from fear and freedom from want, with an equal opportunity to enjoy all their rights and fully develop their human potential. To this end, we commit ourselves to discussing and defining the notion of human security in the General Assembly.

UN General Assembly, *World Summit Outcome* (UN/A/60/1), 24 October 2005: 3I of 38.

74.1 Introduction¹

After the end of the Cold War 'human security' has evolved as a new security concept² on the international policy agenda due to two major reports (UNDP 1994, CHS 003). By shifting the focus from the 'state-centred' perspectives of national, international, and global security to a 'people-' or 'human-centred' perspective, the security concept was *deepened* vertically and the exclusive focus on the state was questioned by

adding the individual human being, communities, society, or humankind as new referent objects.

Since the late 1990's two different concepts were promoted in the political realm. The governments of Canada, Norway, and the European members of the *Human Security Network* (HSN) preferred a narrow concept focusing on 'freedom from fear' that dealt with humanitarian initiatives and human rights (chap. 75 by Fuentes/Brauch; chap. 83 by Black/Swatuk). The government of Japan and the *Friends of Human Security* (FHS) opted for a wider concept that includes with 'freedom from want' the human development agenda (chap. 84 by Shinoda).

In the scientific discourse, the Copenhagen School (Buzan/Waever/de Wilde 1998) proposed a

1 The author would like to thank three reviewers for critical comments and very helpful suggestions for revising the text.

horizontal widening of the primarily ‘state-centred’ national and international security concept. Buzan critiqued the human security concept (Buzan 2002, 2004). Several proponents of a narrow human security concept (Mack 2004, 2004a; Krause 2004, 2008; Mac Farlane/Khong 2006) opposed its horizontal widening to include other policy agendas of development and environment policy. No agreement exists in science and politics on definitions, referent objects, scope and boundaries, as well as on policy goals and human security agendas.³

As the security concept, human security has also been a ‘contested concept’ (Gallie 1955–1956) both in the political realm, where it first emerged, and in scientific discourses, where it has been proposed as an alternative normative paradigm. In the social sciences, the concept has been widely discussed in *development* (Picciotto/Olonisakin/Clarke 2007; Ulbert/Werthes 2008) and *peace studies* (Tadjbakhsh/Chenoy 2006; Thakur 2006/2007), and to a lesser extent in *environmental* (Page/Redclift 2002; Dodds/Pippard 2005) and *security studies* (Dannreuther 2007; Booth 2007) where many realists ignored this discourse (Kolodziej 2005).

The human security concept responds differently to key questions (Møller 2003: 278–279; Hintermeier

2008: 660) of: 1) *Security for whom or what?* This refers to the referent objects of security (states, communities, individuals); 2) *Security for which values?* This points to the values at risk (for states: sovereignty, territorial integrity; societies: collective identities; individuals: well-being, quality of life, safety, physical survival); 3) *Security from whom or what?* This refers to threats, challenges, vulnerabilities, and risks that pose security dangers and concerns (for ‘national security’: other states, non-state actors; for ‘human security’: the state, globalization, nature, humankind and its economic and consumptive behaviour); and 4) *Security by what means and strategies?* This refers to military, political, economic means, and to reactive and proactive strategies (MA 2005). For achieving human security both reactive and proactive strategies for achieving sustainable development are essential. The answers to these four questions differ for national, international, and global security, and for ‘people-’ or ‘human-centred’ concepts of societal, communal, and personal security (Brauch 2008g: 28–29).

The paradigmatic shift from ‘national security’ to ‘human security’ implies a change in the reference objects, in the values to be protected, of the security dangers and concerns which individuals and humankind face and have to cope with, as well as in the policy agendas and strategies for achieving human security. Human security does not replace national, regional or international security of the world of states, but it shifts the focus from nation states to ‘We the peoples of the United Nations’ referred to in the Preamble of the UN Charter, from sovereignty to human well-being and survival, from the fixation with the ‘other’ (state, ethnic or religious group) to ‘us’ as the cause (e.g. of global environmental change and global warming) and the victims of ‘our own consumptive behaviour’ (through an increase in the number and intensity of hydro-meteorological hazards).

Human security requires a fundamental shift in the thinking on security (of worldviews and mindsets, Brauch 2003g), it addresses different policy requirements and needs, and it requires horizontally integrated political coping strategies where the role of development and environment policies is vital and the role and missions of the military changes from fighting wars to *protecting* the people against genocide, natural hazards where the society and social movements have to play a vital role in *empowering* the people to build resilience and to enhance their coping capacities. Thus, the human security concept implies fundamental changes in the priorities of nation states in fulfilling the basic human needs of its people, to

2 According to Jolly and Basu Ray (2006: 4) the human security concept “emerged as part of the holistic paradigm of human development cultivated at UNDP by former Pakistani Finance Minister Mahub ul Haq, with strong support from economist Amartya Sen.” In January 1990, a North-South Roundtable on the “Economics of Peace” in Costa Rica, called for “a new concept of global security” where the “orientation of defence and foreign policy objectives changed from an almost exclusive concern with military security ... to a broader concern for overall security of individuals from social violence, economic distress and environmental degradation.” This would require “attention to causes of individual insecurity and obstacles to realization of the full potential of individuals.” The participants included President Oscar Arias (Costa Rica), President Obasanjo (Nigeria), Robert McNamara (USA), Jim Grant (UNICEF), Maurice Strong (Canada), Inga Thorsson (Sweden), Brian Urquhart (UN). Among the experts were Richard Jolly, Mary Kaldor, Julian Robinson, Anthony Sampson, Kennedy Graham (all UK), and Herbert Wulf (Germany).

3 See definitions by Astri Suhrke (2002), at: <<http://www.humansecurity-chs.org/activities/outreach/frame.html>>; Sabina Alkire (2004); Kanti Bajpai (2000, 2004); and at: <http://kroc.nd.edu/ocpapers/op_19_1.PDF>; Devyani Mani (UNCRD); at: <http://www.uncrd.or.jp/hs/doc/04a_10jun_mani_concept.pdf>.

Table 74.1: Contextualizing human security concepts, pillars, and policy agendas. **Source:** Compiled by the author.

Security dimension (widening) Level of interaction (deepening)	Referent object (security for whom)	Military	Political	Economic	Societal	Environmental
Global security International/Regional National security	World of states	Primary focus of the <i>Copenhagen School</i> (<i>securitization</i> : a ‘move’ to put policy issues of utmost importance that require extraordinary measures on the agenda of the state or of international governmental organizations (IGOs) <i>Securitizing actors</i> : states and societal bodies (e.g. IPCC)				
Village/Community/Society Human security (sectorialization)	Human-kind	Sectoral security concepts cut across dimensions and referent objects. (Energy, water, food, health, livelihood security)				
• Four pillars	peoples	Freedom to live in dignity				
	people	Freedom from fear	Freedom from want	Freedom from hazard impacts		
	community	protection	empowerment			
• Policy agendas	human being individual	<ul style="list-style-type: none"> • Humanitarian law • Disarmament • landmines • small arms • cluster bombs 	<ul style="list-style-type: none"> • Human rights • Democratic governance • Rule of law 	<ul style="list-style-type: none"> • Human and sustainable development 	<ul style="list-style-type: none"> • Resilience, reduction of social vulnerability 	<ul style="list-style-type: none"> • Early warning • Disaster response • disaster preparedness
scope (wide)		UNDP (1994), CHS (2003), Friends of Human Security (2006-) Japan, Mexico (co-chairs) Some member states of the Human Security Network (1999-)				
• scope (focus during their presidencies of the Human Security Network (HSN) and the ministerial in their country)		Norway (1999) Switzerland (2000) Canada (2005)	Austria (2003): Human rights education Slovenia (2007): Children in armed conflicts	Jordan (2001) Chile (2002) Mali (2004) Thailand (2006) Costa Rica (South Africa)	Ireland (2009): Gender security	Greece: (2008): climate change

protect its human beings from manifold security dangers and to empower them to cope with these manifold security dangers.

While the theory of *securitization* was developed by the Copenhagen School for a widened security agenda for a world of states, the human security concepts and policy agendas enhance the role of the societal groups and of knowledge-based scientific epistemic communities (such as the IPCC) as new *securitizing actors* that have put issues of global environmental change and climate change on the top policy agendas of nation states and of the global and re-

gional UN system, the Bretton Woods institutions, of the G-8, G-5, G-77, as well as of the European Union (chap. 4 by Brauch; chap. 11 by Oswald/Brauch).

Thus, the policy debate and the scientific discourse on human security has become an essential part of the broader reconceptualization of security dangers and concerns focusing on different soft security threats, challenges, vulnerabilities, and risks caused by and affecting the well-being and survival of humankind and human beings alike. Human security has the human being and humankind as a referent object, whose values at risk are human well-being, quality

of life and survival, and whose sources of threat are the state, globalization, and nature (Møller 2003: 279).

While the narrow Canadian conceptualization of human security is limited to the political and military dimension, the wider Japanese notion includes the economic dimension, while the all-encompassing UNDP concept (1994) covers the societal and environmental⁴ dimension as well. Human security has been discussed in relationship to *national* (Đurđević-Lukić 2004), *international* (Dannreuther 2007) or *global security* (Stoett 1999) but also with several sectoral security concepts, especially with *water* (chap. 41–58), *food* (chap. 33–35), *health security* (chap. 38 by Leaning; Leaning/Aries 2000, 2001; Szreter 2003; Chen/Leaning/Narasimhan 2003), *livelihood security* (chap. 36 by Bohle; Bohle/O'Brien 2007). Oswald (chap. 90) proposed a composite concept that links human with gender and environmental security.

This chapter maps the policy debates and offers a brief overview of scientific discourses on human security, and discusses its political utility by addressing these research questions:

- How can 'human security' be contextualized in the framework of the reconceptualization of security?
- How has the human security concept evolved, been defined, and conceptualized in the political and scientific realm, and which states have supported the concept for which reasons, and which policy agenda have they promoted herewith?
- Have the promoters of the human security concept succeeded to put new policy items on the national and international policy agenda, and have they been implemented?

The chapter reviews the evolution of the human security concept as a policy (74.2) and a scientific concept (74.3), examines the four conceptual pillars and the related national and international agendas and the role of UN agencies (74.4), and it concludes with a brief assessment of its past impact and an outlook of the potential for security (Dalby 2009) and a sustainable peace policy in the Anthropocene (74.5).

4 This has been covered elsewhere in detail by Brauch (2005, 2005a, 2006e, 2006h, 2007, 2007a, 2007b, 2007c, 2008g); Barnett 2001.

74.2 Evolution of Human Security as a Policy Concept

Human security is a highly disputed political concept whose political and intellectual origins have been widely analysed in the literature.⁵

74.2.1 Human Security and the United Nations

Since the publication of the 1994 HDR (UNDP 1994), the human security concept has been discussed within the UN system, by the UN Security Council during Canada's membership (1999–2000) when it succeeded to adopt the 'Protection of Civilians in Armed Conflict' as a new agenda item (Dedring 2008). The Canadian approach (chap. 83 by Black/Swatuk) focused on 'freedom from fear' (landmines, small arms, cluster bombs, protection of civilians, and responsibility to protect).

Japan (chap. 84 by Shinoda) launched and funded the *Commission on Human Security*, co-chaired by Sadako Ogata and Amartya Sen (2001–2003) that resulted in the report: *Human Security Now* (CHS 2003). In May 2004 the *Human Security Unit* (HSU) was established in the United Nations' *Office for the Coordination of Humanitarian Affairs* (OCHA⁶),

5 MacFarlane and Khong (2006) provide a comprehensive critical history of the evolution of the human security concept and its relationship to the UN. Jolly and Basu Ray (2006) offered a brief history of the evolution of the concept and assessed its application in 13 UNDP national human development reports on Afghanistan, Latvia, Macedonia, Philippines, Moldova, Kyrgyzstan, Lesotho, Mozambique, Sierra Leone, Timor-Leste, Bulgaria, Estonia, Solomon Islands. UNESCO (2008) summarized its own activities and publications from 1996 to early 2008. See also: Tadjbakhsh/Chenoy (2006); Kaldor (2007); Ulberth/Werthes (2008). For bibliographies see: Harvard Program on Humanitarian Policy and Conflict Research (August 2001); at: <<http://www.gdrc.org/sustdev/husec/Bibliography.pdf>>; Sara Edson, Centre For History And Economics, King's College, University of Cambridge (June 2001); at: <<http://www.humansecurity-chs.org/activities/meetings/first/bibliography.pdf>>; Human Security Gateway, bibliography; at: <<http://www.humansecuritygateway.info/feeds/feedsById3.xml>>. See also the bibliographical references of the Peace Centre at SciencePo in Paris; at: <<http://www.peacecenter.sciences-po.fr/ol-bg.htm>>; and the UNOCHA online library on human security, at: <<http://ochaonline.un.org/DigitalLibrary/tabid/2185/Default.aspx>>.

6 See for details; at: <<http://ochaonline.un.org/Home/tabid/2097/Default.aspx>>.

whose objective is to “integrate human security in all UN activities,” to manage the *United Nations Trust Fund for Human Security* (UNTFHS) that was set up in 1999 and funded by Japan, and to promote activities on human security. Japan also co-chairs - together with Mexico - the *Friends of Human Security* (FHS) and it also chaired the Peacebuilding Commission.

Former UN Secretary-General Kofi Annan (2001, 2005) had repeatedly endorsed the concept. References to human security were included in the report of the *High Level Panel on Threats, Challenges and Change* (December 2004) and in his report *In Larger Freedom* (March 2005) where he distinguished among ‘freedom from want’ (human and sustainable development agenda), ‘freedom from fear’ (collective security, terrorism, WMD, reducing risk of war and use of force), and ‘freedom to live in dignity’ (rule of law, human rights, democracy).

These efforts cumulated in paragraph 143 of the ‘Outcome Document’ in which the UN GA committed itself to define and discuss ‘the notion of human security’. The World Summit in September 2005 had also reached a consensus on three issues relevant for human security: a) the establishment of a Peacebuilding Commission; b) the creation of a new Council on Human Rights and on the adoption of the principle of the ‘responsibility to protect’ (ICSS 2001), and the right to intervene in case of genocide and major human rights violations (Einsiedel/Nitzschke/Chhabra 2008).

74.2.2 Debate on Human Security in the UN General Assembly

On 15 February 2008, the *Friends of Human Security* (FHS) submitted a compendium of human security-related initiatives and activities by its members and United Nations agencies, funds and programmes to the President of the General Assembly (A/62/695).⁷ On 22 May 2008 the UN GA held its first thematic debate on human security.

This debate was opened by the President of the UNGA, Srgjan Kerim (FYR of Macedonia)⁸ and with a keynote speech by HRH Prince El Hassan bin Talal (Jordan)⁹ to which three state groups (Slovenia for the EU, Iraq for the Arab group, and Tonga for the SIDS) and 22 member states, among them the co-chairs of the FHS (Japan, Mexico), six members of the HSN (Greece, Austria, Chile, Switzerland, Thailand, Canada) and 14 other countries from Asia (Mongolia, Turkey, Qatar, Philippines, Kazakhstan, Republic of Korea, Israel), Africa (Egypt, Sudan), Europe (Monaco, Portugal) and Latin America (Colombia, Cuba, Brazil) contributed.¹⁰

While none of the five permanent member countries in the Security Council contributed to the debate, two candidates for a permanent seat (Japan and Brazil) participated, although with different perspectives. Among the 25 state representatives, only Cuba openly rejected the concept, Brazil raised many questions, and Egypt and Colombia pointed to the principles of national sovereignty and nonintervention (Art. 2,7, UN Charter). A large majority of states pointed to individuals, (poor) communities, (vulnerable) people (women, children, elderly, migrants) or peoples but not to humankind as a referent object. Egypt, Colombia, Cuba, and Brazil stressed that the nation state remained the key referent of security and opposed the

⁷ This document (A/62/695) lists the “Human security-related initiatives and activities of the following members of the Friends of Human Security: Chile, Japan, Mexico, Slovenia, Switzerland and Thailand, and of 17 UN organizations: DESA, OSAA, FAO, IAEA, ILO, UNDP, UNESCO, UNFPA, UN-Habitat, UNHCR, UNICEF, UNIDO, UNIFEM, UNMAS, UNODC, WFP and WHO.

⁸ The President of the UNGA, Srgjan Kerim (Macedonia) pointed to a wide range of security dangers ranging “from hunger, poverty, to armed forces, human trafficking, environmental degradation, international terrorism and breaches of human rights of all kind.” He called for a “new culture of international relations - with the precept of human security at its core” that is “embedded in the UN’s ideals.” Source: <<http://www.un.org/ga/president/62/statements/humansecurity220508.shtml>>.

⁹ HRH Prince El Hassan bin Talal (Jordan) argued that human security should “contain the imperative of *human survivability* and *resilience*.” He reviewed current global conditions, distinguishing among nine security concepts of population, food, resource, environmental, energy, monetary, cultural, preventive, and state and market security. He suggested that “responsibility and authority must shift from governments downwards to individuals. Communities and civil society, and upwards to international organizations, regional systems and networks”, as states and markets are not equipped to address the many new security dangers of the present and future. Source: <http://www.un.org/ga/president/62/statements/hrhelhasan_speech.pdf>.

¹⁰ See for details; at: <<http://www.un.org/News/Press/docs/2008/ga10709.doc.htm>>. See for documentation at: <<http://www.un.org/ga/president/62/ThematicDebates/humansecurity.shtml>>.

Table 74.2: Systematic overview on referent objects, key values, nature of threats, and agents of insecurity and policy agendas referred to in the debate in the United Nations General Assembly on 22 May 2008. **Source:** speeches analysed by the author.^a

Country	Referent Object	Key goals and values	Nature of threats	Source	Policy agenda
Slovenia (EU, HSN, OECD, OSCE, NATO)	Individual	Promote people's rights and freedoms, protect them from both violent and non-violent threats	Hunger, poverty, infectious disease, environmental degradation, climate change, armed conflicts, crime, repression, terrorism, forced migration, human trafficking	Individuals Environment, states	Humanitarian Law (protection)
Iraq (Arab group)	Peoples, states have exclusive responsibility to ensure HS	Discussion of HS must respect principles of sovereignty, non intervention, right to self determination. Opposed to 'responsibility to protect'. achieve the MDGs	Disease, illiteracy, vulnerable groups (women, children), natural and man-made disasters, climate change, WMD, mines, arms trafficking, food and water security, international conflicts	Foreign intervention, terrorist groups	State sovereignty, respect of UN Charter, respect for traditional rules of diplomacy
Tonga (SIDS)	People, Poor communities	Right to development, protect livelihood and dignity of people, basic need of food, water, shelter, livelihood	Climate change, intensive flooding, coastal settlements, decline in food production, water stress, health implications, infectious diseases, malaria, dengue, increase migratory pressures, droughts, natural disasters	Human-kind, nature	Development Environment Climate change
Japan (FHS, OECD)	Individual, vulnerable people and communities	Freedom from fear, freedom from want, enjoy their rights, fully develop their potential culture of empowerment and protection	Wide range of threats, conflict, violence, poverty, underdevelopment, infectious disease, human rights violations, natural disasters		Human development
Mexico (FHS, OECD)	Human person	Political, legal, economic, social, cultural, civil, military means of protection of a person	Climate change, natural disasters food crises, food security scheme, early warning and proactive action small and light arms, control traffic of these weapons	Human-kind, nature	Disarmament development environment
Greece (HSN, OECD, OSCE, EU, NATO)	Human being, vulnerable population groups, women, children, elderly, migrants	People can live in security and dignity human rights education protecting women and children from violence freedom from fear, want, and freedom to live in dignity	Antipersonnel landmines, small and light weapons, threats from human conflict, natural disasters, poverty, discrimination, disease, scarcity of natural resources climate change, vulnerable regions, pre-existing conflicts, poverty, unequal access to resources, weak institutions, food insecurity, disease	Peoples, states, nature	Disarmament, human rights environment (climate change, disasters)
Mongolia	individual	Food and physical security, preventive measures to reduce vulnerability and minimize risk, human rights covenants, right to development, protection of people in violent conflict, of migrants, human life and dignity	Food crisis regionalism, ethnicity, mass migration, communal violence, ecological vulnerability	nature	Human rights development environment

Table 74.2: Systematic overview on referent objects, key values, nature of threats, and agents of insecurity and policy agendas referred to in the debate in the United Nations General Assembly on 22 May 2008. **Source:** speeches analysed by the author.^a

Country	Referent Object	Key goals and values	Nature of threats	Source	Policy agenda
Turkey (OECD, OSCE, NATO)	Peoples, states	Right of people to live in freedom and dignity, free from poverty and despair, strengthen human rights and development	Hunger, disease, natural disasters, environmental problems	Environment	Human rights development Environment
Monaco	Human being	Development agenda, civil society, protection of the child	Desertification and biodiversity loss, impacts of natural disasters on conflicts		Protection, development
Qatar (Arab League)		Fundamental right of all to education on human rights and democracy			Human rights education
Egypt (Arab League, AU)	Individual, peoples, state to provide security	Debate in UNGA to be based on nonintervention, development and human rights, human development, health education, protection of women and children, human development, dignity	Natural and environmental disasters, climate change, nuclear disasters, acquisition and stockpiling of nuclear weapons and other weapons of mass destruction, landmines, illicit trade with small and light weapons, integrated approach to food security		Human rights, development environment (climate change, disasters)
Austria (HSN, OECD, OSCE, EU)	People, individual, most vulnerable women	Freedom from fear and want, equal opportunity to enjoy their rights and develop their potential, live in dignity free of poverty and despair human rights education psycho-social rehabilitation of children	Cluster bombs, landmines children and armed conflict small and light weapons human trafficking women, peace and security climate change		Humanitarian law, human rights disarmament
Portugal (OECD, OSCE, EU, NATO)	People	Human dignity through human rights	Climate change and DRR strategies		Human rights, climate change
Chile (HSN, OAS)	Individual community	Human rights and dignity, security and development disarmament and humanitarian law human health, pandemics, children in conflicts	Natural disasters		Human rights, disarmament disasters
Colombia (OAS)	State has primary responsibility	Development, peace and security and human rights	Too broad, difficulty to find agreement on relevant threats		Development, peace and security human rights
Philippines (ASEAN)	Human person	Human security is at the heart of UN Charter quality of life	Food security, health security, environmental security, energy security, political security		

Table 74.2: Systematic overview on referent objects, key values, nature of threats, and agents of insecurity and policy agendas referred to in the debate in the United Nations General Assembly on 22 May 2008. **Source:** speeches analysed by the author.^a

Country	Referent Object	Key goals and values	Nature of threats	Source	Policy agenda
Cuba (OAS)	Human security an empty rhetorical phrase opposed	protect sovereignty of the state	unjust, unequal, unsustainable international order, unequal trade, impenetrable markets of industrialized countries, speculation, restrictions on technology transfer unsustainable production and consumption, climate change, nuclear weapons		
Switzerland (HSN, OECD, OSCE)	People	Humanitarian law, reduction of armed violence, conflict prevention	Armed violence impedes development, organized crime, gangs, gender-based violence small arms and light weapons	Armed conflict	Humanitarian law and disarmament
Thailand (HSN, FHS, ASEAN)	Vulnerable people	Freedom from want and fear, human trafficking MDGs, global partnership for development	human trafficking underdevelopment		Human development, protection
Brazil (OAS)	Sceptical of scope and purpose	Right to development, economic and social development, human rights education	Hunger and poverty, underdevelopment, climate change, MDGs, food prices, HIV/AIDS, gender-motivated violence		Development, human rights
Kazakhstan (OSCE)			Natural disasters, climate change, proliferation of weapons of mass destruction, water scarcity food crisis		Disarmament, climate change
Canada (HSN, OECD, OSCE, NATO)	World's people individual	Freedom, democracy, human rights, rule of law, protection of civilians, of children in armed conflicts, landmines, ICC, tribunals for human life, dignity, safety			Disarmament, human rights
Sudan (AU, Arab League)	Definition of HS must respect state sovereignty and its responsibility for HS	Social peace and stability, access to food, education, health, respect of fundamental rights and freedoms, right of refugees to return to their homes	Conflicts, civil wars, lack of respect of basic principles of international law and practices (e.g. right to self determination, non intervention)	Interventionist states	Define HS within the exclusive framework of UN Charter and by the GA
South Korea (FHS)	Individual community	need of people on the ground (economic security of people)	Food crisis violence against women, sexual violence		Development protection
Israel	People, individual		Climate change, environment, sustainable development, nonproliferation, human rights, armed conflict, culture of hate, crime prevention, terrorism and others		protection development environment

a. The author is grateful to Béchir Chourou for translating the statements of Iraq and Sudan from Arabic into English and for preparing them for inclusion in this table.

debate on humanitarian interventions (responsibility to protect). Among the key goals and values, the states referred to their respective priorities, national actions or international initiatives. All references to security dangers and concerns indicate a widening of the understanding of security. Of 25 countries (table 74.2), 12 states referred to climate change, ten mentioned natural disasters and food crises (food security), and six included diseases (health security) as human security issues.

This first thematic debate on human security in the General Assembly documents the diversity of responses, conceptual and policy approaches where most sceptics and opponents preferred to remain silent. In these statements a *widening, deepening and sectorialization* of the security concept could be mapped. The adherents to a narrow (violence, weapons, protection of vulnerable people, promotion of human rights) and of a wider conceptualization of human security (development and environmental agenda, climate change, natural disasters) stressed their different preferences and conceptualizations. Several members of the HSN also referred to their achievements to adopt the landmine convention (1999) and to negotiate an agreement to ban cluster bombs (2008). Canada, Austria, Switzerland, Slovenia, Greece, and Chile were quite successful in creating awareness for the protection of civilians in armed conflicts and addressing the role of women as victims and as actors on international peace and security.

74.2.3 UNDP: From Concept to Action

While the human security concept was conceptually developed by Mahbub ul Haq (Pakistan) and Amartya Sen (Bangladesh/India), many countries in the South and of the G-77 remained sceptical of all securitization efforts pertaining to development and environmental issues. The *Human Development Report* (HDR) of 1994 (UNDP 1994) “was written as a basis for UNDP input to the 1995 Copenhagen World Summit on Social Development” but UNDP failed to have its conceptual suggestions included on the agenda for the Copenhagen Summit and in its final documents. Its challenge of sovereignty “was deeply problematic for many southern states and for Russia and China” but also within UN bodies (e.g. in DPKO and in UNHCR) the “development side of security met with little enthusiasm” (MacFarlane/Khong 2006: 149).

Within UNDP the concept was applied in *National Human Development Reports* (NHDRs).¹¹ Jolly and Basu Ray (2006: 1–2) reviewed 13 NHDRs

focusing on “definitions, key components, originality of analysis, measures, statistics, methodology and policy conclusions.” They analysed in detail the case study on Afghanistan (chap. 94 by Tadjbakhsh). They concluded that these NHDRs “reinforce the value of human security as an operational approach to people-centred security that is able to identify priorities and produce important conclusions for national and international policy.” They argued with regard to the UN’s Peacebuilding Commission that such analyses “could help provide a frame of reference to ensure a broad approach to peacebuilding related to the wider issues of human security.”

In its contribution to the survey of activities of UN organizations on human security-related issues (CGA/62/695 of 15 February 2008), UNDP listed 25 regional, national, and sub-national reports. Its *Bureau for Crisis Prevention and Recovery* (BCPR) conducted security-related projects, on *Small Arms and Light Weapons, including Disarmament, Demobilization and Reintegration* (SALW); *Mine Action* (MA); *Conflict Prevention* (CP); and *Justice and Security Sector Reform* (JSSR). The survey offers a country-specific project list of the BCPR’s activities and of UNDP’s projects supported by the UN Trust Fund for Human Security. These projects have dealt with post-conflict recovery issues and hardly focused on the wide scope the initial all-embracing UNDP concept had suggested and the statements of the state representatives during the debate on 22 May 2008 have indicated.

74.2.4 UNESCO: Promoting Human Security (1996-2008)

Krause (2008: 46–47) argued that most activities in promoting human security in developing countries have been conducted by UNESCO through conferences in all parts of the world. The survey (GA/62/695: 37–43) that was done in preparation for the first debate on the human security concept in the General Assembly provides a comprehensive overview of all official statements, publications, and proceedings of international conferences. It offers a list of completed and ongoing projects as well as a list of eight UNESCO projects supported by the United Nations *Trust Fund for Human Security*. According to the

11 The 13 NHDRs covered Afghanistan, Latvia, Macedonia, Philippines, Moldova, Kyrgyzstan, Lesotho, Mozambique, Sierra Leone, Timor Leste, Bulgaria, Estonia, and Solomon Islands.

strategic objectives of UNESCO's medium term strategy, its member states emphasized the need to comprehend the multidimensional nature of the concept of human security. Accordingly, UNESCO addresses

the need to prevent conflicts at their source [...] through its global network of peace research and training institutions, thereby reinforcing human security." One of the Organization's expected outcomes is 'the elaboration of integrated approaches to human security at the regional, subregional and national levels, targeting the most vulnerable populations, including the prevention and resolution of conflicts."¹²

As part of its task in the areas of education, science and culture, since 1996 UNESCO has promoted the human security concept along two major fronts:

On the one hand, it is engaged in enriching the concept of human security through relating it to the actions of peoples, nations and international organizations. On the other, UNESCO is exploring different approaches to various complex and interconnected human security issues, taking into account the impact of globalization, the promotion of human rights, and concerns about security in the larger sense of the term (Foreword by Pierre Sané, UNESCO 2008: xiii).

As a platform for the international dialogue on human security, UNESCO avoided a strict definition and addressed instead "the specific needs ... of individuals and communities confronted by extreme poverty, conflict and post-conflict situations, or environmental degradation" but it also referred to fundamental freedoms: "human dignity", "the intellectual and moral solidarity of mankind" and it invoked "the spiritual and religious traditions" as part of the cultural diversity. Since 2000, UNESCO has promoted human security within the ethical, normative, and educational framework at the regional level by commissioning studies and organizing regional and sub-regional conferences thus to foster an inclusion of human security issues into the curricula at the national and local level. In preparation of its Medium-Term Strategy (2008-2013), UNESCO published two reports on its achievements between 1996 and 2008 and to assess emerging societal challenges (Sané 2008: xv, 2008a): a) *Human Security: Approaches and Challenges* (UNESCO 2008); and b) *Rethinking Human Security*.

Moufida Goucha reviewed UNESCO's action on peace and security during its first five decades (1945-1995) and in the last two medium-term strategies for 1996-2001 and 2002-2007, first framing security

(UNESCO 1998) within its 'Culture of Peace' agenda and from 2000 to 2007 as integrated approaches to human security (UNESCO 2008: xvii-xxiii).

An international meeting of directors of peace research and training institutions in 2000 helped to frame an "Agenda for Human Security in the Twenty-first Century" (UNESCO ¹2001, ²2005). In December 2005 a high-level meeting of experts and representatives of the *Human Security Network* (HSN) discussed an outline of its assessment report (UNESCO 2008) and addressed new challenges (UNESCO 2008a). In March 2006, an Intersectoral Group on Human Security was created to ensure that all activities on human security should be based on an interdisciplinary approach in which all UNESCO areas were represented.

The second publication on *Rethinking Human Security* (UNESCO 2008a) focused on: a) human security and human rights interaction (Benedek 2006, 2008); b) the ethical challenges of human security in the age of globalization (Burgess 2008); c) on conceptualizing the environmental dimension of human security in the UN (Brauch 2005, 2005a, 2006e, 2006h, 2008g); d) addressing the gender dimension of human security (Moussa 2008; chap. 90 by Oswald); e) building the agenda of human security: policy and practice within the *Human Security Network* (Krause 2008, 2008a); f) on basic elements of a policy framework for human security (Oquist 2008), and g) on the uncertain future of human security in the UN (Owen 2008).

UNESCO's (2008) assessment report reviewed UNESCO's action in the field of human security (pp. 1-78), before it discussed (pp. 79-112) UNESCO's regional and sub-regional recommendations for the promotion of human security issues as they evolved from the regional meetings and publications examining the ethical, normative, and educational frameworks in Africa (Goucha/Cilliers 2001; van Wyk 2007), in Arab States (Chourou 2005; UNESCO 2007), in East Asia (Lee 2004, UNESCO 2004), Central Asia (Tabyshaliev 2006) and South-East Asia (Acharya 2007), in Latin America and the Caribbean (Goucha/Rojas 2003; Fuentes/Rojas 2005), as well as in Eastern Europe (Tadjbakhsh/Tomescu-Hatto 2007) and in Western Europe (Burgess et al. 2007).

In early 2008, UNESCO listed these five ongoing projects that focused on: 1) *Promoting Human Security in the Arab States Region*¹³; 2) *Promotion of Human Security Concept in Rural Areas in China* (GA/62:695: 41); 3) *Human Security in China: A North-East Asian Perspective* (GA/62:695: 41-42); 4) *Con-*

12 31 C/4 Approved, Medium-Term Strategy 2002-2007, Paris, France, November, 2001.

tributing to the eradication of poverty by strengthening human security in Benin, Burkina Faso, Mali, Niger and Senegal (GA/62:695: 41–42).

In close cooperation with other UN organizations and supported by the United Nations Trust Fund for Human Security, UNESCO has conducted projects on poverty reduction in Bosnia Herzegovina (with UNDP), on the improvement of human security in São Paulo (Brazil) in cooperation with UNFPA, WHO and UNICEF; a programme on the sustainable rehabilitation of war victims in Burundi (with UNICEF, UNIFEM and UNDP); on basic education and vocational training for children and youth at risk in Cambodia; on capacity building for integrated psychological, pedagogical, and medico-social rehabilitation of school children and educational personnel in Chechnya (with WHO); on the rehabilitation of boarding schools and provisions of refresher training courses for headmasters and teachers in the Dzud affected Gobi Desert provinces in Mongolia; on a community learning centre in Nepal; and on promoting the human security concept in the Arab Region (A/62/695: 43).

These regional discussions launched by UNESCO brought regional experts together and enhanced their awareness for a different conceptualization of security, what has been reflected in the curricula of some universities (e.g. in Thailand) and may trigger future research. While these initiatives have focused on the educational and research sector, their impact on present or future policy agendas, programmes, and their implementation will be difficult to assess.

74.2.5 United Nations University

Within the United Nations system, the United Nations University in Tokyo¹⁴ has addressed scientific issues that were related to issues on the human security research agenda. In its Strategic Plan 2000, UNU (2000: 7–9) referred to “human security” as one of four powerful ideas for the new millennium, besides “development as freedom”, “risk societies”, and “comprehensive development”. The *UNU Strategic*

Plan 2002 stressed the “need for a stronger global governance system” focusing on “the maintenance of world peace, human security and development as well as the sustainable management of the world’s resources” to provide “global public goods, such as financial stability and environmental security, and fight ‘global public bads’ such as organized crime, terrorism, and illegal trade” (Brauch 2005, 2005a).

Quoting van Ginkel (2000), the former Rector of UNU, “in policy terms, human security is an integrated, sustainable, comprehensive security from fear, conflict, ignorance, poverty, social and cultural deprivation, and hunger, resting upon positive and negative freedoms.” UNU’s former Vice-rector Thakur (2004: 347; 2006) rejected both a national security concept and an all-inclusive security agenda.

UNU never had a human security programme. In October 1996 UNU organized a global seminar on *Our Planet and Human Security* (Inoguchi/Serita 1996).¹⁵ Only one volume of UNU-Press on *Asia’s Emerging Regional Order* addressed the need to reconcile traditional and human security (Tow/Thakur/Hyun 2000). Besides Ramesh Thakur (2004, 2006, 2008), Edward Newman (Newman/Richmond 2001) and Albrecht Schnabel (2004, 2008) addressed human security-related issues in their own publications: There was some cooperation between UNU and the *Human Security Commission*. UNU has also contributed financially to launching the *Human Security Report* (Human Security Centre 2005).

The United Nations University Institute on Environment and Human Security (UNU-EHS) in Bonn was established in late 2003 to develop the environmental dimension of human security further, not only the scientific conceptual debate, but also its operational consequences for capacity building primarily to enhance governance capabilities within the UN system and in the member states. From its perspective, the concept of human security is closely related to vulnerability, “the latent threat that some dimensions of human insecurity could manifest themselves in crises and disasters”. In a speech to the World Conference on Disaster Reduction (WCDR) in January 2005, UN Undersecretary-General van Ginkel emphasized to re-

13 This project has been jointly implemented by the League of Arab States (LAS), the Human Security Unit (HSU/OCHA) and UNESCO. For details see at: GA/62/695

14 See for details at: <<http://www.unu.edu/>>. Its “Peace and Governance Programme” has worked in the past on human security issues, although it presently does not refer to human security as a research item.

15 This report addressed the relationship of human security with sustainable development (Ayala-Lasso 1996), women and human rights (Mongella 1996), the linkage with world security (Iokibe 2006), on human development and the mismanagement of tropical forests (Kazadi 2006) on globalization and human development (Kaul 1996) and on the UN in the post-Cold War international order (Roberts 1996).

duce “vulnerabilities and improving coping capacities, through education and capacity development, strengthening response preparedness and vigilance.” He pointed to the activities of UNU-EHS “to create indicators to measure the vulnerability of communities to disasters. ... Such assessments will help policy-makers set priorities for disaster prevention” (cited in Birkmann 2006).

Through UNU-EHS, the university is working to anticipate the cumulative effects of such long-term, creeping environmental disasters for humankind as desertification, steadily falling levels of groundwater, land degradation, and other consequences of environmental neglect. Janos Bogardi, Vice-rector a.i. for Europe, co-authored the concept of ‘freedom from hazard impact’ (Bogardi/Brauch 2005).¹⁶

74.2.6 Pacesetters of the Human Security Concept

Krause (2002, 2008) has critically analysed to which extent the concept of human security had an innovative impact on foreign and security policy innovations of states in international organizations that have resulted in a rather narrow policy agenda that has focused on issues of disarmament (antipersonnel landmines, small and light weapons, cluster bombs), organized violence, and on the protection of civilians (women and children) in armed conflicts related to ‘freedom from fear’ but also on democratic governance, rule of law, and human rights education. Krause (2008: 45–46) correctly noted that a significant contribution to the conceptualization of human security was made by states as part of specific policy initiatives and by international organizations rather than by civil society and individual scholars. To a significant degree the human security agenda has also been donor driven.

For the agenda setting for human security issues within the UN system, three countries had been the pacesetters: Canada (chap. 83 by Black/Swatuk) and Norway as promoters of a more narrow approach to human security that focused on containing violence and furthering human rights, and Japan as a proponent of a wider conceptualization that was closer to UNDP’s initial very wide concept that linked ‘free-

dom from fear’ with the development agenda of ‘freedom from want’.

For the Japanese Foreign Ministry (1999, 2000; chap. 84 by Shinoda) human security “comprehensively covers all the menaces that threaten human survival, daily life, and dignity ... and strengthens efforts to confront these threats,” while for the Canadian Department for Foreign Affairs human security recognizes “that lasting security cannot be achieved until people are protected from violent threats to their rights, safety or lives” (Alkire 2003: 30–31; McRae/Hubert 2001; Mack 2004; Krause 2004).

For the *International Commission on Intervention and State Sovereignty* (ICISS 2001) in its report: *The Responsibility to Protect*, human security meant: “their physical safety, their economic and social well-being, respect for their dignity and worth as human beings, and the protection of their human rights and fundamental freedoms.” During the first decade of the *Human Security Network* (HSN) the policy agendas gradually widened to comprise all four pillars (table 74.1) and associated policy agendas of the human security concept (chap. 75 by Fuentes/Brauch).¹⁷

Since June 2006, Japan has promoted the *Friends of Human Security* (FHS): “as an unofficial, open-ended forum based in New York ... to provide an informal forum for United Nations Member States as well as relevant international organizations to discuss the concept of human security ... to seek a common understanding of human security and explore collaborative efforts for mainstreaming it in United Nations activities.”¹⁸

The *Human Security Doctrine for Europe* (Glasius/Kaldor 2005) was the result of the *Study Group on Europe’s Security Capabilities* that was convened by Mary Kaldor at the request of EU Secretary-General Javier Solana in 2003.¹⁹ The report called for a fundamental rethinking of Europe’s approach to security. Among its key claims and suggestions are:

17 The activities of the HSN are well documented at: <<http://www.humansecuritynetwork.org/>>.

18 See for an announcement in May 2006 in Bangkok of Japan’s intention to launch the FHS; at: <http://www.mofa.go.jp/policy/human_secu/state0606.html>.

For the summaries of the chair of the first three meetings at: <http://www.mofa.go.jp/policy/human_secu/friends/index.html>. Japan chaired the first FHS meeting in October 2006, the second and third meetings in 2007 were co-chaired with Mexico. The fourth meeting in April 2008 was attended by representatives of 86 countries and 18 international organizations.

16 See: Janos Bogardi, “Evolution of the Human Security Paradigm”, presentation at the International Seminar of the Greek Presidency of the Human Security Network, Athens, 29–30 May 2008; at: <[http://www2.mfa.gr/softlib/bogardi.rpps#339,4,Evolution of the security paradigm](http://www2.mfa.gr/softlib/bogardi.rpps#339,4,Evolution%20of%20the%20security%20paradigm)>.

Human rather than nation-state security should be at the heart of European policy. Instead of defeating enemies or pacifying warring parties, EU missions should focus on protecting civilians, through law enforcement with the occasional use of force. To carry out such missions, the European Union needs an integrated civil-military force of 15,000 personnel, at least one third of whom would be civilians with various professional skills and experiences. ... The Study Group has developed seven principles for Europe's security policy that apply to prevention, conflict and post-conflict contexts alike and which are intended to guide the actions of high-level EU officials, politicians in the member states, diplomats, and soldiers and civilians in the field alike. In order to carry out operations based on human security, the EU will need new greater human resources and skills. At present, Europe has 1.8 million people under arms but only a fraction can be deployed in crisis zones. Police and other civilian professionals will also be needed.²⁰

While members of the European Commission have repeatedly referred to the human security concept, so far no major initiatives have been taken to implement the policy suggestions made by this study group. At the 17th Japan-EU Summit, on 23 April 2008, both partners included a reference to human security in their joint press statement: "Japan and the EU reaffirmed their intention to cooperate in the area of human security by promoting this concept in the General Assembly of the United Nations and other international fora, and to pursue dialogue on human security."²¹ Slovenia during its EU presidency opened the discussion on human security in the General Assembly on 22 May 2008, noting that human security has "been acknowledged and mainstreamed" into the "2005 EU Consensus on Development," and into its 2007 communication on humanitarian assistance, and that several EU mechanisms contribute both to 'freedom from fear' (Common Foreign and Security Policy, European Security and Defence Policy, EU Civil

Protection Mechanism, Stability Instrument, Crisis Management tools) and 'freedom from want' (ECHO, EU Development Cooperation).²²

In substance, several initiatives by the HSN and FHS both within the UN System (UN Security Council, General Assembly, Peacebuilding Commission) but also outside (e.g. the antipersonnel landmine convention (1999) and the convention against cluster bombs (2008) have succeeded despite the opposition of several permanent members of the UN Security Council (Bosold 2008).

The human security concept has offered smaller and medium countries an opportunity to promote their humanitarian agenda in cooperation with the European Union, Japan, and with member countries of the G-5 and G-8 while many members of the G-77 have resisted efforts to widen and to deepen the security concept, fearing that this may be used by powerful countries in the North to legitimate interventions into the internal affairs of countries in the South. Specific human security activities of UN member states have focused on the linkages with development (Bumtawi-Sam 2008), on human rights (Benedek/Kettemann 2008), on intervention and the responsibility to protect (Thakur 2008). Human security concepts and agendas have also been discussed in Africa (Hendricks 2008), Asia (Caballero-Anthony 2008), in Latin America (Stanley 2008), and for the Near and Middle East (Chourou 2005; Bastý 2008).

74.3 Human Security as a Scientific Concept

The policy debate within the UN system and the initiatives by members of the HSN and participants of the FHS were instrumental for an emerging scientific discourse on human security. In their "archaeology of human security" MacFarlane and Khong (2006: 19–138) traced the conceptual tension between the state and the people with regard to security from the pre-modern era through the absolutism and constitutionalism in the Westphalian system, the age of nationalism to the period between the world wars, and during the Cold War and the evolving critique of national security.

In the scientific discourse, since the 1980's, already prior to the global turn, a few scholars called for an expanded concept of international security (Westing

19 Its members are: Ulrich Albrecht, Christine Chinkin, Kemal Dervis, Renata Dwan, Anthony Giddens, Nicole Gnesotto, Sonja Licht, Jan Pronk, Klaus Reinhardt, Genevieve Schmeder, Pavel Seifter and Narcis Serra (2008).

20 See: "Europe needs a human security doctrine - and a new civil military force"; at: <http://www.lse.ac.uk/collections/pressAndInformationOffice/newsAndEvents/archives/2004/Europe_needsHumanSecurity_Doctrine.htm>. The text is available at: <<http://www.lse.ac.uk/Depts/global/Publications/HumanSecurityDoctrine.pdf>>, and at: <http://ue.int/uedocs/cms_data/docs/pressdata/solana/040915CapBar.pdf>.

21 See at: <http://www.deljpn.ec.europa.eu/home/news_en_newsobj2803.php>.

22 See text at: <<http://www.un.org/ga/president/62/The-maticDebates/humansecurity/eu.pdf>>.

1986: 183–203) and for a comprehensive or human security approach (Westing 1993).²³ But the scientific human security discourse was triggered by the UNDP (1994) HDR in political science, international relations (Ulbert/Werthes 2008; Fabra Mata 2007)²⁴, and especially in the peace studies (debates in *Security Dialogue*) and in the development community (McGrew/Poku 2007), but also in geography (Lonergan 1999; Bohle/O'Brien 2007), international law (von Tigerstrom 2007), in education (Nelles 2003), philosophy (Fabra Mata 2007), in theology (Eisen 2008), and even in the health sciences (chap. 38 by Leaning). As this debate has been well documented elsewhere only a few controversies will be highlighted.²⁵

Alkire (2003: 15–39; 2004) pointed to the many different definitions of human security as: “a) safety from chronic threats such as hunger, disease and repression; b) protection from sudden and hurtful disruption in the patterns of daily life”; of the *Commission on Human Security* (2003) that focused on threats from both poverty and violence aiming: “to protect the vital core of all human lives in ways to enhance human freedoms and human fulfilment,” a goal that should be realized “by joint strategies of protection and empowerment.”

The encompassing human security concept suggested by UNDP (1994) was critiqued as being too wide for analytical research (Mack 2004). The narrow concept of ‘freedom from fear’, represented by the *Human Security Network* (HSN) requires from the states “to provide security – in order that individuals can pursue their lives in peace” (Krause 2004). For the security studies community, the state remains the major referent object that is to be secured while both human security visions deal with the protection of the individual. Mack (2004) argued that the state-centred security paradigm cannot deal with threats to the individual emanating from the state, and that it can hardly explain state collapse. The first *Human Security Report* (2005) adopted “a narrowly focused definition of

human security in which the threat is the relatively conventional one of political and criminal violence” (Mack 2004).

Within international relations, the human security concept has remained controversial. While many neo- or structural realists and the strategic studies community (Paris 2001, 2004), as well as ‘state-centred’ peace researchers (Buzan 2000, 2002; Müller 2002; Brock 2008) have rejected the human security concept, authors with liberal and constructivist perspectives and from peace research have rallied behind this concept. However, some proponents are critical of a wide concept as ‘freedom from want’ (Krause 2004; Mack 2004) and have argued instead for “pragmatism, conceptual clarity, and analytic rigor” (Owen 2004: 375). But most authors of a forum in *Security Dialogue* (2004) supported a wide agenda that includes ‘freedom from fear’ (violence) and ‘freedom from want’ (development).

Human security as an analytical and theoretical tool differs from human security as a political mandate. Uvin (2004) uses the concept as a “conceptual bridge between the ... fields of humanitarian relief, development assistance, human rights advocacy, and conflict resolution” (Owen 2004). For Hampson (2004) human security gives voice to the politically marginalized, while Acharya (2004) interpreted it as a response to the globalizing of international policy, and for others human security is a response to genocide and limits of sovereignty justifying humanitarian interventions.

Newman (2001) distinguished four interpretations of human security referring to basic human needs, an assertive or interventionist focus, social welfare or a development focus, and new or non-traditional security issues like drugs, terrorism, small arms, and inhumane weapons. The victims of *human security challenges* have been: “1) victims of war and internal conflict; 2) persons who barely subsist and are thus courting ‘socio-economic disaster’; and 3) victims of natural disasters” (Suhrke 1999) that create severe humanitarian emergencies.

Thomas and Tow (2002, 2002a) distinguished general human security ‘threats’ such as hunger and disease, and specific ones, such as “single actions that have an immediate effect on the safety or welfare of victims and demand immediate remedy”, to which ‘peacekeeping’ emerges as a major response along with peace-enforcement measures. For humanitarian interventions human security and traditional responses to crises overlap. They conclude that human security could be considered “a valid paradigm for

23 Westing (Ed.) 1993: *Transfrontier reserves for peace and nature: a contribution to human security*, UNEP

24 Fabra Mata, Javier: “Playing the Right Game? Human Security Research and its Implications in Policy-making” Paper presented at the annual meeting of the International Studies Association 48th Annual Convention, Chicago, Chicago, IL, USA, Feb 28, 2007; at: <http://www.allacademic.com/me-ta/pr180091_index.html>.

25 In the academic human security debate no common definition on human security has emerged after twelve years. Alkire (2004: 359) noted more than 30 definitions.

identifying, prioritizing and resolving emerging transnational security problems”, and that the model offers ways to respond to these challenges by “safeguarding and improving the quality of life” for individuals and groups.

Bellamy and McDonald (2002) argued that this effort to make human security policy relevant “risks losing its emancipatory potential.” They preferred the approach suggested by Thomas (1999) that human security should stress “the security of the individual and that security is achieved only when basic material needs are met.” They suggest that the focus of human security should be humans (basic human needs) and their ability to “participate in collective endeavours,” and the state “as the primary agent of human insecurity.” Thomas and Tow (2002) argued that “state security and human security are interlinked” and that “state security is a means of providing human security,” but that “outwardly aggressive and inwardly repressive regimes can be a major source of human insecurity.” Mack (2002) observed that “it is impossible to explore causal relationships between violence, on the one hand, and indicators of underdevelopment, on the other, if all are subsumed under the rubric of human insecurity.”

To overcome the dispute between the proponents of a narrow and a wide human security concept, Owen (2004) suggested combining the wide definition of UNDP (1994) with a threshold-based approach “that limits threats by their severity rather than their cause.” He suggested that each category of threats should be “treated separately for the purpose of analysis.” For Owen (2004) “human security is the protection of the vital core of all human lives from critical and pervasive environmental, economic, food, health, personal and political threats” regardless of whether people are affected by floods, communicable disease, or war, but all those threats would be included “that surpass a threshold of severity [and] would be labelled threats to human security” (2004).

Fukuda-Parr (2003: 1–13) referred to several new threats to human security in the era of globalization: a) global crime; b) human trafficking; c) instability and contagion in financial markets; d) labour market insecurities and threats to job security; e) spread of diseases; and f) conflicts within national borders. From this perspective, human security requires a strategy for better social protection.

Khagram, Clark, and Raad (2003: 107–135) discussed both environmental threats (and their impacts on human survival, well-being, and productivity) and environmental opportunities for human security. Envi-

ronmental change can have direct and immediate effects on well-being and livelihoods; it can also impact on health, economic productivity, and political instability. Environmental threats can affect “individuals, families, communities, social organizations, identity groups (women, children), diasporas, governments and biological species.” Also, a single environmental threat “can have potentially adverse effects at multiple scales from the household to the planetary.” The effects (e.g. of climate change) can be both local and global, and they may impact today or in the future. On the other hand, environmental protection, cooperation, and peace-making can improve human security.

Mary Kaldor (2007: 182–187) who headed the *Study Group on Europe's Security Capabilities* (Glasius/Kaldor 2005) placed human security “at the sharp end of human development.” In her view: “It is about crisis management. It includes both civilian and military elements; it offers a way to act, a set of principles for crisis management.” In order to put the concept into practice she suggested five principles (as both ends and means) for the implementation of human security “in a continuum of varying degrees of violence that always involved elements of both protection and reconstruction:” 1) the primacy of human rights; 2) legitimate political authority; 3) multilateralism; 4) the bottom-up approach; and 5) a regional focus.

Kaldor (2007: 190–191) claimed that even after the new wars have been stabilized, “individuals still experience high levels of physical insecurity as a consequence of high crime rates, high human rights violations and high levels of violence against women.” Furthermore, she argued that “physical insecurity is linked with material insecurity. New wars involve high levels of population displacement, rapid urbanization, loss of rural livelihoods, destruction of infrastructure and productive assets, and greater vulnerability to natural disasters.” She suggested that a human security approach to these new security dangers “would aim both to stabilize conflicts and address the sources of insecurity.” This requires public security, Kaldor argued, based on the rule of law and effective law enforcement, what implies for international organizations: a) an expanded international presence; b) new human security forces; and c) a legal framework.

The economic and social priorities for conflict prevention include, in Kaldor’s (2007: 193–195) view: a) combining humanitarian and development assistance; b) creation of legitimate employment and self-sustaining livelihoods; c) institution-building, includ-

ing the rule of law; d) attention to the importance of infrastructure and public works; e) education and social services; f) generating tax revenues. She concluded that a human security approach could benefit development by: a) “providing the conditions (physical safety, rule of law and sustainable institutions) that are integral to development;” b) focusing on human development and strengthening weak institutions; and c) stressing the needs of individuals and communities and thus protecting the humanitarian space.

There has also been an intensive scientific discourse on human security concepts and issues in and with scholars from developing countries, many in the framework of regional conferences organized by UNESCO. For Neff (2003: 40), a Latin American scholar teaching in Canada, human security “is founded on the notion of mutual vulnerability” and for him the “central theme of human security is the reduction of collective and shared risk through analysis, decisions, prevention and action at reducing the causes and circumstances of insecurity.” Human security “focuses on the causes of violence and stresses the need to control the latter by attacking its roots and the factors of its recurrence, not only its expression.”

For Hugo Palma (2003: 111), a Peruvian diplomat, human security deals with internal security and has two aspects that refer to “hunger, sickness and repression, but also to absolute disruption of daily living,” like “natural catastrophes or series of crises that can lead to human tragedies.” For Palma, “human security can be threatened by economic, food, health, personal security, environmental, community or cultural and political problems.”

Miriam Kornblith (2003: 321), a researcher from Venezuela, suggested to develop an objective and subjective human security index and pointed to several challenges for human security in Latin America and in the Caribbean.

Adrian Bonilla, an academic subdirector of FLACSO from Ecuador (2003: 337–351), applied the concept to the fight against drugs in the Andean region, while Ernesto López (2003: 353–363), a scholar from Argentina, outlined a human security agenda for the MERCOSUR dealing with both ‘freedom from want’ and ‘freedom from danger’.

Chari and Gupta (2003: 1–21) from India noted the potential dichotomy of ‘national’ and ‘human security’ if the state and the individual are at variance. In the UNDP (1994: 8) definition “individuals and collectives ... were made the referents of security, and threat perceptions were reformulated in this perspective.”

For the former Pakistani finance minister, World Bank and UNDP official, Mahbub-ul Haq, human development was the bedrock of security and he called for “securing people from economic deprivation, disease, hunger, social conflict and environmental degradation.”

Chari and Gupta (2003: 8–9) listed among the major threats to human security: “challenges of globalization, questions of energy security, mass migration and gender discrimination.” They pointed to “the right to live” as the basic value of human security, and “violence – physical, socio-economic, or psychological – directed against citizens exacerbates human insecurity.” For them, human security “is inextricably linked to human rights, human development and human governance” and “the state should be vitally concerned with human security to ensure its own security.” For South Asia, a further erosion of human security arises from the environmental degradation of water, forests, farmland, and fisheries. They define human security as freedom from fear (anxiety) and want (certitude, protection). To avoid a trivialization of human security by overextending it, Chari and Gupta (2003: 16–17) have proposed:

1. to distinguish “between threats to human security that are amenable to state intervention and others that must be left to public and social action;”
2. non-military threats to human security may become legitimate as threats to state or societal interests if they “meet rigorous criteria for securitizing those threats and disaggregating them into their component sectors;” and
3. threats to human security may be linked with other threats, e.g. environmental degradation can trigger internal displacement of people leading to growth in slums where many people live in fear and suffer from want, thus the effects of environmental degradation lead to human insecurity.

Abdus Sabur (2003: 35–51; chap. 76 below) from Bangladesh saw a major outcome of the rethinking of security since 1990 in “the idea that the security of an individual in terms of his physical safety, human dignity and development is as important as the security of the state” (Sabur 2003: 37). While national security requires investment in the military, “human security needs investment in human development and humane governance.” But with regard to South Asia, Sabur (2003: 47) has noted a lack of attention on human security so far while traditional security issues have dominated. While the primary responsibility for ensuring human security remains with the state, within

the state, non-state actors, civil society, and NGOs play a major role in ensuring human security also regarding actions caused by the state.

Adil Najam (2003: 1–24), a Pakistani scholar who is teaching in the USA, analysed many roots of human insecurity in South Asia that is the world's poorest region (with a GNP/capita below that of Sub-Saharan Africa), the world's most illiterate region; and the region with the highest human deprivation. Based on a project with colleagues from India, Pakistan, Bangladesh, Sri Lanka and Nepal on non-traditional security issues, Najam (2003: 21–22) drew five lessons:

- For South Asia ... environment and security are at best conceptualized within the context of sustainable development;
- The challenge of environment and security in South Asia is principally a challenge at the domestic, even local, level; but it is a challenge common to the region;
- The challenge of environment and security in South Asia is ... not just a problem of resource endowments or geography but, quite distinctly, a problem of institutions and governance; it is only because the issue is the latter rather than the former that we have the ability to change the situation;
- The possibility of an eruption of interstate violence in South Asia over environmental issues is slim; however, given the region's history of distrust and dispute between nations, environmental differences can add to existing tensions and apprehensions, thereby perpetuating the general sense of insecurity that pervades interstate relations in the region;
- There is the potential – albeit small – for a generation for security relations in South Asia, based on the principles of mutual trust, harmony and cooperation rather than on legacies of distrust and dispute, to emerge there around the nexus of environment and security.

Besides Latin America and South Asia, the concept has also been widely debated in Africa. The UN *Office of the Special Adviser on Africa* (OSAA 2005) in a report: *Human Security in Africa* discussed in the framework of the Commission of Human Security's report (CHS 2003) the challenges to human security posed by conflicts and for people on the move. It specifically addressed problems of protection and empowerment of women as well as policy issues of recovering from violent conflict, of governance and participation, of food and health security and of edu-

cation. It also offered many specific recommendations for action. But the study hardly reflected the contributions by African scholars to this debate.

On the political level the debate on human security in Africa was triggered by a *conference on security, stability, development and cooperation* (CSS-DCA) in Kampala in 1991 where 500 African politicians and leaders adopted the Kampala Document that formed the basis for the comprehensive security agenda of the African Union. The human security concept influenced both the *New Partnership for Africa's Development* and the adoption of a *Common African Defence and Security Policy* (2004). While there was agreement on the goals of human security there was disagreement on the policy priorities for achieving them (Hendricks 2008: 137–142).

In June 2001, the *International Institute for Security Studies* (ISS) in Pretoria hosted UNESCO's regional conference on *Peace, Human Security and Conflict Prevention in Africa* (Goucha/Cilliers 2001: vi–vii) that addressed four complementary objectives that were considered as crucial for furthering human security in Africa:

- promoting human capacity-building in the member states of the region;
- helping African countries to establish a strategy for the prevention of HIV/AIDS and other contagious diseases;
- mobilizing and acting as a catalyst for international cooperation in support of initiatives by African Member States; and
- promoting the active participation of communities and representatives of civil society in the planning and implementation of development programmes.

The Pretoria meeting proposed to reinforce many dimensions of human security, including “the relation between human security and the culture of peace, the need for further research on human security indicators, the function of early-warning systems, the policy-building on African parliamentarians, common legislative agendas as HIV/AIDS, poverty, environment, and human rights” (Goucha/Cilliers 2001: vii). After a theoretical conceptualization of human security based on scholars from Europe and Southern Africa by Sagaren Naidoo (2001) all other contributions addressed policy issues of potential relevance for human security.

A study by Hussein, Gnisci and Wanjiru (2004)²⁶ for the Sahel and West Africa Club offered an overview of human security concepts and initiatives and raised the implications for West Africa. It addressed two main issues of a) security system reform (SSR)

and b) regional peace initiatives, and identified these strategic challenges of:

- translating the concept of human security into practice,
- enhancing security sector reform,
- laying the foundation for a coherent security regime in Africa,
- operationalizing the role of ECOWAS in stabilization and peacekeeping efforts,
- achieving greater self-sufficiency in peacekeeping operations,
- coordinating military assistance regionally,
- halting the proliferation of small arms, light weapons and antipersonnel mines.

With the support of the Danish Embassy in South Africa Keith Muloongo, Roger Kibasomba, and Jemina Njeri Kariri (2005) published case studies of seven countries in Southern Africa that analysed the linkage between poverty and human security (Mutesa/Nchito 2005), on multipolarity politics and human security (Mpagala/Lwehabura 2005; Mataure 2005), on security of the young (Kaungulu Ngoy 2005; Correira de Barros 2005; Mlambo 2005) and on rural insecurities (Dzimba/Matooane 2005).

This selective review of definitions of human security and of threats for human security as well as issue areas of relevance for human security documents both the diversity and the lack of a clear consensus that did not facilitate the communication with policy-makers and their efforts to move from declaratory statements to concrete policy initiatives and actions. Thus, after 14 years of debate on human security in the social and human sciences the conceptual discourse remains inconclusive and the used human security definition depends on the approach, preferences of the respective author or donor.

Both in the policy debate and in the scientific discourses on human security the environmental security dangers and concerns were in most cases ignored. But new challenges are being posed by the environmental dimension of human security (Barnett 2001; Brauch 2005, 2005a, 2006, 2006e, 2006h, 2008g) that have led to a proposal for a fourth pillar of human security that is gradually being taken up by governments in the HSN (e.g. by Thailand in 2006 and Greece in 2008).

26 This *Issues Paper* offers a good overview of the contributions of African and international scholars and a comprehensive list of organizations working on these issues in Africa and in the rest of the world.

74.4 Policy Debates, Pillars, and International Agendas

Kofi Annan argued (2005) that human security should be based on three pillars of ‘freedom from want’ (human and sustainable development agenda), ‘freedom from fear’ (the traditional peace and security agenda), and ‘freedom to live in dignity’ (democracy, rule of law and human rights agenda). Stimulated by the *Study Group for Europe’s Security Capabilities* (2004) Ulbert and Werthes (2008: 19) also referred to three dimensions of human security as a) humanitarian security (freedom from fear), b) equality and social justice (freedom from want), and c) liberty and human rights (rule of law or ‘Rechtssicherheit’).

In analogy to Franklin D. Roosevelt’s four basic freedoms in the Atlantic Charter (1941) of the freedom of speech and expression, of the freedom from fear and want, Bogardi and Brauch (2005; chap. 1 by Brauch) suggested to add a fourth conceptual pillar of ‘freedom from hazard impact’ by reducing vulnerability and enhancing coping capabilities of societies confronted with natural and human-induced hazards by empowering people and enhancing their resilience (UNU-EHS 2004, 2008; Oswald 2008, 2008a).

74.4.1 Human Security Agendas

These four pillars of a wide human security concept refer to four different human security agendas that have been listed by the UN member states participating in the first thematic discussion on human security on 22 May 2008. Table 74.3 offers an overview of these four pillars and the associated policy agendas. While in the first three pillars human beings are conceived as victims of multiple security dangers caused by their own state (repression), during internal violent conflict and wars, and of economic, social and legal deprivation, in the fourth pillar human beings (as individuals) and humankind (as a species) are considered both as a cause of new environmental security dangers (due to anthropogenic climate change) and as a victim of human-induced natural hazards (storms, floods, droughts, heat waves, cold spills). While a huge scientific and policy-related literature exists on the first three pillars, the fourth conceptual pillar of ‘freedom from hazard impact’ is increasingly being discussed by the natural hazard community (UNU-EHS, UN-OCHA, UN/ISDR, HSN). Thus, the following section will primarily focus on this fourth evolving human security pillar.

Table 74.3: Four Pillars of Human Security. **Source:** The table was stimulated by Ulbert and Werthes (2008:21) who developed it based on Hampson/Daudelin/Hay/Martin/Reid (2002: 33).

Pillars of human security	Representatives and central actors	Key Elements (policy agendas)	Examples for key strategies and tools	Reference object
Freedom from fear	<ul style="list-style-type: none"> • UNDDA • UNIDIR • Canada, Norway, Switzerland, Austria, Slovenia, Chile • Human Security Network • IFRC-RCS 	<ul style="list-style-type: none"> • <i>protection</i> against violence and remnants of wars, post-conflict rehabilitation peacebuilding • subsistence rights 	<ul style="list-style-type: none"> • measures of conflict and crisis prevention • measures of peace consolidation • humanitarian aid • humanitarian intervention (responsibility to protect) • disarmament (landmines, cluster bombs, small, light arms) • humanitarian law 	<i>individual</i> (as a victim of violence)
Freedom from want	<ul style="list-style-type: none"> • UNDP (1994) • CHS (2003) • Japan, Mexico • Friends of Human Security 	<ul style="list-style-type: none"> • social, economic <i>empowerment</i> for human development • right to development 	<ul style="list-style-type: none"> • overcoming social, economic inequality and injustice • participation at local, subnational, national, and global level 	<i>individual</i> (as a victim of material insecurity: hunger, poverty)
Freedom to live in dignity	<ul style="list-style-type: none"> • Kofi Annan (2005) Study Group on Europe's Security Capabilities (2005) 	<ul style="list-style-type: none"> • legal <i>protection, empowerment</i> • basic personal, economic, social rights, 	<ul style="list-style-type: none"> • role of law • effective law enforcement • democratic governance • sanctions • persecution e.g. ad hoc courts, international court of justice 	<i>individual</i> (as a victim of legal violation or lack of legal entitlements, human rights)
Freedom from hazard impacts	<ul style="list-style-type: none"> • UNU-EHS (2005) • HSN ministerial in Thailand (2006) • Greece (2008) 	<ul style="list-style-type: none"> • social, economic, <i>empowerment</i> • reducing impact • building of resilience 	<ul style="list-style-type: none"> • sustainable development • climate change • natural disasters (early warning, disaster response and preparedness) 	<i>individual and human-kind</i> (as a cause and victim)

74.4.1.1 The Humanitarian Agenda

The urgency in addressing the humanitarian agenda has been stressed in many reports of the former Secretary-General Kofi Annan (1999, 2005). He suggested that “the United Nations must be transformed into the effective instrument for preventing conflict” by addressing these priorities: a) to prevent terrorism; b) to achieve progress on both disarmament and non-proliferation; c) to reduce the prevalence and risk of war; d) to agree on principles with regard to the use of

force; e) to achieve more effective cooperation to combat organized crime; f) to prevent illicit trade in small arms and light weapons, and g) to remove the scourge of landmines.

The latter was achieved outside the Conference on Disarmament (CD) and against the opposition of three permanent members of the Security Council under the joint leadership of Norway and Canada that both took the initiative in 1999 to establish the HSN. The major activities of the HSN have focused on the humanitarian agenda on those issues of disarmament

where no progress was possible within the Conference on Disarmament: on antipersonnel landmines (Matthew/Mc Donald/Rutherford 2004), on small and light weapons (Gasparin Alves/Cipollone 1998; Pirseyedi 2000; Kytomäki/Yankey-Wayne 2005), and on cluster bombs.

The second area of activities has focused on the *protection* of civilians in armed conflict (Dedring 2008), especially of women, children, and the elderly (Oswald 2008). Many of these activities were supported by the *International Federation of the Red Cross - Red Crescent Society* (IFRC-RCS) and by humanitarian organizations that support a prohibition of indiscriminate conventional weapons (cluster bombs, laser weapons) by creating new legal instruments of humanitarian law (Brauch 2003: 27). A third area dealt with the *empowerment* of women in areas of peace and security (UN SC Res. 1325) and with issues of gender security, and a fourth focus was on the responsibility to protect (ICISS 2001; Thakur 2006, 2008: 110-122).

74.4.1.2 The Human and Sustainable Development Agenda

In the post-Cold War period, the development and security linkage has been addressed by scientists and practitioners in both communities (Uvin 2008, Klingebiel/Roehder 2008; Katseli 2008). Mahbub ul Haq's concern with human development was instrumental for the adoption of the human security concept by UNDP (MacFarlane/Khong 2006; Jolly/Das Ray 2006) and this approach was developed further in the report of the *Human Security Commission* (CHS 2003). It has served UNDP as a conceptual basis for the assessment of the development policies and practices of several countries, and many specific projects have been conducted by UNDP and many national and multilateral development agencies.

Kofi Annan (2005) referred to the shared vision of development that was adopted with the *Millennium Development Goals* (MDGs) that were reaffirmed in 2005, with the "global partnership for development" that "is grounded in mutual responsibility and accountability - developing countries must strengthen governance, combat corruption, promote private sector-led growth and maximize domestic resources to fund national development strategies, while developed countries must support these efforts through increased development assistance, a new development-oriented trade round and wider and deeper debt relief."²⁷ Annan referred to the following policy priorities: a) to ensure *environmental sustainability*; b) to

develop tools for mitigating *climate change*; c) to take concrete steps on *desertification* and *biodiversity*; d) to adopt stronger mechanisms for *infectious disease* surveillance and monitoring and a world-wide early warning system on *natural disasters*; e) to support *science and technology* for development, *regional infrastructure* and institutions, reform of *international financial institutions*, and more effective cooperation; and f) to manage *migration* for the benefit of all.

In a recent assessment Butsumtwi-Sam (2002, 2005, 2008: 92) concluded that the realization of human security goals in the human development context has been rather dim. A significant change would have required a reform of existing power structures and institutions with a specific focus on macroeconomic structures and distribution mechanisms.

74.4.1.3 The Rule of Law and Human Rights Agenda

Under 'freedom to live in dignity' Kofi Annan (2005) argued that action was needed on the following three priorities:

- a.) *Rule of law*: The international community should embrace the 'responsibility to protect', as a basis for collective action against genocide, ethnic cleansing, and crimes against humanity. All treaties relating to the protection of civilians should be ratified and implemented. Steps should be taken to strengthen cooperation with the International Criminal Court and other international or mixed war crimes tribunals, and to strengthen the International Court of Justice.
- b.) *Human rights*: The Office of the High Commissioner for Human Rights should be strengthened with more resources and staff, and should play a more active role in the deliberations of the Security Council and of the proposed Peacebuilding Commission. The human rights treaty bodies of the UN system should also be rendered more effective and responsive.
- c.) *Democracy*: A Democracy Fund should be created at the UN to provide assistance to countries seeking to establish or strengthen their democracy.

During its first decade (1998-2008), the members of the *Human Security Network* have succeeded to put many of these issues on the agenda of the UN Security Council, of the General Assembly, and of many

27 See Annan (2005): Executive Summary; at: <<http://www.un.org/largerfreedom/summary.html>>.

other international bodies.²⁸ Canada was instrumental in launching the debate on the *Responsibility to Protect* (ICISS 2001), while Austria and Switzerland launched the UN Security Council Resolution 1325 (October 2000) on the role of women in international peace and security (Ulbert 2008), Austria has stressed human rights education while Slovenia focused on the protection of children in armed conflict.

There are a few cases where scientists had an impact on the national and international human security agenda, and were instrumental for furthering their implementation, as for example Wolfgang Benedek of the University of Graz (Austria), Keith Krause of the University of Geneva (Switzerland)²⁹ or Andrew Mack of Fraser University in Vancouver (Canada).³⁰

Benedek (2006, 2008) and together with Kettmann (2008) reviewed the conceptual relationship between human security and human rights pointing to commonalities and differences, discussing the relevance of human security for implementing human rights as well as the relevance of human rights for achieving human security. They concluded that this relationship has contributed to a dual added value.

Benedek significantly contributed to the activities of the HSN in the area of human rights education after the adoption of the “Graz Declaration on Principles of Human Rights Education and Human Security” at the 5th Ministerial in Graz in May 2003. His institute launched the *HUMSEC Project* with the support of the 6th EU Framework Programme, “whose purpose is to contribute to a better understanding of the link between transnational terrorist groups and

criminal organizations in the Western Balkans and their role in the peacebuilding process in the region.”³¹ Benedek (2006, 2008) has also been involved in the human rights education initiatives within UNESCO. This is a positive example where policy-oriented conceptual work in international law had a direct impact through the endorsement by the HSN on other international organizations.

74.4.1.4 The Climate Change and Natural Hazard Agenda

Bogardi and Brauch (2005) proposed ‘freedom from hazard impacts’ as a fourth pillar of human security that should focus on reducing vulnerability of societies confronted with natural and human-induced hazards, and by enhancing resilience, disaster preparedness, and response (UNU-EHS 2005; Brauch 2005). While such natural hazards cannot be prevented, the impact of these tragic events can be reduced by early warning and better disaster preparedness. ‘Freedom from hazard impact’ would imply that people can mobilize their resources to address sustainable development goals.

To achieve this goal requires four hazard-specific policies and a combination of technical, organizational, and political measures in case of:

- *Slow-onset hazards*: sea-level rise and temperature increase due to climate change require a) long-term strategies for *reducing greenhouse gas emissions*, b) measures of *adaptation* (dams in affected areas), and c) *mitigation* (restriction of housing in coastal areas);
- *Rapid-onset hydro-meteorological hazards*: Climate change has contributed to an increase of extreme weather events. This requires *disaster preparedness* (education, training, infrastructure) and *disaster response* on the national and international level. Different early warning systems are needed for storms (early warning centres, infrastructure), floods (vulnerability mapping), forest fires (monitoring from space and plains), and droughts (precipitation monitoring from satellites);
- *Rapid-onset geophysical hazards*: earthquakes, tsunamis, volcanic eruptions and their possible extreme consequences require improved early warning systems (closer cooperation among seismic and volcanic research centres, tsunami early warning systems), better disaster preparedness (vulner-

28 See the guiding principles adopted on 20 May 1999 at the first ministerial of the HSN in *Lysøen (Norway)*. See text at: <<http://www.humansecuritynetwork.org/principles-e.php>>.

29 Krause is founder and programme director of the *Small Arms Survey* project, and has jointly edited its annual yearbook since 2001. See at: <<http://www.smallarmssurvey.org/files/sas/about/mission.html>>. It offers the principal international source of public information on all aspects of small arms and as a resource for governments, policy-makers, researchers, and activists. Its international staff works closely with a worldwide network of researchers and partners. So far seven volumes of the *Small Arms Survey* (2001, 2002, 2003, 2004, 2005, 2006, 2007) were published; at: <<http://www.smallarmssurvey.org/files/sas/publications/yearb2007.html>>.

30 Mack founded the Peace Research Centre in Canberra, then moved to the UN Secretariat to become an adviser of Kofi Annan and later launched the Human Security Centre in Vancouver that publishes the *Human Security Report* and two *Human Security Briefs*.

31 See the documentation at: <<http://www.humsec.eu/cms/index.php?id=333>>.

Table 74.4: Compilation of Human Security Threats, Challenges, Vulnerabilities, Risks: **Source:** Brauch (2005a: 80).

Humans security infringements posed by	Human Security			
	Threats to	Challenges for	Vulnerabilities to	Risks for
Underdevelopment ('freedom of want')	<ul style="list-style-type: none"> Human well-being, human health life expectancy 	<ul style="list-style-type: none"> social safety nets human development food security 	<ul style="list-style-type: none"> economic crisis and shocks communicable diseases 	those most vulnerable (socially, economically) and exposed to underdevelopment, violence and hazards:
Conflicts and human rights violations ('freedom from fear')	<ul style="list-style-type: none"> Human life and personal safety (from wars) identity, values 	<ul style="list-style-type: none"> feeling secure in a community human rights democracy 	<ul style="list-style-type: none"> warlords, criminals corrupt regime, ruler human rights abuses, violations 	<ul style="list-style-type: none"> poor women, children, old people
Hazards and disasters ('freedom from hazard impact')	<ul style="list-style-type: none"> Livelihood survival settlements 	<ul style="list-style-type: none"> sustainable development food security 	<ul style="list-style-type: none"> exposed population livelihoods, habitat disease (cholera, dengue, malaria, etc.) 	<ul style="list-style-type: none"> indigenous minorities.

ability mapping), improved national and international disaster response, and clear guidelines for post-hazard reconstruction activities;

- *Human induced disasters*: technical (malfunctioning of technical systems, collapse of buildings, dams), industrial (e.g. chemical industry, nuclear reactors) and traffic accidents (road, railway, ships, airplanes, etc.) as well as *intentional malicious acts* by states in war (attacking objects containing dangerous forces, dams, energy, and chemical plants) and by non-state societal (terrorists) and economic (organized crime) actors or a combination of these.

'Human security as freedom from hazard impact' is achieved when people who are vulnerable to and at risk of these manifold environmental hazards and disasters (floods, landslides, and drought) that are often intensified by other associated societal threats (poverty), challenges (food insecurity), vulnerabilities and risks (improper housing in highly vulnerable flood-prone and coastal areas) are better warned of impending hazards, prepared and protected against these impacts and are empowered to prepare themselves effectively to cope with the 'survival dilemma' (Brauch 2000, 2004, 2005). Such extreme events often pose for the most vulnerable three 'no-win' alternatives: a) to die, b) to be forced to migrate, or c) to struggle for their own survival and that of their community. The concept of human security is closely related to 'vulnerability', the latent threat that some dimensions of human insecurity could manifest themselves in crises and disasters.

While hazards and vulnerabilities lead to a direct deterioration of human security, especially for those segments of a society with low coping capacities, strategies to reduce environmental, economic and societal vulnerability by environmental, economic and social policies and measures, and to improve coping capacities (by disaster preparedness, management and response) will contribute to reducing the risks for different strata of the society and thus improve their human security.

During the last 30 years evidence has pointed to a marked growth in the frequency and magnitude of natural hazards and their economic consequences (MunichRe 2000–2007; IPCC 2001, 2007a; UN/ISDR 2004; UNDP 2004). The statistical and political evidence underlines the necessity to study and document the environmental, economic and social vulnerabilities and thus also the environmental dimension of human security that can only be achieved through a dynamic equilibrium between humankind and its surroundings. From a human security perspective many environmental threats, challenges, vulnerabilities, and risks exist for the major referent: the individual human being or humankind (table 74.4).

Addressing the environmental dangers to human security (Brauch 2005a: 64, table 4) requires a complex combination of strategic instruments and policies to reduce the vulnerability to natural hazards and the related risks for human beings and affected societal groups. Thus a dual strategy is needed for dealing with:

Table 74.5: ‘Human Security’ Policies and Measures for Coping with Environmental Threats, Challenges, Vulnerabilities, and Risks for ‘Ecosystems’ and ‘Sustainability’. **Source:** Compiled by the author.

Strategies and means for coping with	Threats of	Challenges of	Vulnerabilities of	Risks of
	Environmental Security for			
Sustainable development policy goals	• Air (climate), soil, water	• agriculture and food security	• vulnerable people (old, children, women, indigenous groups)	
Environment policy (implementation of environmental treaties, regimes)	• Climate change, soil erosion, water scarcity and degradation	• economy • agriculture • tourism • health	• rural livelihood • urban habitat • transport and economic infrastructure	• reducing exposure of people with low resilience
Early recognition (research, education, training, agenda setting)	• Extreme weather events (storm, flood, drought)	• agriculture (shift in crops)	• city planning • building standards	• enhancing knowledge of these people
Early warning of hazards and disasters	• Hydro-meteorological (storms, floods, drought) and geophysical (earthquake, volcano, tsunami) hazards	• agriculture (specific crops) • public health	• vulnerability mapping of hazard prone areas and housing	• enhancing training of these people
Effective disaster preparedness and rapid disaster response		• (inter)national organizations and resources	• vulnerability mapping of hazard prone areas and housing	• enhancing protection of these people
Humanitarian aid	• Hazards and conflicts	• access to affected areas	• spread of infectious disease	• reducing low recognition
Refugee assistance	• Distress migration	• environment • food supply	• refugees (in times of conflict)	• old, weak and poor

- *short-term situational* impacts of extreme weather events and natural hazards; and
- *longer-term structural impacts* of global environmental change.

A conceptual and a policy-oriented mainstreaming is needed to address both impacts. Usually there has been a preference for short-term reactive policies of disaster response, and a hesitation towards long-term proactive climate change policies by reducing greenhouse gas emissions in the domestic energy and transport sector. Effective climate policies with legally binding obligations may be the most cost-effective solutions to counter the projected increase in extreme weather events. To respond to these complex and manifold environmental security ‘threats, challenges, vulnerabilities, risks’ as well as to those posed by manifold hazards, it is primarily *proactive* non-military policies and measures (table 74.5) which are needed.

With regard to the work of international organizations, a dual mainstreaming may be needed:

- to incorporate a ‘human security’ perspective into ‘environmental security initiatives’, such as ENVSEC and the “green diplomacy” of the Euro-

pean Union (chap. I by Brauch); chap. 71 by Cheterian.

- to include an ‘environmental security dimension’ into the work of the Human Security Network (HSN) and elaborating it further in the context of the report of the Commission on Human Security (CHS 2003) and of the Friends of Human Security.

During its ministerial meetings in Bangkok (May 2006) the HSN referred to ‘freedom from hazard impact’, and in Athens (2008) by addressing the socially vulnerable people due to climate change the HSN moved towards the environmental dimension of human security.

74.5 Human Security in the Anthropocene

The focus of both the HSN and of the FHS has been on the first three pillars of human security. The discussion on the ‘environmental dimension of human security’ (Brauch 2008g) and on ‘freedom from hazard impact’ points to a new challenge that humankind, or ‘us’ are posing a threat to the quality of life

and survival of our species. Crutzen (2002) coined the term of the 'Anthropocene' for a new era in earth history (chap. I, 4, II, 98, 99).

The recognition that the enemy is 'us' or more specifically our way of life, our consumptive behaviour, our burning of fossil fuels since the Industrial Revolution, our waste of energy that has caused an increase in the number and intensity of hydro-meteorological hazards, as well as in the number of people killed and affected and in the number of economic damages (IPCC 2001a; MunichRe 2006) has significant implications for the thinking on security in general and on human security in particular.

This 'enemy' cannot be contained by military logic or force. Rather the armed forces as a significant consumer of fossil fuels in peace and even more in war times directly contributes to this threat. The realist tradition as well as critical schools of security studies have difficulties in addressing this new 'enemy' to our own well-being and survival. Addressing climate change as an issue of 'national security' within the traditional worldview of the analyst or mindset of the policy-maker does not offer a solution. But also the prevailing tendency in the scientific discourse and in the policy debates on human security that focus on the individual as the 'victim' of threats posed by states (repressive governments within or by outside powers) cannot address or cope with this new security danger. This enemy being 'us' cannot be bombed, brought to justice, prosecuted and detained in prisons.

Georg Boomgarden, the State Secretary in the German Foreign Office, stated on 26 June 2006 at a conference on "desertification as a security threat":³²

If we ask ourselves who the enemy is in climate change, using the concepts of classic security policy, we must conclude that we are turning nature itself into an enemy, ... and with this enemy, neither deception nor deterrence is going to be of any use. The later we adapt, the greater the cost will be.

This new threat requires a new paradigmatic shift in our thinking and a new basic contract between the state(s), the society, and the economic sector. Only together these three actors can address this threat.

32 See the Conference Report: *Desertification: a security threat? - Analysis of risks and challenges. A conference on the occasion of the World Day to Combat Desertification 2007* Federal Foreign Office, Berlin, June 26, 2007 (Berlin: GTZ, August 2008): at: <<http://www.auswaertiges-amt.de/diplo/de/Aussenpolitik/InternatOrgane/VereinteNationen/VN-Engagements/DesertificationAndSecurity-Download.pdf>>.

But the precondition is a recognition of this threat that does not require intelligence agencies and classified information. This knowledge is public and has been assessed so far in four assessment reports by the IPCC that has become an indirect securitizing actor by putting this message on the top agenda of international politics, of international organizations, and of national governments.

Its third working group on mitigation of climate change (IPCC 2007b) has reviewed both bottom-up and top-down studies and has compiled key mitigation technologies and practices currently available and projected to be commercialized before 2030 in the sectors of energy supply, transport, buildings, industry, agriculture, forestry, and waste management (IPCC 2007b: 10). However, neither pure technological fixes nor technocratic strategies will be able to implement the changes needed to cope with the environmental dangers posed by climate change impacts for human security. In the summary for policy-makers the mitigation report of the IPCC (2007b: 21) concluded:

Making development more sustainable by changing development paths can make a major contribution to climate change mitigation, but implementation may require resources to overcome multiple barriers. There is a growing understanding of the possibilities to choose and implement mitigation options in several sectors to realize synergies and avoid conflicts with other dimensions of sustainable development.

This revolutionary change towards a new sustainable paradigm called for by Clark, Crutzen, and Schellnhuber (2004) requires multi-, inter-, and transdisciplinary research, translation of the key results through the media to the public and to education, and an integration in curricula. It requires a gradual and drastic change in our consumptive behaviour and our use of fossil energy. Sustainability as intergenerational justice requires proactive policy initiatives instead of incremental policy responses with a focus on national 'security first' scenarios or policy strategies. This transition challenges policy mindsets, powerful bureaucracies within government, and lobbies from outside that have succeeded in the past and present to delay proactive sustainable policy initiatives.

In coping with the security dangers and concerns posed by global climate change, international relations and national politics in the Anthropocene era of earth history require a rethinking of the content of 'international peace and security' as referred to in the UN Charter and most particularly in Art. I.1 on the purposes of the United Nations: "to maintain interna-

tional peace and security”, ... “to develop friendly relations among nations”, ... “to achieve international cooperation”, and “to be a centre for harmonizing the actions of nations in the attainment of these common ends.”

The scientific discourses and policy debates on the reconceptualization of security, specifically on ‘human security’, as well as the debate on ‘sustainable peace’ may be interpreted as a policy-relevant effort to adapt these contested policy ‘concepts’ to the new conditions for policy-making in the Anthropocene era in an effort to realize both sustainable and human development paths.

But the victims are not only ‘they’, the poor people in developing countries – e.g. in Bangladesh – that have been affected most by climate change and hazard impacts. The people in the North are also increasingly the victims of winter storms (e.g. Lothar), hurricanes (e.g. Katrina in 2005) and flooding, drought, heat waves and forest fires in OECD countries in North America, Europe, and in the Far East and Pacific regions. These challenges have so far not been conceptualized and dealt with as international, national or human security issues. However, this triple securitization of issues of global environmental change (climate change, water, and desertification) is just emerging.

The shift in the thinking from the individual or community as the victim, to humankind as the new collective security danger, implies a search for new soft security policies, strategies, and measures beyond the armed forces and their operational logic and toolkit. The security dangers for humankind in the Anthropocene age confront us with a puzzle, scientists, citizens and policy-makers will be forced to gradually understand and to find new concepts as policy guidelines. By securitizing – but not militarizing – these challenges they have been put on the top of national and international policy agendas and public concerns. Problem recognition is a precondition for anticipatory learning and proactive policies. Policy concepts, such as human security, have already played a crucial role in the process of problem recognition, contextualization, and policy framing.

ject of security to the individual, the community, the people or humankind.

While no agreement could be reached both in the political and scientific realm on the definition of human security, the concept helped to legitimate four distinct policy agendas for humanitarian initiatives and sustainable development, for sustaining the rule of law and human rights and addressing global climate change and human-induced hydro-meteorological natural hazards. The author called for developing the environmental dimension of human security both conceptually and politically by interpreting the coping strategies (of both adaptation and mitigation) in the context of a widened and deepened understanding of security, where the human security concept has played an important role.

The transition towards the Anthropocene era necessitates a fundamental shift in the understanding of the threat posed by global environmental change to both national and especially human security that also requires a change in the thinking on security and in the policy response to this challenge. This argument will be developed further in chapter 99 below.

74.6 Conclusions

This chapter reviewed both the policy debates and the scientific discourses on human security since the publication of the *Human Development Report 1994* by UNDP. The subsequent debate and discourse has shifted the focus from the state as the key referent ob-

75 The Human Security Network: A Global North-South Coalition

Claudia F. Fuentes Julio and Hans Günter Brauch

75.1 Introduction^{1, 2}

The concept of human security represents an effort to move away from traditional conceptions of security and towards a definition that more thoroughly captures the new security challenges facing countries and individuals. This shift reflects a notable conceptual transition away from the perspective that dominated the Cold War, which emphasized state-centric actions and the role of military power, and thus advocates a new perspective based on the security of individuals. This new era is characterized by threats that are more diffuse and diverse than simply military attacks against territory, and recognizes that many non-state actors have the potential to threaten security (Brauch 2005, 2005a, 2008, 2008a, 2008b, 2008c, chap. 74).

The first effort to define the concept of human security was made by the UN Development Programme in 1994. UNDP's vision was broad, and was grounded in seven dimensions of security: economic, food, health, environmental, personal, community, and political security (UNDP 1994). UNDP aimed to redirect the international discourse on security, shifting from a territorial conception towards one that emphasizes sustainable human development (Krause 2005).

In the subsequent years, human security was increasingly adopted in the international community.

One example was the extent to which the campaign that led to the Mine Ban Treaty, known as the Ottawa Convention, explicitly adopted the language of human security into its efforts. The cause was further advanced through reports by UN agencies that helped stimulate a public debate about the security of individuals in the context of civil wars and humanitarian interventions. It is notable that the concept of human security thus emerged not from the academic world but rather as part of the international policymaking process (Annan 2001, 2005).

Although the theoretical framework for human security continues to be debated, the concept increasingly has been invoked by governments, international institutions (UNDP, UNESCO, UNU) and NGOs in diverse areas of international policy. Countries such as Canada and Japan have defined human security as a pillar of their foreign policies as well as a foundation for efforts toward international cooperation. Other countries such as Chile and Mali have incorporated human security into their foreign policies, but to a lesser degree.

Thus the concept of human security has become a rallying point for international cooperation, a so-called 'political *leitmotif*' for a diverse set of actors. In other words, it has become "a more or less coherent idea which shapes the attitude and performance of actors" at the international level and helps "to formulate political agendas or to guide decisions." Moreover, that coherency remains even though some criticize the concept for its flexibility and ambiguity (Werthes/Debiel 2006: 12).

This chapter examines the work of the *Human Security Network* (HSN) as an example of a policy framework for coordination and action on the part of countries united by a commitment to applying a human security perspective to international problems. It thus addresses the following questions: Why has this group of such diverse countries united to promote human security at the international level? How have they coordinated decisions on which issues to address?

1 Claudia Fuentes received support for this chapter as part of FONDECYT research project #1050231. She also relies on the previous publications by Fuentes/Rojas (2005, 2005a).

2 The additions for the last three presidencies of Thailand, Slovenia and Greece (2005-2008) by Brauch (2006h) partly rely on a contract study for UNESCO. They are also based on the websites of the Human Security Network <<http://www.humansecuritynetwork.org/menu-e.php>> as well as on the websites of the Foreign Ministries of Slovenia <http://www.mzz.gov.si/en/foreign_policy/human_security_network_hsn/> and Greece <http://www.mfa.gr/www.mfa.gr/Articles/en-US/ts18052007_KL2115.htm>.

How have they managed to build consensus around concrete actions?

The chapter first analyses the objectives of the HSN (75.2) and explores the reasons for which the member countries have chosen to join forces to advocate for these objectives at the international level. It examines the specific agenda items on which the HSN member states have focused their efforts, as well as the mechanisms for coordination that have allowed concerted collective action (75.3). It concludes with reflections on the role of the HSN in the international community (75.4).

75.2 Background and Objectives of the Human Security Network

The Human Security Network (HSN) emerged as part of a bilateral agreement between Canada and Norway, signed on the island of Lysoen, Norway in 1998, the objective of which was to generate consensus on a theoretical framework and action agenda for human security (Fuentes 2002, 2003). The agreement had been preceded by their successful coordination as part of the international campaign that culminated in the Ottawa Convention.

In addition, the 1998 agreement called upon other countries to join their effort to push forward the human security agenda. In 1999, the Human Security Network held its first official meeting, thus becoming a group of like-minded countries that, through informal and flexible mechanisms, would seek to generate consensus and promote practical actions as part of this agenda. In February 2008, the HSN has included thirteen countries: Austria, Canada, Chile, Costa Rica, Greece, Ireland, Jordan, Mali, Norway, Slovenia, South Africa (observer), Switzerland and Thailand. During the 8th Ministerial meeting in Bangkok on 1 June 2006, Japan initiated a policy: “Toward forming friends of the Human Security.”³

The Chairman’s Summary of the First Ministerial Meeting of the HSN stated that “human security has become both a new measure of global security and a new agenda for global action.”⁴ Furthermore, the HSN argues that “the network plays a catalytic role by bringing international attention to new and emerging issues. By applying a human security perspective to international problems, the network aims to energize political processes aimed at preventing or solving conflicts and promoting peace and development.”⁵ In a recent document that developed a medium-term work plan, the HSN further specified its objectives by draw-

ing international attention to emerging threats to people’s safety, security and well-being,

- Identifying concrete areas for collective action on human security,
- Promoting greater understanding of, and support for, human security issues, and
- Advancing human security issues at the regional level, within regional groups, and through international negotiations and conferences.⁶

This declaration reflects two key related elements that converged and led to the creation of the Network. First, the HSN is a group of like-minded countries united by common values. They are spread across the globe, but they share economic interests, political orientation and similar conceptions of their role in the international community. The HSN is thus a coalition of countries from the South and North whose fundamental connection is an agenda based on the promotion of democratic principles and human rights. The coalition includes countries from every continent that range the spectrum in terms of indicators such as economic growth and human development (see table 75.1). Nonetheless, they are united by values demonstrated in their declaration, “A commitment to human rights and humanitarian law is the foundation for building human security.”⁷

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- 3 See speech by Amb. Yukio Takasu; at: <http://www.mofa.go.jp/policy/human_secu/state0606.html>; and at the 9th Ministerial Meeting, Ljubljana, Slovenia, 17–18 May 2007; at: <<http://www.humansecuritynetwork.org/docs/2007-ministerial-meeting-ii-takasu.doc>>. At the second meeting of the Friends of the Human Security Network (FHS) in April 2007, co-chaired by Japan and Mexico, they agreed to “collaborate in mainstreaming human security approach in those UN activities related to MDGs, humanitarian assistance, climate change, peace-building, and protection of children.” Amb. Takasu referred to three major priorities of the FHS: 1) post-conflict peace building; 2) human trafficking; and 3) achievement of the MDGs. On 12 September 2007 Amb. Yukio Takasu was elected as chairman of the *UN Peacebuilding Commission* (PBC); at: <http://www.un.org/News/Press/docs/2007/pbc_20.doc.htm>.
 - 4 “A Perspective on Human Security, Chairman’s Summary”, 20 May 1999; at: <http://www.humansecuritynetwork.org/docs/Chairman_summaryMay99-e.php>.
 - 5 Human Security Network: “The Network”; at: <<http://www.humansecuritynetwork.org/network-e.php>>.
 - 6 Second HSN Medium Term Workplan, 2005–2008; at: <<http://www.humansecuritynetwork.org/docs/Second%20Midterm%20Workplan-e.php>>.
 - 7 Human Security Network: “Principles”, at: <<http://www.humansecuritynetwork.org/principles-e.php>>.

Table 75.1: Countries of the Human Security Network. **Source:** Population: PRB 2005: 2005 World Population Data Set; Human Development Index. GDP per capita: UNDP (2005a); membership in multilateral international organizations. Compiled and updated by Hans Günter Brauch.

	Population (2005-2050)		Human Development Index, 2003	GDP per capita, PPP US \$2003	Membership in international organizations in February 2008
Austria	8.2	8.2	17	30.094	OSCE, EU
Canada	32.2	36.9	5	30.677	OSCE, NATO, HRC
Chile	16.1	20.5	37	10.274	OAS, PBC
Costa Rica	4.3	6.3	47	9.606	OAS
Greece	11.1	10.6	24	19.954	OSCE,EU, NATO
Ireland	4.1	4.7	8	37.738	OSCE, EU
Jordan	5.8	10.4	90	4.320	LAS, HRC
Mali	13.5	42.0	174	994	AU, HRC
Norway	4.6	5.6	1	37.670	OSCE,NATO, PBC
Slovenia	2.0	1.9	26	19.150	OSCE, EU, NATO, HRC
South Africa (obs.)	46.9	48.1	120	10.346	AU, HRC
Switzerland	7.4	7.2	7	30.552	OSCE, HRC
Thailand	65.0	73.2	73	7.695	ASEAN

Traditionally, international coalitions have arisen among geographically proximal countries who seek to strengthen ties with an eye toward regional cross-border cooperation. Currently, however, such alliances have diversified, and now more often tend to entail coalitions based on shared values, rather than shared borders. One such transnational project has been the campaign against hunger and poverty involving Brazil, Chile, Spain and France, in which they have lobbied for the United Nations to take action. In fact, Chile provides a particularly interesting example, since it has placed international cooperation at the centre of its foreign policy, with particular emphasis on such non-traditional coalitions based on common interests and values rather than territorial aims (see: Michelle Bachelet Platform, in: Fuentes/Fuentes 2006).

Second, the HSN is an example of a 'new diplomacy' based on 'soft power'. The member countries of the *Human Security Network* see in the coalition the potential to bolster their collective influence in the international community. Given the countries involved, that power clearly is not a result of military strength or the capacity to coerce (i.e. hard power) but rather the result of the capacity to 'seduce' other countries using ideas, values and principles. Joseph Nye describes soft power as:

the ability to get what you want through attraction rather than coercion and payments. It arises from the attractiveness of a country's culture, political ideals and

policies... When you can get others to admire your ideals and to want what you want, you do not have to spend so much on sticks and carrots to move them in your direction. Seduction is always more effective than coercion (Nye 2004: Preface IX)

Indeed, the countries of the Network, including its founders, Canada and Norway, and epitomized by the member state Switzerland, have relatively little military power. But at the same time they are seen as powerful international actors due, in large part, to their capacity as negotiators. In addition, other member countries of the HSN, such as Chile, actively seek the respect of the international community for their commitment to promoting democratic principles after years of military dictatorship. These countries thus seek to strengthen their international influence by helping unite countries around shared values.

Lloyd Axworthy, former Foreign Minister of Canada, described the agreement between Canada and Norway that formed the HSN in the following terms:

As we saw in the development of the Landmine Treaty, 'soft power techniques' such as ideas, negotiation and bridge building, have become effective new tools of international diplomacy... Canada's partnership throughout the process that led to the Treaty demonstrates that our shared values and approaches to foreign policy can make a difference in the international agenda.⁸

Table 75.2: Agendas of nine Ministerial Meetings of the HSN (1999-2007). **Source:** Compilation by the authors, based on “Chair’s Summary” of the Ministerial Meetings of the HSN.

Lysoen-Bergen Norway 1999	Lucerne Switzerland 2000	Petra Jordan 2001	Santiago Chile 2002	Graz Austria 2003	Bamako Mali 2004	Ottawa Canada 2005	Bangkok Thailand 2006	Ljubljana Slovenia 2007
<ul style="list-style-type: none"> • Antipersonnel landmines • Small arms • Children in armed conflict • Human Rights • International humanitarian law • International Criminal Court • Peacekeeping • Conflict Prevention • Transnational organized crime • Development and security 	<ul style="list-style-type: none"> • Small arms • Armed non-state actors • Corporate Citizenship • Education in Human Rights • Children in armed conflict • Armed non-state actors • Corporate citizenship • Conflict Prevention • International Criminal Court • Antipersonnel landmines • Protecting civilians in armed conflict 	<ul style="list-style-type: none"> • Development and Human Security • Peacekeeping • Children in armed conflict • Human Security Index • HIV/AIDS • Gender and human security • Small arms 	<ul style="list-style-type: none"> • Human Security Index • Education in Human Rights • Public security and human security 	<ul style="list-style-type: none"> • Children in armed conflict • Education in Human Rights 	<ul style="list-style-type: none"> • Children in armed conflict • Small arms trafficking • Gender and peacekeeping • Education in Human Rights 	<ul style="list-style-type: none"> • United Nations reform • UN Secretary General Report “In Larger Freedom” 	<ul style="list-style-type: none"> • people-centred development • HIV/AIDS • human trafficking • new issues: environment: global environmental change and natural hazards 	<ul style="list-style-type: none"> • landmines, cluster munitions • protection of women, children, • fight against HIV/AIDS • human trafficking • fight against poverty • WG on children in armed conflicts • climate change impact on vulnerable groups.

75.3 The Agenda of the Human Security Network

Several concrete themes have emerged from the nine meetings of the HSN between 1999 and 2007, creating a broad agenda that reflects the myriad issues involved in human security. As table 75.2 illustrates, the HSN has focused on the following topics: the prohi-

bition and extraction of antipersonnel landmines, small arms, children in armed conflict, and education in human rights, and since 2007 also on climate change. Since 2004, the HSN has increasingly emphasized the importance of UN reform as well as the value of incorporating the concept of human security into the work of the UN. In 2005 the HSN member countries defined a work plan (2005–2008) that emphasized several concrete areas of cooperation:

8 Press Release, 1998: “Canada and Norway form New Partnership on Human Security.” Norwegian Initiative on Small Arms Transfers (NISAT), 11 May 1998: at: <http://www.nisat.org/export_laws-regs%20linked/norway/lysoern.htm>.

- Effective multilateral institutions,
- Human Rights,
- Protection of civilians,
- Small arms, light weapons and landmines,
- Women, Peace and Security,

Box 75.1: Excerpts from the paper for the Greek Presidency on: "Human security and the climate change impact on vulnerable groups" of 8 May 2007. Source: HSN, documents of the 9th Ministerial in Slovenia, 17-18 May 2007; at; <<http://www.humansecuritynetwork.org/docs/2007-ministerial-meeting-04-greek%20paper.doc>>.

The United Nations Security Council held on April 17th [2007] its first-ever debate on the impact of climate change on security where it was argued that Climate change was about 'our collective security in a fragile and increasingly interdependent world and that it could not only have serious environmental, social and economic implications, but implications for peace and security, as well.' This is especially true in vulnerable regions and groups which face multiple stresses at the same time – pre-existing conflict, poverty and unequal access to resources, weak institutions, food insecurity and spreading of diseases.

The Greek HSN Chairmanship

Responding to the challenge of a collective, preventive and cross regional approach to this real threat, [the] Greek HSN chairmanship aims at addressing the human security impact of climate change on vulnerable groups, such as women, children and persons fleeing their homes due to climate change.

Most policy-making analysts of climate change often focus on how to mitigate risk, particularly in the context of "national security." Human security issues related to climate change have largely been framed in terms of conflict or cooperation, rather than in terms of "whose security is at stake, and why?"

The Greek HSN chairmanship wishes to emphasize that climate change is an issue that transcends national boundaries and needs to be addressed accordingly, and that it primarily affects the human security particularly in volatile regions and vulnerable groups.

There is a considerable need for more research on the ways climate change might undermine human security, because the level of understanding people's vulnerability is still sufficiently uncertain for the purposes of designing effective response strategies. ... In this respect the human insecurity caused in part by climate change may in turn lead to more conventional security issues. Both security and climate change problems are determined by complex interaction across global, regional, national and local institutions. They also require an understanding of the affected groups' capacities to adapt to change and the limits of those capacities as well as the potential for violent outcomes, should these capacities fail.

In its capacity as a cross-regional forum/platform of communication, the HSN can aim at raising awareness on the human security impact of climate change on vulnerable groups as well as at promoting international synergies to find path-breaking solutions.

Vulnerable Groups

Women

Climate change can give rise to a number of socio-economic related problems which can have an adverse effect on human security. Namely, it is argued that climate change will severely impact the lives of poor women (who form the majority in the developing world), due to a number of different reasons. Among them first and foremost comes the issue of malnutrition. In many poor countries it is often the case that women are forced to eat less than men and it is therefore anticipated that in cases of scarcity of resources or

natural disasters caused by climate change, it will again be women to be malnourished, something extremely dangerous, especially during pregnancy. In addition, in the event of natural disasters it will be more often them who are vulnerable, since they have to save both their children and themselves.

Also women (and children) refugees created by natural disasters or conflicts caused by scarcity of resources, are exposed to increased risks compared to male refugees, be it in refugee camps, or in their resettlement areas, or even in countries where they seek asylum. Women and girls, in particular, are vulnerable to exploitation, trafficking and other forms of gender-based violence, while children can also be the prey of military recruitment and abduction.

Children

The consequences of climate change mean that the lives of up to tens of millions of children will be endangered by floods, drought and climate change related diseases, over the next decades. This is also the conclusion of a new report by Save the Children UK on how climate change will specifically affect children. Millions of children will be killed, forced to flee their homes and be put at risk from hunger, disease and physical or sexual abuse. Children in developing countries, where there are few adequate warning systems or strategies to lower risk, will also be most affected by 'slow-moving' disasters, including temperature extremes, desertification, and a rise in sea level brought by climate change. Small-scale disasters, which are typically overlooked by the international community, will also intensify, most affecting vulnerable communities living in rural areas, on flood plains or on steep slopes at risk of erosion.

Persons fleeing their homes due to climate change

It is worth quoting a study of 1995 which stated that, at the time, at least 25 million have fled their homes for environmental and climate reasons (due to changing environmental and climate conditions) and this number should double by 2010. The Red Cross estimates more people are now displaced by environmental disasters than by war. It is also important to stress that these people are mostly women and children.

The impacts will be more significant in sectors of the population with high resource-dependency, and in the environmentally and socially marginalized areas. Some of these climate driven outcomes are long term and chronic (such as declining productivity of agricultural land), while others are episodic. Stresses from climate change will differentially affect those made vulnerable by present political-economic processes. The impacts of climate change are likely to increase the costs of providing public infrastructure and services, and may affect State revenues. Therefore, climate change may have a negative impact on the State's ability to create opportunities and provide important freedoms for people, as well as its capacity to adapt and respond to climate change itself. Migration may be one response of people whose livelihoods are affected by climate change, although climate alone is unlikely to be the sole, or even the most important 'push' factor in migration decisions. Yet large-scale movements of people may increase the risk of conflict in host communities.

Table 75.3: List of Lead and Partner Countries for HSN Activities. **Source:** See at: <<http://www.humansecuritynetwork.org/docs/Table%20of%20Lead%20and%20Partner%20Countries-e.php>>.

	Issues	Lead Country/ Countries	Partner Countries
Cluster 1: People-centred Development and HIV/AIDS			
1	HIV/AIDS	Thailand	
2	People-centred development as a process of empowerment	Thailand, Greece	
Cluster 2: Human Rights and Humanitarian Affairs			
3	Human Rights Education	Austria	Thailand, Slovenia
4	Strengthening effectiveness of the UN human rights mechanisms	Canada, Switzerland	Slovenia
5	Children affected by armed conflict		Austria, Slovenia, Switzerland
6	Women, Peace and Security		Austria, Canada, Switzerland
7	Landmines	Austria	Canada, Chile, Thailand Slovenia, Switzerland
8	Small Arms and Light Weapons	Mali	Canada, Switzerland
Cluster 3: Emerging Issues			
9	Responsibility to Protect	Canada	Switzerland
10	Trafficking in persons, especially women and children	Thailand, Greece	Austria, Switzerland

- HIV/AIDS,
- Poverty and individual-directed development, and
- Other emerging issues.⁹

During its 10th ministerial meeting in Athens, in May 2008, the Greek presidency will address as a new theme: “Human Security and Climate Change Impact on Vulnerable Groups” (box 75.1). Since 2007, the members of the HSN have developed their next Medium Term Work Plan for 2009–2012 and during its 10th anniversary in Athens, “its members will review the work done so far and discuss working methods as well as future action.”

The Network has organized its work agenda around a series of intergovernmental meetings held in each of the member countries. In these conferences, Foreign Ministers meet with representatives of civil society involved in the issues under consideration. The participants consider issues according to a set agenda, evaluate proposals related to each element of the agenda, and discuss future areas in which the Network should become involved.

During the Thai presidency (2005–2006). The activities of the HSN focused on three clusters: 1) people-centred development and HIV/AIDS; 2) human rights and humanitarian affairs; and 3) emerging issues with lead and partner countries (table 75.3) taking the initiative.

The network has concentrated its efforts on building consensus to leverage the HSN’s influence among multilateral institutions. Since 2000, the HSN has realized thirty eight declarations, each of which calls upon international organizations such as the U.N. Security Council and the U.N. General Assembly to adopt specific proposals.¹⁰ Through such declarations, the HSN has played a key role in driving forward a number of important international conventions, including the Ottawa Convention, the Action Plan against Small Arms, the Additional Protocol to the Convention of the Rights of the Child, the Additional Protocol to the Convention Against Torture, and the Treaty of Rome establishing the International Criminal Court, and on 30 May 2008 the adaption of the Convention on Cluster Munitions in Dublin.

9 Second HSN Medium Term Workplan, 2005–2008; at: <<http://www.humansecuritynetwork.org/docs/Second%20Midterm%20Workplan-e.php>>.

10 See at: <http://www.humansecuritynetwork.org/statements-e.php>

In addition to seeking common interests and building consensus, each of the member countries has used the Ministerial meetings to bring a range of national and regional issues to the attention of the international body (Winter 2003). Some examples are the following:

- Education in issues of human rights (Canada, Switzerland and Austria);
- Protection of children (Austria, Slovenia and Jordan);
- Child soldiers and the protection of civilians in humanitarian crises in Africa (Mali);
- The spread of AIDS in Southeast Asia (Thailand);
- Human security and the climate change impact on vulnerable groups (Greece).

Through these initiatives, the HSN has incorporated diverse national concerns into its agenda. By adopting flexible mechanisms that allow for a variety of issues to be proposed, the Network has managed to address a series of critical international problems while simultaneously raising its profile in the international community. This is one area in which the flexibility of the concept of human security has been valuable, as it has allowed the HSN to strategically define its policy framework for action.

During the Canadian Presidency in 2004–2005, the HSN focused on the established human security issues (human rights, small and light arms, landmines, children affected by armed conflicts), and on emerging ones (responsibility to protect, HIV/AIDS, women, peace and security) by encouraging discussions surrounding the UN Security Council (Women Peace and Security Resolution).¹¹

During the Thai Presidency (2005–2006) at the 8th Ministerial meeting on 1–2 June 2006 in Bangkok the Thai foreign minister, Kantathi Suphamongkhon, suggested that the HSN should broaden its scope:

We should encourage a balanced approach towards both freedom from want and freedom from fear. The two freedoms are linked. ... We should broaden the scope of our focus into non-traditional threats to human security. This includes the need to address the problem of environmental degradation as well as life threatening diseases and natural disasters. Indeed, during the Human Security Network International Symposium on Building and Synergizing Partnership for Global Human Security and Development, held here in Bangkok yesterday and the day before, it was proposed that ‘freedom

from hazard impact’ be added to our list of concerned topics.¹²

In the ‘chairman’s summary’, the Thai foreign minister noted the traditional and non-traditional threats to human security and he stressed that the HSN “must continue to produce concrete results ... and remain a credible and effective force for providing political impetus to the cause of human security,” i.a. by “the creation of a network of Friends of the HSN,” and a broadening of its scope:

The network should also encourage a balanced approach towards both freedom from want and freedom from fear and broaden the scope of its focus into non-traditional threats to human security by addressing ‘freedom from hazard impact’ such as threatening diseases and natural disasters and promoting ‘freedom from exclusion’ through the involvement of the public in human security dialogue in order to engage all stakeholders.

The 8th ministerial recognized the “serious threats to human security posed by HIV/AIDS, Avian Influenza and a possible human influenza pandemic, SARS and other epidemics, including malaria” and it agreed to “promote and strengthen cooperation, for example, through advocating the mainstreaming of human security perspectives on health issues at all levels of the planning and implementation of policies and plans to address these problems.” The chairman’s summary noted also the proposals on the roles of the HSN made by the civil society:

(1) *Environment*: prevention of global environmental impact as a result of human activities, with emphasis on the cross-sectional connection between human security and environmental impact, the significance of humanitarian assistance, and engagement with the business sector such as the insurance industry in time of natural disasters; (2) *HIV/AIDS*: integration and measurement of human security in existing HIV/AIDS national programmes; (3) *Human rights education*: workshops should be convened to raise awareness on the linkage between human rights and human security through human rights education; and (4) *Small arms and light weapons*: support from governments for dialogues on these problems.¹³

During its presidency (2006–2007) Slovenia has addressed: a) the role of the HSN in the Human Rights

11 See at: <<http://www.humansecuritynetwork.org/docs/28oct2004-e.php>>.

12 See his speech on 1 June 2006, at: <http://www.humansecuritynetwork.org/docs/FM_HSN_Message.pdf>; and at: <<http://www.mfa.go.th/web/200.php?id=16523>>.

13 See the chairman’s summary at: <http://www.humansecuritynetwork.org/docs/HSN_Chairs_Summary.pdf>.

Box 75.2: Excerpts from the “Chair’s statement” on the results of the “9th HSN Ministerial Meeting, Ljubljana, Slovenia, 17-18 May 2007”. Source: <<http://www.humansecuritynetwork.org/docs/2007-ministerial-meeting-01-chair-statement.doc>>.

Protection of children from different forms of violence, including armed conflict

The 9th HSN Ministerial Meeting was devoted particularly to the protection of children from different forms of violence including armed conflict and urban armed violence. ... The HSN recognized that important UN events initiatives and processes on children, scheduled to take place in 2007 offer the opportunity for possible action to advance the agenda on children at international, regional and national levels and in particular to ensure that the protection of children continues to get high priority attention.

The Network encouraged a synergy of efforts and coordinated action of different stakeholders including governments, UN agencies and civil society organizations. In this regard, the Network recognized the importance of pursuing the implementation of the Convention on the Rights of the Child and its optional protocols.

It further recognized the importance of addressing the protection of children from all forms of violence, abuse and exploitation in a holistic manner in times of peace and war as well as in pre- and post-conflict situations as a means of preventing the impact of conflict on children including in its diplomatic, technical assistance and donor roles. In this respect the incoming Greek chairmanship is prepared to touch upon the issue of the impact of climate change on vulnerable groups as children.

The HSN reiterated its long-standing commitment to the protection of children affected by armed conflict and recognized the substantial progress made in this area including the implementation of the Optional Protocol to the Convention on the Rights of the Child on the involvement of children in armed conflict. The Network supported the adoption of the Paris Commitments and Principles on children associated with armed forces or armed groups in February this year. The Paris Principles are a set of Guidelines which relate to the protection of children from recruitment or use in armed conflict, their release and successful reintegration into civilian life. The Paris Commitments are

legal, administrative and operational measures to prevent the unlawful recruitment or use of children by armed forces or groups.

The Network expressed its commitment to continue providing prominent attention to the protection of children's rights from violence and armed conflict at the celebration of the fifth anniversary of the UN General Assembly Special Session on Children to be held in the fall of this year. In this regard, the HSN could collaborate with civil society organizations and encourage the participation of children on this occasion.

The Network highlighted the added value of the promotion of a further follow-up to the UN Study on Violence against Children at the national, regional and international levels, framed by the recommendations of the Study and including the time allowed for recommendations as well as recognizing the multifaceted nature of violence.

HSN members stressed the opportunity provided by the 10 year Strategic Review of the Machel Study conducted by SRSGCAAC in close collaboration with UNICEF to ensure a strategic focus to issues in the field of children and armed conflict, which require further attention.

The Network also recognized the importance of the integration of the protection of children and their rights in the peace and security agenda and in the work of the Peacebuilding Commission. In particular, the Network expressed support for the Security Council resolution 1612 and the work of the Security Council Working Group on Children and Armed Conflict.

The Network considered the possibility of organising a relevant event at the 62nd session of the UN General Assembly with the SRSGCAAC, UN Expert on Violence against Children, the Chair of the Committee on the Rights of the Child and UNICEF to address the child protection concerns in an integrated and strategic manner, as well as in the framework of the priorities of the incoming chair.

The HSN also expressed its intention to provide leadership to a holistic approach to child protection discussions in other international fora including the Human Rights Council as well as within relevant regional bodies and organizations, as appropriate.

Council; b) promotion of intercultural dialogue through human rights education; c) violence against children and children affected by armed conflicts (box 75.2).¹⁴ This was followed by presidencies of Greece (2007–2008) and Ireland (2008–2009).

Building on the success of the *International Campaign against Landmines* and the landmine convention adopted in Ottawa in 1999, the HSN – often in cooperation with citizen’s movements, NGOs and in-

dependent experts – has been a key actor in pushing selected policy issues on the agenda of multilateral organizations, and adding human security on the agenda of both the Security Council and the General Assembly. The agenda of the HSN’s activities addressed all four pillars of the human security concept: 1) ‘Freedom from want’ (UNDP 1994; CHS 2003; Japanese approach), 2) ‘freedom from fear’ (Canadian, Norwegian approach); 3) ‘freedom to live in dignity’ (focus of Austria, Switzerland et al.); 4) ‘freedom from hazard impacts’ (Bogardi/Brauch 2005).

14 See at: <http://www.humansecuritynetwork.org/docs/Slovenian_Plan_of_Action.pdf>.

Table 75.4: The Human Security Network and the four pillars of the Human Security Concept. **Source:** Hans Günter Brauch 2006h and 2008g.

Pillars	UNDP 1994	Pillar I: 'Freedom from want'	Pillar II: 'Freedom from fear'	Pillar III: 'Freedom to live in dignity'	Pillar IV: 'Freedom from hazard impacts'
Policy and issue areas (goal)	Human security	Human, economic, social development	Violence in conflicts, small arms	Rule of law, human rights, democracy	Environmental stress and natural hazards
Promoters (UN System)	UNDP	UNDP, UNESCO, UNU	UNESCO, UNDP, UNU	Secretary General, UNESCO, UNHCR, HRC,	UNESCO, OCHA, UNEP, UNDP, UN/ISDR, UNU-EHS, ENVSEC
Governments		Japan, Thailand, HSN	Canada, Norway, HSN	Austria, Switzerland, Slovenia	<topics: EU, Germany, Japan>
Dimensions					
• Military			(x)		
• Political	(x)		(x)	(x)	
• Economic	(x)	(x)	(x)		(x)
• Societal		(x)	(x)	(x)	(x)
• Environmental	(x)	(x)	(x)	(x)	(x)
Sectoral Security Concepts					
• Food	(x)	(x)		(x)	(x)
• Water		(x)	(x)	(x)	(x)
• Health	(x)	(x)		(x)	(x)
Other Features					
• Community	(x)				
• Personal	(x)				
• Gender			UN-INSTRAW		
• Livelihood					
Agenda items of the Human Security Network (1999-2006)		human & people-centred development, HIV/AIDS,	Antipersonnel Landmines, protection of children in armed conflict, control of small arms & light weapons, conflict prevention, women, peace, security	International Criminal Court, Human Rights Council; Human rights education, implementation of international humanitarian & human rights law, against transnational organized crime, human trafficking	Discussed at the 8 th ministerial meeting of the HSN on 1-2 June 2006 in Bangkok

In a case study on 'Human Security and the Security Council' Dedring (2008) analysed a Canadian initiative during 1999 and 2000 as a non-permanent member in the UNSC transforming 'human security'

into a practical policy guideline that led the UNSC to adopt the 'Protection of Civilians in Armed Conflict' as a new agenda item (Mc Rae/Hubert 2001).

According to Dedring (2008), three trends led to this successful initiative in the UNSC: a) the transformation of the human security concept into a concrete policy norm on the threat by armed conflict against civilians; b) the key role of the *Human Security Network* in garnering the increased responsibility of the UN system as a central pillar of global governance; c) support for the issue of civilian protection in armed conflict by the *High-level Panel on Threats, Challenges and Change* (UN 2004), which discusses 'protecting civilians' in detail and offers several policy recommendations to support specific UN actions. Several members of the *Human Security Network* were involved in the UNSC work where initiative and guidance often comes from non-permanent members who succeeded including the central obligation to ensure the security of the individual in the changing world on the UNSC agenda.

Launching the 'Friends of the Human Security Network' on 1 June 2006 in Bangkok, the Japanese Ambassador in charge of Human Security Yukio Takasu¹⁵ stated with reference to paragraph 143 in the 'Outcome Document' of the GA of September 2005 (von Einsiedel/Nitzschke/Chhabra 2008):

We should not rush to seek formal discussions in the UN on the definition of human security; such as holding formal consultations for negotiating over a legal definition. While human security is a value based approach, it is more to do with a policy-oriented concept. While the Outcome Document affirmed the importance of human security at above mentioned qualification on the use of force under the responsibility to protect, some member states still have reservation on human security, particularly over its relationship with humanitarian intervention. Therefore, it will be counter-productive to seek to define at this stage the concept of human security at a formal UN session. It would be sufficient to agree on a general operational definition as a base of collaborative efforts such as: e.g. to 'protect the vital core of all human lives in ways that enhance human freedoms and human fulfillment' [CHS 2003].

We should rather concentrate on achieving cooperation among interested countries, broaden areas of agreement and partnership rather than focusing on different emphasis; practicing the concept, taking concrete actions, implementing joint projects and combining efforts and resources together, to improve the situation of vulnerable people who are under severe threats. We should minimize formality and prefer an informal modality; such as informal discussions among concerned countries at senior official levels with no regular

meetings, and informal discussions and exchange of views on specific themes will be held on an ad hoc basis in and around NY at the margins of appropriate UN meetings.

Since October 2005 Japan has discussed its proposal of forming "Friends of Human Security" at several seminars, e.g. at the APEC Human Security Seminar (Tokyo, Oct. 2005); the Mexico-Japan Human Security Workshop (Mexico City), at a Swedish IPA Seminar (NY, February 2006), at an OSCE - Thailand Human Security Seminar (Bangkok, April 2006) and at a meeting with the UN Secretary General (Tokyo, May 2006).

During the Japan-EU Summit in April 2006, both sides also agreed to cooperate in spreading the concept of human security as well as promoting concrete actions in the UN and other fora. Currently, Japan is exploring with Mexico and the UN Secretariat the possibility of organizing an informal Friends of Human Security meeting in NY in the near future.¹⁶

Moreover, the diverse implications and applications of the concept of human security have allowed it to become a multidimensional conceptual foundation on which the diverse member countries can build consensus and act in coordination on the international stage (Werthes/Bosold 2006). Thus while academic actors call for a more concrete definition of human security (Owen 2004), the experience of the HSN demonstrates that it is precisely the flexibility of the term that is its most significant comparative advantage, since that flexibility has allowed member countries to generate consensus around an international agenda dedicated to promoting human security worldwide.

75.4 Conclusions

The Human Security Network represents a novel international mechanism for countries from a variety of regions to unite around common interests. The Network has created a structure that is explicitly informal and flexible, which has allowed it to overcome the bureaucratic inertia that has characterized traditional international organizations, thereby providing an effective approach for promoting international action on concrete problems. The HSN's effectiveness is the result of three key advantages:

First, it has developed a recognized capacity in *international agenda-setting*. The member countries,

15 See at: <http://www.mofa.go.jp/policy/human_secu/state0606.html>.

16 See at: <http://www.mofa.go.jp/policy/human_secu/state0606.html>.

through collective advocacy, have succeeded in placing a number of human security issues on the international agenda that would rarely have previously been considered to be matters of international security. Such issues include landmine destruction and aid to landmine victims, small arms trafficking, the rights of children in armed conflict, international humanitarian law, and climate change impact on vulnerable groups. In addition, the HSN has developed creative mechanisms for raising the profile of such issues and convincing the United Nations of the need to address them. Members of the HSN have succeeded putting human security issues on the agenda of the UNSC and including it into the 'Outcome Document' on UN reform adopted by the UN GA in September 2005.

Second, it has emphasized the *broad and multidimensional* nature of both the concept of human security as well as of the Network itself. By maintaining this approach and arguing that security must be addressed holistically, the Network has succeeded in pushing forward a diverse agenda in an inclusive and participatory way.

Third, it has become a platform on which countries can lobby collectively for issues of common concern, thereby contributing to the *international policy-making process*. Human security provides the framework through which like-minded countries can work together to address global problems that the international community has traditionally been unable to solve. Moreover, it allows countries that traditionally have little power on the international stage to leverage their collective influence, resources and experiences to become relevant players in international policymaking.

While these advantages have undoubtedly helped the HSN achieve a notable degree of international influence, much remains to be understood about the full scope of that influence. Thus future academic and public policy research should focus on the following areas.

First, researchers should examine the degree to which the member countries have adopted the policies advocated by the Network, as well as the ways in which they have used their foreign policies to push forward the Network's agenda. For example, the HSN has explicitly called upon the international community to combat illicit trafficking of small arms, but has not called for a general reduction in the trade or production of such weapons. This is explained largely by the fact that Austria, Canada and Switzerland remain the leading international producers of small arms, and often export them to countries with high

levels of crime and public insecurity (Bosold/Werthes 2006). As another example, Chile has still not ratified the Treaty of Rome, even though the HSN has repeatedly called upon countries to do so. Thus in the coming years, researchers should examine in depth the degree to which member countries act on their rhetorical commitments as part of the HSN and adopt the policies and practices necessary to effectively promote human security.

Finally, member states should consider ways to strengthen the role of civil society within the framework of the Network. The flexibility of the HSN should be seen as a way for civil society organizations to directly advocate for international action. By reaching out to civil society, the Network could take advantage of the wealth of mechanisms for policy diagnosis, implementation, monitoring and evaluation that have already been developed by such organizations. One concrete step could be to develop mechanisms to improve the representation of civil society organizations at the ministerial meetings of the HSN. In addition, civil society organizations could develop proposals for effectively implementing the recommendations of the Network, both at the national level in the member countries as well as in countries around the world.

76 Theoretical Perspective on Human Security: A South Asian View

A. K. M. Abdus Sabur

76.1 Introduction¹

Since its very inception, the term 'security' has remained an "ambiguous symbol" (Wolfers 1962: 147-65) and an "essentially contested concept" (Galie 1962: 121-46). "Security, in an objective sense, measures the absence of threats to acquired values, in subjective sense, the absence of fear that such values will be attacked" (Wolfers 1962: 150) has, for long, been considered to be the 'standard' definition of security. As defined from the perspective of the International Relations discipline, the definition leaves a number of questions open. Whose values might be attacked? Which are these values? Who might attack them, and why and by which means? How could this fear be measured? The list of questions that follow the definition mentioned above is quite long (Møller 2001, 2003). Only a few of them are cited above. Nonetheless, security thinking was until very recently an almost exclusive domain of the International Relations discipline and dominated by the realist or neo-realist school of thought (Morgenthau 1960; Smith 1986; Waltz 1979; Keohane 1986). The whole gamut of security thinking was focused on ensuring the security of an allegedly insecure state, though the preferred term was 'national security'. This was certainly a misnomer as what the realists have referred to has been the security of the territorial (rather than nation-) state, which was indeed the principal actor in the Westphalian universe. The salient futures of the realist and neo-realist thinking on security could be summarized as follows:

1. Nation states are the basic building blocks of the international system with unlimited sovereignty;
2. Primary function of a nation state is to survive and enhance its power in an anarchical and conflictual international system;
3. Competition between states to maximize one's interests often at the expense of others;
4. Development of individual state's capability (military and otherwise) to ensure security.

While the source of realist and neo-realist school of thought were Westphalian ideas of the nation-state², its overwhelming domination in Post-War security thinking was based on the bipolar East-West division of the world and the Cold War. For a long time, rethinking the meaning of security yielded only marginal results. Neither 'common security' promulgated in the Palme Commission's 1982 report (Independent Commission on Disarmament and Security Issues 1982) nor a radical extension of the idea under 'collective security' (Møller 2001, 2003) could go beyond the state-centric notion of security.

One of the worst outcomes was that 'national security' was achieved at the expense of the security of the individual or people in terms of their political, social, and economic rights and choices. Thus, instead of ensuring the security of its citizens, the state, quite often, has served as a threat to their security. It may be pertinent to mention that over the last century, 30 million people were killed in international wars, 7 million in civil wars, and 170 million people were killed by their own governments (Thakur 2000a: 3). While some concepts on security during the 1970's and 1980's, like, 'comprehensive security' and 'cooperative security' did, indeed, go beyond the state centric

1 This chapter considerably draws on Sabur (2003) and my ongoing research in the context of the BIIS-Ford Foundation Regional Collaborative Research Project on *Human Security in South Asia: Discourse, Practice and Policy Proposition* being administered by the Bangladesh Institute of International and Strategic Studies (BIIS).

2 The Westphalian state system, based on the separation of political and religious authority, evolved in Europe at the end of the Thirty Years War in the seventeenth century. Territorial sovereignty and the state as the only legitimate wielder of force are its identifying characteristics.

security, these were still far from making a decisive break with the realist school (Møller 2001).

The end of the Cold War and the accompanying structural changes of monumental proportion introduced a revolutionary change in security thinking. On the one hand, it has dramatically decreased the traditional security threats to the states that came out victorious in the Cold War. On the other hand, the world was confronted with a series of intra-state violent conflicts of various origins, large-scale atrocities, and even genocide. It suffices to mention that of the 103 wars since the end of the Cold War, 97 have been fought within rather than between states (Preston/Hubert 2000: 345). These could not be explained within the realist and neo-realist security paradigm, much less permit the devising of appropriate remedies.

In the circumstances, rethinking the meaning of security has become a growth industry during the 1990's. In the changed context, while the state-centric security concerns did not disappear, the new security agenda came to include issues as diverse as intra-state conflict, ethnic-religious violence, landmine, terrorism, democracy, human rights, gender, crime, consequences of underdevelopment, poverty, hunger, deprivation, inequality, diseases and health hazards, human development, economic security, market, water, energy, migration, environmental degradation, and so on. As a matter of fact, a process of 'securitization' of a wide range of issues is in the offing, while simultaneously, a degree of caution persists with regard to how far the process can proceed.

Perhaps, the most significant outcome of this process of new thinking on security is the idea that the security of an individual in terms of his physical safety, human dignity, development opportunity, and socio-economic and politico-cultural rights and choices is as important as the security of a state in the traditional sense. Non-military and non-violent threats to the security of an individual or a group of people are no less important than the violent ones. The new thinking also includes the assertion that ensuring security is no more the monopoly of the state. 'Non-state' actors - individuals, communities, civil society organization and others - also have a vital role to play in ensuring security. A whole gamut of new ideas re-defining the meaning of security in terms of safety, opportunity, and choice for the individual and people came to be known as human security; this would be described at greater length in this chapter (United Nations Development Programme 1994; Department of

Foreign Affairs and International Trade 1999; Ogata/Sen 2003).

Since the publication of the *Human Development Report 1994* by the United Nations Development Programme (UNDP), the concept of human security is attracting increasing attention on the part of scholars as well as practitioners. While it is regarded as a reflection of the new security environment of the post-Cold War era, a debate on the utility or relevance of human security is still continuing. Some scholars are sceptical of the validity of the concept. They argue that it is too vague to be examined academically, or that it should not blur the importance of the traditional security agenda (Paris 2001: 87-102). Others, however, brushing aside such scepticism, are moving ahead in articulating theoretical conceptions of and a practitioners' guide to human security. By now, a large number and wide diversity of literature already exists on human security. Nonetheless, the articulation of a succinct theoretical conception on the issue is far from complete. Meanwhile, attempts are also being made to conceptualize human security in general as well as in the context of different world regions (Ahsan 2001: 101-109; Møller 2001: 41-62; Moussa 2001: 87-92; Rojas-Arevena 2001: 69-76; Shaw 2001: 95-100).

In this regard, the relevance of human security to third world regions, particularly South Asia, could hardly be overstated. Notwithstanding the changes at the global level, South Asia remains bogged down in conflicts. Overarching emphasis on traditional security over a long historical period has led to a severe deterioration in the security situation of the regional states. The two regional archrivals, India and Pakistan, have emerged as the most impoverished nuclear powers of the world. Overarching emphasis on traditional security at the expense of progressive socio-economic and politico-cultural development has, ultimately, transformed South Asia, one of the most developed and promising regions of the Third World at decolonization, into the poorest and the most deprived region of the contemporary world. Nonetheless, not only the policy-making circles in the region, but also the academia and media still continue to remain oriented towards military security.

Keeping this in mind, while an attempt is made below to evolve a theoretical perspective on human security, particular attention is paid to South Asia. Thus, part X.2 is devoted to the issue of human security in a general framework, while part X.3 deals with human security in the context of South Asia.

76.2 Human Security: Evolving Theoretical Perspective

In the process of evolving a theoretical perspective on human security six questions have been the focus of scholarly attention: Security for whom? Security of what values? Security from whom? Security from what threats? Security by whom? Security by which means? (Møller 2001, 2003; Bajpai 2000; MacLean 2002) These questions will be discussed in our subsequent analysis, as the answer to these questions reveals the essence of human security and also separates it from traditional security.

While the term ‘human security’ is of recent origin, the ideas that underpin the concept are far from new (Møller 2001; Bajpai 2000; Department of Foreign Affairs and International Trade 1999). However, the articulation of the human security perspective is attributed to the United Nations Development Programme (UNDP) and Mahbub ul Haq. The first major contribution, in this regard, was the *Human Development Report* (UNDP 1994). The Report suggested that the concept of security must change urgently in two ways:

1. From an exclusive stress on territorial security to a much greater stress on people’s security; and
2. From security through armaments to security through sustainable human development (UNDP 1994: 24).

In the Report, the long list of threats to human security was synthesized under seven broad categories:

1. *Economic security* (assured basic income);
2. *Food security* (physical and economic access to food);
3. *Health security* (access to health care, safe environment, etc.);
4. *Environmental security* (safe physical environment);
5. *Personal security* (security from physical violence from the state, other states, groups of people with different identity, criminals, gender violence, drug and other sources);
6. *Community security* (within family, race, ethno-religious community, and so on); and
7. *Political security* (basic human and democratic rights) (UNDP 1994: 24–35).

While the Report mentioned human security as being ‘freedom from want’ and ‘freedom from fear’, its emphasis was certainly more on the first. This reflected the perspective of more developing countries on the

subject. On the other hand Canada, for which the promotion of human security is a significant foreign policy objective, regards the UNDP approach to be “extremely ambitious” (Preston/Hubert 2000: 349) and “unwieldy as a policy instrument” (Department of Foreign Affairs and International Trade 1999: 3). Considering that the UNDP “largely ignored the continuing human insecurity resulting from violent conflict” (Department of Foreign Affairs and International Trade 1999: 3), Canada came out with its own version of human security that puts significantly more emphasis on the ‘freedom from fear’ (Axworthy 1997: 183–96). The concrete issues that Canada emphasizes are:

1. The *protection of civilians in time of war* (legal and physical protection of people in war zones); and
2. The *resolution of violent conflict* (conflict prevention, resolution and post-conflict peacebuilding) (Axworthy 1997: 183–96).

Norway and some other European countries share the same viewpoint on human security (Bajpai 2000). As the ongoing discourse on human security suggests, the divergence of perspectives between the developed and developing countries on the subject is likely to be long lasting. This has led some analysts to argue that there persists a conflict of ideas and even interests between the East and the West concerning a whole gamut of issues pertaining to human security (Acharya 2001: 455–459).

However, the Canadian or European viewpoint on human security is not the sole viewpoint of the developed countries on the subject. The Japanese human security perspective is closer to the UNDP than the Canadian one. Japan also identified the promotion of human security as one of its foreign policy objectives. This was expressed in several speeches by Japanese Prime Minister Obuchi in December 1998 in Hanoi, and in a symposium on human security organized by the Japan Institute of International Affairs (JIIA) and United Nations University in December 1999. In March 1999, Japan also established a special fund called the “Human Security Fund” to promote human security in developing countries. The Japanese perspective on human security puts more emphasis on ‘freedom from want’ than ‘freedom from fear’. However, the Japanese position on the issue still remains somewhere in between the third world perspective as reflected in the UNDP Report and the other perspectives discussed above (Shinoda 2004: 1–18).

While the security of the individual and people is the prime concern of all the analysts dealing with hu-

Table 76.1: Dimensions of National and Human Security. **Source:** Compilation by the author.

	National Security	Human Security
Security for whom?	Primarily, the state	Primarily, the individual and people
Security of what values?	Territorial integrity and national sovereignty	Safety, freedom and opportunity for the individual and people
Security from whom?	Other states	State, non-state actors, globalization, nature, and so on
Security from what threats?	Direct threats from other states	Direct and indirect threats from state, non-state and global actors, indirect threats from nature
Security by whom?	Primarily by the state	State, non-state actors, civil society, NGOs (local, national and international), UN, International/multilateral organizations and, importantly, cooperation among all these actors
Security by which means?	Primarily by military means, but, to a lesser extent, also by diplomatic and economic means	Primarily by non-military means: conflict prevention, management, resolution and post-conflict peacebuilding, democratization of polity and society, human development and humane governance, building capacity for these purposes, sustainable resource management, prevention and effective management of natural disaster and others

man security, they disagree on whether preference should be given to 'freedom from want' or 'freedom from fear'. Depending on the answer, human security analysts are divided into two camps. A third approach, for instance, makes attempts to synthesize both views (Shinoda 2004: 1-18). On the basis of the critical analysis of these approaches and the available literature, an attempt is made in table 76.1 to define human security and delineate the idea from national security.

As evident from table 76.1, the security discourse in its focus has made a shift away from ensuring the security of the state to ensuring the security and well-being of its citizens, the individual, and people. As against the traditional security agenda of deterring direct threat from other states, the human security agenda is focused on the wider range of direct as well as indirect threats to the individual and people from within the family, community, nation, and the globe at large. While national security needs investment in military, human security needs investment in human development and humane governance.

All these have not only broadened the security agenda but also the actors that would ensure the security. While the state continues to remain an important player, the broadened security agenda recognize an expanded range of non-state and informal actors: civil society, NGOs, international/multilateral institutions, and so on. An important factor, not seldom, the state itself is viewed as a source of insecurity of the individual or people against which their security is to be organized. The new security concept has also paid considerable

attention to the process of globalization and consequential security threats.

On the basis of the above discussions and relying on the available literature, we may identify concrete human security issues, possible responses/methods, and the concerned actors. This is done in table 76.2. While identifying issues, a 'maximist' approach was undertaken. Almost all possible issues were included. This involves the risk of losing focus. However, a 'minimist' approach involves even a greater risk of ignoring either 'freedom from fear' or 'freedom from want', as it is the case with the UNDP and Canadian approaches. More importantly, the intensity of different threats to human security varies from society to society, from country to country, and region to region. Therefore, a broader agenda would allow us to encapsulate all possible threats to human security in a wide and diverse variety of countries and people in the contemporary world. The same will also keep provisions for studying human security situations in particular countries or regions with a focus on specific issues that are relevant to the context.

Two aspects of human security, 'freedom from want' and 'freedom from fear' are equally important for ensuring the security of the individual and people. It is also crucial for ensuring the national security that the Realist/Neo-realist school of security thinking is so much obsessed with. 'Freedom from fear' would be meaningless if 'freedom from want' is not ensured. More importantly, persistence of underdevelopment, poverty, inequality and large-scale human deprivation is certain to generate socio-political turmoil leading to violent intra-state conflict with cross-border repercussions.

Table 76.2: Human Security Issues and Possible Responses. **Source:** Compilation by the author.

Human Security Issues	Possible Responses/Methods	Concerned Actors
1. <i>Personal security of the individual from the consequences of violent conflict</i>	Legal and physical protection of the people in war zones; peacekeeping; conflict prevention; management and resolution; post-conflict peacebuilding; arms exports control; humanitarian response; normative and attitudinal change	State; UN; International/multilateral organizations; civil society; NGOs
2. <i>Economic security (assured basic income)</i>	Development policy and activities; creation of employment and conditions for self-employment	State; private enterprise (domestic and foreign); UN; international development agencies; developmental NGOs
3. <i>Food security (physical and economic access to food)</i>	Increasing food production; improving distribution mechanism; poverty alleviation; particularly, income generation for the vulnerable groups	State; peasantry (farmers); private enterprise; NGOs; UN; International/multilateral organizations
4. <i>Human development: health and education</i>	Viable health and education policy; protection against pandemic diseases; ensuring economic and physical access to health care and education	State; private enterprise; NGOs; UN; international/multilateral organizations
5. <i>Good governance: democracy and human rights</i>	Ensuring representative form of government and democratic governance; constitutional/legal and juridical protection of human rights; normative and attitudinal change	State; civil society; NGOs; UN; international/multilateral organizations
6. <i>Rights of ethno-racial and religious communities</i>	Constitutional/legal and juridical protection; minority right articulation; appropriate mechanism for ensuring the rights of deprived communities; normative and attitudinal change	State; local communities; civil society; NGOs; UN; international/multilateral organizations
7. <i>Discrimination against and abuse of women and children</i>	Constitutional/legal, and juridical protection of the rights of women and children; effective measures against trafficking in women and children; appropriate mechanism for ensuring the rights of women and children; normative and attitudinal change	State; family; local communities; civil society; NGOs; UN; international/multilateral organizations
8. <i>Globalization and disparities in developmental opportunities</i>	Development policy and activities; reform of the state sector; private sector development; foreign direct investment; cooperation at the sub-regional, regional and international levels; overseas development assistance; wider market access; improvement in terms of trade; foreign debt management	State; private enterprise (domestic and foreign); UN; international development agencies; international/multilateral organizations
9. <i>Unchecked population growth</i>	Population control; economic and physical access to health care; normative and attitudinal change	State; family; civil society; NGOs; UN; international/multilateral organizations
10. <i>Migration and refugees</i>	Legal and physical protection of migrants and refugees, humanitarian reaction; resolving the cause of forced migration; normative and attitudinal change	State; civil society; NGOs; UN; International/multilateral organizations
11. <i>Environmental degradation</i>	Dealing with the causes and consequences; sustainable environmental management: devising and implementing policy options through concerted efforts; capacity building	State; UN; international/multilateral organizations; civil society; NGOs
12. <i>Natural/man-made disaster</i>	Dealing with the causes and consequences; disaster prevention, management and mitigation; appropriate capacity building	State; UN; international/multilateral organizations; civil society; NGOs
13. <i>Misuse, overuse, and scarcity of crucial natural resources</i>	Dealing with the causes and consequences; sustainable resource management; capacity building	State; private enterprise; UN; international/multilateral organizations; civil society; NGOs
14. <i>Crime and Terrorism: national and international</i>	Law enforcement measures; dealing with the causes and consequences; capacity building	State; civil society; NGOs; UN; international/multilateral organizations
15. <i>Drug</i>	Law enforcement measures; curtailing the production, trafficking and use; dealing with the causes and consequences	State; civil society; NGOs; UN; international/multilateral organizations

On the other hand, 'freedom from want' is impossible to achieve or sustain without achieving 'freedom from fear'.

As it is evident from table 76.2, even in ensuring human security, the role of the state is of paramount importance. However, what is even more important is the cooperation among nation-state, non-state, and sub-state actors, and of multilateral and international organizations.

76.2.1 Human Security: The South Asian Context

State inherited by South Asian countries from the colonial past have been 'strong states' deeply involved in not only the political but also the economic management of the society down to the grass roots (Kohli 1991: 10). With an omnipotent state at their disposal, the ruling elites in South Asia embarked upon a development strategy with overwhelming preponderance of security considerations over human development. While this applies mostly to the two major actors in South Asia, India and Pakistan, others were also significantly influenced by similar perceptions. Exceptions were of insignificant consequences. Even Sri Lanka, which, among South Asian countries, gave the highest preference to human development even during the Cold War era, ultimately turned to be a 'security state'.

South Asia still remains unresponsive to the changes at the global level. Traditional security issues still dominate the security thinking and practical policy of regional states. The conflict between India and Pakistan over Kashmir, an intense arms race, particularly the nuclearization and the Kargil War of 1999 that is to have lasting impact on bilateral relations indicate this trend (Sabur 1999). The process of a thaw in Indo-Pakistan relations that surfaced in early 2003 is far from bringing any qualitative change in either the bilateral relations between the two countries or in the overall security environment in the region (Sabur 2005).

Concrete evidence also suggests that in the post-Cold War era, South Asia continued to be further militarized, and that against the prevailing trends in the contemporary world. Global military spending declined by about 37 per cent during the period 1987-94, while those in South Asia increased by 12 per cent. During the same period, global standing armies have been reduced by 17 per cent. But in South Asia, these increased by 7.5 per cent. Similarly military holdings have declined by 14.5 per cent in the world, but in South Asia these increased by 43 per cent (World

Bank 1997a: 80-81). India and Pakistan are almost solely responsible for the militarization of the region. The share of India and Pakistan in the total military expenditure of South Asia is 93 per cent and in total armed forces personnel is 87 per cent. Notwithstanding colossal human deprivation, India maintains the fourth largest army in the world and Pakistan the eighth largest one (World Bank 1997a: 81). With the nuclearization and Kargil War, military spending in India and Pakistan is witnessing a spiral of rather dramatic increase (Barai 1998: 44-49).

The overarching emphasis on national security as against human security over the last five plus decades has severely deteriorated the security situation in South Asia and significantly increased the security concerns of the regional states, those of India and Pakistan in particular. More importantly, it has transformed South Asia, one of the most developed and most promising regions in the developing world at decolonization, into the poorest and the most deprived region of the contemporary world. In 1949, average per capita income in Sri Lanka, India, Pakistan and present Bangladesh was almost the double of that in the Philippines, South Korea, and Indonesia. What may sound now almost unbelievable, per capita income in Japan at that time was less than double of the average per capita income in these four South Asian countries (Akash 1992: 122).

Where does South Asia stand now? In terms of per capita income, South Asia has already turned to be the poorest region of the world, barring Sub-Saharan Africa. With a population of 1.4 billion in 2002, South Asia is the home to 22.58 per cent of the world's total population of 6.2 billion (World Bank 2003a: 252-53). Nonetheless, South Asia's Gross National Income (GNI) in 2002 amounted to only US\$ 640 billion, what amounts only to two per cent of the world GNI (World Bank 2003a: 252-53). Nearly 40 per cent of the world's absolute poor numbering 500 million in 1993 live in the region (World Bank 1997a: 1-26). Its adult literacy rate of 48 per cent is lower than any world region. Nearly half the world's illiterate population is South Asian. There are more children out of school in South Asia than in the rest of the world and two-thirds of them are females (World Bank 1997a: 1-26). A striking contrast to the perceptions at the global level, it is not Sub-Saharan Africa with 30 per cent of underweight children, but South Asia with almost half of its children underweight remains the world's most malnourished region (World Bank 1997a: 1-26). The extent of human deprivation in South Asia is colossal. About 260 million people

lack access to health facilities; 337 million have no safe drinking water; 830 million have no access to basic sanitation facilities (World Bank, 1997a: 1–26). The list could be enlarged further, exposing a kind of monumental failure on the part of South Asian ruling elites to face the challenges of development that put the region at the bottom of world regions, adjudged by most development indicators.

Notwithstanding all these and the fact that the security discourse in the world has made a shift in its emphasis away from military security to human security, South Asia remains immune to contemporary trends in the world. Not only the states but also academia and media in the region have paid very little attention to human security issues. Scholarly works specifically devoted to the subject are rather few (Chari/Gupta 2003a; Basrur 2001; Khan 2001; Haq 1994). More importantly, emphasis on the theoretical perspectives on human security in these works has only been peripheral. On the positive side, under a major research project entitled *Human Security in South Asia: Discourse, Practice and Policy Proposition* administered by the Bangladesh Institute of International and Strategic Studies (BIISS) and funded by the Ford Foundation, ten book-length studies dealing with human security in the context of South Asia are being conducted by researchers from Bangladesh, India, Nepal, Pakistan, and Sri Lanka.

Under the circumstances, the task of evolving a theoretical perspective on human security in South Asia still remains both difficult and highly complicated. It is not only due to the complexities that one faces in dealing with human security issues, but also due to the fact that traditional security issues are more predominant in the region than anywhere else in the world. Thus, human security in the region will have to be projected and promoted against an obsession with national security, nationalist passion, and jingoism directed against the neighbouring states as well as ‘internal enemies’ of national integration.

While regional cooperation is indispensable for addressing the issues of socio-economic development, ruling elites in South Asian states have a vested interest in sustaining the conflicts with their neighbours, as these serve as convenient means of redirecting mass grievances caused by the enormous human deprivation that prevails in the region (Sabur 2003: 85–100). Under the circumstances, the most challenging task in the regional context is a shift of focus in the security discourse and practical policy away from a single-minded emphasis on national security to human security. This also remains a precondition for devising ef-

fective policies and sparing necessary resources for dealing with human security issues.

The human security situation in South Asia is one of the worst in the world, characterized by a high degree of both want and fear. Persistence of threats to the safety and security of the individual and people generated by violent intra-state conflicts, non-democratic rule, violation of democratic and human rights, bad governance, corruption, crime, terrorism, gender violence, trafficking in women and children, and the likes are enormous, and remain a constant source of fear. On the other hand, human deprivation caused by consequences of underdevelopment, poverty, hunger, deprivation, inequality, illiteracy, diseases and health hazards, overpopulation, environmental degradation, natural disaster, overuse and misuse of natural resources and so on in the region is more acute than in any world region, barring drought suffering Africa. Therefore, while dealing with human security, both in theory and practice, both the fundamental issues, ‘freedom from want’ and ‘freedom from fear’, are equally important as neither can go without the other. Attempts are made in table 76.3 to list the human security issues in South Asia under these two broad themes. This is done on the basis of the analysis of available literature on the subject as well as South Asian reality.

While both, ‘freedom from want’ and ‘freedom from fear’, are equally important, scope or even necessity for the compartmentalization of human security issues under both the broader themes is undeniable. First of all, it would be virtually impossible to focus equally on all these issues at a particular point of time due to a competitive need for attention and resources. There is also no pressing necessity for paying equal attention to all these issues at the same time. The issues are quite dynamic and the threats to human security generated by these also fluctuate. Therefore, while the most pressing issues could be brought to the forefront for dealing with, others could be temporarily put on the back burner.

While human security is the security of the individual and people, the non-state actors, primary responsibility of ensuring the security lies with the state. As can be seen from table 76.3, it is also particularly true for South Asia. States in the region are not only the agents of political order; they are also responsible for socio-economic development. However, in contrast to national security that is the domain of state, in ensuring human security, non-state actors, civil society, and the NGOs are assigned a crucial role. This is also designed to face the threats to human security emanat-

Table 76.3: Human Security Issues in South Asia and Possible Responses. **Source:** Compilation by the author.

Human Security Issues	Possible Responses/Methods	Concerned Actors
Freedom from Want		
1. <i>Economic security</i> (assured basic income)	Development policy and activities; creation of employment and conditions for self-employment through investment (domestic and foreign), foreign trade, and aid	State; private enterprise (domestic and foreign); regional cooperation; UN; international development agencies; developmental NGOs
2. <i>Food security</i> (physical and economic access to food)	Increasing food production; improving distribution mechanism; poverty alleviation; particularly, income generation for the vulnerable groups	State; peasantry; private enterprise; NGOs; regional cooperation; UN; International/multilateral organizations
3. <i>Human development: health and education</i>	Viable health and education policy; protection against pandemic diseases; ensuring economic and physical access to health care and education.	State; private enterprise; NGOs; regional countries; UN; International/multilateral organizations
4. <i>Population control</i>	Foresighted policy; access to maternity and reproductive health services; normative and attitudinal change	State; civil society; NGOs; regional cooperation; UN; International/multilateral organizations;
5. <i>Environmental degradation</i>	Dealing with the causes and consequences; sustainable environmental management: devising and implementing policy options through concerted efforts; capacity building	State; civil society; NGOs; regional cooperation; UN; International/multilateral organizations;
6. <i>Misuse and overuse of natural resources</i>	Sustainable resource management; capacity building	State; private enterprise; civil society; NGOs; regional countries; UN; International/multilateral organizations;
7. <i>Natural/man-made disaster</i>	Dealing with the causes and consequences; disaster prevention and management; capacity building	State; civil society; NGOs; regional countries; UN; International/multilateral organizations;
Freedom from Fear		
1. <i>Personal security of the individual from violence or harm</i> (violent conflicts within and along the borders)	Legal and physical protection of the people in conflict/insurgency/war zones; conflict prevention; management and resolution; post-conflict peacebuilding; arms exports control; humanitarian reaction; normative and attitudinal change	State; regional countries; civil society; NGOs; International/multilateral organizations;
2. <i>Good governance: democracy and human rights</i>	Ensuring representative form of government and democratic governance; constitutional/legal and juridical protection of human rights; normative and attitudinal change	State; regional countries; civil society; NGOs; UN; International/multilateral organizations
3. <i>Rights of ethnic and religious minorities</i>	Constitutional/legal and juridical protection; minority right articulation; normative and attitudinal change	State; civil society; NGOs; UN; International/multilateral organizations
4. <i>Discrimination against and abuse of women and children</i>	Constitutional/legal, and juridical protection of the rights of women and children; effective measures against trafficking in women and children; normative and attitudinal change	State; civil society; NGOs; regional countries; UN; International/multilateral organizations
5. <i>Crime, Corruption and Terrorism</i> (national and international)	Law enforcement measures; dealing with the causes and consequences; ensuring transparency and accountability in the process of governance; controlling the proliferation of small arms; capacity building; normative and attitudinal change	State; civil society; NGOs; regional countries; UN; International/multilateral organizations
6. <i>Migration and refugees</i>	Legal and physical protection of migrants and refugees, humanitarian reaction; resolving the cause of forced migration; normative and attitudinal change	State; civil society; NGOs; regional countries; UN; International/multilateral organizations
7. <i>Drugs</i>	Law enforcement measures; curtailing the production, trafficking and use; dealing with the causes and consequences	State; civil society; NGOs; regional countries; UN; International/multilateral organizations

ing from the action or inaction of the state. Similarly, cooperation at the regional and international level among the states and within regional multilateral and international organization is also considered crucial for promoting the cause of human security. Because, human security is designed to ensure the physical safety, human dignity, and developmental opportunity of the individual and people at the micro-level (starting with the family) as well as the macro-level (up to the world at large). The idea is international and its implementation significantly depends on the cooperation at the international level. In this regard, the universal international organization, the UN, is also assigned a crucial role (Thakur 1999).

76.3 Conclusion

While the ongoing discourse on human security among academic and policy-making circles is quite intense, it still remains far from being conclusive. A theoretical perspective on the subject is just evolving. The conceptualization of human security would take time and tremendous efforts. Therefore, this chapter was more designed to intensify the ongoing discourse on human security than offering suggestions on the subject.

Evolving a theoretical perspective on human security in South Asia is certainly a highly difficult undertaking, and it is likely to remain the same for some time to come. However, in view of the prevailing reality in the region, the issue is also of urgent necessity. On the one hand, human deprivation in South Asia characterized by large-scale poverty, malnutrition, illiteracy, and the lack of access to health facilities has no comparison in the contemporary world. On the other hand, while the world is making a shift away from military security to human security, the region remained bogged down in old-fashioned conflicts and a new spiral of arms race now extended to the nuclear arms. Therefore, reversing the trend in this regard remains the most cardinal task and the most difficult challenge. Under these circumstances, it is necessary to concentrate concerted efforts on the part of scholars and concerned professionals to face both the academic as well as practical challenges of human security.

77 Horizontal and Vertical Extension of International Security: A Human Security Approach

Sascha Werthes and Tobias Debiel

77.1 Introduction

When the *Human Development Report 1994* (UNDP 1994) was published, nobody expected that its ‘human security’ concept would attract so much attention. This is quite astonishing as the concept has provoked much criticism ever since due to its analytical ambiguity and its disputed political appropriateness. Extending the analytical and contextual focus of *security* was not totally unknown in the political and academic sphere (77.2). Different security concepts such as ‘common’, ‘extended’, and ‘comprehensive security’ had already broadened the scope. Therefore, the description of *security* as a ‘contested concept’ has been and is a very common one in student text books (e.g. Baylis/Smith 2005: 302).

What was new was shifting the reference object from the state to the individual, and to integrate elements of foreign and development policy (77.3). We suppose it is fair to say that this shift again encouraged and hardened the already existing ‘contestation’ of security as a concept. Although many authors agree that security implies freedom from threats to core values (for both individuals and groups), there is a mayor disagreement about the main focus of enquiry, illustrated by the “proliferation of descriptors added to the basic concept itself” (Liotta 2002: 475; see also Baylis/Smith 2005: 300). Despite having said that one can argue that while in the political field the human security approach is adaptable and has found different supporters (77.4). Nevertheless the practical adaptability in the academic field is still contested and doubted. It remains to be shown if a threshold-based definition of human security (77.5) or the work to develop human security indicators might be a first step to prove its practicability for academic purposes (77.6).¹

Human security and its new emphases were a response to the perceived interrelatedness of the complex foreign, developmental and security relevant

challenges in the late 20th and early 21st century. The perforation of state sovereignty – resulting from the multifaceted globalization processes and the incapability of states to respond to growing non-military security threats – produced a pressure for practical solutions and strategic responses. Moreover, in the post-Cold War and post-September 11th world ‘state failure’, ‘failing states’ and ‘defected democracies’ challenged the international community. Or as Carl Bildt points out when emphasizing an other aspect of the changing international order, while “the principle of state sovereignty was previously seen as sacrosanct, the combination of the NATO intervention in Kosovo in 1999 and the non-intervention by the international community in Rwanda in 1995 has led to an intense discussion about the right or duty to intervene in sovereign states in order to prevent massive violations of human rights” (Bildt 2004: 31).

Throughout the 1990’s various international actors were looking for integrative policy strategies. Foreign, development, and security policies lost their clear-cut differentiation. For many politicians and academics ‘complex emergencies’ and the root causes of many perceived threats and problems challenged classical policy approaches. Thus, practical politics had to find new concepts and strategies for new realities, or for the changed perception of reality. Academic and political experts alike had to find alternative ways to analyse and conceptualize these complex challenges in their field of study or region.² This is not to say that

1 The work on measuring human security in conjunction with vulnerability is steadily growing. See e.g. Mani 2005; Owen 2004, 2004a, 2004b; Matthew/Fraser 2002; King/Murray 2001-02; Bajpai 2000; Lonergan/Gustavson/Carter 2000; Bruderlein 2000. Especially the programmatic project work of GECHS: <> and GECHS Associates: <<http://www.gechs.org/associates/>>, UNCRD and UNU-EHS (Bogardi/Brauch 2005; Birkmann 2006; Brauch 2005, 2005a; Rechkemmer 2005) is here of importance and forward-looking.

old challenges and threats to security have disappeared altogether.

In line with these developments the first two parts try to sketch briefly the horizontal and vertical extension of the security agenda. This is by far no comprehensive look at all the relevant contributions in the security discourses and debates; therefore the description is to a certain degree limited and simplistic. The point of doing so is to illustrate why security is such a 'contested' concept and to demonstrate the dimensional extension which led to the human security approach.³

77.2 Horizontal Extension of the Security Agenda

Until the 1980's international security policy focused on military threats emanating from others states (Hough 2004: 6; Debiel/Werthes 2005: 8). A classical definition of security argues that a state is "secure to the extent to which it is not in danger of having to sacrifice core values if it wishes to avoid war and is able, if challenged, to maintain them by victory in such a war" (Lippmann 1943: 51). This 'state-centred' security concept refers to territorial integrity, political independence, survivability, and the capability to protect its own citizens. It is based on the assumption that most threats are of external origin and military in nature (Ayooob 1995: 5). Thus, the convincing ability to respond with (overwhelming) military means was regarded as sufficient. Stephan M. Walt (1991: 212; italics in the original) argued

security studies may be defined as *the study of the threat, use and control of military force* (Nye/Lynn-Jones 1988). It explores the conditions that make the use of force likely, the ways that the use of force affects individuals, states, and societies, and the specific policies that states adopt in order to prepare for, prevent, or engage in war.

2 This e.g. is very well reflected in the publications of UNESCO SecuriPax Forum an international network for promoting human security and peace (<http://www.unesco.org/securopax>), see: e.g. Lee (2004); Chourou (2005); Fuentes/Rojas Aravena (2005), also interesting with regard to this the contributions in Thomas/Wilkin (1999).

3 With regard to Human and Environmental Security see the excellent studies in: Brauch/Liotta/Marquina/Rogers/Selim (2003), and especially Brauch (2003, 2003b, 2005, 2005a, 2008, 2008a, 2008b, 2008c).

These security concepts primarily focus on the security of the state. In the early 21st century they have three major weaknesses. Firstly, the wilful neglect of states' sensitivity to situations in neighbouring states and strategically important regions in traditional security concepts is problematic. Analysing the oil crisis in the 1970's, Joseph S. Nye (1974) argued that in the age of interdependence the security of states can also be endangered by non-military developments. Therefore, Hough (2004: 7) is right when explicating

[a]lthough there is a case to be made that military threats in the twenty-first century are as apparent as ever, and maybe even greater than during the Cold War, the simple fact remains that they are not the only threats that face states, people and the world as a whole. Indeed, they never have been.

Traditional security concepts still adhere to a perspective that violent conflicts are primarily conflicts among states, or inter-state conflicts. Moreover, the assumption that the international system is constituted by sufficiently well consolidated states is too simplistic. It neglects the fact that most threats to security, especially in the crisis regions of the south, in the Caucasus, and in Central Asia, correlate with processes of state transformation and consolidation (Ayooob 1995; Hippler 2005; Paris 2004a). Thirdly, the capability of a country to protect its own citizens clearly overcharged these classic security concepts, as the new threats which endangered the citizens could apparently not be dealt with by military means.

These limits of traditional security concepts induced a horizontal broadening of the international security agenda. Since the 1980's the proponents of strategic studies, and in the 1990's the multilateralists called for new 'extended' or 'comprehensive' security concepts. These concepts not only incorporated an economic and environmental dimension, they also took into account a broad spectrum of additional threats to the security of states, such as for instance cross-border refugee migration, the spread of epidemics, but also gross violations of human rights. But they remained mainly 'state-centred' focusing on the security of the state and its integrity, and not on its capability to protect its citizens. Or as Hough (2004: 8) points out, although the viewpoint is unwelcome for traditionalists, "this widening of security did not undermine the Realist logic of conventional Security Studies." He accentuates that the focus was still on the state system and, even more importantly, that "widening was simply extending the range of factors that affect state power beyond the confines of military and trade affairs."

Although one might easily agree with Hough on the concept of ‘extended’ security, one might critically contest his conclusion on the ‘common’ and ‘comprehensive’ security concepts. One could cautiously claim that common and comprehensive security concepts imply a slight change in the perception of the world, as the perspective is no longer solely directed on the international system of states, but conceives the world as an international society of states. Basically, one can say that the comprehension of the world as an international system of states seduces the analyst to focus primarily on “power politics amongst states, and puts the structure and process of international anarchy at the centre of IR theory” (Buzan 2004a: 7), whereas the perspective of the international society of states “is about the institutionalization of shared interest and identity amongst states, and puts the creation and maintenance of shared norms, rules and institutions at the centre of IR theory” (Buzan 2004a: 7). This change of perspective implies that common and comprehensive security in comparison with traditional and extended security accentuate not only power, but also (international) law to enhance security (of states), or in other words to address security threats.

In a nutshell, the horizontal extension of the security agenda illustrates that besides military threats there are also non-military threats to states. Moreover, as is rudimentarily exemplified with regard to common and comprehensive security, the slight change of the perception of the world as an international society of states with regard to common and comprehensive security conceptions accentuates that states can deal with threats not only by means of (military) power but also with norms, rules, and institutions. Moreover, the change of perspective and the horizontal extension of the security agendas foster the awareness of the need to deal with security issues in different state departments. This is more easily said than done as this demands that the ends and means in a changing security environment have to be balanced. This aspect is nicely pointed out by Liotta (2002: 473, 2005) who emphasizes when speaking about the “Convergences of National and Human Security” that we should be careful not to be too excessively focused “on one aspect of security at the expense or detriment of the other” as this “may well cause us to be ‘boomeranged’ by a poor balancing of ends and means in a changing security environment.” The notion of ‘human security’ exemplifies another dimensional extension of the international security agenda which we will briefly discuss in the next part.

77.3 Vertical Extension of the International Security Agenda

In the 1990’s with the emergence of the ‘Copenhagen School’ (Wæver 2008, 2008a) another shift from the traditionalist, narrow conception of security occurred. This approach was not only broader (including non-military issues among the threats to states), but also emphasized that non-military issues can be considered matters of security even if they are not a direct threat to states (Buzan/Wæver/de Wilde 1998). They state that

[t]hreats and vulnerabilities can arise in many different areas, military and non-military, but to count as security issues they have to meet strictly defined criteria that distinguish them from the normal run of the merely political. They have to be staged as existential threats to a referent object by a securitizing actor who thereby generates endorsement of emergency measures beyond rules that would otherwise bind (Buzan/Wæver/de Wilde 1998: 5).

Their well-known framework of analysis is nevertheless criticized for being state centred, although more subtly (Hough 2004: 9). While accepting “the idea that non-military issues can be securitized and that the referent object of this can be something other than a state”, e.g. societies, the Copenhagen School approach sticks to the idea that it is mainly states who can be the securitizing actor (Hough 2004: 9) and the act of securing threatened people is still left to the state (Hough 2004: 17).

Beside the Copenhagen School (1990’s) other security concepts emerged in the late 1980’s, taking root in the middle of the 1990’s (e.g. the so-called Paris School or the Welsh School), which not only broadened and widened the international security agenda but also deepened⁴ it (Albrecht/Brauch 2008). ‘Comprehensive’ and ‘common’ security concepts opened the way for even more new security concepts, and among them is the *human security* concept. Basically, “the idea of human security is an attempt to conceptualize the changing nature of security” (Glasius/Kaldor 2005: 66, see also Kaldor 2007). The notion that human security “complements state security, enhances human rights and strengthens human development” (CHS 2003: 2), exemplifies that the human security concept is far more comprehensive than other secu-

4 Our perspective is more simplistic than that of ‘Critical Security Studies’. When speaking about *deepening* we simply refer to the level of analysis. On the different notions of deepening see Booth (2005: 14, 15).

rity concepts. Moreover, this description already illustrates the understanding that security threats should not only be dealt with by security policy and military means, but also by foreign and development policy and their respective policy tools. In similar vein Kofi Annan (2005) in his report *In larger Freedom* (A/59/2005) emphasizes the interrelatedness of development, security and human rights when saying:

Not only are development, security and human rights all imperative; they also reinforce each other. This relationship has only been strengthened in our era of rapid technological advances, increasing economic interdependence, globalization and dramatic geopolitical change. While poverty and denial of human rights may not be said to 'cause' civil war, terrorism or organized crime, they all greatly increase the risk of instability and violence (Paragraph 16).

The precursor of the human security concept was the UNDP Report (1994) which shifted the attention from the state as the referent object of security to the sub-national level (social groups and the individual). This move seemed justifiable and necessary as the debates on the legitimacy of humanitarian interventions in the early 1990's showed that the old security concepts offered no answer to the more and more pressing question of what to do when the state itself became the major security threat to its citizens, or when the state is not able to secure its citizens (Thomas/Tow 2002, 2002a; Bellamy/McDonald 2002; Annan 2000a).

'Failed' and 'failing states' as well as 'complex emergencies' challenged the concept of state sovereignty, but they also seriously demanded an answer to the question on the 'responsibility to protect' (ICISS 2001; Thakur 2002, 2005). Moreover, it became apparent and accepted that extreme economic and social distress, epidemics, the flow of refugees and trans-border migration, transnational terrorism, discrimination and violent repression by neo-patrimonial (authoritarian) elites, the illegal trade of drugs and weapons are all a result or a root cause of insecurity for people in the world and that therefore a security concept which mainly focuses on state security might not be sufficient anymore (Bach 2003; Clark 2003; Gasper 2008; Khagram/Clark 2003; Colletta 2003; Chen/Narasimhan 2003; Heymann 2003b; HSC 2005; Helsinki Process Secretariat 2005a, 2005b).

But even more important was the evolving awareness that these situations in distant locations demanded a policy response as they also produced significant effects on other states. Exaggerating this point, one can cautiously argue that proponents of

the human security approach sympathize with a 'world society' perspective. World society "takes individuals, non-state organizations and ultimately the global population as a whole as the focus of global societal identities and arrangements, and puts transcendence of the state-system at the centre of IR theory" (Buzan 2004a: 7). World society emphasizes "the idea of shared norms and values at the individual level, transcending the state" (Buzan 2004a: 10).

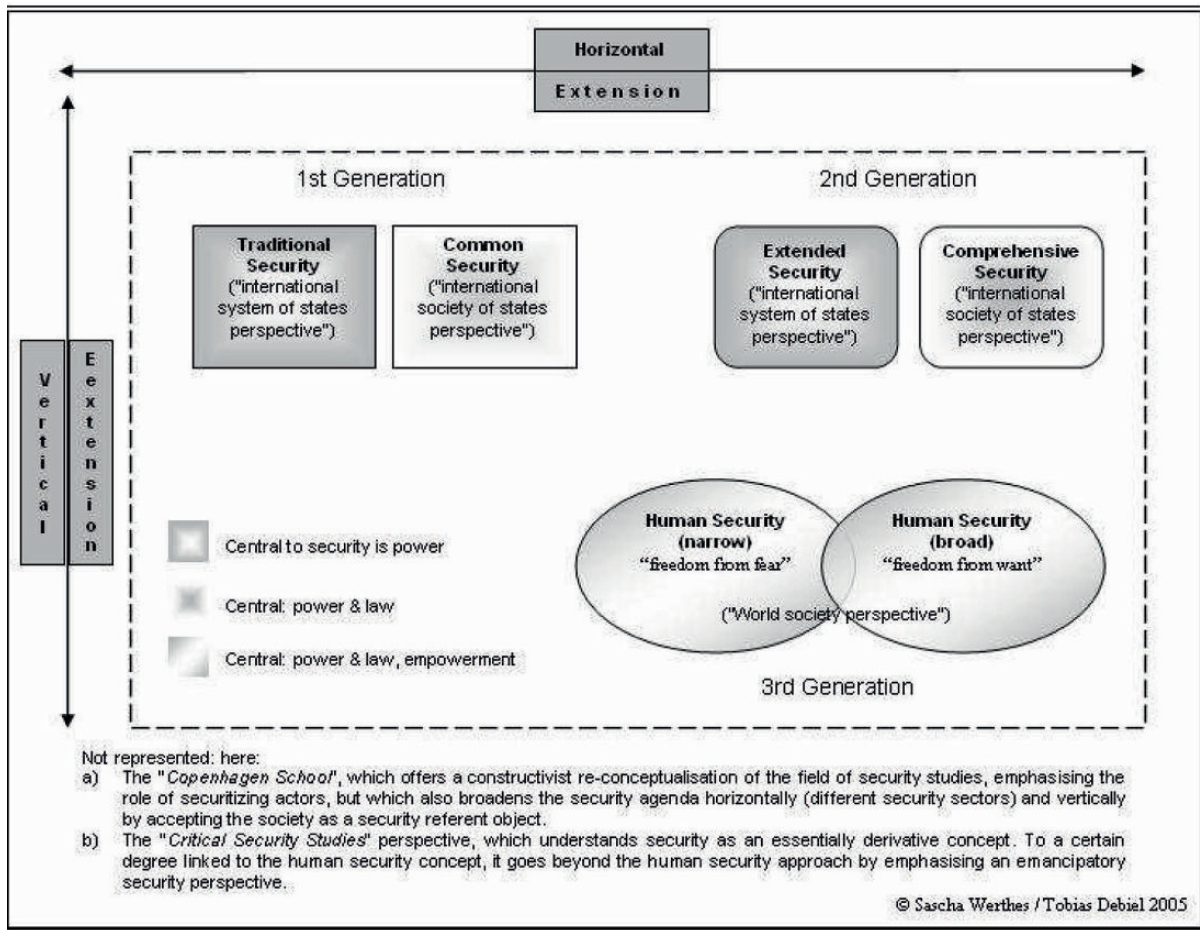
To put it simply, the capability of a country to protect its own citizens could be challenged and influenced by situations far away in other regions and states of the world. Therefore, a response to these events might sometimes seem to be necessary. Glasius and Kaldor call this line of argumentation the "enlightened self-interest case" (Glasius/Kaldor 2005: 70). Besides this, there is a "moral case", which "posits that human beings have a right to live with dignity and security, and a concomitant obligation to help each other when that security is threatened" and a "legal case", "[i]f human security is considered as a narrow category of protection of human rights, (...) then it is now generally accepted that other states, and international institutions such as the EU, have not only a right but also a legal obligation to concern themselves with human security world-wide." As this quotation exemplifies for many though certainly not all authors human security is fundamentally linked to human rights as both concepts concentrate on the core values of individuals: life and dignity (CHS 2003; Bastian 2004) or in the words of Amartya Sen (2003a: 9):

The basically normative nature of the concept of human rights leaves open the question of which particular freedoms are crucial enough to count as human rights that society should acknowledge, safeguard and promote. This is where human security can make a significant contribution by identifying the importance of freedom from basic insecurities - new and old.

Sen emphasizes that human security and human rights can be seen as complementary ideas, "since human security as an important descriptive concepts demands ethical force and political recognition" and therefore, "it is useful that this can be appropriately obtained through seeing freedoms related to human security as an important class of human rights."

But human security - it seems - is not only linked to human rights but also to human development. Precisely, to address the results and the root causes of insecurity, the UNDP proposed a comprehensive conception of human security, as they experienced firsthand the need to acknowledge human security, ei-

Figure 77.1: The Horizontal and Vertical Security Agenda Extension. **Source:** Debiel/Werthes (2005: 10).



ther as a prerequisite for or as a necessary ingredient to human development, as fundamentally pressing. When working in post-conflict situations the link between (human) security and (human) development becomes obvious. As many UNDP projects take place in environments where the link is provocatively obvious (e.g. in post-conflict situations), the UNDP must be at the forefront. This also might explain why its concept ranges from a narrow 'freedom from fear' perspective, which addresses threats to the physical and psychological integrity of people, to a broad 'freedom from want' perspective, which addressed threats to the socio-economic well-being of people (figure 77.1; see also Gasper/Truong 2005).

Although the 'Critical Security Studies' approach (Albrecht/Brauch 2008) stressed the need to focus on the individual, it differs from the other approaches and from the human security approach as it proposes, as Booth points out, thinking primarily on the establishment of "a settled political community (...) where members respect one another and have something to

say in shaping a valued form of life, including one in which we can look for the promotion of human security" as "security is inextricably linked with membership in a political community" and emancipation (Booth 2005: 110; Linklater 2005: 114). Figure 77.1 tries to illustrate the dimensional extension of security concepts (Brauch 2008, 2008a). One can argue that for 'traditional' security concepts and 'extended' security concepts power is central whereas for 'common' and 'comprehensive' security concepts not only power but also law is a central element and focus. Human security concepts add empowerment as a feature and focus, especially in the Japanese or CHS understanding. The term 'generation' is not used in a strictly historical understanding, but tries to put emphasis on peculiar modification processes when horizontally or vertically extending the security concept.

Nevertheless, despite the astonishing attention of the human security concept in the academic and political sphere, still no accepted definition is available (Ewan 2007). One of the most well-known definitions

is the one proposed by the ICISS (2001: 15): “Human security means the security of people – their physical safety, their economic and social well-being, respect for their dignity and worth as human beings, and the protection of their human rights and fundamental freedoms” (Alkire 2003a, see also Mack 2005). Due to this lack of an accepted definition two questions are appropriate: What are the practical adaptabilities and advantages of the concept and how can human security become more substantiated for academic purposes?

77.4 Practical Advantages of the Human Security Concept

One striking new element of the human security concept is that it refers to the security of individuals and to those living in different countries.⁵ No matter how human security is defined, on a normative political basis it emphasizes a universal moral claim of every individual to security. Without establishing a legal right to security, it addresses the question of whose responsibility it is to protect and empower individuals.

Some experts might have the subsidiarity principle in mind. That is, depending on the threat, different hierarchical levels are held responsible. An example is food security: first of all the individual is responsible. If the individual is not capable of securing his/her nutrition, the family, community or the state are held responsible for guaranteeing a possibility to survive. If the state cannot secure the survival of its citizens world society (or the international political community) is held responsible. While the need for humanitarian aid in cases of famine is more easily legitimized, a humanitarian intervention in complex emergencies is harder to legitimize (Thakur 2002; Weiss 2004). In general, the security of the citizens is still the obligation of the state, but in cases of need (e.g. Rwanda, Somalia, Sudan) one must find other coping mechanism (for critical reflections on these points, see e.g. Hampson 2002: 2–7).

Especially on the question of whose responsibility it is to provide security and more specifically when and in what cases, and by what means, the different human security concepts vary widely. The Canadian

(Dedring 2008; chap. 83 by Black/Swatuck) and Norwegian government focus on a narrow human security concept, mainly addressing ‘freedom from fear’, that is physical violence in violent conflicts. This means that under certain circumstances interventions in the internal affairs of a sovereign state can be legitimized. Put differently, they argue that in cases of imminent direct threats to the survival of people like in Rwanda in 1994 the international community has to accept its responsibility and act accordingly. Strategically this narrow approach focuses on banning of anti-personnel landmines (Ottawa Process), stopping the proliferation of small arms and light weapons in conflict zones, and on the establishment of the International Criminal Court. By concentrating mainly on aspects of physical violence this narrow approach allows an easier and clear-cut juxtaposition of ‘human security’ and ‘human development’ policies. The work of the *Human Security Network* (HSN) illustrates the practical and political applicability of this narrow approach (chap. 75 by Fuentes/Brauch). Although some critically argue that the actual network’s policy not always lives up their promises and pretensions (Werthes/Bosold 2006).

Going one step further the broad conception of human security emphasizes that the security *and* well-being of one individual has an effect on the security and well-being of other individuals. For example, extreme poverty might lead to crime or migration, or more drastically to trans-border criminal networks engaging in human, arms, and drug trafficking. The incapability of one state to deal with the spread of HIV/AIDS, SARS, or Dengue fever might lead in a globalized world to an increased spread of the epidemic in the whole world, threatening the survival and well-being of individuals everywhere. This broad approach, emphasized e.g. by UNDP (1994) and the Japanese government (chap. 84 by Shinoda), no longer allows for a clear-cut juxtaposition of (human) security and (human) development policies as it not only addresses threats to the survival but also to the well-being of the people. It therefore demands a policy of protection *and* empowerment (CHS 2003).

The human security concept helps with the conceptualization of a broad range of currently perceived threats. It also offers a normative reference point for evaluating and orientating policies and political instruments for the security and protection of the individual (Werthes/Bosold 2005). It demands creativity and flexibility on policy strategies and instruments.

Canada and Japan have proven that human security can serve as a political leitmotif (Debiel/Werthes

5 We owe this thought to Taylor Owen: “Human Security on Foreign Policy Agendas - Theoretical and Practical Implications” at the 3rd ECPR Conference in Budapest 2005; see at: <http://inef.uni-duisburg.de/page/documents/Panel_ECPR-short-info.pdf>.

2006; Werthes/Bosold 2006), and help to formulate policy agendas leading in the long run to substantial results (e.g. Ottawa Process and to a minor degree the establishment of the International Criminal Court). The ambiguity or the flexibility of the concept allows different (international) actors to focus on and prioritize different aspect of present insecurities. This might permit collaborative efforts of various international actors as long as political inventiveness is maintained (e.g. HSN; Bosold/Werthes 2005: 101; Glasius 2008). And not to forget the influential and interesting academic and practical work the concept itself stimulated (see e.g. projects of GECHS and UNU-EHS; Bogardi/Brauch 2005).

Last but not least, the traditionally harsh categorization, between development and security, leads to an insufficient emphasis of what are very serious and for millions of people all around the world life-threatening problems (Owen 2003b: 10; Chen/Fukuda-Parr 2003). Furthermore, the concentration of intellectual, financial and policy-influencing resources primarily on foreign affairs departments and security institutions, or the restricted focus solely on inter- or intrastate war, would potentially and eventually mean paying too little attention to a majority of threats (as well as their root causes). The human security approach might politically help to foster the necessary critical awareness as it addresses both conflict and development aspects (see Ulbert/Werthes 2008). While human security in the political field might be applicable and helpful, the question remains: how can it be substantiated for academic purposes?

77.5 Substantiating Human Security for Academic Purposes?

While for political purposes the definitional ambiguity positively turns out to be useful and practicable, for academic purposes its ambiguity or flexibility are obstacles for empirical research to help inform and advise public representatives (Paris 2001, 2004b; Buzan 2004b).

In the last decade substantial efforts have been made in trying to measure human insecurity in conjunction with vulnerability aspects (see e.g. HSR 2005; Mani 2005; Matthew/Fraser 2002; King/Murray 2001-02; Bajpai 2000; Lonergan/Gustavson/Carter 2000; Bruderlein 2000). To reiterate especially the programmatic project work of GECHS, UNCRD and UNU-EHS is here of importance and forward-looking. When juxtaposing, for example, the HSR and the

IHI approach (Lonergan/Gustavson/Carter 2000) one obstacle is strikingly obvious. For now all these works emphasize different aspects/dimensions of the broad human security agenda (see figure 77.1). Whereas the HSR concentrates mainly on conflict related insecurities, the *Index of Human Insecurity* is focused on developmental and to a certain degree environmental related insecurities. This is not to say, that one approach is 'better' than the other, but to illustrate a key characteristic of the current approaches, probably related to the complexity and manifoldness of the human security concept. A recent and interesting contribution to these measuring efforts is the work of Taylor Owen. We will briefly introduce his approach here in more detail to give just one simple but persuasive example on how human security can be substantiated for academic purposes.

Taylor Owen's (2003a, 2004, 2004a, 2004b) threshold-based definition of human security is most promising, showing how the human security approach can "legitimize itself in the world of foreign policy and development" to prove its utility (Owen 2003b). He focuses on regional or local insecurities. Based on the reports of UNDP (1994) and of the *Commission on Human Security* (CHS 2003), he incorporates different horizontal security dimensions focusing on imminent life-threatening dangers. On a regional scale, mortality data can be effective in crudely demonstrating threat patterns. He showed that the WHO 2000 mortality data for Cambodia, Laos, and Vietnam give evidence "that the threat from infectious diseases and disasters far outweighs that from violence and war" (Owen 2003b: 9).

His methodology is organized in four stages: In the *first* the most significant threats (e.g. by expert interviews) are determined and classified in six categories of 'human' security: economic, health, food, environment, personal and political. In a *second* step data are collected on these threats and on the imminent life-threatening danger of specific threats. These data help isolate the most serious threats from thousands of possible threats under the broad definitions of UNDP (1994) and of the Commission on Human Security (CHS 2003). In a *third* step the data (of any type with a spatial correlation) are mapped using *Geographic Information System* (GIS) techniques. With GIS, each threat can be shown as a layer on a map, either alone or with other threats. Examining various overlays between the threat layers in the *fourth* stage (data analysis), three trends emerge: *hotspots* (regions that experience the aggregate impact of multiple security threats), *correlations* (based on simple logic equa-

tions: if A and B, then C etc), and *consequences* (e.g. overlaying landmines with regions of high disease rates or poverty provides a picture of the war legacy).

Taylor Owen's methodology has shown that human security can be substantiated for academic purposes. It is designed to collect, organize, map, and analyse data that depicts human security threats, defined as life-threatening dangers with a significant mortality rate. Moreover, it effectively helps to present and illustrate complex, wide-ranging information to the policy making community, as maps are "infinitely more approachable than a complex database, especially when doing multivariate analysis" (Owen 2003b: 11). His methodology is very helpful for measuring and illustrating human (in)security on the sub-national level. Finally, his approach based on a threshold-based definition of human security can be seen as an attempt to overcome the aforementioned challenge. In fact oriented on the UNDP Report (1994) and the CHS Report (2003) the strength of Owen's approach is the first step where first of all exploring *the* specific regional and local insecurities (significant threats) is the main task.

77.6 Conclusion

We hopefully have on the one hand illustrated key elements and logics (horizontal and vertical extension) which furthered the emergence of the human security concept. On the other hand we tried to show that human security not only is of political attractiveness but also has practical advantages and can be substantiated for academic purposes. Especially the work on measuring human security in conjunction with vulnerability can be seen as a highly relevant policy oriented operational undertaking. The success or failure of this undertaking might soften or harden the debates on human security and its contestation.

Nevertheless, one critical question remains: What can peace and conflict studies gain with the human security approach? Similar to other security concepts ('extended', 'comprehensive'), which already broadened the international security agenda the human security approach responds to the manifold challenges of the Janus-faced globalization processes of the 1990's. These processes challenged classical thinking and international and multilateral action in a more and more globalized and interdependent world. Karns and Mingst (2004: 512) argued:

With respect to threats to peace and security, states have always assumed a prominent position and continue to

do so. Yet, even in security issues, the meaning of sovereignty is being challenged. (...), emerging norms of human security and humanitarian intervention, if confirmed, make responsibility to protect people a new aspect of sovereignty. Likewise, the concepts of sustainable development and human rights challenge sovereignty and the principle of non-interventions.

The thinking on human security clings to the idea that human rights, human development and human security are mutually reinforcing. From a peace and conflict research perspective, one might critically ask if the human security approach, when trying to respond to the three-dimensional erosion of state sovereignty, by proclaiming a (normative) responsibility to protect and to empower the individual, sufficiently addresses questions of *collective* violence, which still remains of primary concern for peace and conflict research.

Thinking on how to respond in cases of intra-state war and violent conflicts does not constrain the focus on state security and sovereignty. Although a consolidated (democratic) state in fact might be a guarantor of security and rule of law, in many cases the state itself is a major threat to security – inwards and outwards. Although human security has broadened the focus from the security of borders to the lives of people and communities inside and across those borders, (CHS 2003: 6) it only modestly and indirectly addresses the constituent element of many conflicts, namely the conflict parties. Conflict parties should be understood as more or less clearly definable collective units. One can argue that the human security approach is severely limited in dealing with violent conflict. Or one must criticize it for only addressing some root causes of violence and postulating humanitarian interventions as a matter of last resort. Therefore one must concede that the human security approach currently has no coping strategy for dealing with acute violent conflicts. This remains an important future task.

As a political and normative leitmotif 'human security' helps to clarify how to conduct, justify and sometimes legitimize policy decisions. It may also inspire decisions on policies and policy instruments. It helps to focus the (international) political agenda on the most vulnerable or most threatened individuals, too often forgotten in other security approaches. Finally it can also be substantiated for academic purposes.

78 Human Security in the Arab World: A Perspective from the Maghreb

Béchir Chourou

78.1 Introduction

The concept of ‘human security’ is not a common subject of research or discussion in the Middle East or in North Africa. Only recently has it appeared in newspapers and academic journals published in Arabic, particularly in Egypt and Jordan. But in the Maghreb the topic remains largely unknown, ignored or avoided. Two main factors account for this situation. First, the literature on human security is mostly in English, whereas the main language used by North African social scientists is French (although Arabic, the native tongue, is increasingly used). As a result, Maghrebi academics have little contact with the English-speaking academic community, and their research interests have not evolved in the same direction as the Anglophone research agenda.¹ Secondly and more importantly, human security includes components that are not open to free public discussion in most North African countries. Among those components one may mention protection against arbitrary arrest and torture, enjoying freedom of expression and association, and effective participation in political processes – topics that are too sensitive to be debated publicly.

This chapter seeks to bring human security into the research agenda of North African academia, and to present the current and future state of human security from a Maghrebi perspective. From a wide conceptualization of human security, this chapter refers to

the main threats to human security in the Maghreb and will identify those that can be considered as the most serious and that require, therefore, priority attention. Despite the fact that signs of acute material distress (hunger, disease, homelessness...) are not widespread or highly visible, insecurity in the Maghreb remains unacceptably high and is not likely to improve in the near future.

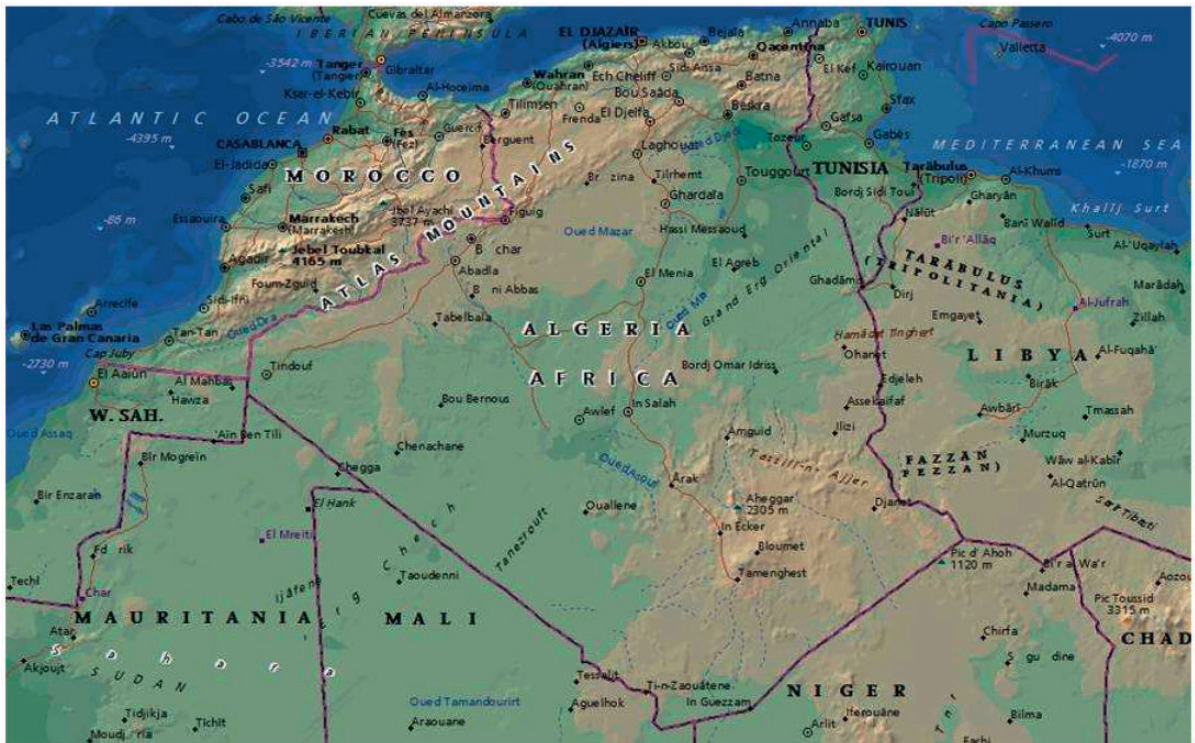
The northern part of Africa, in comparison with other regions of the continent, may appear to be in a fortunate position, but this is just an illusion: one may not see people dying of hunger or sleeping in the streets, but this does not mean that human suffering has been obliterated from the region. The chapter will attempt to show that two forms of direct violence (practices of autocratic regimes and inter-state conflicts) and a number of indirect violence (demographic growth, food insecurity, lack of education particularly among women, exposure to environmental hazards) represent major threats to human security in the Maghreb. This list of threats is not exhaustive but includes those that the author considers as requiring urgent attention and for which remedial action is readily available (at least in principle).

78.2 Identifying and Prioritizing Threats

Elsewhere this author opted for an approach which starts with a general definition of human security (HS) and then applies it to specific countries, regions and/or periods (Chourou 2008a). The main advantage of this approach is that it allows the researcher to identify threats, risks and vulnerabilities that are present in a given area at a specific period, to rank them according to their degree of severity and then on that basis, to recommend actions that need to be taken in the short, medium or long run to alleviate or eliminate such threats or risks. Human security was

1 It may be noted that the active involvement of the Canadian government in the field of human security has led to the publication and dissemination of a body of documents written in French. Also, a number of French social scientists are becoming interested in human security and have started publishing articles to make the topic better known in academic circles (see e.g. Peschadière 2006). One colleague, long-time student of human security Shahrbanou Tadjbakhsh has launched at Sciences Po (Paris) the *Human Security Journal* (although most articles in it are in English).

Figure 78.1: Map of the wider Maghreb consisting of Algeria, Libya, Mauritania, Morocco and Tunisia. **Source:** This map is in the public domain and not protected by copyright; at: <http://www.maghrebarab.com/maghreb_arab_map.html>.



defined as “the protection of the vital core of all human lives from critical and pervasive environmental, economic, food, health, personal and political threats” (Owen 2004a: 20). That chapter further adopted the four main factors that the Oxford Research Group identified as sources of global insecurity:

- adverse effects of climate change and global warming;
- competition for increasingly scarce resources, especially oil;
- increasing socio-economic divisions and the marginalization of the majority world;
- the future spread of military technologies (including weapons of mass destruction; Abbott/Rogers/Sloboda 2006: 28)

Finally, the list of direct and indirect threats to HS by Kanti Bajpai (2000: 40) was used as a basis for identifying those threats that may be considered (in a given situation) as most severe and that need consequently to be addressed in priority.

Combining these three elements, the previous chapter argued that in the Mashreq *direct* forms of violence – in Bajpai’s terminology (table 78.1) – are most

serious, whereas “in the Maghreb (North Africa), it is the forms of *indirect* violence which are more prominent, although some forms of direct violence are not totally absent” (Chourou 2008a: 776). Based on that premise, the present chapter will seek to identify those forms of violence which may be considered as the main threats to HS in the Maghreb.

Some of Bajpai’s categories will be recombined here to avoid repetitions and to gain greater differentiation between categories. Starting with forms of direct violence, ‘violent death/ disablement’ is most likely to be the result of terrorism or counter-terrorist activities undertaken by governments. Forms of violence listed in the category of ‘dehumanization’ and present in North Africa include unlawful detention of political opponents and rigged trials. As for the forms of violence listed under ‘discrimination and domination’ they are quite common in the Maghreb as well as in the rest of the Arab world. What may be noted, however, is that all these forms of violence have a common source and a common cause.

The Arab world is considered as the only region in the world where democracy does not represent a serious threat to existing regimes. For decades various movements have attempted to organize for the pur-

Table 78.1: Direct and Indirect Threats to Human Security. **Source:** Bajpai (2000: 40).

Direct Violence	Indirect Violence
<p>Violent Death/Disablement: victims of violent crime, killing of women and children, sexual assault, terrorism, inter-group riots/pogroms/genocide, killing and torture of dissidents, killing of government officials/agents, war casualties</p> <p>Dehumanization: slavery and trafficking in women and children; use of child soldiers; physical abuse of women and children (in households); kidnapping, abduction, unlawful detention of political opponents + rigged trials</p> <p>Drugs: drug addiction</p> <p>Discrimination and Domination: discriminatory laws/practices against minorities and women; banning/rigging elections; subversion of political institutions and the media</p> <p>International Disputes: Inter-state tensions/crises (bilateral/regional) + great power tensions/crises</p> <p>Most Destructive Weapons: the spread of weapons of mass destruction + advanced conventional, small arms, landmines</p>	<p>Deprivation: Levels of basic needs and entitlements (food, safe drinking water, primary health care, primary education)</p> <p>Disease: Incidence of life-threatening illness (infectious, cardio-vascular, cancer)</p> <p>Natural and Man-made Disasters</p> <p>Underdevelopment: low levels of GNP/capita, low GNP growth, inflation, unemployment, inequality, population growth/decline, poverty, at the national level; and regional/global economic instability and stagnation + demographic change</p> <p>Population Displacement (national, regional, global): refugees and migration</p> <p>Environmental Degradation (local, national, regional, global)</p>

pose of introducing democratic reforms, but in most cases they have been repressed, often violently. The only movements to have continued their opposition to autocratic rule are the Islamist movements. As grass root support for these movements increased, government oppression intensified and became more violent. This in turn led the Islamists to adopt violent action, including terrorist acts. Consequently, and as it will be argued below, terrorism may be considered – at least in its manifestations in North Africa – as a direct consequence of authoritarianism.

As for the other forms of direct violence (torture, unlawful detention of political opponents, subversion of political institutions, etc.) practiced by ruling regimes, they are designed to protect the status quo more than to fight terrorism. Therefore, violent death/disablement, dehumanization and discrimination/domination may be integrated into a single form of direct violence which may be called ‘authoritarianism’, and it will be argued that authoritarianism is one of the most (if not *the* most) important threat to human security in the Arab world in general and the Maghreb in particular.

Another form of direct violence identified by Bajpai is ‘international disputes.’ In the Maghreb the most prominent dispute is between Morocco and Algeria over the status of the Western Sahara. It will be argued that the dispute has had several direct and indirect effects on human security not only on the parties that are directly involved in it (Algerians, Moroc-

cans and Sahraouis) but also on neighbouring communities. In particular, it is responsible to one extent or another for the accumulation of weapons in the region and for stalling multilateral cooperation, including the process of economic integration. On that basis, the factor labelled ‘most destructive weapons’ may be renamed ‘armament’ and discussed in conjunction with ‘international disputes.’

As for the remaining factor in Bajpai’s list – ‘drugs’ – it will not be discussed here because drug addiction is not considered (yet) as a major problem in the Maghreb. This is not to say that there are no drug-related problems in the region. In fact, cross-border trafficking in drugs, particularly between Morocco and Europe, is well known but it will be assumed that its impact on human security is greater in Europe than in Morocco.

Turning now to Bajpai’s list of indirect forms of violence, all of them are present in the Maghreb. However, the allotted space does not allow a comprehensive discussion of each one of them. Consequently, they will be aggregated into two broad categories, each one containing threats that may be considered as most serious and needing urgent solutions. The first new category may be given the familiar label of ‘freedom from want’ and will include components of the *human development index* (HDI) for which improvements are particularly needed. The discussion will focus on access to food and water, education, and gender. The second proposed category may be labelled

‘environmental risks’ and will include sources of insecurity related to natural disasters (earthquakes, floods, droughts) and environmental degradation (pollution, desertification).

To sum up, threats to human security in the Maghreb are numerous but their degree of severity is not uniform throughout the region. The chapter will focus on those threats that are either present in many/all countries in the region or have an impact on many/all of those countries, and that need in all cases urgent attention. Specifically, the following threats will be discussed: Authoritarianism, international disputes and armament, aspects of human welfare (access to vital goods and services, discrimination against women) and exposure to environmental risks.

78.3 Forms of Direct Violence

For any human being the most fundamental right is protection against loss of life or limb *by human decision*. Of course, we are constantly faced with bodily harm as a result of illness or accidents, but we accept those risks as part of life and we normally do not spend sleepless nights worrying about such eventualities. On the other hand, we would feel a great deal of anxiety if there were a threat that another human being might *deliberately* inflict harm on us. Such a feeling of insecurity is widespread in the Arab world in general and North Africa in particular. Its primary cause is the existence of authoritarian regimes which have consistently rejected any form of political reform and which have used – and continue to use – any means to repress and suppress challenges and opposition to their rule. As a result, instead of being a provider of security, the state has become a major source of insecurity.

78.3.1 Authoritarianism

“Through much of human history the danger to an individual’s life, liberty and happiness came from the absolutism of monarchies, the dogma of churches, the terror of dictatorships, and the iron grip of totalitarianism” (Zakaria 1997). This observation applies eminently to the Arab world in general and to the Maghreb in particular. As the table 78.2 shows, the five countries under discussion have been ruled by totalitarian regimes since independence, whether outright absolutist monarchies or pseudo-republican systems. In most cases, rulers stay in power until they die, are killed or are forcibly removed. At the time of writing,

there has not been a single case of a peaceful and voluntary transfer of power.

When they were leading their respective nationalist anti-colonial movements, the later King Mohamed V in Morocco, Ben Bella in Algeria and Bourguiba in Tunisia denounced colonialism as contrary to human rights and democratic principles and called on the people to participate in political and military activities to oust the occupier. Ordinary people joined political parties, trade unions and other civil society organizations, created and ran underground resistance movements, participated in marches, demonstrations and strikes, and became skilled and courageous guerrilla fighters. When the colonial authorities arrested and jailed the top leaders, it was the grass roots rank and file who kept the nationalist movements alive and going. Yet, once independence had been achieved, those same people were declared unfit or at least unprepared for participation in political life.

The ensuing contest for power followed a familiar pattern. Those who became the heads of the newly independent states proceeded to do away, in one way or another, with individuals or groups who challenged them or sought otherwise to participate in the political process. The prevailing attitude among them was that they had a mission to lead their respective countries, and that any challenge to this principle was an act of treason.

This author argued elsewhere (Chourou 2002) that the first leaders who assumed power in North Africa after independence missed a unique opportunity, if not to create democratic forms of government from the outset, at least to set their countries on the road to democratic rule. It is true that in the early period of independence, opposition to the new political order came mostly from individuals or factions of the elite who were not necessarily or primarily motivated by the defence of democratic principles, but who were disappointed that they lost the battle for supreme power.

As for the public at large, they considered that the ‘fathers of the nations’ had the legitimate right to preside over the destinies of the new states. Furthermore, they had more pressing needs than political rights that had to be satisfied: employment, education, health-care, etc. Given the dire condition in which the countries were when colonial rule ended, whatever action taken by the new governments was bound to yield results that could only be considered as major achievements. Having a school, a dispensary, a road where none had existed; having a policeman who spoke one’s own language; having a national army, a na-

Table 78.2: History of Regimes in the Maghreb. **Source:** Compiled by the author.

Algeria	<p>1962: Independence. Ahmed Ben Bella formed the first government. He swiftly moved to neutralize potential opponents. In September 1963 he accumulated the functions of head of state, head of government and supreme commander of the armed forces.</p> <p>1965: Ben Bella was deposed by Defence Minister Houari Boumedienne who dissolved the Parliament and suspended the constitution. A new constitution was adopted in 1976 under which Boumedienne was elected President with 95 percent of the votes. He died in office in December 1978.</p> <p>1979: Colonel Chadli Bendjedid was appointed president.</p> <p>1989: Following popular uprisings in 1988, the government adopted a new constitution that introduced political reforms, including a multiparty system.</p> <p>1991: The Islamist party FIS won a majority of seats in the first round of legislative elections. The government cancelled the elections and Bendjedid resigned. His successor Mohamed Boudiaf was assassinated six months after taking office. Ali Kafi was appointed as the new president and the confrontations between the government and Islamists began.</p> <p>1994: General Liamine Zeroual was designated as acting president and was confirmed by elections in 1995.</p> <p>1999: Zeroual leaves office before the end of his term. The Army picked Abdelaziz Bouteflika as candidate who was elected president and re-elected in 2004.</p>
Libya	<p>1951: Independence. King Idriss Ist assumed power.</p> <p>1969: Col. Muammar Gaddafi overthrew the King, abolished the monarchy and became head of state.</p>
Mauritania	<p>1960: Independence. France chose Moktar Ould Daddah as Prime Minister. He instituted a single-party system and ruled until 1978 when he was overthrown by the military. Power was exercised by a junta. Col. Ould Taya staged a coup in 1984. He introduced a multiparty system in 1992, and was re-elected as president in 1992, 1997 and 2003. In 2005 he was overthrown by his colleagues who set up a transitory government to allow civil society to set up democratic institutions and to prepare for a transfer of power to civilians within two years. Elections were held in March 2007 and a civilian government takes office.</p>
Morocco	<p>1956: Independence. Monarchy was instituted in 1957 and Mohammed V became king. He was succeeded in 1961 by his son Hassan II who ruled until 1999 when he was succeeded by his son Mohammed VI. Since independence the political life has been dominated by the king.</p>
Tunisia	<p>1956: Independence. Habib Bourguiba abolished the monarchy, created a republic and became its first president. He and his party monopolized power.</p> <p>1987: He was overthrown by a military man, Zine el Abidine Ben Ali. Some political reforms were adopted but remained mostly formal. The president's current mandate (his fourth) was due to expire in 2009. The constitution was amended to eliminate limits on the number of allowed mandates and opened the way for the president to seek re-election in 2009.</p>

tional administration – these were concrete results of government policies. It was therefore quite natural that public opinion felt grateful for those achievements and supported the leaders who brought them about.

During the first years following independence, welfare improved quickly and substantially. Governments at that time benefited from a number of favourable conditions that made such gains possible. One of them was the transfer of economic and financial assets from colonial authorities to national governments. Another was the ready availability of funds provided by various donors ostensibly to combat underdevelopment, but in effect to influence the atti-

tudes of the new states towards the protagonists of the Cold War. Thus, the understanding that governments proclaimed, and that populations did not explicitly reject, was that governments would provide for people's needs, and in return people would stay away from politics.

However, by the late 1970's this 'contract' started to fall apart. At one time or another, North African governments had to deal with problems that were becoming more numerous and more difficult to resolve:

- Some policies adopted after independence failed to yield the expected benefits or proved to be outright harmful. This was the case, for example, of the various paths chosen to modernize national

economies and set them on the road to development. Algeria opted for heavy industry, Morocco and Tunisia for import substitution, agriculture being scorned in all three countries as synonymous with backwardness. Many of those decisions had been adopted without submitting them to a thorough public discussion, and when their nefarious effects became visible, it was too late or too costly to correct them.

- Governments controlled most aspects of social life, including economic activities. Agriculture, manufacturing, extractive industries, services were all mostly or totally publicly owned and managed. Thus, governments had the resources to build infrastructure and provide social services, including employment. However, by the early 1980's a number of factors combined to put governments in a difficult position. Prices of raw materials, particularly hydrocarbons, had fallen to historical lows, thereby reducing considerably government revenues. Subsidies to basic products and services (staple food, health, education...) kept increasing as populations and needs grew. Public enterprises, after years of low productivity and inefficient management, had become a major financial liability. In order to finance their growing deficits, governments turned to borrowing from international financial institutions and financial markets. However, this short-term solution was going to create a long-term problem, that of public indebtedness.
- After three or four decades of independence, major progress had been achieved on many fronts: life was certainly better in the 1980's and 1990's than in the 1950's. Nevertheless, public discontent with the political leadership was spreading and intensifying. This was a natural and predictable development, considering that expectations are forever rising, and that people's awareness and political sophistication are bound to improve with time. Unrest was particularly prevalent among the post-independence generation who came to bear the brunt of the ongoing economic and social problems. Unable to provide for their people's welfare, and at the same time unwilling to accept any challenge to their authority, these leaders chose to repress any calls for political change and greater citizen participation in public life.

Thus, the political process turned into a permanent confrontation between regimes that were unwilling to give up power and citizens who were adamant in their demands for political reforms. The forces mobilized by the contenders were highly uneven. Civil society

protesters were denied the use of peaceful means of expression and political action; it turned, therefore, to extra-legal behaviour, including violence and terrorist acts. Regimes, on the other hand, had at their disposal security, military and paramilitary forces, militias, judicial institutions, and other components of the state apparatus which they used, ostensibly, 'to maintain law and order' but in effect to maintain themselves in power.

Two aspects of this confrontation are of particular interest. First, when the confrontation started in earnest (in the 1970's in North Africa), it involved mostly traditional leftist parties (Communist, Trotskyite, liberal democratic...) and activist groups such as trade unions, students, professors, etc. In order to undermine such opposition, many regimes created directly or encouraged the creation of Islamist groups. By and large, the tactic succeeded: unable to resist attacks from the regimes and the religious parties, the lay opposition was sidelined. But for the regimes, this was going to prove to be a Pyrrhic victory. Having become the only movement with effective power and influence, the Islamists organized themselves into political parties which, eventually, sought to govern.

Unlike previous opposition groups, the Islamists parties were well organized, did not limit themselves to urban areas but operated in all parts of their respective countries, and had an ideology that people could understand because it was based on their religion. It was clear that if they were allowed to operate freely, they would be swept into power. Hence, regimes used every means at their disposal to eliminate that threat. But the Islamists were not about to go down without a fight. They proclaimed that since governments refused to fight at the polls and opted for violent confrontation, they had no choice but to fight back with the same tools.

The political agenda of the Islamists - in North Africa and elsewhere - was not restricted to local issues but included various aspects of international relations, including the Israeli-Palestinian conflict and American/Western influence in the Arab and Muslim world. Considering themselves as freedom fighters or oppressed opposition activists, Islamists used or condoned forms of violence which they considered as legitimate acts of war, but that others viewed as terrorist acts. The latter view being advocated by actors who considered themselves as the sole holders of the legitimate right to use violence and as victims of criminal fanatics, it became the accepted orthodoxy, and Muslims in general - not just Muslim activists - and Arabs in particular - and not just those who are members of

Islamist movements, came to be viewed as actual or potential terrorists. This view became even more widespread after 9/11.

Arab regimes exploited the situation to gain the political and material support of frightened Western governments. They resumed in earnest the hunt for political opponents. Any velleity to challenge rulers was branded as part of an Islamist plot to overthrow the existing national and international political order. Acting on the principle that danger had to be eliminated before it materialized governments in the Middle East and, to some extent, in the West launched what one might only call a witch hunt. North Africa was no exception. Practices such as arbitrary arrest and detention, torture, fake trials and other violations of human and civil rights had been common for years; after 9/11 they just became more widespread. People felt that they were under the constant surveillance of visible and invisible security watchdogs, that anything they said, read or wrote was scrutinized for suspicious content, that they may be called to explain not only their own behaviour but also that of family members, friends, neighbours and colleagues. Furthermore, should they be accused of any wrongdoing, they would have little opportunity to defend themselves. As a result, people opted for the prudent decision of not engaging in any activity that had the remotest chance of appearing critical, provocative, or politically motivated. Better yet, and inasmuch as neutrality may appear to be a form of opposition, one had better have a behaviour that shows ostensibly one's support for the existing political order.

In sum, people in North Africa have been victims of various forms of physical violence, including death, as a result of carrying out political activities or holding political opinions. Others perceive that their welfare is constantly threatened by rulers who see enemies everywhere. Reports by various national and international human rights organizations have shown that such fears are justified, and not just imagined. The obvious method of making people less concerned about their lives and limbs is allow them to freely choose their rulers and to periodically evaluate the performance of those rulers – i.e. to find a better method of governing than authoritarianism.

78.3.2 International Disputes and Armament

The conflict between the Polisario Front, Algeria and Morocco over the fate of the Western Sahara has been going on for over 30 years, but it has failed to attract wide international attention despite its human,

social, economic and political cost. Western Sahara was occupied by Spain in 1884; it became a Spanish province in 1936, and kept that status until Spain started in the mid-1970's to divest itself of its colonies. The national liberation front Polisario, created in 1973, asked for total independence, but the neighbouring countries of Mauritania and Morocco, invoking conflicting historical pretensions, asked for a restitution of what they considered as spoiled national territories. In the event, Spain agreed with Mauritania and Morocco to co-administer the province until a referendum on independence could be held. But in 1975, yielding to pressure from Morocco, Spain partitioned the territory into two parts which it turned over to the two North African countries. Polisario rejected that arrangement and proclaimed in early 1976 the creation of the *Sahrawi Arab Democratic Republic* (SADR), with Polisario as its government, operating out of the Algerian city of Tindouf.

Many countries recognized the new sovereign entity, including Algeria which had supported the Polisario since its creation, and continued to give it support in its fight to liberate Western Sahara from Moroccan and Mauritanian rule. In 1978 Mauritania signed a peace agreement with Polisario and abandoned the territory that it controlled, but Morocco moved swiftly to occupy it as well. Polisario's fight continued with Morocco until a ceasefire was negotiated in 1991 and a United Nations force was sent to monitor the ceasefire and prepare for the holding a referendum allowing Sahrawis to determine their future. However, all efforts to find a solution to the Western Sahara conflict have failed, and the problem is still unresolved. The conflict has had serious negative effects on the human security of the two main protagonists², the Sahrawis and the Moroccans. The *International Crisis Group* (ICG 2007) lists the following effects:

The first group of victims are the Sahrawis. Those living in refugees camps on the borders with Algeria suffer from malnutrition, sickness, precarious living conditions, and poverty – a condition shared by refugees all over the world. Their rulers, member of the Polisario, are said to be authoritarian and corrupt, using for their own purposes funds given by the international community to improve the lives of refugees. As

2 For an excellent summary of the Western Sahara crisis, a careful analysis of its human security cost, and useful recommendations to end the conflict, see two reports published by the International Crisis Group ICG 2007a, 2007b) in its series: *Middle East/North Africa Report*.

Figure 78.2: Western Sahara. **Source:** Map 3175, Rev. 2, January 2004. United Nations, Department of Peacekeeping Operations, Cartographic Section. Reprinted with permission; at: <http://www.un.org/Depts/Cartographic/map/profile/wsahara.pdf>.



for Sahrawis living in the Morocco-controlled territories, their material condition is somewhat better, but they have to endure harsh treatment, including arbitrary arrest and torture, from Moroccan authorities who want to discourage anyone from denouncing human rights violations or calling for independence.

They also fear losing their lands to Moroccan settlers who have been moving to Western Sahara in large numbers, with the encouragement of Moroccan authorities. The last categories of victims are the guerrillas who fought against the Moroccan army until 1991 (ICG 2007: 5-7).

Sahrawis also suffered in other ways. Western Sahara holds important reserves of phosphate which have been taken over by Morocco. The reserves are estimated at over one billion cu. m., and Morocco is said to extract 2.4 million tons annually. On the other hand, the ocean off the coast of Western Sahara is a major fishing ground, and Morocco is said to have caught there 700,000 tons of fish in 2005, valued at around US\$242 million (ICG 2007: 11). Such wealth could have improved the welfare of many Sahrawis: a trite but truthful statement.

Turning now to Moroccans, the group among them that suffered most and most directly from the conflict are the soldiers of the Moroccan army. Some 100,000 of them have been stationed in Western Sahara. Aside from those who died or suffered injuries in the course of fighting the Polisario guerrillas, or who have been victims of landmines planted by their own army (no figures or estimates are available for those casualties), Moroccan soldiers who have suffered most from the conflict are those who have been held prisoners by the Polisario. According to estimates made by international human rights organizations, hundreds of soldiers have been held prisoners by Polisario for up to 25 years. During their detention, they have been victims of various forms of ill-treatment. In 2005, Polisario decided to free the last Moroccan soldiers it held prisoners, hoping that Morocco would free some 50 Sahrawi prisoners and give information on 500 others who have 'disappeared' since the beginning of the conflict (ICG 2007: 9).

Economically, the Western Sahara has been a major burden for Morocco, despite the fact that the latter has exploited the territory's natural resources. The security measures alone have been a major burden on Morocco's budget. Building the 2,500 km-long wall (known as *Berm*), equipping it with sophisticated electronic surveillance instruments, and deploying some 130,000 soldiers to guard it – all of this constitutes a costly undertaking. Administering the territory and providing infrastructure and services to serve Moroccan expatriates and pacify local Sahrawis further contribute to the cost of Moroccan control over Western Sahara.

Of course, those expenditures may be viewed as investments that will go to improving the welfare of Moroccans and Sahrawis alike, but there is the risk that Morocco would lose all those investments should it be forced to abandon its control over the territory. Furthermore, those funds could have been spent to improve the welfare of citizens who live in parts of Morocco that continue to be impoverished. As a Mo-

roccan human rights activist, cited by Crisis Group, put it, "the cost of this issue is quite simply Morocco's non-development" (ICG 2007: 13).

In addition to the human and economic costs of the conflict, there is a political cost that needs to be assessed; it is borne not only by SADR and Morocco, but also by Algeria, le Maghreb, and the international community. Starting with the Sahrawis, they have been forced to live in refugee camps or under Moroccan administration for over thirty years. During this period they have had no political activities to speak of, or political institutions they could call their own. In their view, the situation of stalemate has been maintained for too long and there is no end in sight. As a result, a growing number of Sahrawis are getting restless and are calling for a return to warfare to settle the issue.

As for the SADR leadership, the initial success they had on the international scene has waned considerably. Of the 82 countries that have recognized the SADR at one point or another, 35 withdrew or froze their recognition. However, SADR achieved a major breakthrough when the Republic of South Africa granted it recognition in September 2004. But it is yet to be recognized by any member of the European Union, although some Scandinavian countries were reported to be considering such a move. At home, Sahrawi leaders are more and more blamed by the population for the lack of progress towards a settlement, as well as for improper behaviour. This may affect their credibility and legitimacy when dealing with actors involved in settling the Western Sahara conflict which, in turn, will have an impact on the final outcome and hence on the welfare of the Sahrawis.

The third actor involved in the Western Sahara conflict is Algeria. It has always supported Polisario and SADR on the basis that the Sahrawis are entitled to exercise their right to self determination. That support has been both symbolic and very concrete effects on the Algerian government and people. In the 1970's when the Non-Aligned movement still enjoyed some prestige – if not influence – on the international scene, Algeria's stand brought it respect and consideration. But when Polisario agreed to a ceasefire with Morocco, many countries, particularly in Africa, withdrew their recognition. Since then, Algeria has had to invest a lot of energy to ward off any further decline in the support for SADR and further gains by Morocco.

More importantly, Algeria has had to bear more material and costly sacrifices for its stand on the Western Sahara issue. Supporting Polisario has been

at the origin of tension with Morocco, leading both countries to maintain important military forces on their common borders. Antagonism has also resulted in maintaining those borders closed most of the time, preventing any movement of goods or persons between the two countries.

Hostility has also led both countries to devote important resources to defence and armament. According to the 2006 *Human Development Report* (UNDP 2006b), defence expenditures as a percentage of GDP increased for Algeria from 1.5 percent in 1990 to 3.4 percent in 2004, and from 4.1 percent in 1990 to 4.5 percent in 2004 for Morocco. In 1999 Algeria launched a 10-year programme to modernize its defence apparatus, spending about \$ 2.3 billion annually to purchase military equipment. The 2004 budget set aside DZD 202 billion (US\$ 2.8 billion) for the Ministry of Defence and DZD 186.6 billion for the Ministry of Education (Mouloud 2004). In March 2006 Algeria signed a contract with Russia for the purchase of US\$ 7.8 billion worth of military equipment, including 40 Mig-29 fighters.

Morocco, for its part, has been spending, between 1990 and 2004, 4.1 per cent to 4.5 per cent of its GDP on defence. Fighting the Polisario, then protecting and developing the Western Sahara have absorbed most of the defence expenditures. In addition, Morocco has traditionally considered Algeria as a security threat, given the differences in political regimes and ideologies that separate them. It also adopts the view that Algeria nurtures hostile feelings towards it, and could use the Western Sahara problem as a pretext to start a war in the region. Consequently, it feels that it needs to prevent Algeria from acquiring a position of military superiority.

It is therefore not surprising that Morocco should react to Algeria's deal with Russia by seeking to acquire from France 18 Rafale combat aircrafts at a cost of € 2.5 billion, two-thirds of which being financed by Saudi Arabia (Tilouine 2006). The Russo-Algerian deal elicited a similar reaction from Libya which has initiated discussions with France for the purchase of 24 Rafale jet fighters.

This atmosphere of mistrust, suspicion, open or latent hostility, and of rivalry is largely responsible for spending large resources on military activities and equipments instead of means to improve the welfare of the people. It has also led to the stalling of cooperation in the Maghreb. In 1989 the leaders of the five North African countries signed the Charter of the *Union du Maghreb Arabe* (UMA - Union of the Arab Maghreb), with the aim of achieving the economic in-

tegration of the region and increasing cooperation among the members in various domains. So far very little cooperation has been achieved. Even intra-regional trade remains insignificant, representing less than 2 per cent of any one country's foreign trade.

At the same time, most of the countries chose to extend and deepen their relations with Europe and the United States. Thus, Morocco and Tunisia signed in 1995 *Euro-Mediterranean Partnership* (EMP) agreements. Among the purported objectives of the agreements is to improve the human security and welfare of the partners, particularly those of the Southern Mediterranean. However, by the own admission of the Southern partners and even of the EU members, the EMP and the Barcelona Process of which it is a major component, have not reached their expected objectives. Some ten years after Morocco and Tunisia put the EMP agreements into effect, they achieved no welfare improvement that they could attribute directly to the EMP. On the contrary, and looking at Tunisia, the EMP had led to serious economic and social problems (Chourou 2004b).

In sum, the prevailing conflicts in North Africa and the arms race that they triggered and continue to nurture, have led to the death and injury of thousands of citizens, and there may be more victims should violence flare up. They are also the cause of lost opportunities for cooperation that would have gone a long way towards improving human security in the region.

78.4 Forms of Indirect Violence

This section focuses on two forms of indirect violence which have an important impact on human security: achieving greater freedom from want through better access to vital goods and services for all people but particularly for women, and providing greater protection against environmental risks.

Broadly speaking, the level of human welfare in North Africa is not catastrophic. Using the *Human Development Index* (HDI) as an indicator, only Mauritania is in the 'Low Development' category with an HDI of 0.486, ranking it 153rd out of 177 ranked countries. The other four countries are among the 'Median Development' group and are ranked from 64th for Libya to 123rd for Morocco. People on average do not suffer from acute deprivation. As table 78.3 shows, indicators of the standard of living for the three 'core' countries of North Africa are satisfactory; they compare favourably with those of other African and devel-

Table 78.3: Selected social and economic indicators for the 'Core' Maghreb. **Source:** UNDP's *Human Development Report 2006*.

	Algeria	Morocco	Tunisia
Demography (2004)			
Total population (millions)	32.4	31.0	10.0
Annual growth rate (1975-2004), %	2.4	2.0	2.0
Population under age 15 (% of total)	30.4	31.5	26.7
Population ages 65 and above (% of total)	4.5	4.8	6.2
Total fertility rate (births per woman), 2000-2005	2.5	2.8	2.0
Life expectancy at birth (years), 2004	71.4	70.0	73.5
Infant mortality rate (per 1,000 live births), 2004	35	38	21
GDP per capita (PPP US\$), 2004	6 603	4 309	7 768
GDP per capita annual growth rate (%), 1990-2004	0.9	1.1	3.2
Adult literacy rate (% ages 15 and above), 2004			
Total	69.9	52.3	74.3
Female	60.1	39.6	65.3
Youth literacy rate (% ages 15-24), 2004			
Total	90.1	70.5	94.3
Female	86.1	60.5	92.2
Enrolment ratio for primary, secondary and tertiary schools (%), 2004	73	58	75
Population with sustainable access to improved sanitation (2004), %	92	73	85
Population with sustainable access to an improved water source (2002), %	85	81	93
Population undernourished (2001-2003), % of total	5	6	<2.5
Human development index (HDI) value, 2004	0.73	0.64	0.76

oping countries. There are, however, a few areas which represent serious threats to human security and which call for urgent attention.

The first is demography. With the exception of Tunisia, demographic growth continues to be too high in relation to economic growth. Fertility rates remain high, even though they have decreased substantially from their levels in the 1980's and 1990's. One consequence of those early rates is that nearly one-third of the current population are under the age of 15. With a high proportion of youth, and the lack of participation of women in the modern economic sector (a point to which we shall return below), adult males are left with the task of earning a sufficient income to meet the needs of the remaining population. This task is further complicated by the fact that national economies are unable to supply sufficient jobs to meet the demand. Thus, unemployment rates hover around 15-25 per cent according to official figures, the actual figures being probably higher in many

cases, especially if disguised unemployment is taken into account.

These figures have important economic and social implications. As the population increases, national income has to keep up with it if standards of living are to remain stable, but increasing national income and, hence, avoiding poverty, will prove difficult in the future, especially for countries that do not have oil resources - and the core human-security objective of 'freedom from want' is likely to remain out of reach.

The second major challenge facing North Africa is food security. Although the area is predominately covered by desert where droughts are frequent and long-lasting, and water is scarce, the Mediterranean shores used to be quite fertile until human action spoiled them. After independence agriculture was deliberately abandoned in favour of industry, the latter being considered more appropriate for modernization and development. In fertile areas production was switched from food staples to cash crops for export, the rationale being that cash crops bring the hard currency

needed for industrialization. Over the years, such decisions led to the current problems of dependency on foreign markets for agricultural exports and food imports, inefficiency and low productivity of the agricultural sector, ecological and environmental problems arising from inappropriate use of irrigation, mechanization, and chemical products.

Regarding food production, it has been pointed out that "food security is less seen in terms of sufficient global and national agricultural food production, and more in terms of livelihoods that are sufficient to provide enough food for individuals and households" (Boko *et. al.*: 454). Consequently, food security may be defined in terms of: " i. the availability of food (through the market and through own production); ii. adequate purchasing and/or relational power to acquire or access food; iii. the acquisition of sufficient nutrients from the available food, which is influenced by the ability to digest and absorb nutrients necessary for human health, access to safe drinking water, environmental hygiene and the nutritional content of the food itself" (Boko *et. al.*: 454). When a society cannot produce the food it needs and must turn to external suppliers, food may acquire a strategic value, and dependency on outside sources may become a potential threat to human security.

In North Africa agricultural production is highly dependent upon weather conditions. The region is exposed to frequent droughts which may last for several consecutive years. As a result, there are wide variations in production volumes. This is particularly true for rain-fed crops such as wheat and barley, the two main staples for the region. Consumption, on the other hand, has been increasing steadily (see Fig. 79-1). As a consequence, all of the Maghreb countries have had to import larger and larger quantities of grain to fill their growing deficits (see Fig. 79-2). [Fig. 79-1 & Fig. 79-2 about here - all figures are in attached Appendix]

In this regard some remarks are in order. Concerning production, natural conditions in Algeria, Libya and Mauritania (lack of arable land, aridity) are not conducive to agricultural activities. As for Morocco and Tunisia, they opted in the 1970s to develop cash crops (fruits, vegetables) for export and to obtain required staple commodities from foreign markets where supply was plentiful and prices affordable.

However, those decisions were to prove to have been ill-advised. On the one hand, environmental degradation due to human and natural factors, and which was already underway, became more severe and more widespread. Erosion, overgrazing, drought, water scar-

city, increased salinity of aquifers and the extinction of native species of plants were making larger and larger areas unfit for agricultural activities. This has had serious social and economic effects such as loss of livelihood for many communities and migration, both internal and cross border.³

On the other hand, cash crops that Morocco and Tunisia started developing in earnest in the 1970s were to be exported to the European Union (EU) under preferential conditions. However, successive enlargements of the EU made access of North African agricultural products to European markets more and more difficult (Chourou 2004c). Furthermore, most of the exported products required large amounts of water to grow, and exporting them amounted to exporting what is called in environmental jargon 'virtual water', thereby exacerbating the water stress which was already severe in the region (Chourou 2009).

A further threat to food security in the Maghreb is the rising price of cereals on world markets. As Fig. 79-4 shows, prices paid by North African countries for imported wheat varied widely during the period 1990-2005, the average being between USD 140-180 per ton. But in 2007 prices increased sharply, reaching USD 250 per ton in September and USD 300 in October. This has had an effect on governments as well as consumers. Traditionally, all governments in the region had to subsidize basic commodities such as cereals, cooking oil, sugar, liquefied gas used for cooking, and gasoline. When prices increased, governments had to find cash to offset part of the increase and pass the remainder on to consumers. The problem was further compounded by simultaneous sharp increases in the prices of energy products. Inevitably, those who will be most affected by these developments are those who are already vulnerable and insecure.

Even though North Africa does not face at present a severe problem of hunger or malnutrition, the fact remains that food does have a strategic value that should not be allowed to be used as a threat to human security. Countries should adopt measures to achieve food security. This may be a costly process but appropriate results are likely to be obtained if those endowed with land and those with financial resources were to cooperate in achieving collective food security (Chourou 2003).

The third problem confronting the Maghreb is education. The second *Arab Human Development Re-*

3 For a more detailed discussion of environmental problems prevailing in the Maghreb see Chourou 2008b.

port published by UNDP in 2003 being entirely devoted to this question, there is no need to describe the situation in detail. Suffice it to say that illiteracy is still widespread, especially among women; that universal primary education remains a distant goal for many countries; and that higher education is still a luxury accessible only to a minority of the population. Furthermore, there is a dearth of scientific research and production, which is one of the main reasons why the Arab world will remain on the margin of the ongoing scientific and technological revolution. Not only are Arabs in general not participating in the production of knowledge, they are often unable to use knowledge produced by others. How can people use the internet if they cannot read or write, not to mention lacking the means to buy a computer? Human security is unattainable without minimal educational standards.

There is another issue of particular concern, that of gender. Whatever the degree of severity of social problems in the region, the victims of such problems are more likely to be female than male. Many women in the region still do not have access to adequate prenatal and postnatal health care, are not attended by skilled medical staff when they give birth, and die while giving birth.

With respect to education, illiteracy is far more prevalent among women than men. School attendance and enrolment are lower among girls than boys at all levels of education (with the notable exception of Tunisia where in 2006/2007 there have been more women enrolled in higher education than men), and there are more girls than boys who drop out of school or repeat grades.

These are only two aspects of the more general problem of discrimination against women that is besetting many – if not most – of the Arab States, and which is a major obstacle to the realization of human security for all citizens. No society can expect to make progress in any domain if it excludes half of its members from participating in the common efforts tending towards that objective.

The last threat to human security that will be mentioned here is exposure to natural risks and environmental hazards. The issue will not be discussed in detail since an entire chapter will be devoted to it in the forthcoming fifth volume in the Hexagon series (Chourou 2009). Suffice it to mention at this stage that in addition to environmental threats that face all mankind such as climate change and ozone depletion, there are some that are specific to the region. For example, Morocco and Algeria contain major seismic re-

gions. North Africa is also known as a region where rain may not fall for long periods of time, creating severe droughts, or fall in large quantities over short periods of times, thereby causing catastrophic inundations. Other natural phenomena include land degradation and desertification. The effects of these problems on human security are well known, and their future evolution has already been forecast by scientists. For example, there are numerous institutes in the Maghreb that study arid zones and at least one regional organization specializing in combating desertification. With respect to freshwater scarcity, the Food and Agricultural Organization of the United Nations (FAO) has been studying this problem for some time and has even designated 2003 as International Year of Freshwater (Chourou 2004a). The international community and the local authorities and scientists are well aware of these problems. What is needed is the urgent implementation of corrective measures to stop the degradation and waste of land and water resources, and preventive measures to ensure that future generations can have access to food as water required for living.

78.5 Conclusion: Future Prospects of Human Security in the Maghreb

Not all threats to human security confronting people in North Africa have been presented, and those that have been mentioned have not been discussed with the depth they deserve. But the message that this contribution attempted to convey is the following. From a purely material point of view, the majority of North Africans do not face *at present* many major problems. But human beings do not have needs that are exclusively material. Human security includes other aspects of a decent life, such as cultural identity, human dignity and self-fulfilment. It is those non-material dimensions of human security that are most wanting in North Africa and in the rest of the Arab world. It may well be true that average citizen feels lucky that his/her survival is not under immediate threat, yet there are increasingly visible signs that people are not totally happy with life. There are not many scientific studies that evaluate on a regular basis the state of mind or the outlook on life of Arab men and women, but informal observations and impressionistic reports indicate that a general feeling of *malaise* seems to pervade Maghrebi societies. An attentive observer may in fact detect a number of indicators that would confirm that feeling. In short, the crucial problem that con-

fronts most North Africans at present is the fact that the state has become the dominant threat to human security. A large number ordinary people fear their states and their governmental institutions, and feel that their states are not only unwilling or unable to protect them, but are themselves the main threat to their security. Only a few people are exposed to naked threats to their physical safety or to dire economic or social problems, but most see their dignity, their worth as human beings, their human rights and their fundamental freedoms trampled upon on a daily basis by institutions and individuals, including 'security' forces, who act on behalf of, and on orders from, national political authorities.

Numerous reports, books, articles and testimonies have given detailed descriptions of the suffering endured by North Africans for decades. In some countries, the existence of such practices has been acknowledged, and measures to put an end to them have been promised. It is therefore not necessary to enumerate or describe the practices themselves. It is more important to focus on what needs to be done to ensure that all citizens enjoy all aspects of human security – those pertaining to their physical well-being as well as those to their mental, psychological or emotional state.

In this regard prospects for human security in the Maghreb do not appear bright in the estimate of this writer. Reforms announced or introduced in various countries are mostly formalities with little practical impact on people's security. Thus, greater democracy in the form of more transparency in public affairs, greater accountability of political leaders, and formation of opposition parties is either nonexistent or remains purely theoretical. In most countries there are no political parties at all, or there is only one party, or there are several parties which in fact are created and tightly controlled by the ruling regimes. Regimes that are supposed to be republican have had leaders who have been in power for decades and are planning to rule for life, just like kings; some of them are even preparing their sons to succeed them.

In North Africa opposition movements, when they have not been co-opted, have been eliminated by the regimes. Their militants have been victims of various abuses, tried on a variety of fabricated charges, sentenced to long jail terms, and sometimes lost their lives. However, since the number of political activists is usually small, and given the fact that the majority of citizens do not appear to suffer from dire material problems, one might be tempted to dismiss human rights violations as a minor threat to human security

at large. However, such an attitude would be at odds not only with ethical principles (one human being at risk is one too many) but also with the harsh realities that ordinary people have to endure and that outsiders ignore or pretend to ignore.

Political leaders in the Maghreb take credit for advances made towards achieving freedom from want and at the same time, they profess concern that the process may be halted or even reversed should power fall into other, 'irresponsible' hands. However, they need to come to terms with the fact that public opinion no longer accepts such views. There may have been a time when people were willing to accept political leadership in exchange of the provision of public goods, but today they want to choose policies that will affect their lives and participate in the implementation of those policies and the evaluation of their outcomes. In other words, citizens want full and effective participation in the political process, including the right to choose individuals and parties that will manage public affairs: This is what is commonly called democracy.

However, democracy is not likely to take roots and thrive in the Maghreb in the near future, and that is why prospects for human security will remain bleak. Some may find this appraisal surprising or unfounded. Of course, if one takes the view that human security is limited to physical well-being, then one would have to recognize that North Africans are more fortunate than many people around the globe. But such a restrictive definition of human security is unnecessary and unacceptable. People face threats that are real even if they are not always visible to the naked eye. They fear their leaders and their institutions, injustice and arbitrariness, the present and the future. They make proclamations in which they do not believe, they comply with 'suggestions' to express 'spontaneously' their ardent support and eternal gratitude for their wise and beloved leaders, and they do so because they know that even silence and lack of involvement may be interpreted as opposition.

Achievements have been made in the Maghreb towards freedom from want; that much can be acknowledged but the task is far from being completed. It is time to recognize that authoritarianism is not required to sustain welfare – it may even undermine it but, more importantly, it is a major barrier to human security. At present, the main threats to human security in the Maghreb do not emanate from terrorists, unpatriotic power mongers, or selfish opportunistic manipulators but rather from power holders who are unwilling to let people take their lives into their own hands,

make their own mistakes and assume their responsibilities for doing so, and design their future as they see fit. There are no signs that North African leaders are going to change their way of thinking or that people are going to accept indefinitely their serfdom. The confrontation is therefore inevitable and its impact on human security is predictable; only the timing of the pre-announced catastrophe and the extent of the damage it will have on human security are debatable.

There is, however, one possibility for changing the course of events, albeit a remote one. If current leaders are not likely to willingly initiate a peaceful transition to democracy or to yield to public demands for political reforms, they *may* be more responsive to outside pressure. It should be kept in mind that all regimes in the region have been able to stay in power largely as a result of the political and material support they have received from the outside. After 9/11 and in the name of the 'war on terror', that support (as well as punishment in the form of isolation) became more intense and more concerted. Influential members of the international community - notably the United States and members of the European Union - decreed that Libya as a 'rogue state' has to be isolated and the remaining states of the Maghreb need international support as bulwarks against terrorism. But in 2007 even Libya, after making proper amends, was relieved from membership in the 'axis of evil' and its leader was welcomed in European capitals.

Of course, Western governments are fully aware of the poor record of North African states in the area of democracy and human rights. In fact, various initiatives have been taken in Washington and Brussels to put the region on the path towards democratization and greater respect of human rights. However, these efforts have not had any effect. This failure is due to many factors but the main one is the fact that neither the US nor the EU have the will or the desire to revise the foundation of their policy towards the Maghreb or the Middle East or the Muslim world in general. That policy continues to be based on the postulate that the international community, or at least its civilized members, are threatened by Islamic Fundamentalism personified by al-Qaeda, and that all states should and must put the elimination of that threat in the forefront of their priorities. The nefarious effects of that approach have been visible for quite some time, most recently in another part of Africa: Kenya. Following the outbreak of violence in that country following the presidential elections held in December 2007 an observer wrote in the *Financial Times*: "Seldom has an African tragedy been signaled so far in

advance. And seldom have western policymakers been so complicit in a crisis that is turning into Kenya's catastrophe. For the past three years the international donor community, led by the World Bank and supported by the International Monetary Fund, have ignored the warning signs and knowingly backed one of Africa's most corrupt regimes." (Holman 2008) To explain why Western donors and governments have failed to take appropriate action, the author writes: "The truth is, they never had the stomach for a fight. They did not believe it was ultimately in their interests to have a showdown with the barons of corruption. They did not want to upset what they saw as a regional "island of stability" [...] Weighing in the balance are the longstanding military agreements Kenya has signed with the US and the UK, which have assumed particular importance since President George W. Bush launched his war on terrorism." And the author concludes: "Not for the first time, an African country is paying a terrible price for the tolerance of its corrupt government by its [W]estern partners." (Holman 2008)

The West is following the same policy in North Africa as in Kenya and it is highly probable that it will have similar consequences. Yet current conditions at the global and regional levels are not likely to encourage a revision of that policy. With oil costing over \$100 per barrel, the war in Iraq continuing with no end in sight, persisting instability in Afghanistan and Pakistan, and continued tension in Iran, Palestine and Lebanon, the West would take no chance of allowing 'unfriendly' regimes to come to power in strategically vital countries, including those in North Africa.

Enlightenment cannot be expected from North African leaders, or perspicacity from Western democracies. Compassion, morality and humanism have become alien concepts. Fanatics have stepped in this vacuum to convince frustrated citizens that the good life that has been denied them at home and in foreign lands will be theirs in Paradise if they fight Satan personified in national tyrannical leaders and their supporters. Alas, policymakers in the North and the South seem to be doing everything they can to give credence to such a message. How long will this continue before all concerned come to their senses?

79 Human Security Concepts, Approaches and Debates in Southeast Asia

Zarina Othman

79.1 Introduction

The end of the bipolar world in 1989 triggered an in-depth re-evaluation of the concepts of peace and security (Brauch 2008, 2008a, 2008b, 2008c). The realist school defined peace as the absence of war and security as the absence of threats. Alternatively, the neo-liberal institutionalism, focuses on the important role played by international institutions and economic interdependence that can promote cooperation and security (Wæver 2008). Nevertheless, security for the developing states differs somewhat from the Western concept. Most owe their 'insecurity' first to their struggle for independence and later for economic independence (Thomas 1987: 10). As observed by Alagappa (1986: 2), a deteriorating economy can easily lead to domestic conflicts and this can threaten either the state as a whole or the regime in power, or both. Economy and regime security or the survival of the ruling regime are therefore crucial elements in promoting national security for the developing states (Collins 2003: 5; Ayooob 1995, Ayooob/Samudavanija 1986). Additionally their concern for security is focused primarily on the stability of their politics, a well developed economy and a harmonious society (Hernandez 1990, 100-101). The region is also concerned about China's growing economic power and Japan may pose a military threat again but closer economic ties and steps towards establishing the East Asian Community may support the neoliberal institutionalism with regard to the prospect of peace and security in the region (Lee/Tham/Yu 2006).¹

The 'human security' concept has attracted much debate among scholars since the *Human Development Report 1994* defined it as 'freedom from fear' and 'freedom from want', and included seven elements, namely: economic, food, health, environmental, personal, community and political (UNDP 1994). The UN's concept of human security suggests a concern with quality of life, including economic growth and access to resources, rather than a focus on weapons and defence against outside forces. Human security thus means putting the people first, before the state.

Canada has been a leading promoter of human security. The Canadian government defined human security as having an acceptable quality of life and a good guarantee of fundamental human rights (Axworthy 1997; Dedring 2008). Thus, humanitarian intervention due to violent conflicts can be legitimized to protect human rights and the quality of life, in addition to mere survival (ICISS 2001). Canada co-established the *Human Security Network* (HSN), an informal group of like-minded countries who pursue a 'people-centred' approach to security (see chap. 75 by Fuentes/Brauch).²

Japan, a friend of the HSN, defined human security within the context of globalization:

[I]n addition to providing national protection, focusing on each and every person, eliminating threats to people through cooperation by various countries, international organizations, non-governmental organizations and civil society, and striving to strengthen the capacity of people

1 This collection of papers was originally presented in an international conference held at Universiti Kebangsaan Malaysia, jointly organized by the *Institute of Malaysia and International Studies* (IKMAS, UKM) and the Centre for East Asian and Pacific Studies, University of Illinois, Urbana Champagne, on 19-20 May 2005.

2 The HSN wants to strengthen human security by creating a more humane world where people can live in security and dignity, free from want and fear, with equal opportunities to develop their full potential. As the only HSN-member in ASEAN Thailand organized the 8th HSN Ministerial in June 2006 in Bangkok (see at: <http://www.humansecurity.gc.ca/hsi_hsn-en.asp> and chap. 75 by Fuentes/Brauch.

Figure 79.1: Map of Southeast Asia and of the ASEAN Countries. **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection. This map is in the public domain; at: <http://www.lib.utexas.edu/maps/middle_east_and_asia/southeast_asia_pol_2003.jpg>.



and society so as to enable people to lead self-sufficient lives.³

The problems of people, especially those that are affected by globalization, displaced people and refugees have been the focus of Japan's human security approach (see chap. 84 by Shinoda). The awareness of the need for human security has been increasing,

partly due to the prosecution of war crimes, an increase in general violence among people around the world, and human suffering caused by landmines, small arms and the proliferation of child soldiers.

In Southeast Asia, a region that was severely hit by the tsunami of 26 December 2004, the human security concern has been perceived very slowly, at least to be included in the respective national policies. But closer examination reveals that the human security concept has been used since the late 1990's, especially

3 See: Japan's Ministry of Foreign Affairs, at: <www.mofa.go.jp/policy/security> (5 September 2005).

Table 79.1: Membership of Southeast Asian countries in regional IGOS and NGOs: APEC (Asia-Pacific Economic Cooperation); ARF (ASEAN Regional Forum); ASEAN (Association of Southeast Asian Nations); EAC (East Asian Community); AltSEAN (Alternative ASEAN Network); APA (ASEAN People’s Assembly); CSCAP (Council for Security Cooperation in Asia-Pacific); ISIS (Institute of Strategic and International Studies); RWGHR (Regional Working Group on Human Rights). **Source:** Compiled by the author.

County	International Organizations					Regional Networks, NGOs and Institutes				
	APEC	ARF	ASEAN	EAC	AltSEAN	APA	APR	CSCAP	ISIS	RWGHR
Brunei Darussalam	X	X	X (1984)	X	X	X	X	X	X	
Cambodia		X	X (1999)	X	X	X	X	X	X	
Indonesia	X	X	X (1967)	X	X	X	X	X	X	X
Laos		X	X (1997)	X	X	X	X		X	
Malaysia	X	X	X (1967)	X	X	X	X	X	X	X
Myanmar		X	X (1997)	X	X	X	X		X	
Philippines	X	X	X (1967)	X	X	X	X	X	X	X
Singapore	X	X	X (1967)	X	X	X	X	X	X	
Thailand	X	X	X (1967)	X	X	X	X	X	X	X
Vietnam		X	X (1995)	X	X	X	X	X	X	
Timor Leste		X			X					

after the regional economic crisis of 1997–1998 (figure 80.1).

This chapter reviews the dynamics, patterns, approaches and debates on the various human security concepts and analyzes how members of the *Association of Southeast Asian Nations* (ASEAN)⁴ have responded to this approach. The central theme is that its members believe that human security is associated more with economic development as a precondition for political stability; while human rights issues have been considered as domestic problems that are best left to the individual states to deal with, and thus should not be discussed at the regional level.

This chapter discusses first the Southeast Asian concept of ‘comprehensive security’ (80.3), a tra-

ditional approach that has been adopted by ASEAN states for designing their respective national security policies; then it explores the human security approach (80.4), how it has evolved and some specific issues and policies; and finally it suggests what needs to be done to promote and strengthen this concept in Southeast Asia (80.5).

79.2 Competing Security Approaches in Southeast Asia

Southeast Asia lies in the middle of the major sea lanes between the Middle East and East Asia, and thus serves as a connecting channel for both transportation and communication. Southeast Asia is a diverse region (table 79.1) with different levels of development. ASEAN is grouped into four tiers according to their GDP per capita (table 79.2).

At the top tier are Singapore and Brunei; at the second tier are Malaysia and Thailand; at the third

4 ASEAN was established in 1967 by Indonesia, Malaysia, the Philippines, Singapore and Thailand. In 2007, all states except Timor Leste have become members of ASEAN (ASEAN 10). Below Southeast Asia and ASEAN are used interchangeably.

Table 79.2: Demographic and Socio-Economic Information of ASEAN States. **Source:** CIA (2007); at: <<https://www.cia.gov/library/publications/the-world-factbook/>> (15 May 2007); and at: <<http://www.aseansec.org>> (25 February 2008). **Source:** Compiled by the author.

State	Types of Government	Major Ethnic Groups/ Religion	GDP per Capita (US\$) Estimation	Land Area/ Population (Million/M)/ Estimation 2008
Brunei Darussalam	Absolute Monarchy	Malay/ Islam	\$25,600 (2005)	5,765 sq km/0.4 M
Kingdom of Cambodia	Monarchical/ Quasi-democracy	Khmer/ Buddhism	\$2,600 (2006)	181,000 sq km/14 M
Republic of Indonesia	Quasi-democracy	Malay/ Islam	\$3,800 (2006)	1,890,000 sq km/220 M
Lao People's Democratic Republic	Communist	Lao/ Buddhism	\$2,100 (2006)	236,800 sq km/ 6 M
Malaysia	Monarchical/ Quasi-democracy	Malay/ Islam	\$12,700 (2006)	330,257 sq km/ 26 M
Union of Myanmar	Military	Burman/ Buddhism	\$1,800 (2006)	676,577 sq km/ 56 M
Republic of the Philippines	Democratic	Filipino/ Christians	\$5,000 (2006)	76,964 sq km/ 86 M
Republic of Singapore	Quasi-democracy	Chinese/ Buddhism	\$30,900 (2006)	697.1 sq km/ 4 M
Kingdom of Thailand	Monarchical/ Quasi-democracy	Thai/ Buddhism	\$9,100 (2006)	513,254 sq km/ 65 M
Socialist Republic of Vietnam	Communist	Viet/ Buddhism	\$3,100 (2006)	330,360 sq km/ 84 M

tier are the Philippines and Indonesia; and at the fourth tier are Vietnam, Cambodia, Laos and Myanmar. Except Laos, all states are maritime nations, and are located in a volcano belt. Thus, it is vulnerable to earthquakes, volcano eruptions, and tsunamis, as well as other natural disasters.

79.3 Comprehensive Security Concept of ASEAN Members

ASEAN states have been especially concerned about their sovereignty and subscribed to the *Zone of Peace, Freedom and Neutrality* (ZOPFAN)⁵ since the early 1970's (Anthony 2005, Anwar 2001, Severino 1997). They have defined their security in a conventional

way, but most of their security threats have originated from within, from domestic issues - e.g. poverty, lack of economic opportunity for individuals - and from the related encounters with certain groups most affected by those issues, combined with outside forces that have insidiously infiltrated the general population (Al-Mashat 1985; Thomas 1987; Ayooob 1995).

Other security issues in the region have resulted from unresolved border disputes, (such as between Malaysia and the Philippines over Sabah (in Malaysia's North Borneo); Indonesia and Vietnam over the continental shelf near Natuna Island) and from long-standing political disputes, both with neighbouring countries and with certain groups within a state (including Muslim Moros in southern Philippines; Karen separatists in Myanmar, Muslims Patani in Southern Thailand), among others (Hashim/Dinisari 2006; Nik Mahmud 1994; Santos Jr. 2001; Snitwongse/Thompson 2005; Coronel 2005; Lim/Vani 1984).

These issues have attracted most of the attention of those leaders who are most attached to the conventional, or traditional, state-focused security approach

5 ZOPFAN is a doctrine that was adopted by ASEAN in 1971 declaring that the region should take care of their own survival without interference from external forces, particularly the major powers of the Cold War, the United States of America and the Soviet Unions (Anthony 2005, 63-64; Anwar 2001).

What makes Southeast Asia different from other developing regions is that it adopted a 'comprehensive concept' of security, a broader approach to national security, at least since the mid-1980's. This liberal approach to security has also been adopted by others in the more developed countries, such as 'common security' in Europe and 'cooperative security' in Canada (Dewitt 1994).⁶ The comprehensive security concept that ASEAN has adopted was originally brought forth by Japan in the 1970's. Japan's comprehensive security went further than the traditional Western realists' view of security, and yet it did not discount the importance of defence or territorial security (Radtke 2000: 2; 2008; chap. 84 by Shinoda).

Japan's comprehensive security is concerned with non-military issues, but mostly issues that are seen as not originating from within the country. As in Japan, the ASEAN idea of comprehensive security is broader than the more traditional concept, including 'high' as well as 'low' political issues. It goes beyond the traditional military threats, or the internal violence and disorder that arise from ethnic conflicts. It includes other issues such as maritime piracy, famine, environmental pollution, illegal immigration, illicit drug and weapons trafficking, and trafficking in human beings – all of which are threats to the stability of the region. Thus, the ASEAN concept of comprehensive security has included domestic non-military issues as well as external threats to their survival. At the same time, comprehensive security does not neglect the importance of military security (da Chuncha 2000; Ellings/Simon 1996; Ball 1996; Tillman 1987).⁷

Consistent with the notion of comprehensive security, Southeast Asian leaders have begun to understand that 'security begins at home', that 'we have to be strong on the inside in order to be stronger on the outside'. Based on the geographic size and their GDP per capita (table 79.2), Singapore, a tiny but rich state,

adopted the concept of 'total defence'. Indonesia, a huge yet poor state, has a concept it called 'national resilience', while Malaysia, a mid-sized state, has stressed the importance of domestic issues. All three have focused on internal and external as well as military and non military aspects of security in their comprehensive security approach. To ASEAN, domestic matters are considered important as related to national security goals, which generally include political stability, economic well-being and social harmony (Alagappa 1989).

Although comprehensive security has been understood within the context of regional security, it does not include a perception of common external threats. This is partly due to the fact that the focus under a comprehensive security approach continues to be mainly on traditional security. In other words, comprehensive security is just another version – albeit an expanded one – of the typical ASEAN style of state-centric security, where the referent object is the state. In reviewing the literature on comprehensive security, several distinct categories may be distinguished:

1. studies that focus on domestic factors where political stability, economic development and social harmony are considered as important ingredients of security (Alagappa 1989; Euraksul 1998);
2. studies that have viewed the phenomenon of growing interdependence in the region, which includes the possibility of cooperative efforts to resolve conflicts (Herrmann 1998; DuPont 1997; Baviera 1996; Feddema 2000), and
3. studies that have looked at the overall well-being of individuals within a state (including human rights) as being important for the state's comprehensive security (Hassan 1996; Yamamoto 1996).

Nevertheless, ASEAN's primary principles regarding regional security are embodied in its consensus, 'ASEAN Way', and its 'non-interference policy'. Human rights abuse in Myanmar – including the long-term detention of Burmese non-violent pro-democracy activist Aung San Suu Kyi – and the unresolved conflict with Southern Thailand, continue to be considered as under the exclusive jurisdiction of the state. Although these policies and principles have received a fair amount of criticism, nevertheless they have served successfully as a platform of principles from which to manage conflict (Othman 2006a; Sukma 2005; Askandar/Bercovitch/Oishi 2002).

ASEAN has also relied on norm-building, confidence and developing cooperative relationships, as ways to prevent conflict. This is exemplified in the

6 The 'cooperative security' concept developed in Canada is broader and more flexible than either Japan's 'comprehensive security' or Europe's 'common security'. It recognizes the value of existing bilateral and balance of power arrangements in contributing to regional security. The key focus of cooperative security is the habit of having dialogue and moving toward inclusive participation in addressing any given conflict.

7 The external threats in the region include the overlapping claims of the Spratly and Paracel archipelagoes in the South China Sea, nuclear issues in North Korea, the impact of economic growth issues (e.g., illegal immigration), and conflicting interests between India and China.

multilateral security meetings held by the *ASEAN Regional Forum* (ARF).⁸ Track II networks of non-officials, including academics, also play a major role in cultivating the regional security discourse.⁹ Two of these are based, respectively, with the ASEAN Institute of Strategic and International Studies (ISIS)¹⁰, and the Council for Security Cooperation in the Asia-Pacific (CSCAP).¹¹ The civil discourse in re-assessing the concept of security has been sponsored privately by various other groups. As observed by Mely C. Anthony (2004: 166), in 1994, a conference on “Peace, Disarmament and Symbiosis in the Asia Pacific”, explored the issues surrounding peace, security and human well-being, and acted as a catalyst for other similar conferences whose participants include academics and NGOs. In spite of such efforts, the concept of comprehensive security remains underdeveloped in many ways. The primacy of the state and its territory still dominates, even though states have seen security issues differently than those who have the Machiavellian perspective.

79.4 Human Security Debate in Southeast Asia and in ASEAN

The rationale behind the human security approach began with the change of the primary referent object of security from the state, to the human beings who live there. Fully discussing human security issues in Southeast Asia is currently quite difficult because resources for study and research are limited, and access to what is available is not allowed to everyone (Wun Gao 2004; Tan 2003; Pham 2001). In addition, states in this region have been generally slow to place human security on their general security agenda. Yet, the rise in recent years of many serious non-military issues – such as the Asian financial crisis, the Indonesian for-

est fires, the Bali terrorist bombing, the outbreaks of the *severe acute respiratory syndrome* (SARS) and the bird flu, tsunamis (chap. 88 by Wun Gao; Villagran 2009), earthquakes, floods, destruction of the rainforests, and global warming – have called attention in the region to the inadequacy of the combination of traditional and comprehensive security.

At least two major events have sparked interest in the human security approach in the region. The first was the Asian financial crisis of 1997–1998, and the second was the 2004 tsunami. The Asian financial crisis has served as a major turning point which brought human security to the attention of a wider group of Asian scholars.¹² More importantly, the globalization aspects of the phenomenon did not only demonstrate the nexus between the economy, low politics, and security, but also challenged state-centric security. The crisis began in one country, it quickly spread, and the impact was felt regionally. In every country the impact on individual people and families was strong and caused tension between and among different sectors in the society (Sucharithanarunge 2000: 59). The impact has included a rising unemployment rate, declining productivity and consumption, a widening gap between rich and poor, rising inflation, etc. – all of which in one way or another has worked against the well-being of the people and caused severe human insecurity. As people were desperately struggling for the means of survival, population movement across national boundaries increased. In some countries, ethnic tensions have also increased, as documented in the case of Indonesia's Ambon and Lombok, ‘*Reformasi*’, which means pressure for political change. Street demonstrations are seen increasingly in Malaysia and Indonesia, threatening the stability of the regimes in power and therefore the national security of the states themselves (Kim 1999; Sucharithanarunge 2000; Yasmeen 2003; Gochoco-Bautista 2003). In 1998 the fall of Indonesia's President the late Suharto was partly due to this economic crisis (Bhakti 2000, in Tow/Thakur/Taek-Hyun 2000).

Thailand, the first and only country in Southeast Asia that has officially adopted the approach of human security, has called for a common approach in the region to address the issues of human security in a balanced and comprehensive way (Capie/Evans 2002: 144). Thailand has defined human security in a

8 The current participants in the ARF are: Australia, Brunei Darussalam, Cambodia, Canada, China, European Union, India, Indonesia, Japan, Democratic Peoples' Republic of Korea, Republic of Korea, Laos, Malaysia, Myanmar, Mongolia, New Zealand, Pakistan, Papua New Guinea, the Philippines, the Russian Federation, Singapore, Thailand, Timor Leste, the United States, and Vietnam (Anthony 2004: 162).

9 Track I refers to government officials; Track II refers to non-officials and includes academics; while Track III refers to NGO activists.

10 For ISIS, see at: <http://www.isis.org.my/htm/affils/affils_asean-isis.htm>.

11 For CSCAP see at: <<http://www.cscap.org/about.htm>>.

12 The crisis, which began in Thailand, started as a monetary crisis and later was referred to as an economic crisis. Major affected countries in the region included Indonesia, Malaysia, the Philippines and Thailand.

way that is similar to the United Nations' original definition - promoting 'freedom from want' and 'freedom from fear'. According to this policy, prior to the military coup of September 2006, the government of Thailand was committed to eradicating poverty and to improving the quality of life for its people. This resulted in the establishment of a Ministry of Social Development and Human Security in 2002 (chap. 88 by Wun Gaeo).

In addition, the Thai's government has acknowledged that HIV/AIDS is a serious threat not only in Thailand but also in the Greater Mekong sub-region of Vietnam, Laos, Cambodia, Myanmar, Yunnan (Southern China) and Thailand, where prostitution continues to rise (chap. 43 by Affeltranger).¹³ Thailand's efforts extended to the regional level when it proposed the concept of human security to ASEAN, arguing that poverty, illiteracy, and economic dislocation can all lead to violence, rebellion, instability, and general insecurity, which threatens the region as a whole. It suggested that ASEAN should adopt a more people-centred approach to development. ASEAN responded positively in 1998 at the ASEAN *Post-Ministerial Conference* (PMC) in Manila, where it created an ASEAN-PMC Caucus on Human Security. Later another ASEAN-PMC Caucus was established, on Social Safety Nets, programmes targeting the vulnerable people to overcome short term poverty, due to sudden economic downfalls, such as the Asian economic crisis. The concept of human security was later established within the *Asia-Pacific Economic Cooperation* (APEC) meeting in 2003 in Bangkok.

During the Asian financial crisis, in Indonesia programmes included distributing inexpensive rice and scholarships for students from the poorest families. Malaysia has provided expanded training for the unemployed, and in the Philippines a computerized job assistance network was launched. Thailand has been very active in introducing social transfers for the elderly, and by giving cash transfers to needy families and to community-based programmes. Health and education programmes are being provided for the poor, along with a voluntary health insurance card, instalment plans for paying school fees, fee waivers, and free uniforms for students. There is an employee welfare fund for workers of bankrupt firms; extended training for the unemployed; and self-employment loans (Anthony cited in Dickens 2002: 25-26; Daud/Othman 2005: 197-199). Efforts such as these show

how a state demonstrates an ongoing concern with internal insecurity as well as care for the welfare of its people. This shows at least the acknowledgement of the human security concept by the governments in Southeast Asia.

Similarly, it seems that the 2004 tsunami has strengthened and expanded the important roles played by a transnational civil society and NGOs, and the armed forces have had shifting roles as they provided emergency assistance and relief work (Huxley 2005; Adiningsih 2005; Khalikov 2005; Ananta/Onn 2007).¹⁴ However, in between these two major events, the US 'global war on terror', sparked by the attacks of 11 September 2001, has slowed the adoption of a human security approach, because when Southeast Asia was identified as a major areas where terrorism flourishes there was a return to focusing more on traditional security measures.

Elsewhere the human security literature was categorized into three groups: 1) individuals as the object of security; 2) the world system theory, including globalization as a threat to human security; and 3) threats to human security that originate from within the state itself (Othman 2002: 62). Studies and reports in the first category deal with the protection of the most vulnerable groups, including women and children (Suhrke 1999; Kim/Hyun 2000). Analyses in the second category show how globalization - driven by an expansion of capitalism, as well as technological developments - affects human security through inequalities of power and distribution of resources, both within states, between states, and between private corporations. They point to the fact that human security cannot be gained by one group at the expense of another (Thomas 1999, 2000; Kim 1999). Finally, the third category deals with threats that come from within states, such as persons who are internally displaced due to discrimination (Axworthy 1997).

Asian scholars have argued that within the region human security debates are by definition a criticism of the Southeast Asian concept of comprehensive security. Comparing the two, comprehensive security and human security, Anthony (2002) pointed out that the former is more concerned with 'what' [the referent object of security is], while the latter has focused more on the 'who' of security. Issues that are being confronted by ASEAN members illustrate that there still is no single regional approach to human security.

13 See: Ministry of Foreign Affairs, Kingdom of Thailand, at: <<http://www.mfa.go.th>> (12 November 2004).

14 In the case of tsunamis, India, Pakistan, Malaysia and Singapore were among the countries that provided military forces to help with relief.

Table 79.3: Characteristics of Comprehensive Security and Human Security. **Source:** Compiled by the author.

Components	Comprehensive Security	Human Security
Unit of analysis	State	People
Source of threat examined	External and internal	External and internal
Type of threat examined	Military and non-military	Military and non-military
Element of threat examined	State and non-state	State and non-state
Theoretical and empirical emphasis	Human needs	Human rights

Rather, based on the *ASEAN Vision 2020*, its human security has focused mostly on the larger society rather than on the individual people within the society.¹⁵

It is being noted that ASEAN's idea of 'security begins at home' has led its members to begin looking at ways economic development can strengthen their countries' internal security. Although ASEAN countries have not focused on development for the people, the approach is to empower states to be able to provide more freedom for individuals to develop themselves and to take advantage of economic opportunities. Also, in assessing the debates, scholars like Amitav Acharya¹⁶ have argued that the two concepts of comprehensive security and human security can be easily differentiated. First, comprehensive security focuses on human needs, while human security focuses on human rights. Second, comprehensive security focuses on 'which threats to security?' while human security focuses on 'whose security?' Third, comprehensive security focuses on stability and order, while human security focuses on justice and emancipation. It is clear that human rights are the main missing element in comprehensive security. In human security, protecting the dignity and safety of the people is seen as an end in itself, while in comprehensive security protecting the people serves as a means for achieving national security and other goals.¹⁷

In general, ASEAN states were uncomfortable with, and slow to embrace, this concept of human security, perhaps mainly because of the emphasis on the human rights factor. This is because human rights have often been regarded as alien and as a challenge to the supremacy of the state, which usually has been considered as synonymous with the ruling regime (Anwar 2003). Anwar sees human rights and human security as the two sides of the same coin, implying that human security can only be assured if human rights are guaranteed. She has divided human rights into four categories: civil, political, social and economic rights. Although most states are trying to meet the basic needs of their citizens, and indeed pursuing economic development is one of the important components of human security, yet placing a priority on human rights is missing (table 79.2).

However, among the weaker ASEAN members such as Cambodia, Laos, Myanmar and Vietnam, conflicts over resources have also become human security issues (Malhotra 1999). For the Indochina states, democratization was seen as an alternative to the human security approach (Lizee 2002). Similarly, transnational issues such as trafficking in women and children are becoming a common concern in the region (chap. 91 by ThanhDam Truong). Yet, landmines issues, have been minimally studied from human security perspectives. Currently, most sovereign states of Southeast Asia have served at once as a source of trafficked people, as an area through which trafficked persons are transported, and as a destination for those who are trafficked. Trafficking (as opposed to smuggling) involves the ongoing exploitation of illegally transported persons, as they are manipulated or forced into becoming victims of organized crime syndicates and other criminal elements (Othman 2004, 2006b).¹⁸ There is a growing concern for children, defined legally as those under 18, who are trafficked and

15 The perspectives on security include all the fundamental needs and vital interests of human beings –society and the state; the political, social, economic, cultural, environmental, personal and physical climate of that state and society (national resilience and national security); the mutuality and interdependence of all dimensions of security; and threats from both the domestic and external environments. See at: <<http://www.aseansec.org/1814.htm>> (20 January 2006).

16 Amitav Acharya, "Human Security in the Asia-Pacific: Puzzle, Panacea, or Peril", at: <<http://www.cpsindia.org/globalhumanssecurity/puzlepanacea.htm>> (18 August 2004).

17 Amitav Acharya suggested that democracy and human rights should be essential components of human security.

forced into work in the sex industry and other exploitive work – prostitution, pornography, forced begging, some domestic work, and others related (see chap. 91 by ThanhDam Truong; chap. 92 by Perpiñan/Villareal/Oswald Spring). As with forcing children to bear arms as soldiers, by their very nature these activities are guaranteed to endanger the security of future generations.

Discussions and debates about human security have been mainly organized by universities (e.g. by Thammasat and Chulalongkorn universities in Bangkok, Thailand), and mostly attended by academicians.¹⁹ Yet, Track II channels such as annual discussions held by the ASEAN-ISIS *Asia Pacific Roundtable* (APR), have also begun to be a platform for discussing the human security approach in the region.²⁰ The 19th well established Asia Pacific Roundtable that was held in late May 2005, Kuala Lumpur, has partly focused

on ‘human security’.²¹ Another cooperation between an academe and INGO, has successfully established an international conference in Malaysia, that was held in June 2006, with the theme, “Advancing Human Security,” sponsored jointly by the International Committee of the Red Cross (ICRC, Malaysia branch) and the Northern University of Malaysia in June 2006.²² In May 2007, another regional conference jointly organized by Universiti Kebangsaan Malaysia and Universitas Padjadjaran, Indonesia on the theme “National and Regional Human Security: Reality and Aspiration” was organized.²³ The conference demonstrated the increasing awareness and interest in the concept, approach, and issues surrounding human security, and humanitarian and human rights issues were openly debated and discussed. At least this was a step forward, that involved a collaboration with the effort of both international NGOs and academic institutions (Goroscope Jamon 2000).

There were also other networks of NGOs that play an important role in the region. The *People’s Forum* for example, has openly discussed people’s disagreements regarding open regionalism and globalization. The *Alternative ASEAN Network* (AltSEAN), has focused on human rights protection (Anthony 2004: 167), and has openly questioned ASEAN’s non-interference policy.²⁴ Others include the *International Network for Political Leaders Promoting Democracy in Myanmar* (Burma) and the *Asian Network for Free Elections*. These networks are being recognized as respectable and acceptable contributors to the development of a civil society by state authorities (Sucharithanarungse 2000: 59). Meanwhile, a *Regional Working Group on Human Rights* (RWGHR) network seeks to establish a regional Human Rights Commission in ASEAN.

18 These findings rely on empirical research by Zarina Othman: “Trafficking in Women and Children: Challenges to the National Security of Malaysia” that was funded by the Faculty of Humanities and Social Sciences, Universiti Kebangsaan Malaysia. The research began in December 2003 and was completed in June 2006.

19 Since the 1990’s several conferences and workshops have been organized by Chulalongkorn University, Bangkok, Thailand. In 2005 two human security conferences were organized by Thammasat University, Thailand, which were partly sponsored by the Japanese Foundation. In October 2007, Chulalongkorn University, organized an international conference on “Mainstreaming Human Security: The Asian Contribution” in Bangkok. This conference was jointly organized by the University of Philippines Third World Studies Center, Waseda University (Japan), Mahidol University (Thailand), the Konrad Adenauer Stiftung (Germany), the Asian Institute of Technology (Thailand), Osaka University of Economics and Law (Japan), the Tata Institute of Social Sciences, (India), Global Collaboration Centre, Osaka University (Japan), M-Power and Ateneo de Manila University. The conference was a follow up to the previous international symposium on human security that was conducted in Thailand, in 2002, titled “Challenges to Human Security in a Borderless World,” organized by the Commission on Human Security and Chulalongkorn University. These two Thai universities, Thammasat and Chulalongkorn, were instrumental in spreading the conceptual human security debate to other universities in ASEAN countries. UNESCO is another active IO that has conducted several workshops focusing on Human Security in the region. In 2007 the workshop was held in March, in Bangkok. See at: <www.unesco.org>.

20 The Asia Pacific Roundtable (APR) has been hosted annually (usually in late May and early June, in Malaysia) as a forum for ASEAN ISIS since 1987.

21 Proceedings of the 19th Asia Pacific Roundtable, 2005: “Confidence Building and Conflict Reduction,” (Kuala Lumpur: ISIS). See at: <http://www.isis.org.my/html/affils/affils_asean-isis.htm>.

22 Proceedings of the “International Conference on Human Security, “Advancing Human Security, jointly organized by: Institute of Tun Dr. Mahathir Mohamad’s Thoughts (IPDM) and International Committee of the Red Cross (ICRC), 13–14 June 2006, Kuala Lumpur, Malaysia. See at: <http://www.ipdm.uum.edu.my/web/human%20security/hsecurity_preface.htm>.

23 See at: <<http://pkukmweb.ukm.my/~skimx/>>.

24 AltSeam acts as an advocacy group. It produces reports on political situations in Myanmar besides leading campaigns for human rights and democracy in the region.

Although the Malaysian government has argued that the UN concept of human security gives more autonomy to the people, and that such autonomy could cause the UN, or some other country, to justify coming into any nation and violating its territorial integrity and sovereignty for the sake of the 'sovereign individual'. This is observed as a common concern throughout Asia, and represents a fundamental difference between Asian and Western values concerning the individual's relation to society (Huntington 1993, 1996). Together with Indonesia and the Philippines, Malaysia had already established their national human rights institutions by the 1990's.²⁵ That at least shows that they recognized human rights as universal values.

Currently, the *ASEAN People's Assembly* (APA) is an example of a transnational civil society (Track III) that works toward a 'human-first' approach to security (Anthony 2004: 179). The APA Action Plan for example, is aimed at bringing attention to urgently needed security changes and providing alternative modalities for ASEAN governments to consider (Anthony 2004: 180). Among those modalities are the development of a human rights record; developing a *Southeast Asia Human Development Report* (HDR); developing democracy indicators that show the degree to which a country, and/or its government, is promoting or eroding democracy; and developing a framework to evaluate the progress of gender mainstreaming. Although most of these efforts seem to have had little impact on any individual country's policies and laws, at least there is a viable venue and growing infrastructure moving towards empowering civil society in the region, and signalling a healthy move toward a more liberal democracy and human security approach in the region.²⁶

Various small research have dealt with human security within a context that focused on transnational issues, such as drug trafficking (Othman 2002), human trafficking (Othman 2004), even though, as stated by Paul Evans (2004: 364), various research

projects on human security are more collaborative in nature. CSCAP has been actively conducted such research on human security, among which are human trafficking and terrorism. Another major research project that has involved the empirical study of human security approaches, focusing on protecting people, is called, "Whose Security Counts? Participatory Research on Armed Violence and Human Insecurity in Southeast Asia" (Suksai/Narag/Daraaceh 2003). The project focuses on the Philippines, Thailand, Indonesia, Myanmar (Burma) and Cambodia, and has looked at the impact of weapons on the security and well-being of civilians.

79.5 Suggestions and Conclusions

Undoubtedly the main challenge to human security in the region remains the perceived threat to national 'sovereignty' and to the regime in power. In Southeast Asia (ASEAN), security has generally meant to protect the state as the most important entity that needs protection. The general understanding has assumed that states' security, which is also understood as regime security, is a pre-requisite for the survival of the people. Yet security of the states does not necessarily guarantee the peoples' survival. Increasing interdependence, has resulted Southeast Asian states to adopt comprehensive concept of security which acknowledge that non-military issues can be a threat to national security. While acknowledging the existence of the non-military threats, the state continues to be the focus of their security concerns, demonstrating a realist view in their security approach.

It was not until the 1997–1998 Asian financial crises, that the region began to recognize that the people who live within a state are perhaps the more important entity needing protection. Empowering the people leads to freedom which in turn can strengthen the state. Thus the peoples' insecurity can be a threat to the regime and to state survival. Although there have been a slow shifting paradigm from state to human security, Southeast Asian's human security approach appears to focus more on development rather than on human rights, more on 'freedom from want' (Japanese concept) than on 'freedom from fear' (Canadian concept). Human rights continue to be seen as an internal matter only, with the state as the final arbiter and grantor of rights.

In addition, global war on terrorism has further slowed the pace of states accepting the human security approach, because it has caused ASEAN members

25 Members of the National Human Rights Commission in Southeast Asia are Indonesia (Komnas Ham), Malaysia (Suhakam), the Philippine Commission on Human Rights and the Thai Commission on Human Rights.

26 Report of the Fourth APA, 2005: *Towards a People-Centered Development in the ASEAN Community*. (Manila, the Philippines: ASEAN-ISIS & Institute for Strategic and Development Studies, 11–13 May), Report of the Third ASEAN APA. 2003: *Towards an ASEAN Community Caring Society* (25–27 September). The sixth APA took place in Manila in October 2007. See at: <<http://www.asean-isis-aseanpeoplesassembly.net/>>.

to fall back on the more traditional security measures to counter the threats. This trend must be resisted, as it is realized that both traditional and human security must be strong. Thus, the question is: what should be redesigned: ASEAN policies, human security, or perhaps both? Since the ASEAN members differ based on GDP per capita, focusing on development of the weaker ASEAN members as part of the human security approach should be encouraged. Development and modernization can help reduce migration of the people to neighbouring countries in search of jobs. For the more developed ASEAN states, human rights should be the focus, not only for the people, including the minorities, but also for the migrant workers who contribute much to both the host and sending countries (Tsai/Tsay 2004: 96).

Likewise, NGOs have played roles in promoting the concept in the region. Transnational civil society in the region, in the form of networks and other organized group efforts for the common good, has been challenging some of the most serious human security issues, and this should be encouraged to continue and expand human security. The scientific community in Southeast Asia made the following suggestions for developing the human security concept further and made the following policy relevant proposals to enhance its policy relevance within ASEAN member countries and as a regional security concept for ASEAN itself. Among the suggestions made, democratization, extreme poverty reduction and human development, inclusion of the quality of life are included, as well as promoting gender equality and good governance, respecting human rights, and enforcing the rule of law. These three tracks (government, networks and NGOs, scholars) have so far succeeded.

80 Human Security in Sub-Saharan Africa

Nana K. Poku and Bjorg Sandkjaer

80.1 Introduction

For almost half a century, Cold War ideology served to eclipse the distinction between the state and the multiplicity of community values, claims and identities of a state citizenry (Poku/Graham 2000). With regard to security, state and society were considered as one, what was in reality a complex relationship. In general, state policies appeared both well defined and comprehensive enough to include everything that mattered to the national interest. Thus, analysts legitimized state policies with regard to citizens by placing the domestic domain beyond the parameters of inquiry; what happens to the state mattered, what happened to the people within was of second order importance (Poku/Graham 1999). With the end of the Cold War, no similar framework of interpretation (or misinterpretation) is available. What emerges, in each case, as insecure is not a well-defined system of international relationships, but categories of people within a state or straddling state boundaries who have limited or no access to the protection of their state and the international community (Nolutshungu 1996).

The aim of this chapter is twofold: to explore security from a human perspective and to illustrate this perspective by drawing on case material from sub-Saharan Africa. This perspective is based on the premise that for many ordinary Africans the chief security concern is often their own government, either through its pervasive power and oppressive policies, or as a result of its incapacity to sustain the infrastructure of life. The resulting social decay presents a dramatic picture of insecurity of ordinary people in circumstances where states – and the international system of states – are either unable to provide protection or are themselves the principal sources of violence. The issue of how to adequately understand and address the security concerns of a people in these circumstances is the central preoccupation of this chapter.

The chapter is divided into six parts: the first and second explore, in some detail, what is meant by hu-

man security, charts its origins and outlines its significance for the study of contemporary African societies (80.2, 80.3). In the process, the two sections provide an analysis of the African state and the complexities it poses for the provision of security on the continent. Building on this, the third and fourth sections survey the extent of Africa's human security challenges by examining the continent's economic performance as well as development prospects (80.4, 80.5). The fifth examines Africa's progress towards the *Millennium Development Goals* (MDGs) and argues that on current evidence the goals might not be achieved by 2015 (80.6). The final section argues why the human security framework is so appropriate for the study of Africa and its societies (80.7).

80.2 Human Security and Africa

The human security framework is intended to connect the issue of security to a wide range of insecurities in the modern world (McGrew/Poku 2007). In the words of the *United Nations Development Programme* (UNDP) who coined the term 'human security', "the concept of security has for too long been interpreted narrowly: as security of territory from external aggression, or as protection of national interest in foreign policy or as global security from threat of nuclear holocaust ... forgotten were the legitimate concerns of ordinary people who sought security in their daily lives" (UNDP 1994: 22–23). The UNDP critique is clear and powerful; recognizing that in the modern world, threats posed to many people are of a wide variety, of lower intensity and less well-defined. Anthony Giddens offers the following insight: "[This is] a single world, having a unitary framework of experience ... yet at the same time one which creates new forms of fragmentation and dispersal" (Giddens 1990: 22). The binary oppositions, therefore, that shape our interpretation of violence, between private (criminal) and public (legitimate) or between external (interna-

tional) and internal (civil), can only be applied with difficulty to the contemporary world.

The UNDP formulation opens up the possibility of conceiving security as an ontological status; and as such can be threatened from a number of directions and by agents and actors who are not necessarily states. In so doing, it is possible to argue that for the majority of the people in the world apparent 'marginal' or 'esoteric' concerns - such as environmental, food, economic and health security - are far more real and immediate threats to their daily survival than interstate wars. Crucially, the human suffering which underlies it, as well as its impact on regional peace and security, must bring into sharper focus the ways in which different categories of people are marginal to the states in which they live and the various forms of insecurity confronting them.

As a result, security may be established through the specification of a number of variables of which the following two are particularly important (at least for our purposes): namely 'freedom from want' and 'freedom from fear'. The former describes a condition of existence in which basic material needs are met, and in which there is a reasonable expectation that protection will be afforded during any crisis or downturn - natural or manmade - so that survival is not threatened. While the latter refers to a condition of existence in which human dignity is realized, embracing not only physical safety but going beyond that to include meaningful participation in the life of the community, control over one's life and so forth.

Nowhere has the expanded notion of security been more applicable than in sub-Saharan Africa. Here, if we remove territorial boundaries from our cognitive map, we are left with the picture of people across the continent attempting to pursue security within the hostile environment of weak states. Across the continent, governments preside over fractured societies with multiplicity of ethnic identities and divergent interests making it particularly difficult to generate a legitimate basis for governance. Meanwhile, ordinary Africans lurch between an alien superstructure (the state) and decaying traditional African past. Their loyalties stretched between predatory elites and disintegration tribal systems as many heads to the melting pots of ever expanding cities. In lamenting this point, Claude Ake concludes that the African elites are responsible for "a pervasive alienation, the delinking of leaders from followers, a weak sense of national identity and the perception of the government as a hostile force" (Ake 1994: 14).

In the African context, therefore, the notion of security only makes sense if conceived in its broadest context. The 'Non-Aggression and Common Defence Pact' of the *African Union* (AU) of 2004 offers this definition:

[In Africa] human security means the security of individuals with respect to the satisfaction of the basic needs of life; it also encompasses the creation of the social, political, economic, military, environmental and cultural conditions necessary for the survival, including the protection of fundamental freedoms, access to education, healthcare, and ensuring that each individual has opportunities and choices to fulfil his/her own potential.¹

The AU definition thus embraces such issues as human rights; the right to participate fully in the process of governance; the right to equal development as well as the right to have access to resources and the basic necessities of life; the right to protection against poverty; the right to conducive education and health conditions; the right to protection against marginalization on the basis of gender; protection against natural disasters, as well as ecological and environmental degradation. The AU framework, thus, embraces the whole gamut of rights, civil and political, economic and social, and cultural. In this process, offering a radical account of politics as freedom from domination/exploitation as well as material sufficiency.

A word of caution must be entered here; notwithstanding the obvious synergy between the UNDP definition and the AU's reformulation, it would be a mistake to overstate their convergence. While both assert the importance of human security, they differ quite markedly on the role of the state in this process. The UNDP definition questions not only the ability of the state to provide security, but equally importantly, its role in propagating insecurity. For the AU, the breath of the UNDP definition proved problematic, not least because it risks mixing up the quite different agendas of international security on the one hand, and social security and civil liberties on the other. Thus while they readily accept the case for focusing on the interplay between the international and domestic security agendas, they cautioned against a reductionist approach which prioritizes the individual security above

1 Draft text as adopted by the first meeting of the African Ministers of Defence and Security on the establishment of the African Standby Force and the Common African Defence and Security Policy, 20-21 January 2004, Addis Ababa, Ethiopia, The text was adopted during the AU summit of that year.

the collective security of the state. For the AU, therefore, embracing the notion of human security involved devising a formulation which encompassed both the traditional, state-centric, notion of the survival of the state and its protection by military means from external aggression, as well as the non-military notion which is informed by the new international environment and the high incidence of intra-state conflict.

It is possible, therefore, to envisage the AU framework as representing a radical attempt to relocate the security discourse, to move it from the abstract terrain of the international relations discourse and to embed it in the socio-political and economic realities of the African continent. In the process, acknowledging that, in Africa state security is often not threatened by conventional threats of armed attacks by other countries, but by more insidious measures many of which arise from the weakness of the African state itself. Hence, without the provision of effective national security, neither citizen nor communities can be personally secure in the broader sense of the term. Without secure and stable countries and a body of practice or law – whereby countries regulate their interaction – individual, community, regional and international security remains allusive.

80.3 Weak States and Vulnerable Societies

Unlike Europe where nation-builders sought to replace the older empires with states comprising some combination of cultural, linguistic, and patriotic unity, African states emerged from the authoritarian structures of their colonial past. Any analysis of security and insecurity in contemporary Africa must, therefore, begin with the abnormality of the African state. With callous disregard for the histories of their subject, colonial leaders grouped a large number of diverse identities, ethnicities and cultures into new states; while at the same time separating nations with rich and unified histories into separate states. The division of the Somali people of the Horn of Africa is a typical example. Previously united by a common culture but lacking a centralized authority, this classically segmented political system was ultimately subjugated and divided among four imperial powers: Britain, France, Italy and an independent Ethiopia. Regardless of whether one is sympathetic to past or current Somali demands to redraw the inherited colonial boundaries of the horn of Africa, or ultimately accepts the

extreme methods of military force, there is no question that the roots of these conflicts are at least partially the result of illogically drawn European colonial boundaries (Poku 1996).

Total order in the Hobbesian sense, therefore, has thus been virtually impossible to achieve in Africa. Indeed, the biggest challenge to post-colonial leaders has been creating the nation state. Various approaches have been tried to meet this challenge. In some states, the dominant traditional nation became the core of the new nation, as other ethnic groups were assimilated into it or marginalized. Wolof in Senegal, American-Liberian in Liberia, Hutu in Rwanda, Shona in Zimbabwe, Baganda in Uganda, and Amhara in Ethiopia were the key elements in defining the new nations as the cultural basis of the new state. In other states, an artificial creation was decreed and all traditional nations were dissolved in it; those who could or would not fit were excluded. The Ivoirité of President Henri Konan Bedie defined a new nation of essentially southern ethnic groups ‘native’ to the land within Ivory Coast’s boundaries and the rest were decreed non-nationals and non-citizens. President Mobutu Sese Seko of Zaire (named Congo before and after his reign) instilled a Zairean identity among the many ethnic groups of the Congo that was so strong that it outlived both him and the change of name of his (and their) country back to Congo again (Weiss/Carayannis 2005).

John Garang, eventually Sudanese vice-president, struggled mightily all his life not only to give dignity and respect to a Southern Sudanese identity but also to create a single overarching identity to a Sudanese nation within a single state. In Tanzania, where none of the 340 ethnic groups is large enough to hold a dominant position, nationalist elites strove to forge a Tanzanian nation. The irony of these efforts is that their major effect was to arouse divisive reactions among the excluded or the dissolved ethnic groups. Despite, therefore, the claims to national unity which post colonial leaders extolled, the state and its leadership were always alien from the social base on which their power rested. It is, therefore, the case that the African state is less a ‘nation state’ than anywhere else, despite or because of efforts to make it so. In many cases, the state claims to rule over a defined territory but in fact rules only a large part of it and the people in that part, while in another part another group contests its right not just to rule the land but also to speak for the nation. Yet few of these rebellious groups are secessionist, and many of those few are protesting neglect rather than asserting separate-

ness; they do not contest the territorial unity of the state but its national unity.

Artificiality and the weakness of legitimacy, then raise the central question of how African states keep going. There are, it seems to us two linked elements which go some way towards providing an answer. The first is the commitment to the state of those who benefit from it, expressed through the institutions of government of which they form party. So long as the state's own hierarchy and the social groups who forms it continue to hold together, it is very difficult for anyone else to challenge it. The collapse of the state, or the mounting of any secessionist movement dedicated to its dismemberment, has invariably been prompted by deep divisions within the governing class or elite: the fragmentation of the Nigerian offer corps under the stress of coups and massacres in 1966; the destruction of the old Ethiopian government, and the bloody struggle for succession, after the 1974 revolution; the dissolution of the Somali Republic into clan rivalries; the shattering effects of despotic military rule in Liberia or Uganda; and the inability at any time to create a unified governing community in such states as Sudan, Chad and Sierra Leone, are all cases in point.

Much of the current analysis of the African state examines its functional capacities; states are said to collapse "because they can no longer perform the functions required of them to pass as states" (Zartman 2005: 5). One of these key functions is the legitimate monopoly of force. Many states in Africa are not able to claim the legitimate monopoly of force in the Weberian sense, both because the ostensible monopoly is contested and because its legitimacy is as well. Hence, there are large areas where security is challenged by both rebellion and internal lawlessness in Senegal, Guinea-Bissau, Liberia, Ivory Coast, Ghana, Nigeria, Chad, Sudan, Ethiopia, Somalia, Kenya, Uganda, Rwanda, Burundi, Congo, Angola, Zimbabwe, South Africa, and perhaps others, - a list that includes all of Africa's largest states. In all these states, though government is accepted, the political institutions through which its powers are exercised are treated with remarkable indifference by large sections of the community. While this passive acceptance might not be problematic in other contexts (one often hears about the disenfranchised or disenfranchised electorate in Western Europe and North Africa), in the African context it serves to deepen insecurities by alienating people from the apparatus of the state.

As a result, state managers have often had to form compromising alliances to augment their hold on the

livers of political power. This includes reaching to militias, such as the *Jeunes Patriotes* in Ivory Coast or the *Kamajors* and *Civil Defence Forces* in Sierra Leone, *Ninjas* in Congo-Brazzaville, *Janjaweed* in Sudan, civil defence forces in Zimbabwe and *AliR* in Congo who serve as 'official rebel armies' to enforce partisan security and impose their own law and disorder.

More officially, states opt to farm out security to private and public mercenaries at great cost to their own functional legitimacy (Reno 1998). Private mercenaries include such companies as *Executive Outcomes*, *Sandline International*, *Military Professional Resources Inc.*, and others. Public mercenaries include the proliferation of UN *Peace-Keeping Operations* (PKOs) operating in Africa - in Ivory Coast, Congo, Central African Republic, Ethiopia and Eritrea, and Sierra Leone, the African Union's PKO in Sudan, and regional PKOs such as the *Military Observer Groups* (ECOMOGs) of the *Economic Community of West African States* (ECOWAS) in Liberia, Sierra Leone, Ivory Coast and Guinea-Bissau.

For these reasons and more, the parallelism between statism and nationalism has had a limited role in contemporary African history. This has given rise to a position where individuals have greater attachments to their localities (or local communities) than to the overarching state. Hence, though the notion of the state is accepted, the political institutions through which its powers are exercised are treated with remarkable indifference. Indeed, the "vast majority of Africans now regard their governments as irrelevant or as purveyors of indifference and cruelty" (Cheru 1989: 2). When we take these circumstances in sum, it is little wonder that Africa has led the contemporary world in so-called "collapsed states" (Zartman 1997).

80.4 Economic Decline, Poverty and Insecurity

Whatever the causes of Africa's political crisis, the implications on the continent's economic development have been nothing short of catastrophic. Africa now stands as the most marginalized region in the global economy. The promised advantages of economic restructuring, as hailed by the dominant institutions of global economic governance - the IMF and the World Bank - have not been borne out (McGrew/Poku 2007). Take, for example, the nature of *Foreign Direct Investments* (FDI). For most of the past two decades FDI inflows to Africa have increased only mod-

estly, from an annual average of almost US \$1.9 billion in 1983–1987 to US \$3.1 billion in 1988–1992, and from US \$6.0 billion in 1993–1998 (UNCTAD 1999: 12).

While inflows to developing countries as a group almost quadrupled from less than US \$20 billion in 1981–1985 to an average of US \$75 billion in the years 1991–1996, inflows to Africa averaged around US \$4 billion a year. As a result, Africa's share in total inflows to development countries dropped from more than 11 per cent in 1976–1980 to 9 per cent in 1981–1985, 5 per cent in 1995 and to 3.5 per cent in 1998 (UNCTAD 2000). Its share of total output for the so called 'Triad' (European Union, United States and Japan) was even lower during the later parts of the 1990's as other regions became more attractive for investment locations.

The decline in FDI levels to Africa is mirrored by a similar decline in other indices of development. Since the 1980's, the human development index has declined for more than 30 countries (UNDP 1999a: 37). Countries from Africa constitute 95 per cent of this figure. According to UNDP, some 80 per cent of the Low Human Development Countries – countries with high population growth rates, low income, low literacy, and low life expectancy – are in Africa (UNDP 2000: 3). There are only eleven countries in the medium category, including South Africa and Botswana (Algeria, Botswana, Egypt, Gabon, Libya, Mauritius, Morocco, Seychelles, Swaziland and South Africa). Five of them (Mauritius, Seychelles, Botswana, Gabon and Swaziland) have a combined population of 4.6 million. When Libya and Tunisia are added, the figure rises to 17.9 million. All the remaining 42 countries on the continent are in the low human development category. This, however, does not tell the entire story. There are 55 countries in this category, which means African countries account for 79 per cent per cent of the category. Even more telling is that of the 30 countries with the lowest human development indices, 25 (or 83 per cent) are African (UNDP 2000).

The latest economic indicators from the African Development Report 2006 underline the extent of the continent's predicament. The Report's celebrated headline growth of 3.5 per cent in GDP in 2005 compared to 3.2 per cent in 2004 belies the systematic decline observable in real per capital GDP growth from 1.0 per cent to 0.8 per cent in the same period. In developmental terms, this means that the combined economies of Africa actually shrunk by 0.2 per cent in the 12 months up to the end of 2005. To put this in context, all other regions in the world are already out-

performing Africa, and efforts to redress this poor performance over the past two decades have not been successful. In 2005, for example, the average *Gross National Product* (GNP) per capita in the *Organisation for Economic Co-operation and Development* (OECD) countries was US \$29,000, compared with US \$576 in Africa (Bouda 2007). This means that the industrialized countries are roughly 51 times wealthier than African states. Assuming that the OECD countries could stop stretching this development gap further, and hoping that African economies could grow at an annual rate of 5.5 per cent over the coming years, it would still take the continent some 135 years to reach today's level of wealth enjoyed by OECD countries.

Raising the level of domestic savings remains fundamental to Africa's long-term prospects. In the short to medium term the *New Economic Partnership for Africa's* (NEPAD) external capital expectations are tied more to official inflows in the form of *Overseas Development Assistance* (ODA) and debt relief than to private capital inflows despite the continent offering the highest rates of return. This recognizes the historical fact that nowhere has foreign capital led economic transformation in a country and the prospects for private flows relative to the continent's massive needs. "From worldwide experience, private capital flows of more than 5 per cent of GDP are unlikely to be feasible or sustainable" (World Bank 2000a: 235). The removal of Africa's debt burden is critical to the continent's investment prospects – through releasing monies currently spent on debt servicing for urgent public investment and improving the image of the continent as an investment destination. Western creditor countries and institutions such as the World Bank have hitherto resisted calls for radical debt cancellation. The ruling debt relief mechanism HIPC is widely regarded as inadequate and criticized for tying debt relief to IMF World Bank supervised reforms. This policy is one dimension of the new directions in the tying of aid to policy choices of the donor countries.

The Africa Action Plan adopted at the 2002 G-8 meeting, with its highly conditional pledge to support NEPAD has been hailed as signalling a new willingness to raise ODA to Africa but it in fact confirms the trend.² The bright spots of private inflows illustrate both what is possible and their limits. In 2002 FDI inflows amounted to US \$11 billion, a drop of US \$6 billion compared to the previous year (UNCTAD 2001: 19).³ Outside the extractive sector the bulk of recent private flows have been for the purchase of privatized public assets rather than investment in new en-

terprises and the 2002 slow down is directly tied to trends in privatization.⁴ The few African countries, such as Lesotho, that have recently attracted FDI outside privatization and the extractive sector have mainly done so in labour intensive low value added manufacturing, mainly textiles. There is likely to be an expansion in this phenomenon as countries eligible under the USA's *Africa Growth and Opportunity Act* (AGOA) attract capital seeking to take advantage of the preferential US market access offered under the scheme. The opportunities under AGOA are, however, circumscribed by two factors. The first is the ending of the Agreement on Textile and Clothing with its quota limits on 1 January 2005, which will free all lower cost developing country manufacturers. Closely related to the preceding point is the evidence of the limits of such labour-intensive manufacturing in the form of declining terms of trade for such exports (UNCTAD 2001; Akyuz 2003). Even if exports of labour intensive manufactures from Africa should expand, thereby creating jobs and incomes, the stabilization of commodity markets and prices would be important for the ability of millions of Africans to participate effectively in the global economy.

80.5 Structural Adjustment and Human Insecurity

The physical indicators of economic weakness are just a mere foreshadow of the deep insecurity facing ordi-

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- 2 At the 2002 Kananaskis summit G-8 leaders declared, "Each of us will decide, in accordance with our respective priorities and procedures, how we will allocate the additional money we have pledged. Assuming strong African policy commitments, and given recent assistance trends, we believe that in aggregate half or more of our new development assistance could be directed to African nations that govern justly, invest in their own people and promote economic freedom."
 - 3 Capital flows into Africa have declined greatly in real terms since the early 1980's. In 2000 the real per capita inflows were less than a third of what they had been two decades earlier. Over the same period SSA share of total capital inflows to developing countries declined from more than 20 per cent to 10 per cent (UNCTAD 2001: 19).
 - 4 Privatizations have played an important role in the integration of Africa's financial markets into the global system. The creation of stock exchanges to facilitate privatization and the fact that the shares of financial institutions have been a significant proportion of trading on most of these new exchanges have been important contributory factors.

nary people on the African continent. With a fifth of the world populations, Africa is home to one in three poor persons in the world and four of every ten of its inhabitants living in what the World Bank classifies as "a condition of absolute poverty" (World Bank 2000a: 346). More worrying still, Africa is the only region in the world where both the absolute number and the proportion of poor people are expected to increase during this millennium (UNDP 2006). Nearly half the population of Africa (300 million people) lives on less than 1 US\$ a day: if current trends continue, by 2015 Africa will account for 50 per cent of the poor of the developing world (up from 25 per cent in 1990).

Table 80.2 and table 80.3 provide a summary of both income and non-income poverty indicators for Africa and an indication of how this poverty picture has changed over the recent past. The data is sourced from the *Chronic Poverty Report* (CPRC 2005) and the World Bank's *World Development Indicators* (WDI). These poverty figures enable international and inter-regional poverty comparisons to be drawn. The most depressing aspects of the figures in both tables 80.2 and 80.3 is the increase of the numbers of people in poverty.

The culpability of some international institutions in Africa's current malaise should not be overlooked. Over the past two decades, the IMF and the World Bank have implemented a *series of adjustment programmes* (SAPs) which, in the official jargon, "aims to alter the domestic policy weakness of African states - by shifting the emphasis from state led development to market driven approaches" (World Bank 1996a, 1996b). Although there are many variations of SAPs, at heart, they all share the same logic: namely, the need to maintain fiscal discipline. In this sense, two broad policy components have come to characterize SAPs: short-medium term macroeconomic stabilization measures to restore internal and external balances, which falls within the province of the IMF; and SAPs proper, which are designed to "unleash market forces so that competition can help improve the allocation of resources...getting price signals right and creating a climate that allows business to respond to those signals in ways that increase the returns to investment" (World Bank 1996a: 33). In the process, SAPs have led to a radical rationalization of recipient governments' expenditure commitments in mainly - but not exclusively - areas concerned with the provisions of welfare (i.e. the health, education and basic sustenance such as food subsidies).

Table 80.1 represents selected figures for the impact of SAPs on agricultural growth in Africa over the last 20 years. It is clear from the table that SAPs have made very little impact on this sector. The more worrying observation is that this trend can be replicated across all the major indicators of economic growth. In almost all their evaluation reports, the World Bank (1990, 1996a, 1996b, 1997b; Jayarajah/Branson/Sen 1996) observed this trend, but attributed its causes not to the poor designs of SAPs, but their implementation. In their words, “no African country has achieved a sound macro-economic policy stance, and there is considerable concern that the reforms undertaken to date are fragile and that they are merely returning the continent to the slow growth path of the 1960’s and early 1970’s” (World Bank 1994: 1–2).

Table 80.1: GDP growth under adjustment - agriculture-growth rate (median) sub Saharan Africa, 1981-1983, 1987-1991 and 1992-1997. **Source:** Compiled by the authors based on ADB and IMF databases.

	1981-1986	1987-91	1992-97
Large improvements	4.2	2.4	2.0
Small improvements	3.1	2.8	2.1
Deterioration	2.3	3.3	2.8
All Countries	3.1	2.8	2.2

In truth, it is not clear whether the lack of effective implementation results from unwillingness to undertake reforms; from the objective conditions of the economies not permitting the kind of adjustment being recommended; or from the policies being inherently non-implementable. Despite two decades of adjustment policies, this debate remains largely unresolved. The only certainty, however, is that SAPs often have an immediate impact on the welfare of the poorest members of society, especially as they affect food prices, costs of education, and payment of medical services. Across the continent SAPs have done little to foster the social, political and economic conditions that could contribute towards improving the human security of ordinary Africans. Take the following examples:

The right to food: There is convincing evidence demonstrating that nutritional levels decrease among poor segments of the population as a result of the removal of food subsidies. Growing unemployment has a similar result. The switching effect of agricultural

policies, primarily from food crop production for local consumption to generation of foreign exchange through the production of coffee, tobacco or cotton, has resulted in a drastic decline in food production, reduced nutritional levels and increased malnutrition (Mukherjee 1994).

The right to education: Article 26 of the Universal Declaration of Human Rights declares that all people have the right to education. The Convention of the rights of the child has also established the right to early development and education. Thanks to extraordinary efforts during the 1960’s and 1970’s, the percentage of children completing at least four years of primary education reached 50 per cent or more in almost all developing countries. But since the 1980’s, increasing debt and consequent implementation of structural adjustment programmes has led many governments to freeze or cut educational spending (Tomasevski 1995). Primary schooling has often suffered disproportionately, and there was significant slippage in sub-Saharan Africa. The percentage of 6–11 year olds enrolled in school dropped from a high of 55 per cent in 1979 to 45 per cent in 1995 (UNESCO 1996).

The right to health: Health is one of the fundamental human rights embodied in Article 25 of the 1948 Universal Declaration of Human Rights. The goal of ‘Health for All by the year 2000’ agreed upon in the Alma Alta Declaration has been severely undermined by cutbacks in government health budgets as social and development objectives have been superseded by financial imperatives (WHO 2001b). The imposition of ‘user fees’ for primary healthcare drove large numbers away from public health services, contributing to increased rates of sexually transmitted diseases. Moreover, cutbacks in the public sector helped send health professionals to the private sector or abroad and reduced investments in healthcare delivery systems (Turshnet 1994).

The promotion of exports for debt repayment and the cutting of public expenditure on welfare in a region where 100 million people are undernourished; where there is 1 doctor for 36,000 people, compared with 1 for 400 people in the developed world; and where the HIV virus is killing people at a rate of 6,000 people per day is a scandal. One author has even referred to SAPs as a form of ‘economic genocide’. According to Chossudovsky (1997: 21).

Structural adjustment is conducive to a form of economic genocide which is carried out through the deliberate manipulation of market forces. When compared to genocide in various periods of colonial history (for example, forced labour and slavery), its im-

Table 80.2: Summary of poverty indicators for Africa (figures have been rounded). **Source:** Compiled by the authors based on CPRC (2005) and World Bank (2003).

Region	Population	Popula- tion below US\$ 1 day (%) (1989-99)	Popula- tion below US \$2 day (%) (1993- 2000)	Infant mor- tality rate (2000)	Under-5 mortality rate (per 1,000 live births 2001)	Life expectancy, years (2000)		Adult Illiteracy rate (2000)	
						M	F	M	F
West Africa ^{a)}	260,142,000	58	76	111	185	50	51	35	52
Central Africa ^{b)}	72,950,000	50	87	121	196	47	50	28	49
Southern Africa ^{c)}	113,039,000	29	62	111	165	45	47	19	29
East Africa ^{d)}	181,051,140	30	79	100	155	47	49	31	47
Sub-Saharan Africa	628,182,140	43	76	109	174	48	50	30	46
North Africa ^{e)}	169,053,500	3	21	44	53	64	68	30	53

Table 80.3: African poverty 1980 – 2003 (Figures have been rounded). **Source:** Compiled by the authors based on CPRC (2005) and World Bank (2003e).

Region	Change in infant mortality rate (per 1000)	Change in life expectancy (years)		Change in Adult Illiteracy (per 1000)		Average annual change in household consumption per capita (% points)
		M	F	M	F	
West Africa ^{a)}	-18	2	1	-25	-29	-3.9
Central Africa ^{b)}	-5	-2	-5	-23	-28	-0.8
Southern Africa ^{c)}	-6	-6	-8	-13	-15	-0.3
East Africa ^{d)}	-17	-1	-3	-18	-25	-0.3
Sub-Saharan Africa	-15	-1	-3	-21	-25	-2.3
North Africa ^{e)}	-56	10	11	-19	-24	1.2

a) *West Africa:* Benin, Burkina Faso, Cameroon, Cape Verde, Chad, Côte d'Ivoire, Equatorial Guinea, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome, Senegal, Sierra Leone, Togo

b) *Central Africa:* Burundi, Central African Republic, Democratic Republic of Congo, Rwanda

c) *Southern Africa:* Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, Zimbabwe

d) *East Africa:* Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Somalia, Tanzania, Uganda

e) *North Africa:* Algeria, Egypt, Libya, Morocco, Sudan, Tunisia

pact is devastating. Structural adjustment programmes directly affect the livelihood of more than four billion people.

80.6 The Challenge of the MDGs

The physical indicators of economic weakness are just a mere foreshadow of the deep insecurity facing ordinary people on the continent. With a fifth of the world populations, Africa is home to one in three poor persons in the world and four of every ten of its

inhabitants living in what the World Bank classifies as 'a condition of absolute poverty' (World Bank 2000a). More worrying still, Africa is the only region in the world where both the absolute number and the proportion of poor people are expected to increase during this millennium (United Nations 2005). Nearly half the population of Africa (300 million people) lives on less than 1 US\$ a day: if current trends continue, by 2015 Africa will account for 50 per cent of the poor of the developing world (up from 25 per cent in 1990).

Table 80.4: The Millennium Development Goals (MDGs) and targets. **Source:** Compiled by the authors based on UN Millennium Project (2005c).

Goals	Targets
Goal 1: Eradicate extreme poverty and hunger	Target 1: Halve, between 1990 and 2015, the proportion of people whose income is less than US\$1 a day Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger
Goal 2: Achieve universal primary education	Target 3: Ensure that by 2015 children everywhere, boys and girls alike, will be able to complete a full course of primary schooling
Goal 3: Promote gender equality and empower women	Target 4: Eliminate gender disparity in primary and secondary education, preferably by 2005 and in all levels of education not later than 2015
Goal 4: Reduce child mortality	Target 5: Reduce by two-thirds between 1990 and 2015, the under-five mortality rate
Goal 5: Improve maternal health	Target 6: Reduce by three-quarters between 1990 and 2015, the maternal mortality ratio
Goal 6: Combat HIV/AIDS, malaria, and other diseases	Target 7: Have halted by 2015 and begun to reverse the spread of HIV/AIDS

Table 80.2 and table 80.3 provide a summary of both income and non-income poverty indicators for Africa and an indication of how this poverty picture has changed over the recent past. The data is sourced from the Chronic Poverty Report (CPRC 2005) and the World Bank's *World Development Indicators* (WDI). These poverty figures enable international and inter-regional poverty comparisons to be drawn. The most depressing aspects of the figures in both Tables 81.2 and 81.3 is the increase of the numbers of people in poverty.

The world formally adopted the Millennium Development Goals (MDGs) as a programme of action in 2000, with a target date of achievement by 2015. The baseline for measuring progress was chosen as 1990. More than seven years have already passed and countries are left with less than eight years to reach MDG targets (table 80.2). Between 1990 and 2002 many countries made significant progress towards achieving the MDGs: average global incomes went up by 21 per cent; the number of people living in extreme poverty declined by 130 million; life expectancy rose from 63 years to 65 years; and primary school enrolments and access to safe drinking water and sanitation increased. Progress varied across regions, between countries and within countries. Africa fared worst among the regions. It saw the slowest progress overall and suffered reverses in some crucial areas. Based on the trends of the past 50 years, SSA will not achieve the MDGs.⁵ Take the following key areas:

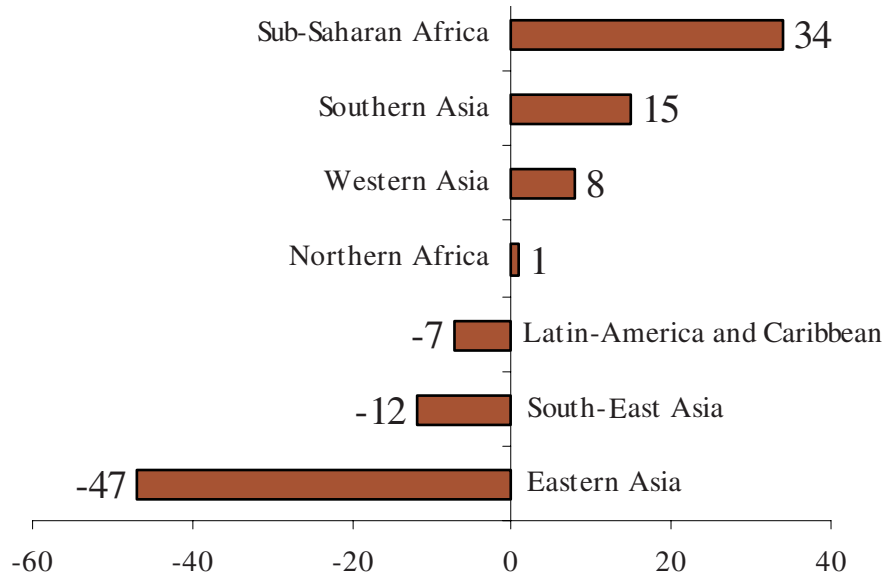
80.6.1 Eradicating Extreme Poverty and Hunger

For sub-Saharan African countries to achieve the MDGs target of reducing by 50 per cent (table 80.1) the proportion of Africans whose incomes are less than 1 US\$ a day by 2015, will require growth in GDP close to 7 per cent in every country on the continent. This is currently not happening on key indicators, and the prevailing evidence indicates that the situation on the ground is getting worse. Economic growth rates in Africa have increased since the mid-1990's, reaching an average for the continent of 4.6 per cent in 2005. This reflected somewhat better terms of trade (especially for mineral exporters), a turn-round in aid levels (which fell until 2000, and then started rising), debt reduction and the impact of earlier macroeconomic and structural reforms. Among low-income countries, only Uganda and Mozambique have recorded consistent declines in poverty levels. These were also, significantly, the only countries that achieved growth close to 7 per cent for several years, although in Uganda growth has dipped and poverty has risen again slightly since 2003. However, most countries have not yet moved to the consistently higher growth needed to achieve the MDGs.

The remaining countries on the continent have made very little progress in eradicating hunger and malnutrition (see figure 80.1). Indeed, the numbers of

5 See: The MDG data base is available at: <<http://millenniumindicators.un.org/>> (27 February 2006).

Figure 80.1: The increase in proportion of hungry is the greatest in sub-Saharan Africa. **Source:** United Nations (2005: 8).

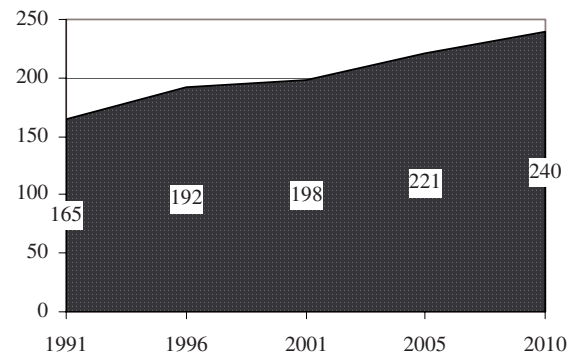


people suffering malnutrition has increased to well over 200 million in recent decades and the problem is especially severe in Central, East and Southern Africa where almost a half of the population of 360 million is estimated as being undernourished (see figure 80.2). Women and children are especially vulnerable to food insecurity and malnutrition, with the latter being especially important as a cause of under-five mortality (CHGA 2004). Trends were actually reversed during the 1990's in those countries most affected by adverse growth in GDP and by the effects of HIV/AIDS. UNDP concluded that, "during the 1990's, the spread of HIV/AIDS had a devastating effect on families and communities. The loss of productive capacity among families affected by HIV/AIDS had a major impact on food production and on nutritional well-being" (Dzenovska/Rasheed/Sandkjaer 2004: 20).

80.6.2 Achieving Universal Primary Education

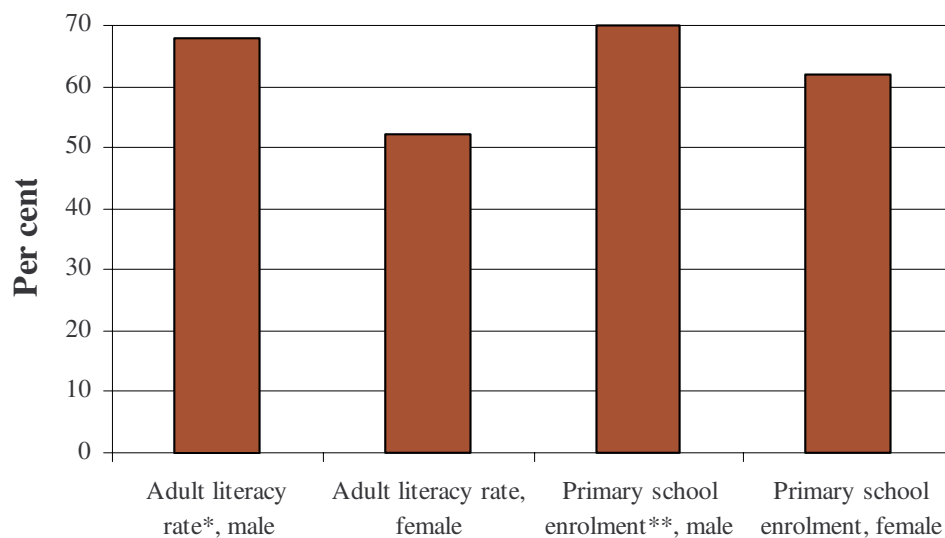
Across Africa, the children not in school are the poorest and the most isolated. Although there has been overall progress in terms of total primary enrolment rates, which has increased by 38 per cent between 1990 and 2000 (UNESCO 2003b), these figures mask country and regional variations, and the problems surrounding the relevance of education, completion rates and progression. Only 46 per cent of girls in sub-Saharan Africa complete primary school, and in seven countries have a 20 per cent less chance of starting primary school than boys (Benin, Niger, Burkina Faso, Chad, Ethiopia, Guinea Bissau, and Mali)

Figure 80.2: Undernourished in Africa, estimated and projected, in millions. **Source:** United Nations (2005) and United Nations Millennium Development Goal Indicators Data Base; at: <<http://mdgs.un.org/unsd/mdg/Default.aspx>> (28 February 2006).



(UNESCO 2003b). The situation is likely to be extremely bad in those countries for which there are no reliable data available, such as DRC, Somalia and Liberia.

The target is that by 2015 children everywhere, boys and girls, will be able to complete a full course of primary schooling. However, achieving *universal primary education* (UPE) as promoted through *Education for All* (EFA) goals of universal access and completion is unlikely to be achieved by 2015 by most African countries, especially the poorest with large rural populations. This is especially true if the sole strategy for achieving EFA is based on the linear expansion of existing public school programmes. Clemens (2004)

Figure 80.3: Gender and education in sub-Saharan Africa. **Source:** UNICEF (2006: 117).

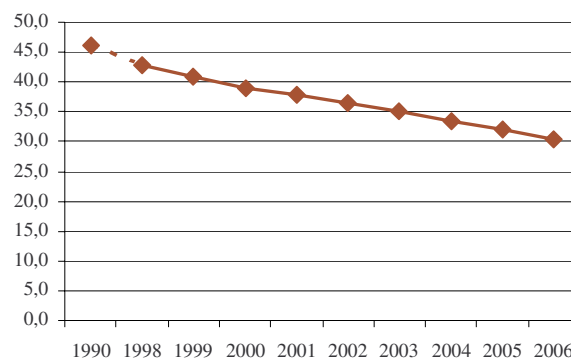
* Percentage of persons aged over 15 who can read and write.

** Percentage of persons of primary school age who attend school.

notes that data from 90 countries indicate that increasing enrolment from 50 per cent to 90 per cent takes an average of 58 years and, they assert, reaching 95 per cent enrolment by 2015 will require historically unprecedented growth rates and as we have noted earlier this is not happening. Sub-Saharan Africa has made only marginal progress on closing the gender gap in primary and secondary enrolment since 1990, and the pace of change required is the most dramatic of any region. At the current rate of progress, gender parity in primary education in SSA will not be reached until 2038 - and this does not mean that every African girl will have claimed her right to primary and secondary education by that date - it only means that there will be as many girls enrolled in school as boys by 2038 (World Bank 2004).

While African countries saw some progress in educating children during the 1990's this was not nearly enough to meet the goal set for 2015. In over a third of countries every other child is not in school; while some countries have increased their enrolment rates [such as Uganda and Malawi] other countries actually experienced declines [such as Central African Republic, Lesotho and South Africa] (see figure 80.4).

There continue to be significant urban-rural gaps in enrolment, and in some countries the enrolment ratio in urban areas is some 2 to 3 times higher than for rural populations. Unless the educational targets are substantially achieved in the coming decade then not only will millions of children be deprived of their right to basic education but many of the other targets

Figure 80.4: Children not enrolled in school, sub-Saharan Africa, per cent*. **Source:** UNESCO Data Base on Millennium Development Goal Attainment; at: <http://www.uis.unesco.org/ev.php?URL_ID=5261&URL_DO=DO_TOPIC&URL_SECTION=201> (28 February 2006).

* Note: estimates based on available data on primary school enrolment ratios.

will also be unachievable. A better-educated population is essential for the achievement of democratic states in Africa and for improvement in systems of governance. It is wholly improbable that economic growth and poverty reduction targets can be met without a better-educated and skilled population, and a more educated population is essential for improving labour productivity. Improved access to education for girls is also crucial for achieving progress on maternal and under-5 mortality, and for progress generally in the area of reproductive health.

Figure 80.5: Infant Mortality Rate. **Source:** United Nations World Population Prospects Data Base; at <http://http://esa.un.org/unpp/> (27 February 2006).

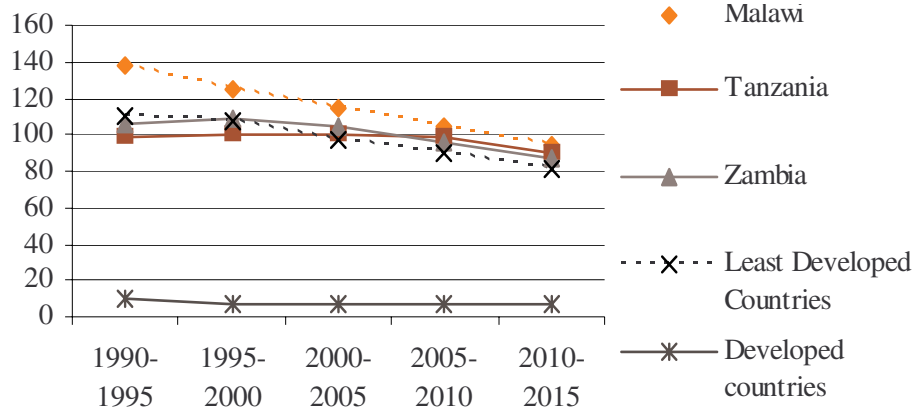
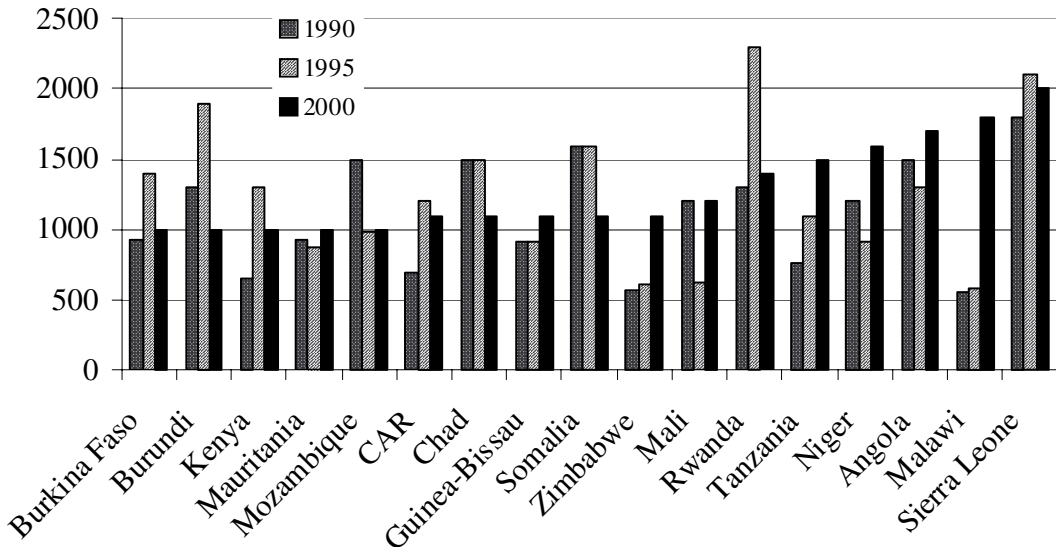


Figure 80.6: Maternal mortality, SSA countries with rates higher than 1000 in 2000. **Source:** UN Statistics Division MDG indicators data base.

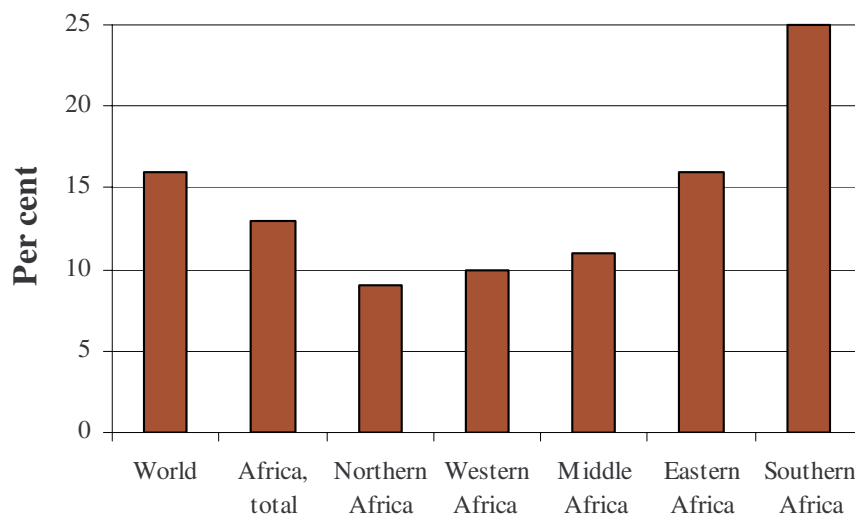


80.6.3 Improving Maternal Health and Reducing Child Mortality

This MDG encompasses two aims: to reduce by two-thirds the under-five mortality rate by 2015, and to reduce by three-quarters the maternal mortality ratio by the same date. At the present time 15 per cent of all children in Africa will not live to see their fifth birthday. Progress in decreasing the infant mortality rate seems to have been reversed during the past two decades, and some countries, such as Zambia, Malawi and Tanzania, have actually seen increases in infant mortality due to HIV/AIDS (see figure 80.5). There also remain significant gaps between urban and rural rates in many countries, and it is clear that the proba-

bility of a child dying is much greater in poorer families than in richer ones (the probability is twice as high for children in the bottom 20 per cent of the income distribution as it is in the top 20 per cent).

African countries currently account for about one third of all maternal deaths worldwide, with about 250,000 women dying during pregnancy and child birth every year. These trends seem if anything to have worsened during the past decade, in part associated with deteriorating health care systems (see figure 80.6). But the primary problem, apart from poor access to health care, continues to be the continued high levels of fertility, and thus persistently high risks of maternal mortality. The comparative rates of maternal mortality between developing country regions

Figure 80.7: Women in Parliament in 2004. **Source:** Population Reference Bureau (2005); United Nations (2005).

strikingly emphasizes the gap between Africa and other regions - in Africa a woman faces a 1 in 13 chance of dying in childbirth compared with 1 in 160 in Latin America and 1 in 280 in East Asia.

80.6.4 Promote Gender Equality and Empowerment of Women

Despite some improvements in addressing gender inequality since the 1995 World Conference on Women in Beijing, much remains to be done in Africa to make gender policy an effective instrument for poverty reduction. MDG3's first target is to eliminate gender disparity in all levels of education. However, the MDGs also link ending poverty to addressing women's unequal access to health services and to productive resources. North Africa has already achieved parity between girls and boys in secondary schools and is on track to achieve parity between the sexes at the primary level. Only six SSA countries are on track to achieve gender parity at the primary level, three of these are also on course to achieve parity at the secondary school level.

In most countries, African women remain vastly under-represented in politics, in the legislature, at the highest levels of the corporate sector and other economic institutions. Between 1990 and 2001, some countries made progress in equal access to paid employment in the non-agricultural sector but without renewed effort, neither sub-region is likely to reach equal employment between men and women by 2015. Despite an increase in the number of women in parliaments, women are still under-represented in political decision-making structures in both North Africa

and south of the Sahara (see figure 80.7). Statistics from all countries in Africa show that more males than females occupy senior government positions. More needs to be done for women to have their say in governance, democracy and decision-making. Research shows that this is a key way to fight poverty.

80.7 Conclusion

Where resources are scarce, as is the case across much of Africa, the object of political contestation is often to secure economic consumption - which in turn is best guaranteed by capturing the state itself. Elite control of the state systems ensures their access to both economic opportunities and the mechanism of the state power (military and police forces) ensuring that their economic and political privileges are protected. Thus, politics easily degenerates into a life and death struggle over private ownership of public resources. State effectiveness, therefore, has continually waned as a result of parochialization of the public realm. While in part, this reflects the way the state was created, its use by post colonial elites has created a skewed distribution of resources in favour of those groups that have power and wealth. The segmentation of society that has followed has impeded the many reforms of the political structures necessary to enhanced Africa's ability to develop sustainably.

States on the continent are, therefore, weak and much of their strength derives from the feebleness of political challengers than from the inherent capabilities of the state itself. For many people in these societies their chief security threat is often the very govern-

ment under whose sovereignty they live, either through its power and oppressive policies, or as a result of its incapacity to sustain the infrastructure of life for the vast majority. As predicate, the human security framework should be conceived as emancipatory; encompassing and empowering the hopes and aspirations of a group of people - individuals, Civil Society, development practitioners, NGOs, CBOs, donor organizations. - for a better continent. A continent on which children are not allowed to die from preventable diseases; where epidemics like HIV/AIDS is not allowed to decimate an entire generation; ethnic prejudice is not allowed to result in gratuitous violence or worse genocide; women are not illegally trafficked or sexually abused; corruption is not allowed to continue to reduce millions of people to a bleak and vulnerable future.

These are issues with an emotional charge of a kind that only a subjectifying narrative can fully convey and around which a coalition of forces are needed to bring radical political change. As such, the concept is intended to evoke discussions as explicit as possible, organized as emotively as possible, while making empirical observations as compelling and practical as possible.

81 Human Security in Central America

Philippe De Lombaerde and Matthew Norton

81.1 Introduction¹

The assessment of human security (HS) challenges and prospects in Central America (CA) presents a complex and contradictory picture. The region has been quite tumultuous during the past three decades, and the legacy of war, social violence, and democratization processes in various stages of progress and disrepair have all left important imprints.

Once considered as unlikely contenders for democratic institutionalization and consolidation (Barnes 1999), Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama can now be considered as democracies. Civil wars which wrecked Guatemala, El Salvador, and Nicaragua through the 1980's and early 1990's have all been officially terminated through the signing of national peace accords, under the umbrella of the Esquipulas regional movement, spearheaded in the late 1980's by Costa Rica's then president Oscar Arias. Peace-building efforts with internal and external support – notably in Guatemala, but elsewhere as well (Pearce 1999) – have initiated the process of democratic consolidation, and though these efforts have been problematic in many ways, the spectre of a return of the organized and widespread political violence of the 1980's has somewhat receded. Since 1998, crises of political institutions have occurred in South America (Argentina: 2001, Bolivia: 2003, Ecuador: 2000, Paraguay: 1999–2000, Peru: 2000, Venezuela: 2002) and in the Caribbean (Haiti: 2001) (Rojas 2004: 10, 2008) but Central America has largely avoided direct involvement in these regional tensions (Malamud 2005).

But no observer or resident of the region would consider this the moment for a declaration of victory in terms of the human security agenda. Major and intractable human security challenges remain. The wars

and violence of the 1980's – in which an estimated 300,000 people died (Pearce 1999) – as well as the political structures in place previously, all exact a heavy toll as the region struggles towards more secure social formations for its residents. The past with its violence is gone but not forgotten. Central American societies are still characterized by high levels of social violence, and important economic security deficits exist. Although relative poverty indicators have shown improvements, absolute figures still rise (UNDP 2003b). The social and geographic income distribution does not show a tendency towards convergence and more equity (SICA-CEPAL 2004). Growth rates are insufficient; in the poorest countries recent GDP growth rates are only marginally higher than population growth rates. Access to basic services is deficient. This complex situation poses serious challenges for the region.

The objectives of this chapter are, first, to assess (real and perceived) HS threats and challenges in CA through the lens of a modern HS conceptual framework, and, second, to assess the relevance of adopting a regional perspective to HS in the Central American case.

We start with the presentation of the conceptual and theoretical framework (81.2). Then, after a general assessment of perceived human security (HS) threats in CA (81.3), we will assess clusters of HS challenges in three major HS pillars and connect them to the emerging regional human security discourse. The first cluster includes social and political issues, and particularly the challenges posed by high levels of social violence, and faltering democratic consolidation processes (81.4); the second is related to issues of economic development and the integration of CA in the regional and global economy (81.5); and the third deals with regional impacts of natural hazards and disasters (81.6). In section 81.7 these three human security threats and challenges are placed in the light of regional strategies to enhance and achieve the human security agenda. Section 81.8 concludes.

1 The authors thank Hans Günter Brauch and three anonymous referees for their useful comments. Only the authors are responsible for remaining errors.

81.2 Conceptual and Theoretical Framework

Due to the complex national and regional challenges facing the Central American countries the HS concept is a suitable tool for analysis. One common feature of all HS concepts is a focus on the linkage of threats to the security of individuals or humankind (Ogata/Cels 2003; CHS 2003). This integrative approach enables politicians, activists, policymakers, scholars, peace-builders and others to think about challenges in a way that does not attempt to isolate them. By conceptualizing the linkages between these complex threats and challenges, complex and integrated responses become possible. The HS approach also offers a normative focus on “the security of the people” (CHS 2003: 2).

The conceptual and theoretical framework on which this chapter is based departs from the traditional national security framework in two respects. On the one hand we will employ a multi-dimensional human security concept, thereby (at least to some extent) ‘moving down’ from the state level to the level of citizens. On the other hand, we will at the same time ‘move up’ from the national level to the regional level of analysis and link the HS perspective with a regional integration perspective.

It goes beyond the scope of this chapter to present in depth the conceptual development that the HS concept has undergone (Rojas/Fuentes 2002; Brauch 2003, 2005). This is done in extenso elsewhere in this volume. Suffice it here to say that we will follow the broader human security concept as it has been developed in the international policy community, particularly the UN context (UNDP 1994), as well as in academia roughly since the beginning of the 1990s (Buzan/Wæver/de Wilde 1998; Brauch 2005).

Concentrating only on the micro-level does not allow one to capture the reality of today’s security threats, risks and challenges and, in addition, as Brauch (2005: 22) also pointed out, it would not lead to many policy-relevant conclusions. ‘Moving down’ to the level of citizens, as we mentioned above, should therefore be taken as a key analytical thematization through all levels of analysis, rather than the only level of analysis considered. Maintaining a focus on the citizen-level provides a valuable analytical orientation for the consideration of national- and regional-level economic, political and social structures.

We thus propose to employ a human-centered and encompassing concept, combining the second and third approaches in Brauch’s overview of the concep-

tual developments of HS, associated with proposals originating in the UN system (UNDP 1994; Annan 2001). Bogardi and Brauch (2005) synthesized the current conceptual discussion and proposed to consider a HS concept based on three pillars:

- *freedom from fear*: political, military and societal security which is reached by reducing the probability that people confront violence and conflict;
- *freedom from want*: economic and societal security which is reached by reducing social vulnerability through poverty eradication;
- *freedom from hazard impacts*: environmental security which is reached by reducing vulnerabilities of societies confronted with natural and human-induced hazards.

We will use this conceptual framework in the rest of this chapter to structure our argumentation. One should be aware, however, that the borderlines between these three pillars are not always very clear and that there is quite some overlap. As we mentioned before, we opt for adding an explicit regional dimension to our conceptual framework, because of the characteristics of the human security issues in CA, as they will be discussed below.

In De Lombaerde (2005) we have argued that the rationales for a regional approach to security policy include the following:

- the regional scale of the threat or problem;
- the nature of border conflicts;
- the occurrence of negative spill-overs;
- destabilizing migration flows;
- prisoner dilemmas leading to e.g. uncoordinated military build-up;
- common external threats;
- external (extra-regional) policy objectives and creation of extra-regional bargaining power.

As we will see below, many of these rationales apply in the case of CA, although we should be aware of the existence of a grey zone between national and regional (human) security issues.

From a theoretical perspective, the linkages between regional integration and human security are complex and causality runs in both directions, if a systemic approach is not preferable. According to the liberal view on international relations, growing (regional) interaction and economic interdependence should lead to more shared prosperity and peace.² Also in the early developments of integration theory (functionalism) (Mitrany 1966, 1975), pragmatic coop-

eration in functional areas was expected to contribute to peace and stability in post-war Europe.

Other arguments are offered in the approaches inspired by the fiscal federalism literature (see e.g. De Lombaerde/Costea 2006), according to which the regional level is the adequate level for the provision of certain public goods (several of which directly contributing to the provision of HS), especially when the national jurisdictions are 'small' and the cross-border spill-over effects are important as in CA (see below).

The conceptual difference between regional cooperation (ad hoc, inter-governmental, sectoral) and integration (structural, supra-national, multi-sectoral) is relevant to the extent that deeper regional integration, whereby more policy areas are gradually involved (economic, political, military, infrastructure, ...), permits bargaining between countries, linking different issues on the policy agenda. This way, agreements can be reached more easily and conflicts avoided. Deeper integration is also capable of generating more effective regional policies since they are somewhat shielded from national political events and cycles, on the condition of having secured sufficient resources.

The Balassa type stages model of regional integration only indirectly informs us about the interlinkages between economic integration and (human) security issues. From the perspective of HS policies, of relevance here is, on the one hand, the possibility offered by customs unions (CUs) to autonomously generate financial resources at the regional level, and, on the other, the fact that deeper economic integration requires the building of regional institutions and administrative capacity, which can then more easily be mobilized in other policy areas.

81.3 Human Security Threats and Challenges in Central America

The perception of and the debate about HS threats in a region is a function of concrete historical circumstances and of the social context. The debate on HS is not (only) an academic debate. In CA, the HS debate is only slowly developing. CA was also absent from the Human Security Network, led by Canada and Norway (Rojas/Fuentes 2002). The debate first centred on the concept of 'democratic security' with

a regional dimension, as inspired by the political events of the late 1980's and early 1990's, and the Tegucigalpa Protocol of 1991. This concept refers to the repositioning of security within a framework of democratic rules, done in the context of the regional pacification process.

The most important aspects of the concept of 'democratic security' as understood in CA are:

- the recognition of the democratic State (*Estado democrático de Derecho*),
- the respect for human rights,
- the submission of the armed forces to civil authority,
- its integral and indivisible character,
- the peaceful solution of conflicts,
- the harmonization, coordination and cooperation in security and defense policies,
- mutual confidence building measures,
- the control of military forces and armaments, and
- collective defence (White Gómez 2004: 24-25).

Only gradually the concept acquired a broader significance when sectors of Central American societies became more conscious that security is not only about the absence of conflict (White Gómez 2004: 15). This conceptual development –and shift in the direction of a true HS conception– is still ongoing.

What are the dominant threats then to HS in CA in the early 21st century? Ranking the HS threats for a country or region and comparing them with other countries or regions is difficult. Rojas (2004, 2008) compiled perceived threat rankings for four sub-regions in Latin America and the Caribbean based on official documents and speeches (table 81.1). In all sub-regions, drugs trafficking and terrorism are ranked 1 and 2. Risks related to the environment and natural disasters, and threats linked to organized crime, are perceived as relatively more important in CA, whereas activities of guerrilla movements or subversive groups appear with the lowest rank. These rankings should be treated with care. Perceived threats may differ from objective threats, challenges, vulnerabilities and risks (Brauch 2005).

They are also very sensitive to 'events' occurring at the moment of assessment and to how they are used in political discourses. The terrorism threat, for example, appeared in many political discourses after the 9/11 event. However, the academic literature in the region seems to focus more on other threats. According to White Gómez (2004: 21), criminal violence is the perceived dominant threat in CA, whereas in the Caribbean the security threats are more related to global

2 Empirically, the causal linkages between trade and security are limited. Democracy appears to have an independent positive effect on both variables (Polachek 1992, 1997).

Table 81.1: Perceptions of threats to human security ranked by sub-region. **Source:** Compiled by the authors based on Rojas (2004: 10).

Rank	Central America	Caribbean	Andean Community	Mercosur
1	Drugs trafficking	Drugs trafficking	Drugs trafficking	Drugs trafficking
2	Terrorism	Terrorism	Terrorism	Terrorism
3	Environment and natural disasters	Poverty and social deprivation	Poverty and social deprivation	Arms trafficking
4	Organized crime	Environment and natural disasters	Guerrilla activity and subversive groups	Organized crime
5	Poverty and social deprivation	Arms trafficking	Arms trafficking	Environment and natural disasters
6	Arms trafficking	Organized crime	Organized crime	Poverty and social deprivation
7	Guerrilla activity and subversive groups	-	Environment and natural disasters	Guerrilla activity and subversive groups

Note: 1 = most important, 7 = least important.

warming, hurricanes, and large scale commercial crises. Thus perceived security threats in CA have shifted from the state level to the level of persons and citizens.

81.4 'Freedom from Fear': Social and Political Dimensions of Human Security in Central America

81.4.1 Interlocked Threats to Human Security

From a human security perspective, the people of CA experience a startling series of interlocked threats: from crime and social violence, to lingering psychosocial impacts of war, high levels of violence against women, migratory pressures and drug smuggling. But the progress that has been achieved in this former Cold War front cannot be ignored. Nicaragua signed its peace accord in 1990, El Salvador in 1992, and Guatemala in 1996. Since then, massive strides have been made in terms of nation-building, the institutionalization of democratic governance, the rule of law, and other social and institutional factors contributing to a future for the region characterized by greater security for all.

Even as the threat of organized political violence and outright civil war have decreased, throughout CA, social violence and crime are on the increase (Rojas/Fuentes 2002; Adorno 2003; Chinchilla 2003). Even in those countries that have not suffered the impacts of brutal wars - Costa Rica, Honduras, and Panama - new and pernicious forms of social violence have

emerged. While each country faces nationally particular challenges, regional threats are also emerging, particularly from emerging transnational crime syndicates. The fact that all Central American regimes are now democratic should not obscure the immense work that needs to be done in all countries to consolidate democratic institutions and civil society. The serious challenges for continuing democratization thus form a backdrop to all other challenges. Governments characterized by varying levels and sorts of fragility are thus stretched to their limits in trying to cope with these present and emerging threats.

The insecurity that characterizes much of CA supports the shift away from state-centric security concepts. If security is limited to threats to the state, then the view from CA looks quite promising. But when the security of individuals is considered as a focal point, an entirely different picture emerges. Rising levels of social violence mean that the threats posed to individuals throughout the region are an increasingly prominent part of the daily experience of Central Americans. Interpersonal violence, for example, has become the leading cause of death among 15-25 year olds (Harris 2002). This sense of insecurity is exacerbated by a generally perceived inability or unwillingness of law enforcement agencies to control this violence. In Honduras, despite numerous high-level efforts to bring the extraordinarily high level of child-murders under control, many remain uninvestigated, and *Casa Alianza*, a regional NGO, estimates that one third of these murders may have been committed by the police (Harris 2002). This combination of widespread violence and perceived impotence of gov-

ernments to cope with it, or even their involvement in it, creates an environment where the fear of violence becomes a generalized, routine, and pervasive dimension of social life throughout CA. Using the HS framework, this and other ways that individuals experience 'fear' and 'want' in their lives have become key security questions. We will review some of the most prominent social and political challenges to HS in the region by focusing on an interlocking set of issues with great impacts on individuals, and that help to conceptualize the nature and range of these challenges. They are in no way an exhaustive listing of HS challenges.

81.4.2 Gang Violence and Illegal Trafficking

Crime and criminal networks are some of the most glaring sources of fear experienced by ordinary Central Americans. Exacerbated by poverty, the region's geographical position between the cocaine-producing countries of South America and the USA, the relative weakness of the rule of law, and the ready availability of weapons, high-levels of crime, and the pervasiveness of various forms of criminal networks are among of CA's most significant contemporary human security challenges. Gang violence is one of the most virulent forms of such criminality, posing serious threats to human security and the consolidation of the rule of law throughout the region, but especially in Guatemala, Honduras, El Salvador, and Nicaragua. Though exact estimates of membership in gangs (*maras*) are difficult and are based on contentious definitions, it is assumed that there are roughly 70,000 to 100,000 members in the region (Arana 2005). Gang violence is not limited to attacks on or homicides of other gang members. Turf wars between gangs, and ongoing battles with police make the streets of many cities and towns in CA potential sites for this new sort of violence.

The mara phenomenon is of relatively recent vintage, beginning with the deportation of gang members from the U.S. and especially from Los Angeles. In 1996, the U.S. Congress extended and toughened immigration laws, making it possible to deport non-citizens who had been jailed for a year or more. This applied to thousands of imprisoned gang members from Los Angeles who were the children of refugees from the conflicts in CA. The deportees brought the knowledge, traditions, institutions, and styles of violence characteristic of U.S. street gangs to CA. Not only does the continuing flow of deported gang members transplant Angeleno gang culture – in 2003 nearly

80,000 immigrants were deported from the U.S. after many of them returned to CA – but it also provides a ready and willing pool of recruits and enables the emergence of robust international criminal networks, as members often maintain allegiance and links to their home gang.

Two outfits in particular have become 'super-gangs', extending from CA up to Los Angeles and other parts of the USA. These two organizations, *Mara Salvatrucha* and *Mara 18*, are only loosely organized, but they share loyalties and connections, and are so widespread that they have become a significant challenge to the state and source of violence. In El Salvador, at least 15 towns or cities are *de facto* run by gangs. This challenge is not limited to El Salvador. Honduras estimates that 40,000 youths are active gang members (Arana 2005). The potential for deadly violence is exacerbated in a regional context where firearms are widely available and only poorly regulated. In El Salvador, there are an estimated 450,000 guns in the hands of civilians, 1 for every 4 El Salvadorans, and 60 per cent are illegal or not properly registered (UNDP 2003a).

Controlling murder and crime that come with these violent groups is a key human security challenge in the region. The problem cannot be easily isolated. CA is a key zone in the drug trade in the western hemisphere. While drug mafias have existed, it is in their connection with the *maras* that the threat of drugs, drug money, and the intense violence associated with drug trafficking is at its most potent as a human security threat. With the easy access to weapons, the cash of the drug mafias and the loosely organized but numerous and territorially vast *maras*, a new potentially frightening threat begins to emerge. Given the desperation of many mara members and their loyalty to the gang, the widespread gang violence may become more severe if the drug mafia-mara links that seem to exist in an embryonic form should become full-fledged.³ There is even a report, perhaps apocryphal but at least suggestive of regional fears, that in the year 2000 members of *Mara Salvatrucha* may have met with an Al-Qaeda leader, Adnan el-Shukrijumah, in Honduras (Papachristos 2005). If such connections with trans-national drug or terror outfits have evolved, these emerging hybrid entities could pose both 'national' and a 'human' security threats.

3 "After the Massacre", in: *Economist*, 374, 8409, (15 January 2005).

81.4.3 Policing the Gangs and the Problems of Policing

Presidents, parliaments, and the public have not let this threat posed by the maras go unchallenged. In 2001, Ricardo Maduro was elected as president of Honduras with a zero tolerance pledge. His popular 'get tough' attitude has become known as '*mano dura*' (hard hand). *Mano dura* policies have since been adopted by Honduras, Nicaragua, and El Salvador to grapple with crime in the region and high penalties are adopted against all sorts of gang activities, and even for gang membership. The criminalization of gang membership has made arrests extremely easy, given the distinctive tattoos that adorn the bodies of most gang members. Due to these policies, jails have swelled with numerous arrests. Public officials and police claim that crime and gang violence have decreased, but so far there is little evidence to support this claim. The regionalization of this *mano dura* approach was solidified with an agreement signed in early 2004 that allows for the sharing of warrants between El Salvador, Honduras, Nicaragua, and Guatemala, the countries hit hardest by the maras (Garland 2004).

These policies have been criticized by human rights and other advocacy groups for two reasons. First, through the criminalization of gang membership, as well as through the policing tactics that have been authorized, these *mano dura* laws themselves pose a fundamental threat to human rights and human security. Second, because they are focused solely on punishment, it is argued that they will be ultimately ineffective in combating the spread of the maras and the violence they cause because both phenomena are closely linked to problems of poverty and social exclusion, and thus not amenable to approaches that focus only on punishment and law enforcement. Thus, the maras raise a dual HS issue for CA. The high level of social violence caused by the maras has created an intolerable atmosphere of threat and fear. But the preservation of human rights is itself a critical HS objective. The question is whether *mano dura* or similar approaches to the problem of the maras will be able to reduce violence and citizens' experience of threat without undermining fundamental human rights and constitutional guaranteed.

Another dimension of HS that is highly relevant for examining the mara problem: the insistence that approaches to HS challenges must address the root causes of violence (Ogata/Cels 2003; Paris 2002). This would require governments to deal with youth

unemployment and to implement unpopular rehabilitation schemes (Thale 2005). It seems that the *mano dura* approach will not be sufficient to combat these problems (Arana 2005). Rather, these laws may be quite counterproductive in the long-term, with thousands of jailed youths solidifying their gang links and commitments while in prison.

The issue becomes ever more tangled, as some groups have begun to take the law into their own hands combating these gangs, while gang members have stepped up their violence by targeting civilians as a response to the new aggressiveness of the police. The death toll of gang and non-gang members continues to grow. In San Pedro Sula in Honduras, two shocking incidents capture the dynamic and violent nature of this situation: In May 2004 over 100 gang members were killed in a fire in a local prison⁴; in December 2004 mara members armed with automatic weapons slaughtered all passengers on a bus travelling on a main highway⁵, as a reprisal for the prison fire and a violent reaction against the *mano dura* laws.

81.4.4 Democratic Transitions

The emergence of authoritarian responses to violence in the Central American context is not surprising. All countries in the region continue to undergo processes of democratic transition and consolidation. With traditions of both authoritarian rule (Sojo 2003) and patrimonialism (Holden 2004), the normative democratic resources of well-established democracies are lacking in most CA states. Thus, complex and urgent issues such as the maras and drugs are further complicated by the relative weakness and rigidity of existing governance structures. Especially in those states emerging from civil wars, these governance structures tend to be fragile and radicalized. Corruption (Brown/Cloke 2005) further complicates these matters. At the same time, processes of democratic consolidation which would allow more coherent and effective responses to HS threats are themselves often casualties of deteriorating HS conditions. Thus, the new democracies are often worse off than authoritarian states in dealing with fundamental and serious threats to individuals, and even to the state. Democratic consolidation is thus an important issue if the "incomplete democracies" (Barnes 1998: 63) in CA are

4 "Bringing it All Back Home", in: *Economist*, 371, 8376, (22 May 2004).

5 "After the Massacre", in: *Economist*, 374, 8409, (15 January 2005).

to be sufficiently empowered to provide security for all individuals.

The institutional level of democratic consolidation is particularly important in a region where the history of the military has remained problematic. Except in Costa Rica, where the military was abolished in 1949, the other countries have long had very powerful military apparatuses, or as Robert Holden (2004) has called them, “armies without nations”. During the 1980’s, the region emerged from this imbalance in the military and civilian relationship. Since the 1980’s the power of the military has been drastically diminished (Robinson 2003), but demilitarization remains a key priority and dimension of democratic consolidation and social change (Kincaid 2000).

Continued demilitarization coupled with a strengthening of the institutions of civil society are another key piece in the solidification of democratic norms and controls in CA states. Even in those countries that did not experience civil war, lingering patrimonialism and authoritarianism, alongside corruption pose tremendous challenges for the continuation of building strong and flexible systems of government capable of responding to the various threats to HS existing and persisting in the region for the foreseeable future.

81.4.5 Violence Against Women

The problem of gender-based violence, and specifically violence against women is endemic through all the countries of CA. This violence exists in a wide variety of different forms and settings which include the specific targeting of women in acts of criminal violence, high rates of domestic violence, and weak or non-existent legal options realistically available. The problem, in Central America as elsewhere in Latin America and the world, can be conceptualized as on the one hand women’s high exposure to violent and potentially violent situations, and on the other hand weak official recourse or response. Women in CA are particularly vulnerable to violence for many reasons not particular to the region: low levels of social, economic, and political power; patriarchal social structures that do little to constrain violent men, and much to constrain women from empowering themselves; and cultural and historical patterns of representation in which women come to be seen as more ‘acceptable’ targets for violence. Sexual violence of various kinds and intimate partner or domestic violence are two of the most epidemic forms of gender-based violence that Central American women experience.

These are compounded by extremely weak regulatory environments (particularly for domestic violence), and police and legal indifference or even obstruction. It is critical that this issue be considered as an integral part of the human rights agenda because of its discriminatory nature, and because of its pervasiveness. While estimates are difficult because of the nature of this sort of violence, UNIFEM estimates that a minimum of 1/3 of women will experience gender based violence at some point in their lives. It is likely that in CA, that percentage is even higher, reflecting trends in Latin America more generally, where *Human Rights Watch* estimates that 40 per cent of women will experience this sort of violence. While the proportion of the population directly affected alone makes this a stark human security issue facing the region, the nature of this kind of violence links it directly to a much more widely experienced environment of fear. Because intimate violence so often occurs over prolonged periods and in the home, it has impacts far beyond its physical repercussions. Children, communities, and society in general are ultimately implicated in this pattern of violence. Governmental policy throughout CA is particularly lacking, with treatment of victims of rape and domestic violence often amounting to a second victimization as women are forced to go from office to office, dealing with officials who are often neither trained to deal with these sorts of crimes, nor necessarily sympathetic (Velzeboer/Ellsberg/Clavel Arcas/García-Moreno 2003). Responses to the problem of violence against women, it should be noted, have varied widely. Costa Rica in many ways leads the region, with tools like its ‘Law Against Domestic Violence’ providing a positive legal framework to deal this sort of crime, as well as promoting training for police and social workers in recognizing and dealing with the particular demands that violence against women entails.

81.4.6 Border Disputes

As the focus of the security debate has been shifting to HS, one should not completely forget the ‘old’ security issues like the existence of continuing border disputes. Of the over 40 territorial claims and/or demarcation problems (on land or sea) in Latin America and in the Caribbean, several involve Central American countries: Belize-Guatemala, Honduras-Nicaragua, Costa Rica-Nicaragua, Colombia-Nicaragua. Looking at the recent history of militarized inter-state conflicts, one should not underestimate this heritage. CA showed a relatively high number of inter-state con-

flicts with a relatively high hostility level in the previous decade (table 81.2). It remains to be seen whether the positive evolution during recent years is solid and sustainable.

A definitive settlement of the pending border disputes is a pre-condition for further progress towards peaceful interaction, trust and cooperation (Rojas/Fuentes 2002: 23).

Table 81.2: Inter-state militarized conflicts in the Americas, 1990-2001. **Source:** Own calculations based on Mares (2003).

	US	Central America	Caribbean	Andean region	Southern Cone
US	-	# = 1 $\mu = 3,0$	# = 6 $\mu = 3,2$	# = 10 $\mu = 3,0$	-
Central America		# = 19 $\mu = 3,5$	-	# = 1 $\mu = 2,0$	-
Caribbean			-	# = 5 $\mu = 3,8$	-
Andean region				# = 13 $\mu = 3,5$	-
Southern Cone					-

Note:

#: number of conflicts;

μ : average hostility level (2 = threat, 3 = mobilization,

4 = use with < 1000 casualties in conflict zone, 5 = war)

Diagonal elements show intra-subregional conflicts.

81.5 Human Security as 'Freedom from Want'

Within the context of globalization and a possibly emerging regional world order, regional groupings of small countries are vulnerable, not only due to structural weaknesses related to their limited scale, often linked to a peripheral location, but also because their environment is highly exogenous. Due to their limited negotiation power in the political and economic arena, they have only few capacities to shape their own conditions for development and security. But flexible niche specialization strategies can show important results, as small countries like Singapore, Chile, various European countries and, to some extent, Costa Rica have shown.

Although the situation in Central America is probably not as extreme as in the Caribbean or South Pacific Islands, the successful integration of this sub-region in the world polity and economy is not without

risks. Initial conditions show problematic features: a limited scale of economic and governmental activity, a vulnerable socio-economic situation, combined with a vulnerable ecological situation (volcanic activity, resource intensive exports). Any realistic strategy should take these factors into account.

Looking at the human development indicators for the region, one observes that, except Costa Rica and Panamá, all countries are almost systematically underperforming, compared to the averages for Latin America and the Caribbean. This is the case for life expectancy, literacy rates, school enrolment, per capita income levels, electronic connectivity, etc. (table 81.3). Two countries, Honduras and Nicaragua, show per capita incomes of less than one third of the average figure for the wider region. Poverty, the quantity and quality of education, the quantity and quality of health services, and (intra and extra-regional) migration have been described as the most important social equity deficits in the region, and it has been argued that these should be the intervention points for a new HS strategy (Urquyo 2004: 112-122). The importance of the promotion of basic economic security as a pre-condition for further social development and development in general has also been emphasized by UNDP (2003b).

In addition to these low levels of socio-economic development, social and economic inequality should be addressed. This is one of the structural obstacles that represent risk for the further democratic development of the region and the generation of crisis situations (Rojas/Fuentes 2002: 23).

Pressures from intra-regional and extra-regional migration will continue. These migration flows have usually socio-economic determinants (e.g.: migration from Nicaragua to Costa Rica, migration flows to the US, transit migration to Mexico) but can be temporarily influenced by natural hazards like in the case of hurricane Mitch. In Costa Rica the decent treatment of legal and illegal immigrants from Nicaragua must remain a major priority in a country with a stable governmental system, founded on the rule of law and protection of human rights. Human trafficking (Clark 2003, 2003a), high levels of violence against women, child abuse and prostitution are important challenges for CA as its states seek to meet the demands to ensure HS for all residents.

Table 81.3: Selected development indicators for Central America: **Source:** <<http://hdr.undp.org/statistics>> and own calculations.

	Belize	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panamá	Latin America/ Caribbean
Life expectancy at birth (years), 2003	71,3	78,6	70,4	66,1	66,1	68,8	75,0	70,9
Population growth (average annual %), 2000-2004	3,0	1,7	1,7	2,6	2,5	2,5	1,5	1,4
Population total, 2004 (million)	0,3	4,0	6,7	12,6	7,1	5,6	3,0	541,3
Literacy rate, adult female (% of females ages 15), 2002	77,1 (00)	95,9	77,1	63,3	80,2 (2001)	76,6	91,3 (2000)	88,1 (2004)
Literacy rate, adult male (% of males ages 15), 2002	76,7 (00)	95,7	82,4	75,4	79,8 (2001)	76,8	92,6 (2000)	89,9 (2004)
School enrolment, primary (% net), 2002	99,2	90,4	90,4	87,3	87,5 (2001)	85,5	99,6	95,3
Poverty headcount ratio at national poverty line (% of population), 2000	Na	na	na	56,2	na	na	na	
GDP growth (average annual %), 2000-2004	7,0	3,3	1,9	2,6	3,8	2,9	3,2	2,3
GNI per capita, Atlas method (current USD), 2004	3.940	4.670	2.350	2.130	1.030	790	4.450	3.600
Improved sanitation facilities, urban (% of urban population with access), 2002	71	89	78	72	89	78	89	84
Internal freshwater resources per capita (cubic meters), 2003	58.458	27.967	2.755	8.857	13.776	34.672	49.262	25.193
Internet users (per 1000 people), 2002	109	193	84 (2003)	33	25	17	62 (2003)	106 (2003)
Roads paved (% of total roads), 2002	Na	22	na	Na	na	11	na	Na
Trade in goods (% of GDP), 2003	77	79	60	38	66	61	30	42
Exports of goods and services (% of GDP)	54	47	27	16	36	24	59	24
Short-term debt outstanding (DOD, current billion USD)	0,1	16.265	1.759	1.257	464	595	440	-
Aid per capita (current USD), 2003	44	7	29	20	56	152	10	12

81.6 Human Security as 'Freedom from Hazard Impacts'

The Central American states face other serious HS challenges and threats than the ones described thus far. Deforestation and ecological devastation are not only environmental issues (Khagram/Clark/Raad 2003, 2003a), but they are linked to human insecurity through the increased prevalence of natural disasters such as hurricanes, mud slides, through the destruction of valuable farm land, and the increasing pressure placed on fresh water.

Central America has been extremely vulnerable to natural hazards: hurricanes, flash floods, land slides, volcano eruptions, earthquakes etc. Data sources like the EM-DAT database make it now possible to analyse data on natural disasters in a systematic way over long periods of time. In table 81.4, we made a selection of data showing up-to-date cumulative figures since the beginning of the XXth century. These figures illustrate the tremendous environmental and social vulnerability reflected in the high figure of people who died in these events. One way of visualizing the degree of vulnerability of the region to natural disasters consists of relating these figures to population figures. If, for example, the total stock of affected people is related to current population stocks (see table 81.3), we find that the former represents the equivalent of between 35 and 79 per cent of current populations for Central American countries (except Panama); these are obviously very high figures. These and other indicators (e.g. number of events) also show that the vulnerability towards natural disasters of the region is relatively homogeneously distributed across countries. This has important implications for the need, design and feasibility of regional responses and policies in order to face these challenges, as will be further developed in the next section. One of the issues that emerges in this context is the fact that, apparently, the poorest countries bear the highest burden if we look at the damage figures.

Of the 11 categories of disasters that are considered, drought, earthquakes, epidemics, floods, and wind storms are the ones that affect practically the whole region. Earthquakes, floods and wind storms (in this order) are the most mortal disasters. Windstorms, earthquakes and floods (in this order) also have the highest economic cost.

81.7 Regional Cooperation and Integration as Responses to Human Security Challenges

81.7.1 The Regional Dimension of the HS Issues in CA

Many, if not most, of the challenges and threats in the social and political realm are regional in nature, requiring careful coordination and gradual harmonization of laws and practices. Others are far more pressing in some countries. Their officials and populations - with international support - must find a balance between ineffective responses to threats with failures to respond. Both responses will diminish future prospects for meeting the very serious social and political HS challenges that persist in the region.

Also in the economic realm, problematic policy issues and areas are increasingly international (regional and/or global) in scope. Migration issues and health policies, linked to the discussion on services and intellectual property rights on medicines at the WTO and in the CAFTA framework, illustrate very well that effective policy responses aimed at increasing HS levels increasingly require a coordinated regional approach, complementary to national policies. To cope with these challenges and to facilitate the integration of CA in the global economy, regional cooperation and integration will be crucial. Regional cooperation increases scales of operations, makes the handling of common and cross-border problems easier, enhances opportunities to provide regional public goods and strengthens the region's external negotiation position. One of the most important lessons of the signing of the Esquipulas agreements has precisely been to clarify the links between the HS and regional integration agendas in CA (Solís Rivera 2003).

In the area of environmental security (freedom from natural hazard), the situation in CA is a clear case in support of the call for a regional orientation in the 'fourth phase' of environmental security research and policy discussion (Brauch 2005: 38-39; 2008, 2008a, 2008b, 2008c). According to this author, this requires regional natural science models (climate, soil, water), and also new case studies from a comparative social science perspective on the policy processes at the regional level. In table 81.4 we showed the important overlap that exists between countries in terms of the type of natural disasters to which they are vulnerable. This offers many opportunities for joint learning, for joint designs of prevention policies and for the mobilization and pooling of resources for disaster

Table 81.4: Stock of Natural Disasters Affecting Central American Countries. **Source:** OFDA/CRED International Disaster Database (EM-DAT); at: <www.em-dat.net> (8 August 2006); own calculations.

	Drought	Earth-quake	Epidemic	Extreme tem- perature	Famine	Flood	Slides	Volcano	Wave/surge	Wild fires	Wind storm	Totals
Belize (Sep 1931- Oct 2005)												
# events				1		3					10	14
# killed				0		0					1840	1840
total affected				0		19600					218570	238170
Damage (1000 USD)				2250		2700					410040	414990
Costa Rica (Apr 1910 – Oct 2005)												
# events	2	12	1			18	1	6		2	6	48
# killed	0	1844	0			84	7	104		0	90	2129
total affected	0	35113	4786			394745	200	91321		1200	869336	1396701
Damage (1000 USD)	0	20700	0			317000	0	5000		0	151090	493790
El Salvador (Jan 1902 – Oct 2005)												
# events	2	8	8			11	2	1	1		9	42
# killed	0	3405	506			610	44	2	185		2563	7315
total affected	412640	2533521	69570			125842	0	2000	0		163381	3306954
Damage (1000 USD)	30800	2936500	0			281500	0	0	0		745400	3994200
Guatemala (Apr 1902 – Oct 2005)												
# events	5	12	7	1		13	6	11		2	5	62
# killed	42	27697	608	0		40808	234	12000		0	2176	83565
total affected	206596	5028912	33597	1850		149555	3242	11678		0	599160	6034590
Damage (1000 USD)	21500	1005000	0	0		117500	0	0		0	1751300	2895300
Honduras (Dec 1915 – Nov 2005)												
# events	7	3	6			21	2		1	1	15	56
# killed	0	2	37			693	2810		0	0	24597	28139
total affected	1412019	500	23150			860947	0		1720	0	2937726	5236062
Damage (1000 USD)	55000	0	0			278800	0		0	0	4454600	4788400
Nicaragua (Feb 1906 – Oct 2005)												
# events	4	9	9		1	10	1	5		3	13	55
# killed	0	12686	80		0	394	29	0		0	3672	16861
total affected	557645	735894	17584		0	327207	5769	30577		16000	1453926	3144602
Damage (1000 USD)	202300	887000	7		50	11550	0	2722		80000	1754080	2937709
Panama												
# events	1	4	5		1	20					4	35
# killed	0	32	101		0	135					43	311
total affected	81000	21511	5554		3000	140224					16800	268089
Damage (1000 USD)	0	0	0		0	17700					70300	88000

Table 81.4: Stock of Natural Disasters Affecting Central American Countries. **Source:** OFDA/CRED International Disaster Database (EM-DAT); at: <www.em-dat.net> (8 August 2006); own calculations.

Totals for Central America											
# events	21	48	36	2	2	96	12	23	2	8	62
# killed	42	45666	1332	0	0	42724	3124	12106	185	0	34981
total affected	2669900	8355451	154241	1850	3000	2018120	9211	135576	1720	17200	6258899
Damage (1000 USD)	309600	4849200	7	2250	50	1026750	0	7722	0	80000	9336810

Notes: 'Total affected' is the sum of killed, injured, homeless and other effected persons. 'Epidemics' include: arbovirus (dengue fever) in Costa Rica; arbovirus (equine encephalitis), diarrhoeal/enteric (cholera), arbovirus (dengue fever), arbovirus (dengue) and respiratory (pneumonia) in El Salvador; arbovirus (equine encephalitis), measles, diarrhoeal/enteric (cholera), arbovirus (dengue fever) and arbovirus (dengue) in Guatemala; meningitis (polio), arbovirus (equine encephalitis), arbovirus (dengue fever), diarrhoeal/enteric (cholera) and arbovirus (dengue) in Honduras; arbovirus (equine encephalitis), diarrhoeal:enteric (cholera), arbovirus (dengue fever), leptosporosis and arbovirus (dengue) in Nicaragua; measles, diarrhoeal/enteric (cholera), arbovirus (dengue fever), meningitis (viral meningitis).

management and reconstruction efforts. Especially in situations of major non-synchronous events, the region-wide (rapid) concentration of regional resources has a potential to save many lives.

81.7.2 Building Blocks for Regional Cooperation and Integration

Although the solidity of the historical process of regional integration in CA is an issue under debate, there are building blocks and relevant antecedents to further regional integration and cooperation.

Early stages of the institutionalization of the integration process were the creation of the *Organization of Central American States* in 1951 and, more importantly and after long negotiations (1952-1960), the creation of the *Central American Common Market* (CACM) in 1960 by the treaty of Managua. Original member states of CACM were Guatemala, Honduras, Nicaragua and El Salvador, with Costa Rica joining in 1962. Its objective was to encourage the industrialization and development through trade and regional integration. Although the CACM shared several weaknesses with other initiatives of the so-called first wave of regionalism in Latin America, like low levels of production factor mobility and unsuccessful industrial cooperation, it also showed quite remarkable results in terms of intra-regional trade expansion and coverage of the common external tariff (De Lombaerde 2005).⁶

As part of a 'second wave' of regionalization, taking place worldwide, the integration process was reactivated in 1991 with the signature of the *Tegucigalpa Protocol* (in force in 1993), establishing the *Central*

American Integration System (CAIS).⁷ The formal objectives of the CAIS are to initiate a process of political, economic, social, cultural and ecological integration in order to build a region of peace, liberty, democracy and development. The CAIS reformulated the security concept, with a new model of 'regional security' based on power balances, strengthening of civil power, fight against extreme poverty, promotion of sustainable development, environmental protection, eradication of violence, corruption, drugs and arms trafficking. In 1993, regional economic integration was re-launched with the Guatemala protocol and in 1994, a pragmatic content was given to the integration scheme with the adoption of the *Alliance for a Sustainable Development* (ALIDES) at the Summit of Masaya (White Gómez 2004: 40). In 1995 a *Social Integration Treaty* and a *Framework Agreement on Democratic Security* were signed, stressing the cooperative and collective dimension to security issues and reaffirming the emphasis on 'democratic security'. According to a recent comprehensive study of Central American regional integration, there are still significant potential gains to be expected from a further deepening of the process (SICA-CEPAL 2004).

Whether cooperation and integration deliver the quality of regional governance and the amount of regional goods that are needed, depends on the way in which political leadership further moulds the integration architecture and addresses a number of challenges and threats.

One of these challenges is related to the sustainability of the regional integration process and, by implication, the effectiveness of regional responses to HS

⁶ More than 98 per cent of extra-regional trade covered.

⁷ Members are: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panamá.

challenges in CA. This is linked to the level of social participation of the citizens in these processes. In both CACM and OCAS, as in other initiatives in Latin America and the Caribbean, the state was the principal actor, influenced by national and regional bureaucracies (including ECLAC). According to some authors (Delgado Rojas 2001: 230, 240) the business communities were not closely involved in these negotiations and described as 'passive' players, whereas others saw them as key players influencing the process (Best 2006: 200). The attitude of the trade unions was one of distrust and ideological opposition. This has changed to some extent with the new regionalism wave of the 1990's (De Lombaerde/Garay 2006). Civil society became more involved in these revived or new schemes. With regard to institutionalized participation, CA has been innovative though (Delgado Rojas 2001: 238). Whereas the Andean Pact and, more recently, MERCOSUR established socio-economic advisory committees modelled on the European Social and Economic Committee, the Tegucigalpa protocol foresaw the creation of a Consultative Committee of CAIS in which regional workers' organizations, employers' federations, but also intellectuals and other groups in society took part. The particularity of this Committee is that eligibility is based on regional representation. Although this experiment was positive and promising in its conception, the results are deceiving (Best 2006: 200-201). Much activity of civil society at the regional level is reactive, rather than constructive, and reproduces national political dynamics, at the cost of more coordination of regional objectives (Rojas Delgado 2001: 243). For the integration process to be able to fulfil its promises in the political, economic and HS spheres, more effective civil society participation is still needed (Herrera 1999).

A second challenge is related to the linkages and tensions between the regional and other levels of governance. In our opinion, the emphasis on a stronger Central American region does not imply that the processes taking place at other levels are ignored. The governance architecture of the near future is probably one of multi-level governance with a high degree of flexibility and jurisdictional overlap. Bilateral and cross-border cooperation will remain important as well as developments at wider regional scales (continental and in the Caribbean Basin) and at a global multilateral level (WTO).

The *Association of Caribbean States* (ACS), is one such a forum that might offer opportunities for Central American states. The ACS was created in 1994 by the *Convention of Cartagena de Indias* signed as full

members by 25 independent states and by 12 associated member states, in order to foster regional integration and cooperation in various policy areas. Despite its internal heterogeneity, the ACS presents important possibilities for cooperation including the joint management of natural disasters, the development of solidarity mechanisms (spreading and reducing risks), and the joint promotion of tourism. The prudence with which CA has approached the ACS, is due to the fact that Cuba is a member, and that the CA states are highly dependent (both economically and politically) on the U.S.⁸ The work agenda of the ACS has been rather weak (González Arana 2001) but there is room for a more active and beneficial involvement of the Central American countries.

A third challenge to the regional integration process is precisely related to the multiple linkages with the U.S. An important recent development was the signing of the *Central American Free Trade Agreement* (CAFTA) in May 2004 by five Central American countries (Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua).⁹ Ratification is still pending in Costa Rica, and in the U.S., the President has been hesitant for domestic reasons to present this agreement to Congress.

CAFTA covers: (i) principles of national treatment and non-discrimination of goods, services and FDI, (ii) market access and gradual reduction of trade barriers, (iii) trade facilitation, (iv) public procurement, (v) agriculture, (vi) services, and (vii) conflict resolution mechanisms. Analysts (and the public) have been divided on the expected effects of this agreement for economic activity and HS. This does not differ from the situation in other Latin American sub-regions and the discussion on the FTAA and the Andean-U.S. bilateral agreements. A balanced view necessarily may conclude that such agreements present both opportunities and threats to the countries involved. In addition, the contents of such agreements reflect necessarily the structural characteristics of the negotiation setting: the U.S., on the one hand, and the small Central American countries, on the other.

On the opportunities side, usually market access is highlighted. In the short and medium term, however, these effects may well be very limited. The reason is that access is only marginally increased if it is compared with access under the *Caribbean Basin Initia-*

8 Another obstacle is the border dispute between Colombia and Nicaragua.

9 The Dominican Republic joined the Agreement in November 2005 (DR-CAFTA).

tive (CBI), a unilateral concession by the U.S. in place since 1984. What is more relevant from an economic security point of view, is that unilateral preferences are now integrated in a bilateral agreement which should give more regulatory security to economic agents.¹⁰ Having negotiated the framework is particularly relevant if recent developments on the FTAA are taken into account. After the debacle at the Mar del Plata Summit on 4–5 November 2005, DR-CAFTA offers probably a more secure trade environment, which the Andean region, also quite dependent on the U.S. market, is still lacking.

As far as the threats are concerned, there are several issues at stake: (i) agriculture (especially the effects of trade liberalization on small farmers), (ii) intellectual property rights (traditional knowledge, pharmaceuticals), services (privatizations), (iv) worker rights protection. According to observers like *Human Rights Watch*, the latter are too weak in the agreement, because it does not include binding clauses which are able to bring labour legislation closer to critical standards.¹¹

This leads to a perhaps contradictory situation where, although the regional level is able to provide policy answers to HS threats of different kinds, they present at the same time also new threats.

81.8 Conclusions

A complex and, to some extent contradictory, picture follows from our assessment of the human security challenges and prospects in CA. This complexity makes the HS concept a particularly apt mode of analysis, although its use in Central American academia and politics is only slowly gaining importance.

Parting from a state-centered focus on national security, the last decade undoubtedly showed substantial progress after the difficult episodes in the 1980's and early 1990's.

However, if we part from a broader and person-centered definition of HS, the image is not as positive. Serious threats to HS, both from internal and external origins, exist and require policy responses. They are related to organized crime, poverty, low educational levels, distorting migratory flows, environmental risks, and the adjustment costs of economic liberaliza-

tion. Although reactive policies are often needed and urgent, a further shift towards proactive policies that address root causes of insecurity in the three HS pillars (like e.g. issues of social equity and mobility, corruption, housing, reforestation, etc.) is necessary along with the adoption of longer time horizons.

We have shown that traditional and non-traditional HS threats are highly interlocked in CA and that due to the structural characteristics of the region (small scales, high degrees of openness, dependence vis-à-vis US, etc.), effective policy responses require (deeper) regional cooperation and integration driven by institutional and political processes with (higher) degrees of democratic participation.

10 A similar development can be expected regarding the EU-GSP.

11 For a discussion of the process and results of CAFTA, see Weisleder (2004); see also at: <<http://www.hrw.org>>.

82 Human Security: A South American Perspective

Francisco Rojas Aravena

82.1 Introduction

For over a decade, human security has been in the global and hemispheric agenda. During this time it became a central concept within the United Nations system. This post Cold War security concept changed its approach towards people's security. 'Human security' stands within an ethical point of view in how priorities and politics are defined in this matter. Vulnerabilities link to the concept generate risks that will impact millions of people. Human security undertakes transnational challenges, and seeks to provide local responses. It also demands establishing international public goods to protect citizens. Although 'human security' is different from the classical security concept, a substantial progress on it will only be possible if there is not a confrontational defiance to the traditional concept of state security. There for it is a complementary concept.

'Freedom from fear' is the security objective laid down by the United Nations (2000) in its *Millennium Report*. Achieving this goal requires a recognition that the international system has fundamentally changed in recent years and that in the process a clear need has arisen to develop innovative approaches and perspectives so that we can grasp these changes and respond to new challenges.

During the Cold War, concepts of security mainly related to the state, and the military viewpoint prevailed. Since 1990 a transition can be observed towards a broader security concept whose objectives are peace, international stability and protection of individuals and communities. Since the mid-1990's the concept of human security emerged that emphasizes the protection of individuals. One major change that influenced the evolution of the human security concept is the new nature of conflicts, most of which take place within states.

Another factor that has contributed to this change in the security outlook deals with the complexity of global problems and their repercussions for millions

of people. There are now threats very different from that of a military attack against one's homeland, including environmental risks, international crime, drug trafficking and terrorism. All this entails far-reaching changes in the basic idea of sovereignty and shows that national capabilities are inadequate to deal with these problems.

The main changes and tendencies in the international system that have influenced the perception and analysis of new security challenges, and that have contributed to a reconceptualization are associated with the following structural and international factors:

1. End of bipolar conflict;
2. New power relationships;
3. Impact of globalization in different areas, and interdependence;
4. Changes in the dimensions of time and space;
5. Loss of state capabilities;
6. Increase in intra-national conflicts;
7. New international actors;
8. New threats to security; and
9. Development gaps.

Some tendencies that worked in the immediate post-Cold War years (1990-2000) were dropped after the terrorists attacks of 11 September 2001 in the U.S., which later spread to Europe (Madrid, 11 March 2004; London, 7 July 2005) and Asia. The U.S. response to this tragedy has challenged not only international law but also the multilateral agreements. This 'radical unilateral approach' has generated within the U.S. a serious polarization, and abroad it contributed to an increasing anti-Americanism.

In Latin America, especially in South America, the end of the Cold War coincided with a process of democratization and pacification in certain countries of South and Central America (Fuentes/Rojas 2005; chap. 81 by De Lombaerde/Norton). When consid-

Figure 82.1: Map of South America. **Source:** © 2005-2007 Map-Of-South-America.us. All rights reserved. Download at: <<http://www.map-of-south-america.us/south-america-map.gif>>.



ering the new security situation in the Americas, a number of tendencies must be taken into account:

1. Latin America and the Caribbean have had, and still have, a marginal position in global strategic affairs.
2. Latin America has not consolidated a disarmament policy in relation to weapons of mass destruction.
3. The military spending of Latin America and the Caribbean is low by comparison with the rest of the world.
4. International security institutions are weak in Latin America and the Caribbean.
5. Latin America has reached consensus on a common conceptual framework for security.
6. Internal conflicts.
7. The United States was the main actor in the region and hemisphere during the Cold War, and still is.

Latin American governments have gradually assimilated the new human security concept. In South America, for example, Chile made of this concept part of its foreign policy strategy through the Human Security Network. Ecuador included it in its defence policy definition. However, the debate over this issue among the governments has been relatively weak. More interesting debates take place within the aca-

demic community, but there is no consensus on the subject. Traditional concepts are still very powerful, and so is the notion of sovereignty in South America. Fear of foreign intervention, especially from the United States of America is also a factor. On the other hand, non-state actors have some visibility, including those organizations from the civil society, something seen as suspicious by many states. In sum, the concept of human security is still under construction.

This chapter also examines the relationship between human security and development, on the one hand, and human security and its links with state security and international security. A brief summary of the vulnerabilities of the region is done as well as the perceptions of threats and new threats. Finally, the chapter suggests some areas for future action.

82.2 Conceptual Approach on Human Security

Fear takes away freedom, and without freedom dignity and justice are lost. Without freedom, dignity and justice, people lose their basic rights. Human security presupposed the right to have rights; and the best way in which people can ensure themselves to those rights, is to reinforce democracy and governance.

Democracy is the political system that increases the rights of the people and facilitates the peaceful resolutions of conflict. Democracy could be an important measure of human security: i) Democracy have been better suited to hold governmental authorities accountable for human rights abuses. ii) There is a correlation between a lack of democracy and an inhibited economic development. iii) In democracy the ability to set the agenda via persuasion diffuses power from the central authority into the hands of citizens who chose to engage in the democratic process (Kay 2006: 267).

Human security complements state security; it does not oppose it. "Protecting and empowering people are thus about creating genuine possibilities for people to leave in safety and dignity. Seen from this angle human security reinforces state security but thus not replace it" (Ogata 2003: 5). The *Human Security Now* report defines human security as a way "to protect the vital core of all human live in ways that enhance human freedoms and human fulfilment" (CHS 2003). Human security is a universal concern and interdependent. The UN Secretary General defined human security as "freedom from fear and freedom from want" (Annan 2000a: 43).

In May 1999, a group of like-minded nations in international matters established the *Human Security Network* (HSN, see chap 76 by Fuentes). In the hemisphere Canada, Chile and Costa Rica have joined this initiative. But the HSN has established no common definition of human security, which led too two groups within the HSN. The first group emphasizes more on 'basic needs' or human development ('freedom from want'), while the other focused on a world without fear, giving priority to certain vulnerabilities resulting from more restricted threats ('freedom from fear').

South American nations stand in this second group. They separate the development from the defence and security agenda to avoid a 'militarizing' of the development agenda and the social demands and protests (Winter 2003; Garreta 2003; Villagra 2003). During the Third Summit of the Americas in Quebec (2001), the Presidents of the hemisphere addressed issues and challenges that included improved access to education, poverty, alleviation, strengthening human rights, democracy and economic integration. The resulting *Declaration of Quebec City* determined the region's priorities and goals for the upcoming years, which recognized the need to "continue addressing weakness in the development processes and increasing human security."¹

The 'Special Conference on Security' held in Mexico on October 2003, achieved a great and important consensus on security matters. The *Declaration on Security in the Americas*, adopted by the OAS, expresses principles and reaffirms shared values and a common approach, and also the coincidence of commitments and cooperation measures. The Declaration defines the basic purpose of security as the protection of human beings: "Security is strengthened when we deepen its human dimension"² (Rojas 2008).

82.3 Double Human Security Triad

Human security is linked on one hand with human centred concepts such as human rights and human development, and on the other with international and state security.

1 Third Summit of the Americas, *Declaration of Québec City*. Canada, 20–22 April 2001; at: <www.summit-americas.org/eng-2002/quebeccity-summit.htm>.

2 OAS, "Declaration on Security in the Americas", Mexico DF, 28 October 2003; at: <www.oas.org>.

82.3.1 Human Rights, Human Development and Human Security

Human security as an idea fruitfully supplements the expansionist perspective of human development by directly paying attention to what are sometimes called 'downside risks'. The insecurities that threaten human survival or the safety of daily life, or imperil the natural dignity of men and women, or expose human beings to uncertainty of disease and pestilence, or subject vulnerable people to abrupt penury related to economic downturns demand that special attention be paid to the dangers of sudden deprivation. Human security demands protection from these dangers and the empowerment of people so that they can cope with - and when possible overcome - these hazards (Sen 2003b: 8).

There is a complementarity between the concepts of human rights and human security. There is something deeply attractive in the idea that every person anywhere in the world, irrespective of citizenship or location, has some basic rights that others should respect. The moral appeal of human rights has been used for varying purposes, from resisting torture and arbitrary incarceration to demanding the end of hunger and unequal treatment of women (Sen 2003b: 9).

82.3.2 International, State and Human Security

One of the main intellectual and institutional challenges is to establish a conceptual link between human and international security that includes state security (Goucha/Rojas 2003). Once satisfactorily established, this relationship will simultaneously satisfy world security needs, as well as those of nations, individuals and people. It will also improve the implementation on human security measures.

The primordial characteristic of the new international conflicts, centred on intra-state problems, reveals the need to reach a better understanding of the interrelationship between these three levels, particularly in view of the impact of globalization. The new threats are transnational in nature and involve actors and agents that in most cases do not represent a nation or are not located in a clearly delimited state territory. There are a multidimensional causes for public and civil (in)security. New ways of linking states and non states actors are present in global scenarios. Private actors will increase their participation in the human security arena considering the emergence of new world threats, such as the green house effect and nat-

ural disasters, HIV/AIDS and other pandemic viruses, and transnational illegal crimes.

Globalization and interdependence brings new risks and vulnerabilities that affect nation's security. This also affects other states. As a result of this situation, problems arising because of these causes cannot be resolved within its own borders. Wars have also radically changed. The great majority of conflicts occur within states and have inter-state consequences. Their origins and motivations have more to do with ethnicity, religion or self-determination than with disagreements over borders or state interests. Non-state actors are playing a more prominent part. Demands are increasingly being directed at international, inter-state and non-governmental organizations, which mean that the capabilities of states, especially the less powerful ones, are being reduced.

Human security centres on the protection of individuals and communities. This concept has a unifying and multidimensional nature. It takes in more local dimensions, even if these relate to issues affecting great masses of people. It also takes in issues of a planetary scale that affect humanity as a whole (AIDS, SARS, the environment, organized crime, etc.). In both cases, these are non-traditional issues that have been taken at the other two levels (national security and international security). In other words, the focus is shifting from the state to individuals; the fundamental issue is the protection of individuals and people over and above their connection with a particular state.

The conditions required for human security can only be met in conjunction with the conditions required for state and international security. Indeed, an international crisis is at once a state crisis and a human security crisis. Likewise, a state crisis becomes a humanitarian crisis and an international crisis, and a human security crisis is simultaneously a state and international crisis, whence the need for a holistic approach.

To avoid the danger of over-reach it is necessary to agree on an approach or element that can provide a focal point for the concept of human security in the different dimensions and at the different levels where it is expressed. Similarly, a holistic or integrated perspective means that appropriate linkages can be made in the conceptual triad.

The specific structural element that enables this phenomenon to be best understood and targeted is violence, both the conditions under which this appears and its perpetrators. Joint action to forestall the use of force reaffirms international law and generates increased opportunities for concerted action. This

Table 82.1: Conceptualization of National, International and Human Security Dimensions. **Source:** Gurtov (1999: 25-26). Permission was obtained from Rienner Publishers.

	National security	International security (traditional)	Human security
Approach	National	Inter-state	Multidimensional
Focus	Nation state	Inter-state Regional Global	Individual Global (because of impact on individuals)
Conflicts	Intra-national Inter-state	Inter-state Transnational	Intra-national Inter-state Transnational Global
Implementation	National defence system Interministerial coordination	Bilateral coordination United Nations Coordination through regional organizations (OAS)	United Nations Interministerial coordination Intergovernmental coordination Coordination through regional/ international organizations Global networks
Function of the armed forces	Protecting national borders	Inter-state cooperation Cooperation through international organizations Peacekeeping operations (mainly chapter VI)	Protecting national borders, and peacekeeping operations (Chapters VI, VII of the UN Charter) Inter-state cooperation Cooperation through international organizations
Actors	State	State Intergovernmental organizations Non-governmental organizations	Individual Intergovernmental organizations Non-state actors Civil society Non-governmental organizations State

phenomenon can be analysed if three main aspects are considered: i) the conditions under which violence is likely to occur; ii) the perpetrators of violence; iii) and the preventive measures that can be taken so that violence and humanitarian crises do not break out.

Identifying violence as a pivotal element makes it possible to achieve a broad understanding of the phenomena that determine it and to obtain specific responses as to when and in what cases legitimate violence is the best means and when other instruments should be used. The militarization of responses results in a rising spiral of violence that is hard to stop. Conversely, the adoption of preventive measures limits the scope for the emergence of conditions that favours violence.

82.4 South America as a Part of the Main Vulnerabilities

In the case of Latin America, especially the South American nations, the main threats to human security are associated with a set of circumstances that include, weak democracy, rising poverty and inequity and, increasingly, urban violence and crime (Fuentes/Rojas Aravena 2005a: 103-179 or: 129-163). Although efforts have been made by multilateral institutions, governments and civil society to deal with these vulnerabilities, there is still a long way to go. There are six basic areas where threats could arise for human security:

1. *Socio-economic vulnerabilities.* Social and economic vulnerabilities reflect the growing inability of the production, trading and financial systems to

Table 82.2: The five variables of human security and mutual vulnerability. **Source:** Goucha/Rojas Aravena (2003: 22).

Variables	Ecology (Life)	Economy (Wealth)	Society (Support)	Politics (Power)	Culture (Knowledge)
	Environmental capital	Economic capital	Social capital	Political capital	Cultural capital
Effects	Sustainability Disaster	Prosperity Poverty	Equality Inequality	Peace Violence	Wisdom Ignorance
Globalization	A world of as- sociated effect 'greenhouse effect'	Dark side of globalization and compe-tition, more inequality	Refugees Migrations Hyper- urbaniza-tion	Governance Global regimes Co-operation/ conflict	Identities Values
Use of force	Bio-terrorism	Financial cri-sis E-terrorism Money laundering	Polarization Ungovernability Citizen security	Anti-mines Children at war Small arms Traditional disarmament	Intolerance and religious wars Local identities clashing with national and global security

solve people's most immediate problems, essentially poverty, the distribution of income and, increasingly, unemployment. From the human security point of view, it is essential to find the best tools for dealing with these insecurities. Accordingly, emphasis has been laid on the need to reiterate the principle of 'growth with equity' and establish that of 'crisis with security'. In other words, to generate and encourage the creation of mechanisms to protect people in adverse situations that includes inflation, unemployment and fiscal crises. A review of some indicators for Latin America reveals low rates of growth and great vulnerability to upheavals in the international economy, rising external debts and high unemployment rates. This last factor leads to an uncertain economic outlook for the countries of the region. From the social point of view, furthermore, we find that poverty levels are rising, social exclusion is not improving, the gap between rich and poor is widening, and social spending is low in some countries.

2. *Social integration and vulnerability.* The persistence of high levels of poverty in the region, combined with the weakness of democratic institutions, is seriously affecting the social integration of traditionally excluded sectors that are subject to severe discrimination. The sectors that are particularly vulnerable in Latin America are ethnic groups and immigrants. Empowerment of these is essential, because they are the sectors that suffer most from economic, social and indeed cultural insecurities. This section shows some examples of this exclusion. It examines more closely the subject of migration, a vital issue for human security

both internationally and regionally. It also considers the digital divide as a source of human insecurity.

3. *Politico-institutional vulnerabilities: weak democracies.* In Latin America, democracy has proved to be the best political system for attaining the goals of 'freedom from fear' and 'want'. The region has a disastrous history of violations of human rights and political rights during the periods of dictatorship, when the doc of national security was paramount. This is why it is important to consolidate democracy, as a system that has an inbuilt preference for dialogue and policy agreement, to solve disputes and promote human rights among the different actors and agents of society.

Latin American democracies tend to be weak. With a few exceptions, the region displays serious politico-institutional shortcomings that manifest themselves in recurring crises, unwarranted interference by the armed forces in domestic political matters in certain countries, lack of respect for political and civil rights and basic guarantees, high indices of corruption and institutionalized violence. It is not surprising that a feeling of profound mistrust prevails towards political parties and the crisis of representation affecting these.

4. *International security vulnerabilities (traditional).* In the Latin American region the traditional conflict and associated insecurity is linked to unresolved border conflicts. There are at least a dozen interstate border conflicts. The last small war was in 1995 between Ecuador and Peru. In countries like Colombia the guerrilla warfare has been spreading beyond national borders. In addition

important transnational security threats, such as drug trafficking and organized crime – including money laundering, kidnapping and others – threats to people security. The nature of these threats is multidimensional and required a cooperative approach to fight them.

5. *Internal security vulnerabilities.* The social violence and crime became an important problem in Latin American countries. The poverty, inequity and lack of social cohesion open opportunities to organized crime in the mayor cities. Unemployment, easy access to light weapons, and a weak police organization increase criminal rates and homicides. In addition, in many countries institutionalized violence is a constant threat; and normally the death squads are related to repression forces.
6. *Environmental vulnerabilities.* Since the 1990's the existence of a world environmental crises have been widely discussed. This has been portrayed as a problem of planetary scale whose origins are essentially human and not natural. For example, deforestation resulting from over-exploitation of woodland is reducing plant cover, diminishing genetic variety and triggering alluvial erosion and desertification.

Water shortages are also a serious problem for future development. During the twentieth century, water consumption grew more than twice as fast as population. Four in ten of the world's inhabitants live in areas where water is scarce. It is possible that by 2025, no less than two-thirds of the world's population, or some 5.5 billion people, will be living in countries where there is a serious shortage of water.

This context of deforestation and loss of plant species, water shortages and drought is generally intertwined with socio-political disasters such as armed conflict and forced migration that exacerbate the degradation, erosion and desertification of soils. The resultant loss of farming land is largely responsible for one of the main threats to people's security in the region and worldwide, i.e. food security.

82.5 New Threats in Latin America

Each one of these vulnerabilities can change into an effective threat with a great impact to human security in the region. The more traditional threats have a low probability of occurrence, but it is necessary to develop and complete the measures of mutual trust to

avoid making interpretation errors. The Special Security Conference of OAS in Mexico City in October 2003 referred to seven new threats.³ The security of states of the hemisphere is affected in different ways, by traditional threats and the following new threats, concerns, and other challenges of a diverse nature:

- terrorism, transnational organized crime, the global drug problem, corruption, asset laundering, illicit trafficking in weapons, and the connections among them;
- extreme poverty and social exclusion of broad sectors of the population, which also affect stability and democracy. Extreme poverty erodes social cohesion and undermines the security of states;
- natural and man-made disasters, HIV/AIDS and others diseases, other health risks, and environmental degradation;
- trafficking in persons;
- attacks to cyber security;
- the potential for damage to arise in the event of an accident of incident during the maritime transport of potentially hazardous materials, including petroleum and radioactive materials and toxic waste; and
- the possibility of access, possession, and use of weapons of mass destruction and their means of delivery by terrorists.

It is the responsibility of the specialized fora of the OAS, and inter-American and international fora to develop cooperation mechanisms to address these new threats, concerns, and other challenges, based on applicable instruments and mechanisms.

82.6 The South American Community of Nations

The South American Community of Nations has 12 States: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela. It was created as a proposal from Brazil in 2000, where a first summit of Heads of State and Governments of the region took place. The main ideas in the first two summits were centered on the concept of integration. In the context of the III Summit progress was made towards the constitution of the South American Community of Nations, on 7 December 2004, in Cuzco, Peru.

3 OAS, Special Conference in Security. Mexico, 2003. Paragraph M.

Box 82.1: South American Presidential Summits. **Source:** Compiled by the author.

31 August 2000:	I Summit of Heads of State of the South American countries.
26 July 2002:	II Summit of the Heads of State of the South American countries.
1 July 2004:	Mercosur – Andean Community Trade Agreement.
8 December 2004:	III South American Presidential Summit.
8 December 2004:	Declaration of Cuzco.
30 September 2005:	I Summit of the South American Community of Nations
9 December 2006:	II Summit of the South American Community of Nations
28 March 2008:	III Summit of the South American Community of Nations

The foundational agreement of the South American Community of Nations expresses the need to “develop a South American framework that leads to an integration process in political, social, economic, environmental and infrastructure aspects in order to strengthen South America’s own identity.” It also states that it “has to contribute to the strengthening of Latin America and the Caribbean, providing a more visible representation in the international arena.” (Cuzco Declaration, 7–8 December 2004)

From the very beginning the South American Community of Nations signaled that peace, democracy and integration are fundamental components to guarantee development and security. The democratic commitment, in agreement with Democratic Charter of the OAS, had already been present in the context of the Declarations of Peace Zone of Usuhaiá, 1998 and Galapagos, 1989. During the Summit of 2002, in Guayaquil, the presidents signed the Declaration on the South American Zone of Peace. The leaders ratified the prohibition of the use or threat of use of force; of all massive destruction weapons; of the transit of arms through the region; and the elimination of the anti-personal mines. It also encouraged more transparency and the progressive limitation of arms purchases.

In the field of citizen security, during the Summit of Brasília, September 2005, the Heads of State released a declaration on this subject, stressing the growing relevance of the concept of human security and its ongoing evolution. They stated the importance of establishing common public policies and envision a more holistic vision of the subject.

In the official texts of the Community the concept of human security is not mentioned. However, many of the contents of citizen security are quite similar to those of human security. In South America violence and deaths due to the use of small arms and light weapons continue to be a primary challenge. Likewise, the expansion of organized crime has become a

real threat to the stability of the region. Global issues as the climate change continue to endanger the ecological balances and the biodiversity of South America. Instability and governance problems in the region are also major elements to consider. In sum, all these problems and limitations make it more difficult to reach consensus on policies and the joint confrontation of threats and vulnerabilities.

82.7 Policies for Action on Human Security

The end of the Cold War let the American continent in the path of searching and developing representative democracy. This was ensured in the Santiago Commitment to Democracy and the Renewal of the Inter-American System in 1991. This compromise was reconfirmed by the Summits of the Americas, and a decade later in Lima, Peru; on 11 September 2001 the *Inter-American Democratic Charter* was signed where essential elements of democracy are expressed such as the recognition and respect for human rights, public participation, free and fair elections, and transparency and accountability of government institutions. Article 1 established that: “The people of the Americas have a right to democracy and their governments have an obligation to promote and defend it. Democracy is essential for the social, political, and economic development of the Americas” (OAS 2001). As well Article 11 emphasizes that “Democracy and social and economic development are interdependent and are mutually reinforcing” (OAS 2001).

Even though democracy is now secure in the region, in the last decade there are signs of great difficulties expressed in high levels due to a lack of governance. The anticipated renunciation of 9 presidents, as well as the weakness and deficiencies shown by the political institutions are just part of this crisis (Rojas 2005a: 129–163). Regardless of this, since the last

Table 82.3: South American Data. **Source:** Prepared by the author.

	Territory	Population (million) (HDI 2005)	GNP – Per Capita (HDI 2005)	HDI Rank (2005)
Argentina	3,761,274 km ²	38,000,000	\$12,106	34
Brazil	8,500 km ²	181,400,000	\$7,790	63
Chile	756,096 km ²	16,000,000	\$10,274	37
Paraguay	406,752km ²	5,900,000	\$4,684	88
Uruguay	176,216 km ²	3,400,000	\$8,280	46
Bolivia	1,098,581 km ²	8,800,000	\$2,587	113
Colombia	1,141,748 km ²	44,200,000	\$6,702	69
Ecuador	270,667 km ²	12,900,000	\$3,641	82
Peru	1,285,220 km ²	27,200,000	\$5,260	79
Venezuela	916,445 km ²	25,800,000	\$4,919	75

months of 2005 to October 2006, free and fair elections took place in 12 countries in Latin America. This is a strong base for the citizens to express their will and their rights.

The results of these elections not only changed the political map of the region (Rojas 2006), they have also shown a dangerous tendency of less participation in the political processes. This signals the weak state of certain political parties, the disbelief of majority groups in the possibility of being included in the political agendas, as well as a strong feeling of disappointment with the democratic system, the rule of law, and the courts of justice to be able to resolve their needs of well-being.

Weakness in democracy and difficulties in governance will only help in limiting peoples rights. Also poverty and low levels of human development are factors that adversely affect social cohesion, the consolidation of democracy, and become issues that bend the balance against human security (Fernández 2006).

A new era of regional cooperation, the design to defend and protect the civil population, started with the decision of sending a regional military contingent – composed of troops from Brazil, Argentina and Chile – to first stabilize and then guarantee free elections in Haiti. This action can be seen as a mayor compromise with the operations for peace maintenance in the newly constituted UN Peace Commission⁴.

The human security concept has been incorporated in the definitions of the defence policy in Ecuador (República del Ecuador 2006). The President of

Chile, Ms. Michelle Bachelet (2006), reaffirmed in her UN speech on 20 September 2006 that this concept will be part of the international policy definitions in Chile.

Following the Ottawa Convention, a compromise on an anti-personal mine free zone has been adopted. Cooperative approaches and efforts of all states, as well as those of the OAS Mine Action Team will support humanitarian de-mining, mine risk education, landmine victim assistance and rehabilitation, and socio-economic recovery. As for terrorism, it is recognized as a serious threat to security, institutions, and democratic values. The entire region signed the Inter-American Convention against Terrorism where all states renew their commitment to fight terrorism and it's financing with full respect for the rule of law and international law, including international humanitarian law, international human rights law, and international refugee law.

All states in the Hemisphere signed the *Palermo Convention*, UN Convention against Transnational Organized Crime held by Italian government, in Palermo, 12–15 December, 2000. Regardless of these initiatives, actions against organized crime have been deficient. The region also signed the *Inter-American Drug Abuse Control Commission* (CICAD) and the Consultant Committee of the *Inter-American Convention against the Illicit Manufacturing of and Trafficking in Firearms, Ammunition, Explosives, and other Related Materials* (CIFTA).

The 'Maras' phenomenon in Central America is undermining weak states, bringing serious threats to democratic governance as well as national and regional stability (Rojas 2005: 56–73; Rojas 2008).

4 UN, General Assembly Resolution, UNGA document, A/RES/60/180, 20 December 2005; Ekinor (2006).

South American nations face the challenge of improving policies and actions in the double triad of human security. Achieving human development is crucial. Without resolving inequity and poverty issues, the main goal in human security will be impossible to obtain. Advancing an investigation and studies in defence and security are a part of the essential keys for conceptual development on human security. This will help improve public policies that will enhance stability and international and regional peace. In addition, for South American countries conceptual development is a key tool for the consolidation of democratic regimes and to overcome the unjust situation for its people.

83 Human Security in North America: A Canadian Perspective

David R. Black and Larry A. Swatuk

83.1 Introduction

This chapter maps the intellectual and practical terrain of human security in North America primarily from a Canadian perspective. Where it compares Canadian and U.S. perspectives and approaches to ‘human security’, it does so for illustrative purposes – the chapter does not present a systematic comparison. What the chapter shows in part is that ‘human security’ has lost much of its framing power since 9/11. The terrorist attacks on the U.S. have resulted in a restructuring of formal American approaches to foreign policy along more unilateralist and realist security lines (Harvey 2003/4). In Canada, 9/11 has helped displace the developmental aspects of human security (‘freedom from want’) by the responsibility to protect agenda (‘freedom from fear’).

This is most clearly illustrated by the former Paul Martin-led Liberal government’s ‘international policy statement’ (see below). With the rise of the minority-government of conservative Stephen Harper, Canada has continued to support the ‘freedom from fear’ agenda in its human security programme (see at: <<http://www.humansecurity.gc.ca/psh-en.asp>>). This is not to suggest that the developmental aspects of human security have been ignored by the new government. Rather, these issues have been shifted from the high-political ‘security’ agenda back to their traditional ‘homes’: the *Canadian International Development Agency* (CIDA; at: <www.acdi-cida.gc.ca>) and the *U.S. Agency for International Development* (USAID; at: <www.usaid.gov>). Fourteen years beyond the UNDP’s inaugural discussion of ‘human security’, it is clear that the core business of ‘security’ for North America’s states remains ‘security of the state’ (and by extension its citizens) first and foremost from external attacks by hostile forces (U.S. Government 2006).

American and Canadian approaches to ‘core threats’ differ markedly and in direct proportion to their roles and places in global politics. As the sole-remaining superpower, the U.S. official position is to

pursue American interests across the globe and to build coalitions if and where necessary (Swatuk 2004). The Canadian approach is more muted in line with the state’s global reach and capability. In this way, the Canadian turn toward ‘human security’ constitutes a logical extension of Canada’s post-World War II ‘middle power’ status and self-proclaimed ‘helpful fixer’ role in global politics (Holmes 1976; Wood 1988; Pratt 1989; Higgott/Cooper 1990). In contrast to American unilateralism, the ‘helpful fixer’ approach is based on multilateralism and consensus seeking and building – a process commonly known today as global governance (Black/Smith 1993; Hampson/Hillmer/Molot 2001).

The chapter proceeds as follows: after this introduction, it briefly examines current debates about human security in the North American and European settings in an indicative rather than exhaustive manner (83.2). It then describes official Canadian human security policy and practice (83.3), highlights debates among Canadian academics surrounding this approach (83.4) and offers concluding remarks (83.5).

A primary organizing concept is Cox’s (1986) distinction between ‘problem solving theory’ and ‘critical theory’. Problem solving theory accepts the basic parameters of the international system as it finds them – notably the privileged position of states – and seeks to ameliorate and ‘manage’ the action within it. Critical theory, on the other hand, takes a historicized view. It regards all orders as fundamentally transient, albeit over long historical periods, and analytically steps outside the confines of the existing order to identify both its origins, and the potential trajectories for change from the current to various alternative future orders. The distinction also entails a vital ethical dimension. Problem solving theory assumes the functional desirability of the existing order, and is therefore fundamentally conservative – both assuming and in effect working to replicate the core features of the dominant order. Critical theory on the other hand, in highlighting contradictions and conflicts within the current or-

der, highlights the potential to identify and work towards a normatively preferable future – a better, more just social and political order. As will be shown below, debates regarding the meaning and content of human security generally divide along problem solving versus critical theoretical lines.

83.2 Human Security Debates and Perspectives from Europe and North America

Since the 1994 UNDP Human Development Report, much has been said in the academic and policy worlds about ‘human security’, with an increasing circularity to on-going debates (see Paris 2001, 2004; Hampson 2002; and special section of *Security Dialogue* (2004), on ‘What is Human Security?’ for overviews). From the mid-1990’s, human security emerged as a hallmark of foreign policy in a relatively small group of more or less ‘like-minded’ states as members of the *Human Security Network* (HSN)¹, Canada central among them (chap. 75 by Fuentes/Brauch).

Clearly, there is a core network of groups and individuals committed to embedding human security in state, inter-state and non-state policy agendas (see: <www.humansecuritygateway.org> which is a Canadian research and information database managed by the Centre for Human Security at the Liu Institute, University of British Columbia). State-based support for ‘human security’ revolves around five interrelated concerns. *First*, the post-Cold War proliferation of collapsed, failed, fragile or otherwise dysfunctional states primarily found in Africa, Asia and Eastern Europe; *second*, the rise of ‘problems without passports’ (Renner 2005: 3) – e.g. small arms proliferation, climate change, drug and human trafficking, terrorism – resulting in ‘shared risks and vulnerabilities’ not amenable to single-state action; *third*, a strong desire to avoid unilateral strong/rogue-state action undertaken for power political motives, sometimes framed as ‘defence of national interests’ (and a corresponding decline in multilateral, international law-based behaviour); *fourth*, development fatigue and the end of ‘mega-conferences’: and *fifth*, real and potential

knock-on and/or spill-over effects of the preceding four factors – e.g. increasing poverty, disease pandemics, civil war, genocide, mass migration, environmental degradation (see, e.g., Government of Canada 2005; Worldwatch Institute 2005; CHS 2003).

Assumptions underlying a human security-based action agenda reflect primarily a liberal world view and a neo-liberal or liberal institutionalist theoretical position (Keohane 1984). Thus, the primary referent of security is the individual. In an interdependent, globalizing world, the capacity of individual states to ‘secure’ individuals qua citizens is limited. In several cases, states actually constitute a primary threat to the security of particular groups of people (women, children, the poor, marginalized ethnic groups). Nevertheless, states constitute the pre-eminent form of social organization and the only entity, separately or together, capable of amassing and deploying resources on a scale large enough to address complex socio-political and socio-economic problems (Mittelman 1988). Moreover, power is constituted in many forms – not just the threat and use of military force – and may reside with actors other than states. Thus, particular issues may be addressed successfully through creative networks of differently empowered actors (Axworthy 2001: 24). The global coalition of states, NGOs and social movements in support of banning – however partial – anti-personnel landmines is consistently cited as an example of the positive potential of a human security approach to shared threats and vulnerabilities (Renner 2005).

Such an analysis of world order also fits well with particular strands of constructivist social theory (Wendt 1999). Thus the international system is characterized by ‘mature anarchy’. While far from a settled social order, there is nevertheless an emergent global culture of behaviour based on norms, rules and procedures. Improved applied science across a variety of issue areas – e.g. on global climate change – is leading to the rise of ‘epistemic communities’ (Haas 1989, 1990, 1992, 1993). Social learning is leading toward global consensus on best economic and political practice. A wide variety of institutions and technologies facilitates dissemination, discussion and debate of these ideas across time and space.

Despite the neat categorization of human security into ‘freedom from fear’ and ‘freedom from want’, the actual agenda as suggested above is massive, indeed all-encompassing. The Commission on Human Security (2003) has attempted to capture these issues within six specific categories: a) violent conflict; b) migration; c) post-conflict reconstruction; d) economic insecurity; e) health threats; and f) poor educa-

1 The member states of the HSN are: Austria, Canada, Chile, Costa Rica, Greece, the Netherlands, Ireland, Jordan, Mali, Norway, Slovenia, Switzerland and Thailand, with South Africa as an observer, as well as Japan and Mexico as friends of the HSN (chap. 75 by Fuentes/Brauch).

tion. Yet, within each category are myriad issues and concerns. The post-Cold War linking of underdevelopment in the global South to insecurity in the global North ensured significant institutional overlap (Duffield 2001; Uvin 2008).²

In conflict situations, the Canadian government argues that defence must be able to fight a ‘three block war’ (combining combat, stabilization, and humanitarian relief and reconstruction; see: Government of Canada 2005: 8). Moreover, the government must employ a ‘3D’ approach (defence, diplomacy, development) to complex conflict and post-conflict situations (Government of Canada 2005: 24). This entails both an integrated ‘whole of government’ approach as well as firm commitment to multilateral cooperation.

The focus on conflict prevention through integrated, multilateral action is one part of the liberal prescriptive formula for achieving human security. Other key elements are: strong states must adhere to international rules, norms and procedures; mature democracies must lead by example; collective action based on shared consensus will lead to positive lasting outcomes; persistent political and/or economic instability of one state or region will result in the insecurity of all states and regions. The goal, baldly stated in the 2006 U.S. National Security Strategy document, is a world of liberal democratic states pursuing liberal capitalist economic policies (U.S. Government 2006; Government of Canada 2005).

While most Western liberal democracies agree on the objectives as well as the problems, there is less agreement on two key points: *One*, what has caused all this insecurity? For some it is bad governance (World Bank 1989, 1997b); for others it is ‘hyper-liberal’ globalization (Gill 1996; Panitch 1996; Panitch/Leys 2006). *Two*, how far should sovereign states commit to an agenda that may inhibit their ability to act unilaterally on the basis of national interest (in other words, how multilateral?). Most states are satisfied with drawn-out negotiation at the global level (e.g. the Doha Round) but firmer commitment at the regional level (e.g. NAFTA, EU, African Union) (Hette/Inotai/Sunkel 2001). Disagreement on these two

questions has inhibited the progress of a ‘human security’-agenda. This is particularly so in the post-9/11 context, where Washington policy makers seem unwilling to bend from a realist position of self-help across issue areas – from use of military force to global warming to farm subsidies to softwood lumber (Suhrke 2004: 365).

What we are left with is a circularity of the discussion about the meaning and utility of human security, on the one hand; and, a smorgasbord approach – where actors pick and choose what they will treat under the rubric of ‘human security’ – to implementation, on the other hand. Given that supporters and detractors of a human security approach to foreign policy constitute a global network, the North American debate is not dissimilar to the debate in Europe or elsewhere. However, America’s dominant global position and Canada’s position as the U.S.’s primary trading partner and physical neighbour, affects the ‘what is to be done?’ aspect of geopolitical analysis. Given the extent of the ‘war on terror’, it is perhaps understandable therefore that ‘freedom from fear’ has taken a central position in the state houses of Canada and the United States, with Canada’s human security programme looking very much like a ‘social triage’ – picking up the pieces and patching up the cracks in a world of states deeply affected both by post-Cold War state collapse (in West/Central Africa and the Balkans) and by the U.S.-led war on terror in the Middle East (Harvey 2004).

8.3.3 Human Security in Canadian Foreign Policy: Tracking the ‘Official’ Trajectory

Much has been written about the ‘human security’-agenda in Canadian foreign policy, particularly under Foreign Minister Lloyd Axworthy from January 1996 to October 2000.³ Canadian support through national policies and international groups, organizations and activities such as the *Human Security Network* (HSN), the Brahimi Report, and the Responsibility to Protect agenda led Grayson (2004a: 41–43) to argue that human security became a central theme in the ‘branding’ of Canada, both domestically and internationally. The Canadian government and its state-based human security fellow travellers were networked, in turn, with a diverse coalition of International and

2 The influence of Kaplan (1994) on Western government thinking is well chronicled (see Dalby 2002). The Canadian government statements begin with the premise that “security in Canada ultimately begins with stability abroad” (Government of Canada 2005: 2). The U.S. position on National Security (U.S. Government 2006) takes a similar position.

3 For a summary and critique, see Grayson (2004b), and the contributions to Hampson/Hillmer/Molot (2001).

Non-governmental Organizations in what former Foreign Minister Lloyd Axworthy characterized as the 'new diplomacy'.

Axworthy and other protagonists of human security in the 1990's drew much of their initial inspiration from the 1994 UNDP Human Development Report. Axworthy's early pronouncements on human security reflected the broad and holistic understanding articulated there:

[H]uman security is much more than the absence of military threat. It includes security against economic privation, an acceptable quality of life, and a guarantee of fundamental human rights. This concept ... recognizes the complexity of the human environment and accepts that the forces influencing human security are interrelated and mutually reinforcing (Axworthy 1997: 184).

In attempting to give operational shape to this approach, Axworthy explicitly prioritized peacebuilding (vs. peacekeeping), the campaign to ban anti-personnel landmines (in the context of broader efforts to promote disarmament), the need for greater coherence between foreign and development policies around the conceptual premises of human security (e.g., through the Canadian Peacebuilding Initiative; see at: <http://www.humansecurity.info/sites/cchs/files/pdfs/Consultation%20Papers/thibault_pdf.pdf>), the situation of children, and economic development through rules-based trade (Axworthy 1997). This last priority, in particular, illustrates how even in this early phase, there was a tendency to filter human security priorities through long-established, interest-based priorities of Canadian foreign (economic) policy. Even so, this articulation of human security clearly encompassed both 'freedom from fear' and 'freedom from want', broadly in the mold of the UNDP approach.

By 1999, however, the Department of Foreign Affairs had articulated a narrower 'freedom from fear' approach as Canada's distinctive conception of human security. While still emphasizing prevention as well as resolution of conflicts, it laid out five specific priorities focused on protecting individuals from physical threats. These priorities were: public safety, focusing on countering transnational terrorism, drug trafficking, and organized crime; protecting civilians in war-affected contexts, with emphasis on the threat of landmines, the plight of war-affected children and the internally displaced, and *in extremis* military deployments to halt atrocities and war crimes; conflict prevention, with particular attention to addressing the proliferation of *small arms and light weapons* (SALW) and the economic dimensions of civil wars; governance and accountability, from the global (In-

ternational Criminal Court) to the national and local (security sector reform) levels; and support for more sophisticated, multi-dimensional and effective Peace Support Operations (DFAIT 2002). While the recent 'International Policy Statement' (2005) has downplayed the *explicit* framing of these priorities as part of a coherent 'human security'-agenda, substantively they have been largely retained and indeed reinforced in this document.⁴

From a policy perspective, several points about this shift are worth emphasizing. First, the move to focus and narrow the 'human security'-agenda in this manner was and is entirely understandable in pragmatic policy-making terms. Indeed, despite these efforts to render this agenda more 'actionable', it remains a vast, ambitious, and in some respects highly intrusive (and therefore controversial) agenda from the perspective of practitioners of diplomatic statecraft. Moreover, it has been associated with some high profile diplomatic initiatives and achievements, however partial and fragile - notably the Landmines Convention; the creation of the International Criminal Court; the sponsorship of the *International Commission on Intervention and State Sovereignty* (ICISS 2001) and the championing of its conception of "the Responsibility to Protect" as a basis for more timely and effective responses to egregious human suffering; and the Kimberley Process to roll back the trade in 'blood diamonds', among others (at: <<http://www.humansecurity.gc.ca/psh-en.asp>>).

This raises a number of more or less immediate concerns. *First*, are Canadian resource commitments sufficient to meaningfully influence even the more focused 'freedom from fear' agenda sketched above? Certainly, prior to the IPS, the *explicit* resource commitments of CAN\$ 50 million over five years for the Foreign Affairs' Human Security Programme, beginning in June 2000, even when supplemented by the CAN \$10 million annual Canadian Peacebuilding Fund administered by CIDA, was strikingly limited in relation to the magnitude of the stated aspirations and priorities of the 'human security'-agenda. While these resource commitments have been enhanced through the creation of a 5-year, CAN\$ 500 million Global Peace and Security Fund in 2005, they remain quite minimal in relation to the expansive aspirations and demands of global human security. If, on the

4 See, for example, the discussions of "Building a More Secure World" and "Promoting a New Multilateralism" in the Diplomacy Document (Government of Canada 2005: 9-21).

other hand, one regards much of the spending on Development Assistance and at least some of the resources deployed to National Defence as crucial support for a 'human security'-agenda – a perhaps contentious but plausible claim – Canadian resource availability grows considerably (though still not sufficiently, according to the government's many critics). However another set of concerns arises about the ability of government agencies to effectively coordinate and concert their human security-oriented activities, through the 'whole-of-government' approaches that have become a policy watchword in Ottawa and other national capitals. There are also neglected questions to be posed about what *risks* may be associated with the urge to harmonize – what may be lost in the process – as well as how this governmentally-centred process of concertation affects the activities of, and relationships with, non-governmental actors?

A related concern is whether the widely-decried decline of 'problem-solving' resources – notably aid and defence capabilities (e.g., Welsh 2004: 224–234; Nossal 1998/9) – even if partially reversed through the plans set out in the IPS, effectively compromises Canadian ability to credibly promote the broader processes of normative change it has championed? What, for example, are the implications for promoting the principles associated with the 'Responsibility to Protect' of Canada's tardy and limited response to the crisis in Darfur, and the parallel neglect of equally urgent human security imperatives in, for example, the Democratic Republic of the Congo?

Third, do the priorities set out in Canada's 'freedom from fear' agenda constitute an effective basis for common action among the governments in the *Human Security Network* and others sympathetic to the concept, as well as between these governments and fellow travelling non-state actors? There is a tension here between the essentially statist desire to deploy a *distinctive* 'Canadian' approach to human security as a means of 'branding' this country with a positive image of enlightened cosmopolitanism,⁵ and the unavoidable conclusion that the urgent and wide-ranging imperatives highlighted by the notion of human security can only be effectively addressed through robust and determined collective (multilateral) action. Leadership in this domain must, therefore, be sensitive to the demands of building a broadly based normative and practical coalition across boundaries of region, culture, history, and wealth – an im-

perative that may be contradicted by urges of self-promotion and celebration.

For those *within* the Canadian government bureaucracy (and in other state-based bureaucracies) who have championed the 'human security'-agenda, there has been a strong sense of moral purpose and pride taken in what has been achieved. There is a palpable sense that they are engaged in an enterprise that is fundamentally worthwhile and, within the parameters of diplomatic practice, quite radical.⁶ Given this sense that they are pushing the boundaries of acceptable diplomatic conduct, as well as the deeply embedded assumption within diplomatic services that their proper role is to advance a relatively narrowly constructed 'national interest', human security advocates have felt a concomitant sense of intra-organizational vulnerability and a desire to minimize their differences with more traditional foreign policy priorities – for example, by stressing the essential complementarity between 'human' and 'state' security (DFAIT 2002: 1–3; Axworthy 2004). This ambiguous sense of both mission and vulnerability helps to explain some of the criticisms of the 'human security'-agenda from within the academic community, as well as the impatience and frustration expressed by human security policy makers towards their academic critics particularly on the left, who policy makers regard as potentially undermining a cause that they *should be* actively promoting and supporting.

83.4 Academic Debates

Scholarly reactions to the 'human security'-agenda in Canadian foreign policy can be loosely categorized into supporters, mostly of liberal/constructivist orientations; critics on the ideological right and critics on the ideological left. Collectively, these perspectives reflect diverse viewpoints concerning the nature of world politics and the potentialities for change in line with the 'problem solving' vs. 'critical theory' distinction, as well as varied commitments concerning the potential for the idea of human security to contribute to deep and normatively desirable change.

5 An image which does not necessarily withstand closer scrutiny; see: Grayson (2004b).

6 See essays in: McRae/Hubert (2001). These observations are also based, in part, on one of the co-author's 'participant observation' in the 'Annual Peacebuilding and Human Security Consultations' in Ottawa since 2002.

83.4.1 Supportive Perspectives

The Government of Canada (2005: 1) describes its approach to human security as “a people-centred approach to foreign policy which recognizes that lasting stability cannot be achieved until people are protected from violent threats to their rights, safety or lives”. The official viewpoint is that the human security programme “permits Canada to take leading edge positions on human security issues at a relatively low cost.” The Human Security Programme provides the Department of Foreign Affairs and International Trade with a tool for advocacy, leverage and support for multilateral initiatives (Government of Canada 2005).

Among the intellectual supporters of this approach are many analysts associated with development and disarmament NGOs, frequently affiliated with the *Canadian Peacebuilding Coordinating Committee* (CPCC; see: <<http://www.peacebuild.ca/>>; also NSI 2004; Regehr/Whelan 2004). Their approach is substantially based on informed ethical commitments and policy advocacy. They would certainly agree that the resources devoted to human security endeavours have been insufficient – often grossly so. Nevertheless, they see this agenda as a valuable innovation insofar as it compels a response to urgent humanitarian imperatives. They also see it as paving the way, potentially at least, towards deeper processes of change and innovation aimed at enhanced prevention of deadly conflicts and the building of ‘deep’ and sustainable peace. In this sense, their approach straddles the ‘problem solving’ vs. ‘critical theory’ divide. These researcher/activist/practitioners have a delicate strategic relationship with government officials supportive of human security within government – as more or less dependent allies, and at the same time as ‘civil society actors’ who must sustain a degree of critical distance to be legitimate and effective (see: <www.hsn.ubc.ca>).⁷

The multilaterally-funded *Human Security Centre* located within the University of British Columbia’s Liu Institute for Global Affairs constitutes a crucial node for coordinating activities and building networks both within Canada and around the world (<<http://www.humansecuritycentre.info/>>). The CIDA and

Foreign Affairs supported *Canadian Peacebuilding Coordinating Committee Annual Meeting* provides an important platform for state, NGO and academic actors to come together around crucial ‘freedom from fear issues’ (see, e.g. <<http://www.peacebuild.ca/consultations/?language=english>>). These consultations bring together Canadian, U.S. (e.g. *Harvard University’s Program on Humanitarian Policy and Conflict Research* (HPCR); *International Peace Academy*; the Fletcher School’s *Human Security Institute* at Tufts University; the *Centre for Unconventional Security Affairs* at the University of California-Irvine) and other (e.g., the Canadian government-supported *Human Security Institute* in Amman, Jordan) actors in an ever-growing network of support for the ‘freedom from fear’ agenda.

More theoretically, scholars from a liberal/constructivist perspective have emphasized the importance of the long-term global social change in creating the basis for a more just and secure global order. Through processes of normative change and institutional innovation, states *can be* increasingly compelled and constrained to embrace more ethically oriented policies, underpinning enhanced human security. Of course, this is a long-term process, and states will always have mixed motives. Scholars from this perspective argue, however, that rather than being simply dismissive of states’ professed commitments, critics should ‘hold them accountable to such standards ... demand consistency, and ... remain vigilant against the manipulation of moral norms for self-serving and short-sighted purposes’ (Franceschet/Knight 2001: 61). From this perspective, Canada’s (and Lloyd Axworthy’s) ‘human security’-agenda looks much more promising, even if this promise remains fragile and uncertain. Initiatives such as the Landmines Convention, effective support for the creation of the Rome Statute establishing the International Criminal Court, sponsorship of the ICISS and promotion of the “Responsibility to Protect”, and the campaign to create legal and institutional prohibitions on the trade in Small Arms and Light Weapons are all potential advances towards greater human security. Moreover, Canada’s role – through ‘soft power, moral suasion, and norm entrepreneurship’, or as a ‘tipping agent’ in constructing and popularizing new international norms through a process of ‘cascade’ (Franceschet/ Knight 2001; Howard/Neufeldt 2000) – has been highly significant.

Whether the diminution of ‘hard power resources’ (military and developmental) decried by the mainstream critics, as discussed below, significantly compromises these efforts to promote normative and in-

7 The ‘problem solving’ and ‘critical theory’ gap is often bridged in policy-oriented research that is funded by government, managed through university structures and involves several academics from different (liberal, feminist, post-modern/ structuralist) theoretical positions (see, e.g. Baines/Thomson/Wilson 2005).

stitutional innovation is an important though elusive question. Does Canada still have the standing and influence to play a leading role in such processes? How is this standing and influence created and sustained? At a deeper level, critical scholars question how much these high-level, reformist processes of normative and institutional politics change the underlying power structures of the global order, or simply create the *illusion* of change, thereby deflecting and demobilizing sources of potent and justified dissent (Panitch/Leys 2006). However, most supporters of human security as proselytized by Western governments would agree with the Harvard University HPCR claim that human security is ‘a complement to state-centric security models’, not a substitute for them (<<http://www.hpcr.org/>>). Where there are formal programmes in place – such as those at Tufts, University of California-Irvine, UBC – it is clear that they are designed to work within the interstices of state priorities. Given that, in U.S. President Bush’s words ‘America is at war’, this leads inevitably to a programme concentrating on ameliorating the worst effects of the exercise of traditional forms of state power (U.S. Government 2006).

83.4.2 Conservative Critics

One, more theoretical line of criticism takes seriously the radically transformative and cosmopolitan potential of human security, and argues that such a development is imprudent or even dangerous in a highly pluralistic world. This ‘Grotian’ or ‘international society’ perspective cautions that it is unwise, at best, to destabilize long-established norms of sovereign autonomy and self-determination, by potentially legitimizing intrusions of external actors in the name of the universalistic ideal of human security, and thus giving license to ‘crusading’. According to William Bain, “(t)he ethic of human security challenges and possibly undermines the moral foundation of international society as it has existed for nearly four-hundred years”, and “a foreign policy which is guided, at least in part, by a universal doctrine such as human security is difficult to reconcile with the practical realities and fundamentally pluralist nature of international society” (Bain 1999: 85 and 86). This critique finds resonance among many in the developing world, who pointedly question the target selection and motivations of the predominantly rich, Western ‘interveners’ in situations of profound human insecurity (Ayoob 2001). In the final analysis, this critique overstates the degree of universalistic coherence associated with the idea of human security. It also overestimates the continuing force of

the traditional norms of state-centric international society in a globalizing world context, and underestimates the adaptability of state-based authorities and prerogatives. It is important, however, in highlighting key tensions and dangers associated with the normative changes that human security promotes.

The critique of excessive and unseemly crusading is also a core feature of a second line of conservative criticism. From the perspective of some of the leading ‘mainstream’ scholars of Canadian foreign policy, there is nothing inherently wrong with devoting public resources to the amelioration of suffering in the name of human security where prudent and feasible (what Kim Nossal might characterize as voluntaristic acts of ‘good international citizenship’; see Nossal 1998/99: 98–105). They do, however, stress the continued centrality of states in world politics and the privileged status of inter-state security interests in the hierarchy of world issues, in line with ‘problem solving’ theory assumptions. They also stress that states are fundamentally and appropriately accountable to their own citizens; and they decry the excessive moralizing and hypocrisy which they see in a ‘human security’-agenda that promises much but can deliver very little, given the egregious neglect of traditional instruments of statecraft (Stairs 2001; Hampson/ Oliver 1998; Welsh 2004: 183–186). This, they imply, has the ultimate effect of diminishing the Canadian state, both intrinsically and in its ability to operate effectively in international affairs. Such a theoretical stance is at the heart of U.S. foreign policy both past and present, although one might disagree with the means chosen to secure the ‘national interest’ in the post-9/11 era (<<http://www.thenation.com/doc/20020715/falk>>). Similarly, the Canadian shift away from a broad ‘human security’-agenda, to a narrower ‘freedom from fear’ approach, to the close political and economic links Canada has with the U.S. (Government of Canada 2005).

A third, related type of worry, emanating from some scholars of international law, is that human security, by ‘securitizing’ a wide range of global dangers, opens the door to their being constructed as ‘threats’ and thereby gives license to a much more permissive approach to the application of force by those in a position to use it. For Vale (2002: 149), the UNDP-initiated focus on human security “helped to break the stranglehold that the military enjoyed over the security discourse ... But perversely it empowered the military, for the expansion of the security discourse enabled the military to redefine its role in multiple new ways.” Similarly, for Bruneel and Toope (2004: 258),

“The human security’-agenda is being perverted so that the stress is on ‘security’ and not on humanitarian concerns.” States and other advocates of human security have been too cavalier about the importance of traditional legal prohibitions on the use of force and the dangers of their erosion, with the result that many people may be rendered *less* rather than more secure. They have in mind, of course, the human costs associated with the war in Iraq and other excesses associated with the ‘war on terror’.

Interestingly in light of this concern, there has been at least one contribution to the debate from the security studies mainstream that has argued *for* the human security doctrine in Canadian foreign policy, on the grounds that it “has paved the way for nothing short of the rescuing of Canadian defence policy from military irrelevance and strategic sterility.” Sokolsky and Jockel (2000: 1) argue that the rise of the ‘human security’-agenda, with its much more frequent demands for robust interventions in situations of instability and conflict, has provided a far more compelling strategic rationale for upgrading the Canadian armed forces than the Cold War context did, and for enhancing their interoperability with allies – particularly the United States.⁸ They also argue that the ‘human security’-agenda has the *realpolitik* virtue of being fundamentally discretionary: policy makers can ‘pick and choose’ which human security causes they wish to pursue. Whether Canadian public opinion and transnational mobilization allow as much political discretion as the authors suggest is debatable, but critics on the left would share the overall view that these interventions have been treated as fundamentally discretionary and have therefore been far less timely and generous than the real needs of the people affected would warrant.

Notwithstanding Sokolsky and Jockel’s dissent, however, the dominant view of critics in this broad ‘problem solving’ category is that human security may be excessively destabilizing as an ideal, leads to false and inflated expectations, provides little or no basis on which to set priorities among competing claims on government attention and resources, and breeds unseemly and counter-productive crusading and sanctimony. The more muted tone of discussions of human security in the ‘International Policy Statement’ suggest that these criticisms have been telling among foreign policy-makers, even if much of the *substance* of the

‘freedom from fear’ agenda has been retained and re-inforced.

83.4.3 Critical and Transformative Perspectives

From this perspective, the Department of Foreign Affairs and International Trade (DFAIT) retreat from the more holistic and structural vision embodied in early human security pronouncements towards the more limited ‘freedom from fear’ agenda robs the concept of its transformative potential. Indeed from the outset, Lloyd Axworthy’s argument that the path to economic development (and hence human security) lies through ‘rules based trade’ – and hence the promotion of economic and trade liberalization along neo-liberal lines at national, regional, and global levels – is regarded by critics on the left as fundamentally compromising the promotion of human security. On this analysis, the ‘freedom from fear’ approach ends up addressing the worst manifestations of human insecurity, while neglecting a deeper analysis of both their links to structures of inequality, and Canada’s and other Western governments’ and societies’ complicity in those structures – notably through the neo-liberal trade and development policies we propagate (see, *The Socialist Register*, at: <<http://socialistregister.com/>>).

Canada’s ‘human security’-agenda also discursively constructs human insecurity as something emanating from the global South – thereby reinforcing the widely-held view of the South as a source of *threat* to Northern security, while deflecting attention from manifestations of human insecurity in Canada (Dalby 2002; Swatuk 2005a; Swatuk/Vale 1999). It also ignores the role of Western actors in creating persistent instability in the global South. For Renner (2005: 16), ‘The term ‘failed state’ hides an inconvenient truth: external factors are equally important’ (Callaghy/Kasimir/Latham 2001).

In its ‘freedom from fear’ variation, therefore, human security becomes a conservative, problem-solving approach – a palliative for and deflection from the deeper causes and manifestations of human *insecurity* (Swatuk 2001). Indeed, by masquerading as something radically new and transformative, this idea actually becomes retrogressive. In Kyle Grayson’s provocative and compelling analysis, ‘[n]ot only is there the illusion of change, but it is presented as a real and ultimate solution to the problem at hand. This, of course, greatly augments the hegemonic interests of particular actors, as existing asymmetrical power relations remain in place’ (Grayson 2004b: 49).

8 Hence, the particularly smooth fit among commerce, diplomacy, defence and development in Canada’s international policy (Government of Canada 2005).

This kind of deep critique is likely to be greeted with impatience and even hostility by many officials and practitioners who are doing the 'heavy lifting' on human security within government, and in various international and non-governmental organizations. Surely, by intellectualizing and criticizing the efforts of those attempting to ameliorate human suffering – both through immediate responses and through efforts to build the foundations for long-term normative change – such critical approaches are bound to be resented by those on the 'frontlines'. As post-conflict situations relapse into renewed violence with alarming frequency, however, and as diverse global threats – ecological, economic, and cultural – mount, such deep critiques need to be taken seriously if the more transformative and emancipatory potential of human security is to be approached.

While acknowledging, even absorbing, post-modern, feminist and other theoretical insights into the dangers of emancipatory projects, critical theorists generally focus on the need to construct a fairer world order through organized social protest, reformed international institutions, and sophisticated international law and regulation (Bond 2001; Cox 1997; Mittelman 1996). For many scholars of the left, this requires a clinical approach to politics (making positive inroads toward social justice wherever and whenever possible), as opposed to the cynical politics practiced by neo-realists (Pettifor 2003; Hayden/El-Ojeili 2005).⁹ Critical scholars in North America have generally engaged with 'problem-solving' theory and practice across two broad fronts: one, in the area of security studies (Krause/Williams 1997; Dalby 2002); the other, regarding the character and consequences of neoliberal globalization (Gill 1992; Cox 1997). The human security debate is not often engaged directly by critical theorists although all theoretical perspectives are ostensibly interested in world order values of peace, economic prosperity and environmental sustainability.

For many critical scholars, the human security debate exists at a superficial level. The real issues surrounding human *insecurity* are to be found at the level of a neo-liberal capitalist world order: address these inequalities and most other problems will fall away. This argument was at the heart of the post-9/11 debate regarding appropriate American responses to

terrorism. For scholars of the left, the new American imperialism was itself the cause of 9/11 (Panitch/Gindin 2005). It is primarily for this reason that critical scholars give the 'human security' debate short shrift.

Thus, leftist critics regard Canada's commitment to both globalization – albeit 'a fairer globalization' (Government of Canada 2005) – and deeper forms of integration with the United States (particularly economic and military) as ensuring that at best human security as practiced in Canada will be little more than 'poor relief and riot control' (Cox 1987).

83.5 Conclusion

In North America, human security as an academic pursuit remains a marginal addition to a mainstream overwhelmingly concerned with traditional issues of war and peace. It is telling that neither the Worldwatch Institute's 2005 annual 'State of the World' (focused on global security) nor the Krause and Williams (1997) seminal collection on critical security studies even mention the term 'human security'. While there are pockets of interest scattered across Canada and the United States, the number of actors and institutions specifically involved in human security research, teaching and advocacy is limited. Moreover, most of these actors are linked directly to U.S. and Canadian governments – for funding and through policy networks. These links limit the parameters for thinking beyond the narrow confines of state-determined interests. In our view, this explains why the study and practice of human security in North America is overwhelmingly centred on the 'freedom from fear' agenda, and why 'freedom from want' issues continue to be considered 'low security' and properly housed at CIDA and USAID.

To be sure, the debate regarding meaning and content of 'human security' is a global one. The networks being created – albeit with limited funds – are also global. At the same time, however, human security as theory and practice takes on particular forms in Canada and the United States, in part due to the specific geographies and geo-political economies of the two states. In our view, 'human security' has been folded into on-going practices of statecraft, and any emancipatory potential contained within the concept has been lost particularly since 9/11. While the U.S. government claims to 'champion aspirations for human dignity', the Bush doctrine makes it clear where American national security priorities currently lie (U.S. Government 2006). As a state politically and

9 This is a distinction first made to the authors some years ago by Craig Murphy as the then editor of *Global Governance* in a personal communication in August 1999.

economically subordinate to and dependent upon the United States, Canada finds real currency in 'human security'. It complements its historical self-definition as a 'helpful fixer' in global politics and its contemporary place as key American ally in North America.

One would like to see the North American debates regarding human security engage more directly with the critiques made by critical scholars on the left. This would mean, in part, reinvigorating discussions regarding the ways in which 'fear' and 'want' are inter-related, including exploring possible causal pathways. However, current trends suggest that this is unlikely to happen, so pressing are the needs of people caught in the crossfire of the war on terror.

84 Human Security Initiatives of Japan

Hideaki Shinoda

84.1 Introduction

This chapter examines the use of the concept ‘human security’ by the government of Japan and its implications. It argues that this concept has been favourably accepted by the Japanese government as a policy theme and it interprets how the government refers to it. While there are historical and political contexts in which Japan is naturally attracted by concepts like human security, it would be premature to assert that Japanese foreign policy as a whole is guided by this human security concept.

As its military power is constitutionally constrained, Japan naturally constructs security policies to cover not only military affairs but also economic and social affairs. The oil crisis in the 1970’s accelerated the pressure for Japan to develop a broad security perspective and invent the concept of ‘sogo-anzenhoshou’ or ‘comprehensive security’ (Nakanishi 1998: 150–154). The scope of ‘comprehensive security’ corresponded with that of human security insofar as both are intended to cover economic and social security concerns in addition to military ones (Miyawaki 1997: 54), although the concept of ‘comprehensive security’ did not yet address a ‘human-centred’ perspective.

When Kaoruko Kuruu introduced the debate about human security in the journal of the Japan Association of International Relations in 1998, the concept had not gained popularity among Japanese scholars (Kuruu 1998). But her article as well as some others’ appealed to the Japanese audience who were not satisfied with the “traditional” understanding of security. In general, those who were critical of the state-centred conception of security, or Japan’s security alliance with the United States, tended to take the idea of human security favourably. A research group chaired by Makoto Katsumata emphasized human security in order to examine negative impacts of economic globalization (Katsumata 2001). One of those involved in the group later published a lengthy

book on human security, in which the author looked over human-security-related discourses in major civilizations in the world (Mushanokoji 2003).

There are some others who take human security sceptically. It seems that most Japanese scholars on international relations initially found the concept of human security too ambiguous. Experts on ‘traditional security’ seldom speak of human security. On the other hand, Hiroyuki Tosa, post-positivist international relations researcher, harshly attacked the spread of the discourses on human security, insisting that it was in fact an inhumane standardization of human beings by the dominant power holders (Tosa 2003).

But neither scholastic scepticism nor philosophical examination prevented the Japanese audience from taking human security favourably. Sadako Ogata, one of the chairs of the *Commission on Human Security* (2003) became the president of the Japan International Cooperation Agency (JICA) and created a specialized section on human security issues within the structure of JICA. Many Japanese NGOs also talk about human security in favourable manners. An editorial writer of the Asahi Newspaper published his reports on international affairs under the title of ‘the strategy of human security’ (Yoshida 2004). Shinoda and Uesugi pointed out similarities between national security and human security as strategic perspectives, and also advocated more policy-oriented studies of human security (Shinoda/Uesugi 2005).

With this generally positive attitude toward human security in Japanese society, the government of Japan often emphasized the importance of human security and incorporated it into its foreign policy. According to the Ministry of Foreign Affairs (MoFA): Japan emphasizes ‘Human Security’ from the perspective of strengthening efforts to cope with threats to human lives, livelihoods and dignity as poverty, environmental degradation, illicit drugs, transnational organized crime, infectious diseases such as HIV/AIDS, the outflow of refugees and anti-personnel land mines, and has taken various initiatives in this context. To ensure ‘Human freedom and

potential', a range of issues needs to be addressed from the perspective of 'Human Security' focused on the individual, requiring cooperation among the various actors in the international community, including governments, international organizations and civil society (Ministry of Foreign Affairs of Japan, 2000, 2000a).

Taking this statement into account, this chapter analyses where human security concerns are reflected in Japanese foreign policy, and where Japan is advancing human security as a rationale for its development policy and humanitarian aid. But this does not imply that Japanese foreign policy as a whole is based on human security concerns.

84.2 Initial Reference to Human Security by the Japanese Government

After the Asian financial crisis, Japanese officials began to refer to human security. At an international conference in December 1998, Prime Minister Keizo Ouchi remarked:

The current economic crisis has aggravated those strains, threatening the daily lives of many people. Taking this fact fully into consideration, I believe that we must deal with these difficulties with due consideration for the socially vulnerable segments of population, in the light of 'Human Security', and that we must seek new strategies for economic development which attach importance to human security with a view to enhancing the long-term development of our region. ... While the phrase 'human security' is a relatively new one, I understand that it is the key which comprehensively covers all the menaces that threaten the survival, daily life, and dignity of human beings and strengthens the efforts to confront those threats. ... To support Asian countries in this economic crisis, we have pledged and steadily implemented contributions on the largest scale in the world. With Human Security in mind, we have given, as one of the most important pillars of our support, assistance to the poor, the aged, the disabled, women and children, and other socially vulnerable segments of population on whom economic difficulties have the heaviest impacts (Obuchi 1998).

Obuchi mentioned human security on his visit to Vietnam in the same month, and pledged to contribute 500 million yen (US\$ 4.2 million) to the establishment of the *Human Security Fund* under the United Nations (Obuchi 1998a). Obuchi (2000, 2000a) and his Foreign Minister Masahiko Komura (2000, 2000a) have repeatedly mentioned human security in Japan's national Diet and at the UN General Assembly. The topic of human security was discussed at sev-

eral international conferences hosted by the government of Japan and raised by Japan at summit meetings.¹ Foreign Minister Obuchi was a politician who was interested in advancing humanitarian affairs in international society, and he played an active role in signing the anti-land mines treaty.

Yukio Takasu (2000), then Director-General of Multilateral Cooperation Department of the MoFA, explained the Japanese interest in human security in 2000 by stating that:

The Japanese understanding of human security is very similar to the comprehensive and inclusive concept advocated by UNDP. I believe that Japan's experience since the end of the Second World War in promoting prosperity and the well-being of its people through economic and social development makes it particularly well-prepared to advocate such a broad concept of human security. We are confident, moreover, that this is the direction in which the world will be heading in the 21st century.

Takasu (2000) continues to link human security with Japanese foreign policy by emphasizing that "Human security is not a brand new concept. While the ultimate responsibility of a state is to protect its territory and safeguard the survival and well-being of its people, sound governments have long pursued human security as part of their national policy." While admitting that "the level of attention and high priority accorded to human security internationally these days are a reflection of several developments," he adds that:

I must hasten to add that the role of government will not diminish in a human-centered century. Human security efforts will not replace national security arrangements - the protection of territory and the life and property of the people remain the responsibility of government. While national security is prerequisite for ensuing security - that is, the survival and dignity of the individual - it is not the only requirement. Even if a state becomes rich and strong, there is no guarantee that the individuals who live in that state will be safe and rich. The role of government is to provide a foundation or environment that will enable individuals to take care of themselves and to develop their capabilities without undue restrictions (Takasu 2000).

It is evident that the Japanese government took advantage of the possibilities of human security by linking it with the international position of Japan. The central role of governments for human security pro-

1 See: Takemi (1999, 1999a); Takasu (2000, 2000a, 2000b); Ministry of Foreign Affairs of Japan (2000, 2000a, 2000b, 2000c); Komura (2000a).

vides Japan with a new mission. MoFA's *Diplomatic Blue Book 2000* referred to the concept of human security as a principle for Japan to tackle such broad international problems as global environmental issues, terrorism, transnational organized crime and drugs, protection of human rights and promotion of democratization, healthcare, international cooperation on the peaceful use of nuclear power and science and technology, and international emergency assistance for natural disasters.

The United Nations Trust Fund for Human Security, established by the Japanese contribution to the UN, has initiated projects ranging from the Human Dignity Initiative Project carried out by the UN Economic and Social Commission for Asia and the Pacific (ESCAP), the Medical Training Project in Tajikistan, designed by UNDP, the Tokyo International Conference on Semipalatinsk, to the Emergency School Rehabilitation in Decane, Kosovo, carried out by UNICEF with a Japanese NGO. Japan also earmarked 6.6 billion yen (US\$ 55.05 million) for the Fund from the Fiscal Year 1999 supplementary budget to assist the rehabilitation of Kosovo and the return of refugees, as well as the rehabilitation of East Timor (Ministry of Foreign Affairs of Japan 2000). As Prime Minister Yoshiro Mori announced in his speech at the UN Millennium Summit on the expansion of the UN Trust Fund for Human Security, Japan added to the Fund 2.5 billion yen (US\$ 23.81 million) in July 2000, an additional 1.5 billion yen (US\$ 14.48 million) in March 2001, 7.7 billion yen (US\$ 72.16 million) in August 2001, and 4 billion yen (US\$ 32.79 million) in February 2003.² In total, 25.9 billion yen (approximately US\$ 227 million) has been so far contributed by Japan to the Trust Fund (Japan remains the sole contributor of the Fund).³ This approximates the amount of Japan's annual contribution to the UN budget.⁴

The *Diplomatic Blue Book 2004* (Ministry of Foreign Affairs 2004: 185) enumerates major areas of support by the Trust Fund as follows:

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- 2 For a "Chronology of activities related to Human Security by the Japanese Government," see details at: <http://www.mofa.go.jp/policy/human_secu/chronology.html>.
 - 3 See Ministry of Foreign Affairs (2004: 185).
 - 4 Around the time Japan was expanding the Trust Fund, Japan's assessment rate for the UN budget went down from 20.57% in 2000 (22.7 billion yen) to 19.63% in 2001 (21.7 billion yen). With the same assessment rate, however, the actual amount went up in the following years to 26.6 billion yen in 2002 and 32.1 billion yen in 2003.

Poverty: community reconstruction, vocational training, food production and the protection of children; medical and health care: reproductive health, control of infectious diseases such as HIV/AIDS and improvement of public health; refugees and internally displaced persons, assistance and conflict-related areas such as social reintegration for ex-combatants through vocational training (Ministry of Foreign Affairs 2004).

To further develop the human security concept, the Japanese government sponsored the Commission on Human Security⁵ that was co-chaired by the former UN High Commissioner for Refugees, Sadako Ogata, and Professor Amartya Sen, Master of Trinity College, Cambridge University, and composed of 10 prominent figures, including Ambassador Lakhdar Brahimi. The Commission held its first meeting in June 2001 and five more meetings up to February 2003. Ogata and Sen submitted the summary of the Final Report to the Japanese Prime Minister, Junichiro Koizumi, in February 2003, and the actual Final Report to the UN Secretary General, Kofi Annan, in May 2003.

The main proposals of the Commission in its Final Report were explained as follows: (1) Protecting people in violent conflict; (2) Protecting people from the proliferation of arms; (3) Supporting the security of people on the move; (4) Establishing human security transition funds for post-conflict situations; (5) Encouraging fair trade and markets to benefit the extreme poor; (6) Working to provide minimum living standards everywhere; (7) According higher priority to ensuring universal access to basic health care; (8) Developing an efficient and equitable global system for patent rights; (9) Empowering all people with universal basic education; (10) Clarifying the need for a global human identity while respecting the freedom of individuals to have diverse identities and affiliations.⁶

It is apparent that the first part in the Final Report (chapt. 1-5) were within Ogata's areas of concerns, and corresponded to 'freedom from fear', while the latter part of the report (the following five chapters) were within Sen's and corresponded to 'freedom from want'. As Ogata is close to the Japanese diplomatic circle, the influence of the Japanese government on the report has been widely specu-

5 See: Ministry of Foreign Affairs of Japan: "Commission on Human Security", at: <http://www.mofa.go.jp/policy/human_secu/commission/index.html>.

6 See: Commission on Human Security website, at: <<http://www.humansecurity-chs.org/finalreport/index.html>>.

lated. While there remained a demand to the international community for decisive actions in the realm of humanitarian causes (probably to the extent that Japan usually does not commit itself), it can be contended that the way the Commission set agendas was preferable to the Japanese government. The report covers the areas of concerns in which Japanese assistances have been conspicuous.

The Commission developed into the *Advisory Board on Human Security* in order to “carry forward the recommendations of the Commission.” The Advisory Board is composed of 8 members. Ogata remained as the chair, while Sen left. Three other members of the Commission remained, including Brahimi, and the Japanese Ambassador to the UN joined. It advises the UN Secretary General concerning the management of the UN Trust Fund to ensure that the general orientations of the Trust Fund fulfil its objectives as specified by the Commission’s Report.⁷

84.3 The Japanese Government’s Reference to Human Security in the Post-9-11 World

The world has changed after 11 September 2001. If not so in some or many nations, a certain change in the world-view has occurred in the United States, and with its major allies like Japan. It was evident that the Japanese government began to seek the way human security would be located in the new paradigm of the post September 11th world.

In December 2001, MoFA held an international symposium in Tokyo under the theme of ‘Human Security and Terrorism’. The members of the Commission on Human Security were mobilized to participate in the symposium – or accurately speaking, it had been originally prepared for them. In a similar tone, an international symposium was held in Tokyo again under the theme of “Human Security – Its Role in an Era of Various Threats to the International Community.”⁸

In the 2001 symposium’s opening speech, Prime Minister Koizumi began with the terrorist attacks of

11 September, recognizing such as a “threat to the entire humankind and challenge to democracy and freedom.” But he added, “prompt actions of the international community to prevent and eradicate terrorism, and its united initiatives concerning Afghanistan, have given us a ray of hope.” He continued:

Japan has made efforts to strengthen international solidarity, knowing that the fight against terrorism is a challenge of our own. Moreover, Japan proactively supported Afghan refugees through providing rescue materials and transportation as well as through extending economic assistance to neighbouring countries. Now, with Mrs. Sadako Ogata, my special representative, Japan will continue to contribute human resources and provide active support through United Nations organizations. Furthermore, in late January next year, Japan hosts a ministerial level Afghanistan reconstruction conference. Japan will also participate actively in the broad-based international initiatives against terrorism, through concluding and ratifying international conventions, cutting financial sources of terrorist organizations and taking other measures. Terrorism should never be tolerated, regardless of motives, since it threatens the survival, livelihood and dignity of citizens with heinous violence and killings. At the same time, we should take a closer look at the possibilities that armed conflicts, poverty and other socio-economic factors create ‘hotbeds’ for terrorism. To eradicate terrorism, it is necessary to tackle not only terrorism itself but also other diverse threats to individuals. This means that we have to build and sustain a society where individual human beings can fully realise their possibilities. This is what human security aims at, and this is what Japan’s foreign policy has attached importance.⁹

Apparently, while Japan kept its traditional emphasis upon “freedom from want,” it never doubted the military solution to terrorism conducted by its senior ally. What Japan sought to do was to present the field of its traditional activities as part of the fight against terrorism.

The 2003 symposium was an occasion for the members of the Commission on Human Security to present their views that were supposed to be reflected in the Final Report. There was no expert on terrorism among the Commission members. But the Minister for Foreign Affairs, Yoriko Kawaguchi, began her speech by saying that “in the first year of the new century, we witnessed the 11 September terrorist attacks, which victimized many people, including Japanese nationals.” She then remarked:

7 See: United Nations Office for the Coordination of Humanitarian Affairs (OCHA) website: “Advisor Board on Human Security”, at: <<http://ochaonline.un.org/webpage.asp?Page=1495>>.y

8 See: “Chronology of activities related to Human Security by the Japanese Government”, at: <http://www.mofa.go.jp/policy/human_secu/chronology.html>.

9 Remark by Mr. Junichiro Koizumi, Prime Minister of Japan, Tokyo, December 15, 2001, at: <http://www.mofa.go.jp/policy/human_secu/sympoo112_pm.html>.

I believe that the ideal of human security calls us to strengthen our efforts to enable each individual human being to achieve his or her abundant potential, and to ensure that the viewpoints of individual people are respected. The Japanese Government has actively promoted these goals as an important perspective in Japan's foreign policy, and since last year, I have personally continued to stress, in newspapers, magazines and other media, that human security should be one of the areas of emphasis of Japan's foreign policy and its Official Development Assistance (ODA) ... can assure you that the Japanese Government intends to take into account the Report's findings while developing new measures to further promote its foreign policy focused on human security. We will do so at a wide range of fora, such as the United Nations and other multilateral gatherings, and as we advance bilateral cooperation with individual countries as well. Japan's ODA has been playing an effective and important role in promoting human security. The Government has decided to greatly expand its conventional grant assistance for grassroots projects by offering 'grassroots human security grant aid', in keeping with the human security concept. Through its establishment of the Trust Fund for Human Security in the United Nations in March 1999, Japan has continued to offer concrete assistance, giving an orientation to the activities of international organizations that is based on the concept of human security. From now on, on the basis of this Report, Japan aims to utilize these two tools for realizing human security even more actively, achieving effective synergies between the two.¹⁰

Kawaguchi did not forget to mention the limit of state sovereignty and the necessity of human security. But by connecting Japan's aid to September 11th, she implied that Japan's efforts for human security would contribute to the "fight against terrorism," while the US was making efforts in the field of traditional security. Japan could duly support US activities, since it was presupposed that there was no contradiction between national security and human security.

The *Diplomatic Blue Book 2002* and *Diplomatic Blue Book 2003* mentioned human security only as a subsection of a chapter. *Diplomatic Blue Book 2004* somehow reversed the trend by including human se-

curity in the section title "Efforts to tackle Various Global Issues to promote Human Security" of a chapter on: "Japan's Foreign Policy in Major Diplomatic Fields." A general discussion on the Human Security Trust Fund and the Commission on Human Security in the section was followed by Controlling Infectious Diseases, Sustainable Development and Global Environmental Issues, Transnational Organized Crime and Illicit Drugs, and Human Rights.¹¹ So, human security is one of has now joined the major diplomatic fields and has now been mentioned to present a list of Japan's international assistances in social affairs.

Human security does not provide a dramatic change in Japan's ODA policy, while the so-called ODA Charter was revised to include human security in 2003. The revision indicates how human security is incorporated into Japan's foreign policy. Human security was recognized as the major principle of "Japan's Medium-Term Policy on ODA," which was understood to link the ODA Charter with specific Country Assistance Plans. This medium-term policy uses the terms "protection" and "empowerment" borrowed from the Final Report of the Commission on Human Security in order to explain how ODA leads to its ultimate goal of "people's life with dignity" or "strengthening local community." In short, Japan's reference to human security is intrinsically linked with its ODA and other forms of international aid. But it does not go beyond it. Thus, the position to promote human security is not contradictory to other major diplomatic fields, since it is very important in a compartmentalized way.

The Trust Fund for Human Security does not have a particularly coherent application of human security, as grants are provided according to the applications from existing UN agencies.¹² There is another channel of aid by the government of Japan called "grassroots human security grant aid." Eighteen projects for Iraq (exclusively for the Samawah region where the Self Defence Forces [SDFs] are stationed) have been implemented, in addition to two for Afghanistan and one for the Kyrgyz Republic.¹³ It is strategic with respect of the focused area, but not with regard to a coherent aid policy. It is more important to say that Japan's policy on human security does

10 Statement by Ms. Yoriko Kawaguchi, Minister for Foreign Affairs of Japan, at the International Symposium on Human Security (February 25, 2003), at: <http://www.mofa.go.jp/policy/human_seu/symp00302_fm.html>. See also: Statement by Parliamentary Secretary for Foreign Affairs of Japan Shinako Tsuchiya on the occasion of the International Symposium on Human Security: "Human Security - Its role in an era of various threats to the international community (February 25, 2003)", at: <http://www.mofa.go.jp/policy/human_secu/symp00302_ps.html>.

11 See Ministry of Foreign Affairs of Japan (2004: 187-201).

12 See at: <http://www.mofa.go.jp/policy/human_secu/assistance.html>.

13 See at: <http://www.mofa.go.jp/policy/human_secu/assistance-2.html>.

not contradict its own pursuit of national security, as well as its allies' pursuit of national security. Human security will just reinforce them by broadening the sphere of security.

An interesting remark was made by Keitaro Sato, Special Adviser to the Minister for Foreign Affairs of Japan, when he attended a Ministerial Meeting of the Human Security Network as an observer in May 2004. He explained that “[t]he Japanese concept on human security is clearly in line with the conclusions of this report [of the Commission on Human Security],” while praising the efforts of the Commission, especially Ogata. He added that it was because the “Japanese notion of human security is to complement traditional state security by being people-centred and addressing insecurities that have not been considered as state security threats.” He then went on to point out the difference between the Network’s concept of human security and Japan’s.

As I stated previously, the concepts of human security promoted by the Network and by Japan are very similar...However, the fact remains that countries such as Cuba, Brazil, Mexico and Egypt raise objections to the phrase “human security,” because they believe that it means intervention in domestic affairs by foreign powers in the name of humanism. The Chair’s Summary delivered at the Fifth Ministerial Meeting of the Network last year stated that the Network will further discuss the recommendations of the report of the International Commission on Intervention and State Sovereignty entitled “The Responsibility to Protect,” and agreed that the Network will consider ways of supporting follow-up efforts described in the report. Japan is also convinced that sovereign states have a primary responsibility to protect their own citizens from avoidable catastrophe. However, having suffered from imperialistic pressure ourselves in the 19th century, we understand that the Network may wish to dissipate rising doubt based on the instinct of the above-mentioned countries. The notion of the ‘right of humanitarian intervention’, elaborated by the International Commission on Intervention and State Sovereignty, though interesting as a concept, is raising hopefully unfounded doubt on so-called ‘double-standard approach’. What may be important for both of us is to tell the world that human security has nothing to do with the double-standard approach. Indeed, the more we talk with the above-mentioned sceptical countries, the more worried they become about the double-standard approach. Needless to say, human security is at the opposite extreme of such an approach.¹⁴

It is interesting to see that Sato was able to attack the Human Security Network for the reason of suspected double standard, even after Japan’s unequivocal support for the US war against Iraq in 2003. It is true

that Japan has never officially committed itself to the “beheading of a dictator” or “democracy promotion” or the “spread of freedom in the region.” The Iraq War was not a war about human security for Japan. It was a consequence of traditional national security at least from the perspective of Japan. Japan found the cause of the war in the weapons of mass destruction and Iraq’s rejection of the UN inspection, whether such weapons had existed or not. Japan supported the U.S. also for its strong security alliance and its concerns over North Korea. A war may be waged for a reason of traditional national security, and not of human security. Thus the support for the Iraq War has nothing to do with Japan’s pursuit for human security, let alone the deployment of Self Defence Forces in Iraq. The government of Japan continues to say that its SDFs are engaged “only in humanitarian affairs.” It is true that SDFs have not been engaged in security operations and that they have only been supplying water and rebuilding schools. Should we say then that SDFs are doing something for human security? It is no use asking such a question. Human security is a diplomatic tool to conceptualize Japanese international aid policy like ODA. To link SDFs with human security does not sound attractive for those who are defending Japan’s alliance with the US, as well as those who are presenting Japanese aid policy. Human security is by definition not said to clash with national security, if it is well understood. Whether logical enough or not, Japan’s notion of human security fits well with its traditional foreign policy and security interests.

84.4 Reasons for Japan’s Interest in Human Security

Having looked at the way the government of Japan refers to human security, it is now necessary to examine its characteristics. First, the Japanese use of human security was derived from practical considerations. To rescue Asian countries from the financial

14 See: Statement by H.E. Ambassador Keitaro Sato, Special Adviser to the Minister for Foreign Affairs of Japan, on the Occasion of the Sixth Ministerial Meeting of the Human Security Network, held in Bamako 27–28 May 2004, at: <http://www.mofa.go.jp/policy/human_secu/state0405.html>. See also Statement by H.E. Ambassador Kenzo Oshima, Permanent Representative of Japan to the United Nations, at the Informal Meeting of the Plenary of the General Assembly, 27 January 2005, at: <<http://www.un.int/japan/statements/oshimao50127.html>>.

crisis was not only 'human-centred', but also in accordance with the national interests of Japan. It was crucial for Japan's economic recovery to keep strong markets in Asia. It was also important for Japan's political leadership to show concerns over the plight of Asian countries. Recently, an expansion of target areas to Africa occurred with respect to the management of the Trust Fund for Human Security. It is also rational for Japan to target African countries as well, since it has been regarding them as a base of supporters of Japan, for instance, in the United Nations especially when it comes to the issue of the permanent membership of the UN Security Council.

Second, following the first point, the Japanese interest in human security was developed in accordance with the way Japan presents the achievements of its ODA and other forms of international aids. It is certainly advantageous to present human security as a philosophy of its developmental and humanitarian aid. ODA and other forms of international assistances are the major tools to promote Japan's international status. To emphasize security, if not the traditional meaning of security, may advance the chance of Japan's candidacy for the permanent seat of the UN Security Council. The Trust Fund for Human Security and the Commission on Human Security, both the creatures of Japanese initiatives, may enhance the chance, when associated with the UN organization.

Third, it goes without saying that the government of Japan has no intention to imply a decline of nation states by referring to human security. What is crucial is to create effective governmental systems. The government of Japan expressed its willingness to take human security measures, and demanded due respect for Japan's efforts. Human security in this sense is not presented as an idea of universal cosmopolitanism: it is international at best and certainly embedded in international politics of states. The introduction of human security is not intended to revolutionize Japan's foreign policy, but polish and hopefully reinforce it.

Fourth, the soft image of human security coincides with the image of Japan which the Japanese government wants to advance. Due to the constitutional constraints and historical disadvantages, Japan has difficulty in earning a good reputation in international cooperation concerning 'traditional' security issues such as participation in peacekeeping operations. Human security is apparently expected to enable Japan to compensate for weakness in the traditional security field. The incumbent permanent members of the Security Council established their

status in the traditional security area, and Japan might be a leading force in a newly recognized field called human security. For this purpose, Japan declined to associate itself even with the countries of the Human Security Network.

Fifth, it is taken for granted that human security is a concept of foreign policy, and more specifically, an explanatory tool for international aid. It is advanced by the Ministry of Foreign Affairs, but does not go beyond the circle. For instance, there is no attempt in Japan to apply the concept to domestic issues. This also means that as human security presupposes the subject of providing security and the object to be secured, the government of Japan takes for granted an uneven relationship between Japan and people in other (developing) countries. Human security may be a comprehensive concept, but its use presupposes a particular environment of international politics.

Pointing to these characteristics does not necessarily lead to criticism of the Japanese use of the concept of human security. It simply indicates the fact that the Japanese interest in human security is never intended to sacrifice the national interests of Japan. By saying that the concept of human security does not add anything substantially new to Japanese foreign policy, however, this chapter argues that human security provides Japan with a useful conceptual tool to pursue its own foreign policy goals.

84.5 Japan and Human Security in the Post-9-11-World

Japan never dreamt of a world in which its major ally draws Japan into a fight against terrorism in a visible manner. During the Cold War, Japan made some efforts as an ally of the United States, but fortunately did not come across a situation in which Japan was asked to offer physical contributions. In the post-Cold War, Japan is recognized as an important player, if not most capable, and the Japanese government or more appropriately, MoFA, wishes to take the status of a major player in international society. In order to endear itself to the international community, Japan must do something that is appealing. Japan may have to send SDFs to Iraq, while repeatedly saying to the Iraqi people that they never engage in security operations, and that what they do is only humanitarian activities like supplying water and rebuilding schools. In other words, Japan is trying to adapt itself to a world under new security conditions, while keeping its traditional 'soft' image. Whether such an attitude

is wise or shrewd, it seems that for a foreseeable period of time Japanese policy-makers are willing to keep the image and hope to maintain associated reality.

In such a context, human security is most welcome for Japan. It does not harm the traditional orientations of Japanese foreign policy, in cases where it might the Japanese government carefully avoids such a scenario. Still, human security is expected to contribute to an advancement of the goals of Japanese foreign policy. This chapter emphasizes that this is no criticism of the Japanese use of human security. But the author can say so, as long as the Japanese interest in human security really contributes to what most of us believe is human security, or at least, that Japan's actions will not be harmful to efforts toward human security by others.

85 Human Security: International Discourses and Local Reality – Case of Mali

Max Schott

Studying security issues on the ground inevitably leads to the discovery of the inadequacy of our concept of human security (Burgess/Owen 2004: 345)

85.1 Introduction¹

Since the early 1990's, the concept of 'human security' has been the object of a multitude of discourses at the academic and policy-making level. Although the UNDP Human Development Report in 1994 (UNDP 1994) was not necessarily the starting point of human security as a "people-centered" idea², the discussion on human security that introduced this term began with the afore-mentioned UNDP publication. Since then, several international organizations, NGOs, governments, academics and research institutions have launched various human security initiatives such as the *Human Security Network*³ (HSN; see chap. 75 by Fuentes/Brauch) with Mali as a member, the Commission on Human Security⁴, UNESCO's Human Security Programme⁵, the Human Security Centre⁶, and many others⁷. These different actors incorporated the

concept into their discourses or research in pursuit of their individual or institutional values and interests.

One of the most important issues in the debate on human security concerns both its definition, how narrow or broad the concept should be; and its policy utility, the practice of human security (Owen 2004: 375–376). Despite the existence of these debates and many attempts to define human security, there is still no consensus on its definition⁸ or analytical utility⁹. This is also the case for the issue of policy utility: there is no common agreement as to how (and whether) the human security concept could be operationalized in terms of concrete policy. However, even without a common definition of human security, it is

1 The author is responsible for the choice and the presentation of the facts contained in this chapter and for the opinions expressed therein, which are not necessarily those of the United Nations and do not commit the Organization.

2 See among others: the Geneva Conventions, UN Charter, Universal Declaration on Human Rights and the international human rights framework.

3 The *Human Security Network* (HSN) is a group of countries that maintains dialogue on questions pertaining to human security. It includes Austria, Canada, Chile, Costa Rica, Greece, Ireland, Jordan, Mali, The Netherlands, Norway, Switzerland, Slovenia and Thailand, and South Africa as an observer. See at: <<http://www.humansecuritynetwork.org/>>.

4 The *Commission on Human Security* was established in January 2001. In 2003, Sadako Ogata and Amartya Sen, presented its Final Report. See *Human Security Now* (CHS 2003) at: <<http://www.humansecurity-chs.org/>>.

5 Since 2000, UNESCO's *Human Security Programme*, in cooperation with regional partners, has organized a series of regional experts meetings on the promotion of human security. See at: <<http://www.unesco.org/shs/humansecurity/>>.

6 The *Human Security Centre at the University of British Columbia* published a Human Security Report in 2005. See at: <<http://www.humansecurityreport.info/>>.

7 For example: *The Program for Peace and Human Security at the Centre d'études et de recherches internationales*; *The Institute for Human Security* at The Fletcher School of Law & Diplomacy; *The Jordan Regional Human Security Centre*; *The Program on Humanitarian Policy and Conflict Research* at the Harvard School of Public Health; and Canada's and Japan's foreign policies.

8 A recent initiative to define human security can be found in the outcome document of the UN World Summit: "We (Heads of State and Government) commit ourselves to discussing and defining the notion of human security in the General Assembly", September 2005 (A/60/L.1): 32 §143.

9 For a detailed discussion on this issue see: Special Edition on: "What is Human Security?", in: *Security Dialogue*, 35,3 (September 2004): 345–387.

possible to identify some common characteristics which appear in nearly all human security discourses. The individual is considered as the referent object of human security, the protection of human beings within a country being more important than the protection of borders, territory and sovereignty. Another common characteristic of the human security debate is the use of the 'freedom from want' and/or 'freedom from fear' slogan, mainly to describe or define human security. But the questions of what and whom exactly individuals 'fear' and what they 'want' are often left aside in what is a largely theoretical discourse.

In fact, a contradiction exists in the current discourse on human security and in the discussion on its conceptualization: on the one hand, the main characteristic of the concept is that the referent object for human security is the individual rather than the state. However, in contrast to this, it seems that human security has been largely conceptualized from the top down without consulting its referent object¹⁰. Thus, the related debates take place, more or less, only at a theoretical level without concretely taking into account the security concerns of the individual. However, this chapter argues that if one seeks to describe human security in a valid way, it is important to consult its referent object, the individual, not only with regards to concrete action but also in the conceptualization and policy formulation processes.

The objective of this case study is to contribute to greater conceptual precision and understanding of the human security concept in Mali through consultations with the local population and national policy-makers. Numerous interviews were carried out with the local population at the urban, pre-urban and rural levels in Mali to identify the security concerns on the ground. This research also focused on the implications of the human security agenda at the policy level in Mali. Interviews were carried out with members of the Human Security Cell in the *Ministry of Foreign Affairs and International Cooperation* (MOFAIC) of the Republic of Mali to analyse the following questions: How has the human security concept been translated into concrete policy plans? What were the priorities of the Malian government as Chair of the HSN from May 2003 to May 2004, and how independent was Mali in choosing these priorities? Finally, what is the level of correspondence or divergence between the human security priorities formulated at the

policy level and the human security preoccupations of the population at the local level?

In the first part, the discourses on human security will be analysed both by looking at some common rhetorical categories used to defend or criticize the human security concept, and by identifying common arguments concerning its necessity or the reasons for its existence (85.2). The second part will analyse the implications of the human security agenda at the policy level in Mali as Chair of the HSN and investigates its autonomy in formulating policy priorities (85.3). Finally, the third part will evaluate the perceptions of human security on the ground through consultations carried-out with the local populations at the rural, pre-urban and urban levels in Mali (85.4).

85.2 Discourses on Human Security: Rhetorical Categories and Arguments on its *raison d'être*

85.2.1 Three Rhetorical Categories in the Discourses on the Human Security Concept

In the discourses on human security three recurrent arguments for or against the human security concept and/or policy can be identified. These argumentation strategies correspond to three rhetorical categories identified by Albert Hirschman (1991) as the *perversity* thesis, the *futility* thesis and the *jeopardy* thesis. Although these theses have been developed to demonstrate reactionary rhetoric against social change, it is equally possible to use them in favour of change, in this case for the promotion of the human security concept; allowing one to place the different discourses for or against human security within this typology of argumentation strategies.

The *perversity* thesis implies that any action to improve something is fated to worsen the situation; in other words, it is the obverse of the intended result. One example of a 'classic' argument against the human security concept is that a certain security balance among world powers exists, and that any change in this balance - e.g. the introduction of a new security concept and/or policy - leads to disorder, insecurity and an increase in conflicts and victims instead of reducing them. But if the *perversity* thesis is used in a discourse in favour of human security, it could be said that, for example, responding to transnational threats such as terrorism with merely a 'classic' security logic

10 There are only a few studies consulting the individual in conceptualizing human security, e.g.: Bajpai (2004: 360).

and with military means, only ‘produces’ more terrorists and insecurity.

The *futility* thesis argues that attempts or resistance to change are in vain and will have no effect; they are powerless to alter the natural order of things. This argument is used against the promotion of the human security concept in the following way: a status quo exists in the security domain, and all attempts at change do not change anything. In other words, the various initiatives to promote human security are in vain because they cannot impose themselves upon major military powers. However, this thesis can also be found in a discourse in favour of the human security concept: e.g. despite resistance, it is impossible to ignore this concept at the policy level because worldwide interdependence and new transnational threats, such as infectious diseases, massive population movements, etc. would not permit such a position in the long term. This argument also applies to the academic level in terms of analytical utility (Thakur 2004: 347).

The *jeopardy* thesis states that the cost of the proposed reform or resistance to reform of the security agenda is too high, endangering other important projects or previously hard-won accomplishments. Using this argument against the human security concept states, for example, that it is indeed “an attractive idea” but that it threatens traditional issues of international cooperation such as the promotion of human rights (Buzan 2004b: 370) and ‘classic’ development aid projects or the cost is its analytical utility (Newman 2004: 358; Paris 2004: 371). In applying the jeopardy thesis in favour of the human security concept, one could say that it is possible to protect territory against transnational threats but the cost of increased military presence and investment in new surveillance technology would jeopardize other national interests such as public health systems (through budget cuts) or the implementation of human rights standards.

85.2.2 Human Security as a Response to New Transnational Threats or Power Struggles: Common Arguments for the Promotion of Human Security

Besides these three rhetorical categories, there are various arguments to explain the existence of the human security concept. One could identify two views with related arguments concerning the *raison d’être* of the concept and its promotion.

Through the *first view*, human security is considered as a response to the perception of new threats. This means that the world, the ‘environment’ of the

actors (states, civil society organizations, researchers, etc.) changes and the actors are thus ‘obliged’ to adapt their policies, priorities, and research issues to this new reality (Axworthy 2004: 348). Growing interdependence and new global threats are examples of perceptions of a changing environment (CHS 2003: 6). Thus, the necessity of the human security concept explains itself through exogenous change (both, perceived or real).

In the *second view*, the *raison d’être* of the human security concept is considered as a response to, or as a result of, changes in the configuration of actors – changes in power relations in the international sphere. The fall of the Berlin wall or the attacks of 11 September 2001, have mostly been considered as starting points of a new post-bipolar configuration; where ‘Middle power states’ are often identified as promoters of the human security concept (Liotta 2004: 363), aiming to find their niche in the world security agenda (Behringer 2005). The promotion of the human security concept could also be considered as an expression of ethical conviction of a powerful actor or as a result of pressure from new actors such as civil society organizations.

The formulation of policy priorities in the field of human security can either be seen as a response to perceived human security threats, or as an endogenous result of power relations. A combination of both is also possible because the perception of human security threats is also frequently a result of interactions between different human security actors.

85.3 Human Security on the Policy Level: Mali in the Human Security Network

How did the Malian government translate human security into concrete policy priorities during its Chairmanship of the Human Security Network (HSN), and how independent was Mali in identifying these priorities? Mali was invited to join the HSN in 1999, and during the HSN Ministerial Conference in Lucerne (Switzerland) in 11–12 April 2000, it became a full member of the Network, as the only African country. Mali has regularly participated in HSN meetings and activities. In Mali, human security issues are managed at the Ministry of Foreign Affairs by a *Conseiller Technique* acting as focal point for the HSN with limited assistance from the *Direction des Affaires Politiques*.

Before looking at Mali’s human security policy priorities, an overview of its precarious situation is indis-

pensable. As a *Least Developed Country* (LDC), ranked 174 of 177 in the Human Development Index (UNDP 2005b: 222), Mali is one of the world's poorest countries. Its 11 million inhabitants have a life expectancy at birth of 47.9 years and 72.3 per cent of its population lives with less than \$1 a day. 52 per cent live without sustainable access to an improved water source and 29 per cent are undernourished. More than 1 in 5 children dies before reaching the age of 5 and 33 per cent of children under 5 are underweight (UNDP 2005: 222–261).

85.3.1 Mali's Human Security Priorities as Chair of the Human Security Network

Mali organized several meetings to identify its priorities as Chair of the HSN, among them a *National Workshop on Human Security* (14–15 April 2003 in Bamako) arranged by the Government of Mali with financial and technical support from Canada and Switzerland¹¹. Approximately 50 participants from various ministries and public services, civil society organizations, and representatives from member states of the HSN in Mali attended the workshop and discussed possible priorities for Mali's Chair of the HSN¹². Based on the recommendations of several workshops, the Minister for Foreign Affairs and International Cooperation presented Mali's priorities¹³: a) human rights education; b) children in armed conflicts; c) small arms and light weapons; and d) gender in peace-keeping operations. In accordance with these priorities, several activities were selected during the national workshop to translate the human security

agenda into action at the national, sub-regional and international levels. The following activities were identified¹⁴:

- *At the national level*: Citizenship education, awareness-raising on trafficking of children, and road hazards, development of a manual on Mali's experience in fighting the illicit proliferation of small arms and light weapons, research on human rights education, promotion and development of a culture of peace, and the human rights 'Cités Consensuelles'.
- *At the sub-regional level*: Reinforcement of sub-regional cooperation in the fight against trafficking of children, and against illicit proliferation of small arms and light weapons, realization of a study on conflicts and armed non-state actors in the Economic Community of West African States (ECOWAS), consideration of food security as a dimension of human security, and awareness-raising on the human security concept in ECOWAS.
- *At the international level*: Support the development of an international convention concerning small arms and light weapons.

Although the consultative committee in charge of human security in Mali also identified and recommended 'freedom from want' dimensions of human security such as economic security or "health as an essential element of human security"¹⁵, which specifically correspond to the precarious situation of its population, it is interesting to see that the final priorities and envisaged actions of Mali correspond only to the 'freedom from fear' dimension of human security (except on food security). However, both 'freedom from want' and 'freedom from fear' are explicitly mentioned as part of the human security concept of the HSN¹⁶. This leads to the question of how independent was Mali in identifying its priorities as Chair of the HSN.

11 Ministry of Foreign Affairs and International Cooperation of the Republic of Mali (MOFAIC), Human Security Cell: "Termes de référence de l'atelier national sur la Sécurité Humaine" (Bamako, 2003): 3.

12 The Government of Mali in cooperation with the Advisory Board on Human Security also co-organized a colloquium in Bamako on 24 May 2004 on: "*Conflict and Development - The Human Security Approach*" to submit the general conclusions to the Ministerial Meeting of the Human Security Network in Bamako on 27–29 May 2004.

13 See the message by the Minister of Foreign Affairs of Mali, H.E. Mr. Lassana Traore delivered at the Fifth Ministerial Meeting of the Human Security Network, 10 May 2003 at: <http://www.humansecuritynetwork.org/docs/mali_priorities-e.pdf>. On the issue of Mali's autonomy in choosing its policy priorities, it is notable that its priorities were presented, *ex post*, slightly different in the Chair's Summary of the 6th Ministerial Meeting of the HSN, 27–29 May, Bamako, Mali 2004.

14 Ministry of Foreign Affairs and International Cooperation of the Republic of Mali (MOFAIC), Secrétariat général: "Rapport sur les travaux et le résultats de l'atelier national sur la Sécurité Humaine", Bamako, 14–15 April 2003: 11–12.

15 See at: <<http://ochaonline.un.org/webpage.asp?Page=1928>>.

16 See "The Vision of the Human Security Network"; at: <<http://www.humansecuritynetwork.org/menu-e.php>>.

85.3.2 Mali: An Autonomous Actor Within the Human Security Network?

If one compares the priorities of Mali's Chairmanship of the HSN with one aspect of the principles of the HSN, namely "Promoting sustainable human development, through the alleviation of absolute poverty, providing basic social services for all, and pursuing the goals of people-centred development, is necessary for building human security"¹⁷, it is interesting to note that Mali, one of the poorest countries in the world, where mortality is predominantly linked to poverty, did not mention poverty as a human security concern or priority while Chair of the HSN¹⁸. During a colloquium on "Conflict and Development - The Human Security Approach", the Malian Foreign Affairs Minister, strongly highlighted the inter-linkages between conflict and development, recognizing that "conflicts and poverty are the main causes of human insecurity in Africa"¹⁹. He also stressed the importance of finding practical solutions to attaining 'freedom from fear' and 'freedom from want'. However, the poverty issue is not reflected in the priorities or policy recommendations of Mali despite the fact that poverty is also explicitly mentioned in the 'Vision of the HSN':

A humane world where people can live in security and dignity, free from poverty and despair, is still a dream for many and should be enjoyed by all. In such a world, every individual would be guaranteed freedom from fear and freedom from want, with an equal opportunity to fully develop their human potential. Building human security is essential to achieving this goal²⁰.

This discrepancy between the policy priorities of Mali as Chair of the HSN and its national priorities²¹ raises the question of how independent Mali was in formulating the agenda of its Chairmanship. One key factor which may have undermined Mali's autonomy in the HSN is financial dependence. The expenses for the participation of the Malian delegation at the HSN meetings were generally covered by other HSN members (i.e. Canada, Austria and Switzerland). The national workshop on human security, whose objectives were to identify the priorities of Mali's Chair of the HSN, received financial and technical support from Canada and Switzerland²².

Obtaining information on the autonomy of Mali proved difficult, but the consultation process led to interesting questions, such as: if "the HSN is a group of like-minded countries from all regions of the world"²³ one could ask who or what determines this 'like-mindedness'?²⁴ The fact that the official description of the HSN stipulates the participation of countries from "all regions of the world" implies that the HSN seeks legitimacy and importance through this global dimension. Thus, had Mali only been chosen as a token member to represent Africa?

85.4 Human Security Facing Local Reality: A Bottom-up View from Mali

After a discussion of the theoretical framework of the human security concept and its policy implications for Mali's Chairmanship of the HSN, the pertinence of a theoretical approach to human security will be evaluated through a practical case study. This field research

17 See "Principles" of the Human Security Network at: <<http://www.humansecuritynetwork.org/principles-e.php>>. See also point 10 of the Chair's summary of the 6th Ministerial Meeting of the HSN, 27-29 May, Bamako, Mali 2004: "Recognizing that poverty reduction and people-centered development are essential elements to achieving human security, in particular freedom from want, the Network reaffirmed their commitments to the realization of Millennium Development Goals (MDGs), which call for global efforts to reduce poverty by half within 2015" at: <http://www.humansecuritynetwork.org/docs/bamako_chair-e.php>.

18 The only issue related to poverty is the "Declaration on Food Security" adopted during the 6th Ministerial Meeting of the HSN at the initiative of Mali.

19 See the Report of the colloquium "Conflict and Development - The Human Security Approach" Bamako, Mali, 24 May 2004 at <<http://ochaonline.un.org/DocView.asp?DocID=3268>>.

20 See "The Vision of the Human Security Network", at: <<http://www.humansecuritynetwork.org/menu-e.php>>.

21 See for example: "Cadre Stratégique de Lutte Contre la Pauvreté" (CSLP), final document prepared and adopted by the Malian Government, May 2002.

22 Ministry of Foreign Affairs and International Cooperation of the Republic of Mali (MOFAIC), Human Security Cell: "Termes de référence de l'atelier national sur la Sécurité Humaine" (Bamako, Mali, 2003): 3.

23 See "The Network" at: <<http://www.humansecuritynetwork.org/network-e.php>>.

24 The purpose is not to say that policy priorities are always imposed by the 'strong' members of the HSN, but rather that influence can be very subtle (or even unconscious for both sides). Providing a country that lacks financial and human resources with financial support for certain workshops, documentation or experts, has an impact on the results (policy priorities) because the 'donor' usually only finances what is deemed relevant in its view.

has served as a basis for comparing the human security policy priorities of Mali as Chair of the HSN with

the human security priorities of the Malian population.

Figure 85.1: Interview Situation in the Village Tienfala, Mali, 2003. **Source:** photo by Max Schott.



85.4.1 Methodology for a Human Security Survey

The field research was carried out in 2003 through consultations with the local population in *Korofina sud* (urban area of Bamako), *Samaya* (pre-urban area) and *Tienfala* (rural area)²⁵ to consider the various human security preoccupations of people from different environments. Six local interviewers (3 women and 3 men) completed 120 interviews (40 in each area). In total, approximately 220 people were interviewed for the purpose of this research as both individual and ‘focus group’²⁶ interviews were used to collect infor-

mation. The human security concept as proposed by UNDP’s Human Development Report in 1994 served as a research basis, combining seven dimensions: *economic security*, *food security*, *health security*, *environmental security*, *personal security*, *community security* and *political security*.

In the questionnaire each of these security dimensions was subdivided into a series of qualitative and quantitative questions allowing the total set of answers to serve as an indicator representing an entire security dimension (e.g. food security). The sum of the seven security dimensions has been considered to be the indicator of human security. The largest part of the questionnaire covered qualitative questions because- based on an earlier feasibility study, the testing of the questionnaire, and on discussions with local actors- the evaluation of sentiments and perceptions of (in)security in a purely statistical manner was not considered appropriate. A quantitative dimension has been included by ranking different security dimensions (see table 85.2). After the data collection, methodological problems (translations from the local language, understandings and interpretations of security by the local populations, possibility that answers were given to obtain development projects or resources, etc.) and the validity of the results were extensively discussed with local interviewers and representatives

25 The survey and questioning were carried out during the period of June 6th to July 20th 2003 by APROFEM (*Association pour la Promotion de la Femme et de l’Enfant au Mali*), a local NGO, under the supervision of the Netherlands Development Organization (SNV - Bamako).

26 A ‘focus group’ interview refers to a group of individuals with common characteristics (e.g. divorced women), who are interviewed at the same time. This method can help reveal some preoccupations or sensitive issues such as domestic violence that might not necessarily emerge during one-on-one interviews. One problem with such a method, however, is the mutual influence within the focus group and the recording of polyvalent responses.

of the SNV-Bamako. This facilitated the analysis of the collected information and allowed for a clearer understanding of the responses given by the local populations.

85.4.2 Subjecting the Human Security Concept to Local Reality: Experience of Human Security in Mali

Table 85.1 gives an overview of the human security preoccupation of the local populations in Mali. It synthesizes the outcomes of the interviews based on the seven human security dimensions. Results stressed that these dimensions were perceived as interlinked; the perception of human (in)security mainly depends on comparison and human security was felt as a short term issue by local populations in Mali²⁷.

85.4.2.1 Three Main Aspects of Human Security in Mali

The following section summarizes the main human security concerns of the local Malian population.

Human security is close to the multidimensional concept of poverty. One important result is the verification of the hypothesis that human insecurity experienced by populations in peaceful areas (as the one covered) is close to the multidimensional concept of poverty.

The results of the interviews show that the security concerns of these populations are close or similar to what is called ‘multidimensional’ poverty by international development actors. Physical and economic access to healthcare services, food, fresh water, land, but also to the labour market and education were main examples deemed fundamental to the economic, food and health dimensions of human security (see table 85.2). On political and community security, the results are in line with ‘empowerment’ and ‘capacity building’ of the development discourse – to fight against the ‘voicelessness’ of the poor and to improve their involvement in debates and decision-making processes.

Table 85.2 shows that the most important locally identified security issues match with basic poverty issues: economic poverty, food shortages, and health is-

ues. However, the security dimensions that rely on good governance practices (political, community or environmental security) are considered less important by the local people. Thus, local governance is not understood as a key issue but rather as a topic in the sphere of development agencies discourse: positive developmental effects and impact of local participative democracy or active citizenship still have to be illustrated.

The risk of social exclusion as a major threat to human security in Mali. The interviews endorsed another hypothesis that the principal dimension of human insecurity in Mali is the risk of social exclusion. The main perceived source of human insecurity is to be alone and/or deprived of social relations/networks. The absence of the State or the malfunctioning of its (social) services and the insufficient redistribution of wealth are factors in the renewed importance of other forms of solidarity, such as family, friends, gangs, the village, etc. However, if solidarity among family or friends becomes weaker simultaneous with the urbanization processes, while at the same time, the State does not want to or cannot redress this lack of security; this contributes to a degradation of human security in Mali. This is particularly the case after the ‘downsizing’ of state services (Sen 2000c: 31–34) through structural adjustment programmes. The colloquium on ‘Conflict and Development - The Human Security Approach’ (Bamako, 24 May 2004) underlined the direct link between conflicts and the political and economic choice of states. Furthermore, negative impacts from adjustment programmes in the 1980’s were explicitly mentioned. The workshop also stressed the links between increasing unemployment through privatization, the transfer of resources out of the continent and increased conflict potential²⁸. Privatization and the downsizing of public social services due to structural adjustment programmes imposed from outside have had a negative impact on human security. This contributed to the delegitimization of the State and a relocation of power, human resources and expertise to the NGO community.

The most vulnerable groups to human insecurity in Mali are women and girls. In the context of social exclusion, another result was the verification of the hy-

27 Answers have shown that projections of the human security issue in the future are difficult for local people because the next day (‘tomorrow’) is seen as already insecure, and that poverty appeared in all seven dimensions as a cause of insecurity.

28 See the report of the colloquium “Conflict and Development - The Human Security Approach”, Bamako, Mali, 24 May 2004 at: <<http://ochaonline.un.org/DocView.asp?DocID=3268>>.

Table 85.1: Perception of causes/effects related to the seven human security dimensions by the local population of Mali in urban, pre-urban and rural areas. **Source:** Compiled by the author.

Economic insecurity	<ul style="list-style-type: none"> • Lack of sufficient and stable income (~\$20-\$170 per month) due to unemployment, unstable jobs, unequal access to work and insufficient access to capital (credit or grant); • Lack of legal or social protection at work in the informal sector; • Climatic conditions (drought periods) and insufficient access to water and fertile land ^{a)} (pre-urban and rural); loss of land due to expansion of the city (pre-urban); • Inability to save money because of social pressures to aid family and friends ^{b)}; • Lack of state assistance in crisis situations (particularly for women).
Food insecurity	<ul style="list-style-type: none"> • Lack of sustainable physical (rural) and economic access to sufficient and nutritious food; periods (July-August) of hunger, undernourishment; • Crop failure and insufficient food production owing to climatic conditions – drought periods and insufficient rainfall – and lack of fertile land and economic access to fertilizer (rural, pre-urban); • Living conditions: large families, lack of solidarity (urban, pre-urban); • Lack of political will and appropriate public policy, (pollution, bad crop management).
Health insecurity	<ul style="list-style-type: none"> • Exposure to diseases such as diarrhoea, malaria, meningitis, tuberculosis, hypertension, cholera, onchocerciasis; • Dirty and run-down environments: poor water quality, rubbish, pollution, (urban); proliferation of insects; • Lack of sustainable physical (rural) and economic access to good quality healthcare services (doctors) and drugs; and lack of choice between traditional or modern medicine owing to insufficient financial resources (use of witchcraft) (rural); • Misuse of drugs ('mobile pharmacies'), inadequate hygiene, strenuous work, bad (rotten food) or insufficient nourishment; • Lack of political will or capacity to provide equal and good quality healthcare services to poor people.
Environmental insecurity	<ul style="list-style-type: none"> • Insufficient development of public infrastructure or bad management of public services in the area (canalization, lack of rehabilitation measures, land speculation, (urban); lack of access to fresh water); • Deforestation (in drought periods as a result of poverty) (rural); pollution as a consequence of urbanization (pre-urban); use of rubbish as fertilizer; monocultures; • Lack of economic resources for fresh water, fertile land and the construction of flood protection measures (urban); • Climatic conditions – droughts, insufficient rain, insects (transmitting malaria and onchocerciasis).
Personal insecurity	<ul style="list-style-type: none"> • Criminality, domestic violence, rape, mistreatment; • Absence or failure of the state ^{c)} and its public institutions: lack of protection, non-application of the rule of law, (complicity or ignorance of the police); insufficient development of public infrastructure (lack of electricity, slums); (urban, pre-urban); • Collective self-justice: perception of dangerous individuals (outlaws, witches, etc.) resulting in lynch mobs and ostracism; • Road hazards (traffic accidents in urban areas).
Community insecurity	<ul style="list-style-type: none"> • Lack of trust among community members, social isolation and lack of social cohesion (pre-urban, urban) ('selfishness', 'disrespect of others', 'jealousy'); high-conflict potential due to permanent stress caused by financial insecurity; • Application of cruel traditions and 'traditional' laws: unequal rights of women; genital mutilation; • Failure of local public institutions: corruption, disrespect of community interests, abuse of power; unequal access to infrastructures and services within community; • Potential for conflict caused by disturbance of traditional power structures (village chiefs) as a result of the rapid introduction of democratic procedures.

Table 85.1: Perception of causes/effects related to the seven human security dimensions by the local population of Mali in urban, pre-urban and rural areas. **Source:** Compiled by the author.

Political insecurity	<ul style="list-style-type: none"> Absence or failure of public institutions (corruption, injustice, non-application of law); police corruption (<i>'they protect only the rich'</i>) (urban), lack of protection (rural), arbitrary arrests and mistreatment by the police in poor areas; Feelings of injustice: unequal access to justice and rights due to poverty (<i>'access to justice only for the rich...they can bribe'</i>); Inaccessibility of public institutions; feeling of being neglected by the government because of being poor; Non-access to decision-making levels because of poor status; feeling of non-representation and lack of voice among poor (voicelessness), particularly among poor women.
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- a. Access to land is generally codified by family traditions, with only men having inheritance rights. Women are excluded because they are considered most likely to leave the land following marriage or divorce.
- b. On the one hand, solidarity has been identified as securing but on the other, solidarity -as social pressure to help family and friends- has also been perceived as a threat to economic security.
- c. The fact that nobody made reference to the state in the rural area may demonstrate that the state is not recognized as a legitimate authority with duties and that these functions are still embedded within traditional authority structures (village chiefs).

Table 85.2: Ranking of the seven human security dimensions by local populations. **Source:** Compiled by the author..

	Urban area			Pre-urban area			Rural area			General		
	Women	Men	Total	Women	Men	Total	Women	Men	Total	Women	Men	Total
Economic security	2.5	2.5	2.5	1.7	1.6	1.7	2.8	4.3	3.6	2.3	2.8	2.6
Food security	2.3	2.2	2.3	2.0	2.0	2.0	1.8	2.0	1.9	2.0	2.1	2.1
Health security	1.9	1.7	1.8	3.0	3.2	3.1	2.3	1.7	2.0	2.4	2.2	2.3
Environmental security	5.1	4.6	4.9	5.3	5.0	5.2	5.1	5.0	5.1	5.2	4.9	5.1
Personal security	4.4	4.2	4.3	4.1	4.4	4.3	4.7	4.7	4.7	4.4	4.4	4.4
Community security	6.1	6.3	6.2	5.2	5.0	5.1	4.5	5.4	5.0	5.3	5.6	5.4
Political security	5.9	6.5	6.2	6.7	6.8	6.8	6.6	6.5	6.6	6.4	6.6	6.5

The interviewed persons were asked to rank the seven human security dimensions: the table shows the average values (1= the most important to 7= the least important).

pothesis that the most vulnerable populations to social exclusion and thus to human insecurity are women and young girls. Although the statement of the vulnerability of women is widely accepted by the 'development community', our field research enhanced the understanding of the precarious situation of women and young girls from a security-insecurity perspective (Chenoy 2005).

The results on the seven human security dimensions demonstrate that vulnerability to a state of insecurity increases very significantly when a person is not

integrated within a social network. It is mainly women, especially widows, divorcees or single women living alone, who find themselves in this situation of exclusion. From a human security perspective, these women have an 'interest' in getting married or, if separated, in returning to their families or village (if this is accepted by the community) so as to be protected within a social structure. The results have also demonstrated the heightened vulnerability of women to various forms of violence such as rape and domestic violence. Although women and men are theoretic

cally equally protected by the constitution, traditions still prevail and 'modern' institutions fail in applying the law: some traditions are often still considered legitimate and applied even if they do not fall within the realm of law.

85.4.3 Human Security Priorities at the Policy Level and Human Security Concerns of the Local Population: Discrepancy and Correspondence

A comparison of the thematic priorities during Mali's Chair of the HSN with the results of this 'bottom-up' research on human security, points to a discrepancy between the discourses on human security, the policy priorities of Mali, and concerns at the local level. In comparing the results of the consultations with the population of Mali with the 'official' discourse of the HSN, a certain correspondence can be observed between this discourse and the 'experience' of a local reality; poverty as a factor of human insecurity being present in both cases. However, analysis of the HSN discourse has shown us that the principal reason for this correspondence lies in the vast and fluid nature of the discourse, which encompasses everything (Paris 2001: 88) and immunizes itself against all forms of critique (except those related to its vast and fluid character).

85.4.4 Conclusion

This chapter argued that there is a need to nourish the discourses and discussions on human security with a 'bottom-up' view of a local reality, with concrete inputs from its referent object, the individual. This is especially important for the conceptualization process of human security and for the formulation of related policy priorities. In addition, human security issues should be identified by the concerned actors (policy makers together with the local population and civil society actors) on local or regional levels. This is important for appropriate and efficient action but also for analytical pertinence. As individuals are living in different cultural, social, political and economic contexts, their human security concerns also depend on local realities. Therefore, the definition of human security depends on the local or regional context. In other words, defining human security clearly and consensually seems to be impossible at a global level (Bajpai 2004: 360; Uvin 2004: 352) but definitions could be clarified (and probably more widely accepted) and

policies made more effective if they were applied to a specific context or region.

The issue of how narrowly or broadly to conceptualize human security can be linked to regional contexts. However, if one applies human security too narrowly to the local context of the interviewed population without taking into account the 'freedom from want' dimension of human security, it will 'reap' only incomprehension as it fails to correspond to the security preoccupations of the local population in Mali, which are closely linked to poverty and its consequences. Thus, while a narrow human security concept might be of interest at the policy or academic level, this concept will remain disconnected from the fundamental security preoccupations of its referent object: the individual. One could further generalize this statement with the hypothesis that this applies to the majority of populations living in 'peaceful' poor countries.

Improving human security in poor countries is closely linked to equal access (economic and geographic) to social services (Sen 2000a: 4). Thus, the state, at the global, national, and local levels, has an important role to play in promoting human security. The 'empowerment' of democratic states, which enables the provision of effective social services, is vital for improving the living conditions of the most vulnerable groups in terms of human insecurity, such as women, girls and elderly people. Therefore 'structural adjustments' of social services in poor countries through privatization and requests for 'cost efficiency', as well as promoting local governance without mobilizing and transferring the needed public resources, can threaten human security, especially in times of economic crises (Sen 2000b: 3). This could be of particular interest as the perception of exclusion and vulnerability is often linked to an increased potential for conflict and violence (UNDP 2005: 149-181). Consequently, eradication of poverty seems central to ensuring the security of the people as well as the security of the state (CHS 2003: 3, 5, 7).

While advocating a regional approach in defining a human security agenda, it might be possible, after further consultation with individuals in different parts of the world, to identify common characteristics and challenges to human security through comparative analysis of local/regional human security definitions. This would, in time, allow the development of a global human security concept, and eventually better and more efficient policy implementation.

86 Enhancing Human Rights – A Contribution to Human Security

Dieter Senghaas

86.1 Introduction

On 10 December 1948, the Universal Declaration of Human Rights was adopted in Resolution 217 (III) of the United Nations General Assembly. The prior history of this declaration had already been marked by considerable controversy. Essentially, there was a clash between the liberal and the real-socialist understanding of human rights; and the concern of several Islamic states, mainly with regard to reservations on Article 18 of the Declaration, which embodied the right of every person to freedom of conscience and religion, including the freedom “to change one’s religion or belief.”

These controversies continued during the next eighteen years, when the U.N. Commission on Human Rights elaborated internationally legally binding agreements. In 1966, these were adopted in the form of two human-rights conventions; the *Covenant on Civil and Political Rights* and the *Covenant on Economic, Social and Cultural Rights*. As the two decades following 1948 were marked, in terms of international politics, by the struggle for decolonization, and hence for the right to self-determination for peoples and to independent economic, social, and cultural development, corresponding demands found their way into the documents mentioned. Both covenants begin in identical fashion with the affirmation that: “All peoples have the right of self-determination.” Like many other statements in the covenants, this first sentence in itself highlights the fact that human rights have not only an individualistic but also a collective rights dimension. Looking at the two *Covenants* together and taking into consideration the concern for the ecological problématique as having been articulated since the early 1970’s there is a tremendous conceptual and political overlap of the human rights debate and movement as well as the concern for human security.

86.2 The Emergence of the Concept of Human Rights and Human Security

Taking into consideration the early controversies, which continued beyond 1966, the functional status of human rights in political and social processes, within societies and at the international level, can presently be resumed as follows: Reference to human rights, particularly, of course, civil and political rights, is aimed at averting arbitrary action by the state. Corresponding rights serve to safeguard individual autonomy and, ultimately, the inviolability of “human dignity.” This scheme of argumentation, of course, presupposes the existence of a legal community, because the possibility of arbitrary action by private persons against other private persons is deemed to be eliminated by virtue of the existence of a state monopoly on the use of force and of the “rule of law.”

However, a legitimate state monopoly on the use of force and the rule of law are only an embodiment and expression of a decent legal community if law has come into being by democratic means, and if there are constitutionally stipulated measures for furthermore developing existing law in the light of new political, social, economic, cultural, and (by implication) legal requirements. Hence, the realization of human rights—a process that must constantly start anew, though it necessarily remains controversial—is thus dependent on the existence of a democratic constitutional state based on the separation of powers and a broadly based political participation. It follows that the struggle for human rights is always also a struggle for the institutionalization of modern democracy, and, despite identical premises (separation of powers, principle of openness, freedom of assembly, etc.), that democracy takes very different institutional forms.

As well as offering protection against arbitrary action by the state and also promoting the constitutionally regulated elaboration of law, reference to human

rights currently primarily serves to identify and overcome all types of discrimination. In this respect, the discourse about human rights has become an anti-discrimination discourse – a trend which, incidentally, is fully in line with the 1948 declaration and the two 1966 *Covenants*. This does not just involve political discrimination *per se*, but also the social, economic, and cultural disadvantage that underlies such discrimination. The aim of such discourse is to overcome an institutionally entrenched order that systematically produces inequalities and thus goes against equality of opportunity at the most basic level. In concrete situations of chronic disadvantage, reference to human rights and by implication to human security thus becomes a lever to protest and, in some cases, to liberation. Article 27 of the *Covenant on Civil and Political Rights*, for example, states that: “In those States in which ethnic, religious or linguistic minorities exist, persons belonging to such minorities shall not be denied the right, in community with the other members of their group, to enjoy their own culture, to profess and practise their own religion, or to use their own language.”

Provisions such as these have often been criticized for their ‘collectivist’ stance. But such criticism is flimsy, for, as history shows, collective discrimination such as that which occurs in the case of minorities cannot generally be eliminated by individual measures alone. In fact, it is precisely in such cases that group-based legal provisions and collective measures are needed to ensure that the requirements of Article 2 of the *Declaration* focused on the individual are satisfied: “Everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.”

Protection of the individual can be fixed by law, as can the prohibition of discrimination. Discrimination can, additionally, be overcome through appropriate constitutional regulations (such as the safeguarding of minority rights) and also through general measures of support. Over and above these important and fundamental reference points, human rights in general and the concern for human security imply a social order in which there are specific measures to ensure that human dignity is given some kind of look-in politically, legally, economically, socially, and culturally. The basic human rights documents, thus, leave no room for doubt as to the fact that they are underpinned by the notion of a “society in correspondence with the dignity of human beings.”

Much – some would say too much – is already contained in the 1948 *Declaration*: the freedom to marry, for example, and the protection of the family; social security and the right to work and to equal wages; even “the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay” (Art. 24). Finally, there are provisions on cultural freedom, in that Art. 27 states that: “Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.”

These kinds of general statements naturally need to be given concrete shape. The fact that there are a host of conflicting opinions as to what constitutes a “society in correspondence with the dignity of human beings”, ensuring human security, is not a drawback; it turns out to be almost an elixir of life for the idea of human rights. The widening and deepening of the idea of human rights – from the rights guaranteeing protection of the individual and non-discrimination, through to the positive notions for shaping a society, including an international order worthy of human rights – would never have come about if there had ever been one single self-consistent blueprint for human rights. The longer the discourse about human rights continues, and the more international it becomes, the more human rights will take concrete shape over the controversies it arouses. This trend is definitely to be welcomed, and it accounts for the conceptual bridge between the historically prior concept of human rights and the concept of human security as it is understood today.

86.3 Human Rights as the Result of a Cultural Revolution

In the West, and also beyond it – though in this case with anti-Western feeling – human rights have been interpreted as a typical outgrowth of European culture. This self-perception and external interpretation are essentially correct, given that human rights, as currently understood, are a product of European developments. But what do “European culture” and “European development” mean here? If one assumes European culture began with Greek antiquity, then it would now be about 2,500 years old. But it is only in the last 250 years that the idea of human rights has played a determining role in the development of European culture. The political struggle to get human rights enforced is confined to this period as well. And since it was a struggle in the true sense, the the-

sis that human rights had to be enforced *in opposition to Europe's own tradition*, as it had been shaped over the preceding centuries, is not a groundless one. What we nowadays associate with human rights in the narrow or broad sense was therefore clearly not something implanted into Europe's original 'cultural genes'. The overwhelming part of European history, including its cultural history, does not attest any particular sympathy for those things which human rights currently represent. And it is also quite wrong to imply that European history, by virtue of its internal logic, had inexorably to lead to the triumph of the idea of human rights.

The history of human rights in itself proves that this is not so. The human rights declarations of the late eighteenth century refer to humankind, but in reality this term only ever included a section of it: for a long time, it did not mean anyone who did not have education or property; it did not mean women, or children, let alone coloured people or slaves. All of them were excluded without scruple; and philosophy and political theory sometimes offered extravagant justifications for this kind of exclusion – justifications that one should also recall as a genuine expression of European cultural heritage! And what began in exclusionary fashion became inclusive, not because there is some internal logic leading from exclusion to inclusion, but because, with the passage of time and as a consequence of social mobilization from traditional to a modernizing society, those who were excluded were no longer willing to remain so, and instead called for equal rights – until finally the idea triumphed that where human rights are cited, this embraces *all* people, regardless of the concrete and cultural shape they take.

Hence, what we nowadays regard as self-evident, and what is claimed, with a reference to the Christian notion of man's being created in the image of God, to have always been regarded as self-evident in European history, had no determining influence whatever for 90 per cent of that history. The early European social and political system was autocratic and status-based, corporatist-and-collectivist; one seeks in vain across many centuries for the 'autonomous individual' as found in modern human rights documents. And until well into the nineteenth century, despite the revolutions at the end of the eighteenth, many European societies continued to be characterized by status-based social stratification and legal divisions, with individual rights and duties varyingly defined according to gender, status, and later on to class.

The *abstract individual* of Article 1 of the 1948 Declaration ("All human beings are born free and equal in dignity and rights") – in other words the individual irrespective of gender, age, colour, and so on – did not exist at all socially, legally, and thus culturally for most of European history. The idea of such an individual only emerged in the context of social conditions that were becoming intolerable because of class privilege and class exploitation, of conspicuous wealth side by side with poverty, and also because of the new, mostly bourgeois classes, who found the traditional order, the *ancien régime*, incompatible with their own aspirations. It was this constellation that generated the explosive cultural and political energy against Europe's own tradition which finally got the human-rights idea going – a process which was deepened by social movements of different orientation.

Of course, every far-reaching idea has isolated intellectual precursors. But it was only in a relatively late phase of European development that it was possible to emancipate the status-based individual, who possessed only an unequal status-determined freedom and dignity, and make of him or her a human being *per se*. It was only then – and, as already stated, in complete contrast to Europe's long history – that all people came to be regarded as free and equal *in principle*.

The idea of human rights thus represents a profound turningpoint in European history as well, indeed a cultural revolution. This was much more profound than is implied in those arguments that portray human rights – their embodiment in constitutional provisions and social policy – as an expression of "timeless European culture", or indeed as the end-product of European cultural traits present from time immemorial. By way of a counter to this, one should remember: Human rights were not given to Europe in the cradle, with the idea that one just had to sit and wait until Europe at some point reached maturity. On the contrary, they were the result of public agitation on a mass basis – the work of subversives in spirit and deed and of social revolutionary movements, led first by the bourgeoisie and then by the workers' movement. Women and marginal groups then followed.

This, then, is the true history of the idea of human rights and its translation into a social and political system that we nowadays view as "typically European/Western." This order only stabilized after 1945, and only after this did it – and the political culture underlying it – become a foregone conclusion. *Prior to*

this, every Western society had waged a battle, each in its own particular way, against its own tradition.

In Germany in particular, there should be no trouble recalling this fact, given that, until the middle of the last century, prominent intellectual currents and political movements existed here that expressly opposed the hard-won achievements of a political culture that we nowadays see as “Western”. Thus, Thomas Mann, far from acting as an eccentric, was actually being quite representative of what now seems an anachronistic intellectual current in Germany when, in 1918, writing of the contrast between Germany and the West, he stated that democracy was “alien and noxious” to the German nature: “I confess I am of the profound conviction that the German people will never bring itself to love political democracy, and that the much-decried ‘authoritarian state’ (Obrigkeitsstaat) is, and will remain, the form of government that best suits, best befits, and is essentially desired by, the German people.” And this then already world-renowned German writer (a Nobel prize winner) goes on to say: “Anyone who sought to make Germany simply into a bourgeois democracy in the Roman-cum-Western sense and spirit would rob it of what is best and most complex about it, of its problematical features, in which its nationality truly consists. He would be seeking to make it monotonous, unambiguous, un-subtle, and un-German and would thus be an anti-nationalist, insisting that Germany should become a nation in a sense and spirit alien to it.” (Mann 1918: 46) This was written nearly 90 years ago – by one of the most respected champions of “the German spirit”, and it reads like many present statements from some intellectuals of the non-Western world (Buruma/Margalit 2004).

86.4 History Repeats Itself Indeed

A realistic view of European development – one that is aware of Europe’s human rights struggle against its own tradition – is also important for understanding the human rights problematic outside Europe and the West, because tensions familiar from early European history are being played out afresh there. All extra-European societies currently find themselves in a state of profound upheaval. On top of this, they are undergoing internal pluralization. As a consequence, traditions are breaking away and reorientation is becoming overdue. Internal cultural conflicts are arising which are ultimately about the future of the social and political system. The human rights problematic

acquires, as ever, particular political explosiveness in this context.

The lines of conflict are relatively clearly drawn up: some want to imitate Europe, others want to revitalize the old traditions. Others again believe they can combine modern technologies with old values. Not surprisingly, the battlelines in argumentation observable in the late eighteenth century and the nineteenth century are also being replicated: Individual human rights are seen as a threat to traditional values, to the particular country’s own culture and tradition, and, most importantly, to current standards of decency. In contrast, the champions of human rights in the non-Western world are no longer prepared to bow to autocratic or despotic regimes, economic exploitation, or social and cultural discrimination.

It is serious abuse that once again gets human rights onto the agenda in each particular place all over the world, and this means that outside Europe too, traditional orders and cultures are coming into conflict with themselves. In East Asia, South-East Asia, and South Asia, and in the broad Islamic sphere of influence, cultures of corporatist-collectivist, patriarchal, or paternalistic bent are being called into question as a result of social mobilization leading to pluralization. This is an actual repetition of one of the crucial and recent experiences of Europe.

This process is not a smooth one, and it does not even follow a straight course. It gives rise to recalcitrant fundamentalist movements to which human rights for the most part are anathema. At the same time, however, there is a spread of political movements that have made it their aim to make human rights, the rule of law, and self-sustaining democracy a political reality. Of course, the prospects for human rights and democracy are greater in societies where development has been relatively successful than in societies that find themselves in a chronic development-crisis with no immediate prospect of a solution. This is the difference – to cite a concrete example – between Taiwan and Egypt.

86.5 Conclusion

Until well into the present century, anti-Western “German values” were still being championed in Germany. Until recently, “socialist values” were being played off against bourgeois ones in the real-socialist system. “Islamic values” are currently being propagated in Islamic societies. And the autocrats of Asia, along with the fundamentalist writers of the Arab-Is-

lamic region, are arguing in just the same way as Thomas Mann did 90 years ago with respect to Germany. In the case of these latter, the Islamist argumentation also displays an astonishing degree of congruence with the Catholic-inspired “theocratic counter-revolution”, so-called, which, during the first half of the nineteenth century, vehemently opposed both the humanistic view of history, culture, and mankind propounded by the French Revolution, and, of course, any form of liberalism and individualism.

The worldwide cultural conflict scenario, of which the human rights discourse is currently a core element, is thus very familiar. Its real setting is individual societies with their specific cultural cleavages. In these societies, a “clash *within* civilizations” is being fought out. In contrast, the “clash of civilizations” as predicted by Huntington, is a chimera (Senghaas 2002). This state of affairs has a remarkable side effect: the international dialogue is becoming easier, because the encounter is no longer between internally harmonious, rather monolithic or homogenous cultures, but between cultures that have come into conflict with themselves.

Whether the idea of human rights will ultimately triumph in many different places in the world, and whether this idea will be translated into political orders congenial to human rights – these are open questions. But just as was once the case in Europe, the answers outside Europe too will not depend on age-old preprogrammed cultural characteristics that supposedly help or hinder such transition. The decisive factor will be the political power-constellations within development processes, which will either succeed or fail – or, more frequently, will be caught in the cross-current between success and failure. It is here, and not in cultural legacies, that the uncertain future fate of human rights lies.

Since there has been an overlap between human rights issues and the concern for human security, there is a high probability that neither the concepts of human rights and human security nor the political movements, respectively, will counteract each other. It is rather to be assumed that with respect to both intellectual and political activities there will be a kind of mutually reinforcing feedback.

87 Natural Disasters, Vulnerability and Human Security

Fabien Nathan

87.1 Introduction

The 26th of December 2004 earthquake and tsunami in the Pacific region has attracted attention to the tremendous devastations triggered by natural hazards. The figures cannot express the amount of human suffering and loss of security experienced: more than 270,000 deaths, 5 million homeless, and dozens of billions of damage in dollars. In fact, every year thousands of people die, are injured, lose their homes, livelihoods or jobs in natural disasters, and the trend is on the rise. This clearly constitutes one of the most serious threats for a growing number of people and cannot be ignored by security studies. The aim of this chapter is first to stress the importance of this underestimated threat, and second to present risks as a situation of insecurity which calls for new security concepts, such as ‘human security’. When linked with vulnerability, as proposed in this chapter, this concept may be useful to encompass these threats. Security Studies could both benefit from such an enlargement and deepening of their security concepts and from assistance in reducing the vulnerability of people and societies.

87.2 What Insecurity: Natural Risks and Disasters

87.2.1 Types of Hazards, Disasters, and Impacts

87.2.1.1 Hazards

Disasters arise from the interaction between hazards and the ‘stakes’, i.e., the material and immaterial, living and inert, fixed and moving elements that these hazards threaten. The hazards therefore constitute the origin of the threat, the elements which might trigger disasters if they encounter vulnerable stakes.

A simple classification (UN/ISDR 2002¹) would encompass natural hazards into geological (earth

processes), hydro meteorological (atmospheric, hydrological and oceanographic processes), and biological hazards (epidemics, insect infestations). Geological hazards include earthquakes, tsunamis, volcanic activity, mass movements (landslides, rock fall, etc.), surface collapse, fault activity, etc.; hydro meteorological hazards include floods, mudflows, cyclones, storms, temperature extremes, drought, desertification, wild land fires, and avalanches; biological hazards include epidemics, insect infestations, and the like (UNISDR 2002: 44).

These hazards are not evenly scattered throughout the globe. They result from natural and ecosystemic processes and constraints, such as tectonics and subducted zones, climatic variation and logic, geological processes, fault lines, etc. No tsunami can happen in Bolivia, a country with no access to the sea; neither are there any snowstorms in the Sahara, nor cricket infestations in Austria.

Even if there is no absolute certainty about the total number of natural hazards in the world², it is increasingly recognized that some specific hazards have slightly risen³, and will continue to do so much more in the future because of human factors (climate change, deforestation, etc.).

1 Many authors adopt a similar classification, such as Ledoux 1995.

2 For Blaikie, Cannon, Davis, and Wisner (1994: 31): “there is a general consensus in research on disasters that the number of natural hazard events (earthquakes, eruptions, floods, or cyclones) has not increased in recent decades.” But that was in 1994 in their first edition, updated in 2004.

3 According to Feldbrügge and Von Braun (2002: 36) “the total sum of natural hazard events does not seem to have increased (...), but this is probably not true for all types of disasters. (...) The frequency and duration of some types of disasters (...) probably did increase.”

87.2.1.2 Types of Disasters

One usually makes a distinction between *natural* and *anthropogenic* disasters, such as *technological* (or *industrial*), and *socio-political*, (wars, ‘complex emergencies’). Sometimes, the category *environmental disaster* or *ecological disaster* is used to qualify both natural disasters affecting societies and disasters affecting the ecosystems (Boisson de Chazournes/Desgagné 1995). *Land degradation* is an intermediary between hazards and disasters. It describes “how one or more of the land resources (soil, water, vegetation, rocks, air, climate, relief) has changed to the worse” (Bohle 2002).

87.2.1.3 Types of Societal Impacts

Disasters induce several types of impacts. They produce three types of loss or damage, both at the individual and collective level, and also direct, indirect, and secondary.

Human losses or damages, characterized by deaths, injuries, physical and mental affections. In statistical databases, only the number of deaths, injured, and affected people are calculated as damage, while the mental/psychological consequences are swept away. Secondary effects include for instance premature deaths due to the increased vulnerability caused by the impact of a disaster, such as illnesses, and the impoverishment and degradation of the quality of life. A disaster, by increasing vulnerability to future disasters, can be a cause of human losses in another disaster.

Economic losses include the destruction of goods, livelihoods, networks, services, and economic fluxes. Disorganization is high when networks essential for social reproduction (communication networks and big technical macro-systems⁴ in industrialized countries) are interrupted. Indirect economic damages and secondary effects are much more difficult to quantify, but can be even greater.

Environmental losses consist of damage to one or several ecosystems. These losses are generally more induced by non-water-related hazards, as these are often integral parts of the ecosystems.

These impacts induce several *types of crises*:

Economic crisis: Economic recessions can result from the impact of natural disasters. In Ecuador, the El Niño phenomenon of 1998–1999 induced a

decrease of more than 7 per cent in the country’s Gross Domestic Product from one year to the other (UN/ISDR 2002: 34). A World Bank projection for Honduras (1999–2008) shows that “if access to foreign savings is limited post-event, catastrophes could stagnate GDP for Honduras over the next 8 years” (Freeman/Martin/Mechler/Warner/Hausmann 2002). Economic crisis, in turn, is a great factor of vulnerability for future disasters.

Socio-political: A disaster always threatens social order in some way or other. That is the reason why the states have always been very willing to control disaster response through civil protection schemes. The actual domination of those in power might be threatened by the impact of such a disaster, the challenge of the domination of any power being to guarantee stability and order. Disasters therefore are proof of the shortcoming of the current social order, and contestation might arise.

Cultural crisis: A disaster is also generally a cultural shock. It always induces a cultural trauma, as it deeply reminds the mortal character of societies and the fragility, even the arbitrariness, of the cultural arrangements (Duclos 1991). Generally, a disaster generates a mix of these damages and crises.

87.2.1.4 Disaster Impacts of Natural Hazards

The damages caused by natural hazard’s impacts are enormous. One reports between 600,000 and 800,000 deaths per decade⁵ and between 1 and 2 billion cumulated affected people. Economic losses amount to more than US\$ 685 billion in the 1990’s, rising exponentially.

87.2.1.5 Human Damages

Since the 1970’s, the global number of deaths has amounted to approximately 3.6 million persons (excluding droughts, famines and epidemics – OFDA/CRED 2002). The 1970 Bangladesh cyclone itself killed an estimated 300,000 people, and the Tangshan earthquake in China between 242,000 and 600,000 according to different estimates. The 1991 Bangladesh cyclone also caused more than 100,000 deaths.

Even if the total number of deaths seems to decline (without considering epidemics) because of the disappearance of the mega-disasters (more than

4 Such as the energy, transportation, commercial, and financial networks, as well as public services in capitalist societies (Gras 2003).

5 Since 1980, depending on what 10-year period one considers. During the 1970–1979 period, more than 2 million people died in natural disasters.

1 million deaths in a row) and the decrease of the very large ones (more than 100,000 deaths), it is probable that the number of deaths due to smaller disasters might be on the rise. The December 2004 tsunami caused the worst disaster since 1991, and quite often there are disasters of several thousands of victims, as the Bam earthquake in Iran (2003, 40,000 deaths), or the floods and mudslides in Venezuela (1999, more than 20,000).

The cumulative number of affected people is rising very fast, respectively 717,000 to 1,374 and 1,880 million people in the 1970's, 1980's, and 1990's (OFDA/CRED 2002). According to the Red Cross, when comparing "the decades 1983-1992 and 1993-2002, reported global deaths from natural and technological disasters have fallen by 38%. However, numbers of affected people reported have risen by 54% over the same period" (IFRC 2003: 179).

87.2.2 Cost of Disasters

The most spectacular trend in disasters is their rising costs, which overtakes the rise induced by economic growth. In the 1970's, natural disasters cost US\$ 54 billion, rising to US\$ 201 billion in the 1980's and US\$ 686 billion in the 1990's (IFRC). It is estimated, that the growth rate of economic damage due to natural disaster is increasing by 6 per cent a year (Dauphiné 2001). Since the 1950's, the value of damages in the 1990's has multiplied by a factor of 13.9 (MunichRe 2001: 43).

The most expensive disaster in history, the 1995 Kobe earthquake, cost more than US\$ 100 billion alone, devastating the city's portal economy. Second comes the Los Angeles earthquake in 1994 (US\$ 44 billion), then Hurricane Andrew in 1992 - also in the United States (US\$ 30 billion).

Generally, most losses are uninsured, especially in poor countries, and even more when indirect damages are included. The biggest 234 disasters of the second half of the 20th century (141 of which were insured) have amounted to destruction in monetary terms of US\$ 960 billion. Of these quasi tera-dollar damages, 35 per cent were due to earthquakes, 30 per cent to floods, and 28 per cent to storms (MunichRe 2001).

87.2.3 Water-related Disasters

Water-related disasters deserve a special mention. According to the World Water Assessment Programme, "more than 2,200 major and minor water-

related disasters occurred in the world during the period 1990-2001" (UNESCO/WWAP 2003a: 272). Of these disasters, 50 per cent were floods. Among the 234 biggest disasters of the second half of the century, 90 per cent of them are storms and floods, amounting to about 1.4 million deaths (MunichRe 2001: 43).

Floods account for a high proportion of damage and suffering throughout the world, accounting for 49 per cent of deaths through natural disasters from 1985 to 1999 (Abramovitz 2001: 11). In absolute numbers, "between 1973 and 1997 an average of 66 million people a year suffered flood damage, making flooding the most damaging of all natural disasters" (UNESCO/WWAP 2003a: 274). In terms of economic losses also: "global economic losses to floods alone average US\$ 3 billion per year, the equivalent of 20% of new investment in the water sector in developing countries" (UNESCO/WWAP 2003a: 22).

Moreover, 46 million people per year in coastal areas are at risk from storm surges and sea level rises (UN/ISDR 2002: 57). These figures highlight the tremendous importance of water-related disasters. About 70 per cent of the sum of all natural disasters is already induced by climatic processes (UN/ISDR 2001: 16), and climate change should increase this figure, contributing to more extreme precipitation patterns, accelerated sea level rises, and the like.

87.2.4 Urban Disasters

Urban disasters have occurred ever since cities have been in existence. But since half of the world population now lives in urban areas, this figure is rising and the problem is becoming more serious. Among the biggest urban disasters of the past 25 years are the Armero lahar (Colombia, 1985, with 21,800 deaths), the floods in Rio (1988, almost 20 per cent of the population affected, US\$ 1 billion damages), the Izmit earthquake (1999 in Turkey with 18,000 deaths), the Gujarat earthquake (2001 in India with 20,000 deaths), and the Bam earthquake (Iran in 2003 with 40,000 deaths).

Such great catastrophes are generally well covered in the media. But there are numerous neglected smaller events that affect people locally. For example, "In Sao Paulo, localized environmental degradation was associated with 220 floods and 180 landslides in 1996 alone" (Pelling 2003a: 27). These smaller disasters pose high risks for many cities of the South. In Bogota (Colombia) 60 per cent of the population live on slopes exposed to landslides; in Calcutta

(India) 66 per cent of the population live in slums exposed to floods and cyclones, and in La Paz (Bolivia) 83 per cent of the soil is theoretically not suitable for housing, but it is actually used for this very purpose.

87.2.5 Definition of a Disaster

Disasters are usually defined as: “a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community/society to cope using its own resources” (UN/ISDR 2002a: 338). Thus, disasters are disruptions in the patterns of normal daily life, generating a crisis and a societal response to come back to order.

But the distinction between the normal and the crisis state is highly social. It depends on the perceptions of the people who qualify a state of disaster or crisis. For instance, when several million people die from malaria, or several thousand people die in car accidents in every country and city every year, or in work accidents, or prematurely in slums due to their terrible living conditions, this is not considered as a disaster. In contrast with a stock market crash (as in 1987, when the stock market is closed after a heavy windstorm, contributing to the greatest financial crash since 1929), which is considered a disaster and thus generates a crisis.

Disasters are also the result of perceptions. They are a question of measure and proportion. Human beings must evaluate the extent to which the situation is disastrous; damages must overtake a certain critical threshold to trigger such an evaluation. It is known that the Bangladeshi people have adapted to recurrent floods, considered as beneficial (*‘barsha’*), but they distinguish these from devastating floods (*‘bonna’*).

In capitalist cities, the threshold generally consists of the loss or damage of a certain number of human beings, goods, infrastructures, and services, all critical elements that contribute to social order. In ancient times, the destruction of a temple for instance may have been interpreted as a huge disaster generating a social crisis, and consequently disruption. In terms of security, it is thus easy to understand that multiplying disasters, especially urban and/or water-related, constitute a serious challenge. Now we must consider how to understand these disasters, i.e., who is at risk and why.

87.3 The Sources of Vulnerabilities and Affected Areas

87.3.1 The Geographic and Wealth Inequalities Among Impacts

Disasters do not affect societies evenly. Asia is disproportionately affected, being home to 94 per cent of the victims of natural disasters between 1964 and 1998 (Michellier 1999). Bangladesh, China, and India are home to 85 per cent of all affected people in the world. Ninety per cent of these disasters are due to floods and landslides. Broadly speaking, there is a clear differentiation in the severity of the impact between rich and poor countries, the latter being much more severely disturbed by the impact of natural disasters, both in human and economic terms (relative to the size of their economies).

Ninety-seven per cent of deaths occasioned by natural disasters occur in developing countries. Of the 50 deadliest natural disasters between 1960 and 2000, none occurred in an industrialized country⁶. The same applies to the 50 disasters with most affected people, and only three of them appear in the ‘top 50’ with regard to injuries. However, when the most costly disasters are considered, ‘industrialized countries’ appear 25 times among the ‘top 50’. Indeed, the economic prejudice in absolute values is much bigger in these countries. But in relative terms, closer to the reality of the impact, poorer countries suffer much more. Between 1985 and 1999, 57.3 per cent of the economic losses occurred in the richest countries, representing 2.5 per cent of their GDP. In the same period, the poorest countries experienced 24.4 per cent economic losses, amounting to 13.4 per cent of their GDP (Abramovitz 2001: 13–14).

This dichotomy between the rich and well protected, and the poor at high risk, is relevant for countries, sub-regions, and social groups or individuals within countries. Rich people are generally less affected, living in less dangerous areas, and being able to overcome losses. Miserable, marginalized, elderly people and all fragile groups that are relegated, dominated or stigmatized are among the prime victims of disasters and suffer more from their impacts. They are the most vulnerable groups. The same differentiation applies also to countries.

6 This data is drawn from the CRED/Em-Dat database, including also droughts, famines, and epidemics.

87.3.2 Explanation of These Inequalities: Risk, Vulnerability, and Insecurity

Disasters are less numerous and severe in well-off countries, even when the hazards are comparable. This can be explained by their different states of vulnerability.

Two types of definitions of risk may be distinguished:

- Objectivist definition: a *probability of damages* inflicted by one or several hazards to a vulnerable unit, or 'stake'. It accounts for latent threats, not yet manifested, but objectively and virtually existing (probable) and sometimes measurable.
- Subjectivist definition: "*perception of a possible danger*, more or less foreseeable by a social group or individual exposed to it"; a "representation of a real or supposed danger or hazard, affecting the stakes, indicators of a vulnerability" (Veyret 2003: 16,20). It accounts for socially constructed threats, and is closely related to their perception and representation.

Vulnerability can be described on the one side as a tendency to undergo damages, i.e. a state of fragility, or a set of conditions that raise the susceptibility of a community to the impact of a damaging phenomenon. On the other side, vulnerability is the incapacity to anticipate, cope with, resist to, adapt to, and recover from hazards. Vulnerable units are either non-resistant, i.e. incapable of withstanding the shock (without adapting); and/or non-resilient, i.e. incapable of absorbing the shock and adapting back to an acceptable state.

Security studies and risk or disaster studies use different vocabulary, but often qualify the same type of uncertain or realized states or situations. In order to procure a better integration of these disciplines, it could be useful to try and transcribe one 'language game' into another. This is proposed below.

If security is defined as the absence of threats, both objective and subjective, and safety is used for the absence of damages, then:

- *Risk* as a threat (real or perceived) accounts for a *state of insecurity*;
- *Disaster* as a realized threat describes a state of *non-safety*;
- *Vulnerability* as a contributor to a potential disaster is a *component of insecurity*.

Therefore *people* or societies *affected* by disasters are *not safe*; vulnerable people or societies at risk of haz-

ards are *insecure*. Wilches-Chaux (1993) remarks that if 'secure' means "free and exempt from any danger, damage or risk", vulnerability is synonymous with insecurity: "in the most profound sense of the term: insecurity for the existence; uncertainty in front of the daily history and in front of the surrounding world" (Wilches-Chaux 1992: 23). But according to our above-mentioned reasoning, vulnerability is not exactly *synonymous* with insecurity but a *component* of insecurity. If there were no hazard, the people, as vulnerable as they can be, wouldn't be threatened, and would not live in insecurity.

The concept of risk would be closer to describing a state of insecurity. Nevertheless, risk is a function of hazards and vulnerability. Consequently, no vulnerability (or no hazard) means no risk, which means no disaster, which means a situation of objective security and safety⁷. For this reason vulnerability is at the centre of the security problem. Thus, it is very important to understand the different components of vulnerability.

87.3.3 Features of Vulnerability

87.3.3.1 General Features

Vulnerability can be characterized as a *complex* process encompassing multiple intricate dimensions. As a process it is *dynamic*, i.e. constantly changing through time. Thouret and d'Ercole (1996: 408) interestingly talk of 'contingent vulnerability', i.e. conjunctural factors of vulnerability, "temporal and unpredictable, in a given locus and at the moment of the impact."

It is also often *cumulative*, causing disasters that in turn aggravate it, or adding to vulnerabilities in the case of other risks (such as socio-economical risks, etc.). Furthermore, vulnerability is both *hazard-related* (vulnerable to something) and *subject-related* (*one* is vulnerable, be it an individual, a group, a city, a society, the entire humankind, etc.). Therefore, one has to specify clearly which vulnerability one is talking about, and at which level of analysis (the individual level, the group level, or the societal level).

To make the analysis even more complex, vulnerability is also highly differentiated: different subjects, even at the same level, have different vulnerabilities. Some countries are disproportionately affected by

⁷ Note that there can be no vulnerability and no risk (objective security) but insecurity in a subjective sense can still exist.

disasters, as well as some cities, individuals, etc. Generally, the most miserable and isolated suffer most, as well as the less organized.

Finally, one can conclude that vulnerability is *context-dependent*, be it an individual exposed to natural hazards at the household level, or mankind at a global level. These 'transversal' features of global vulnerability apply to each component of vulnerability.

87.3.3.2 Components of Vulnerability

Vulnerability has two sides in interaction: exposure, and a series of insufficient capacities. Two types of *exposure* may be distinguished: a) physical exposure: presence and density of the people, habitat, networks, goods and services in risk zones, defining potential losses or damages, both human and non-human (stakes); and b) socio-ecological: human-induced ecosystemic perturbations aggravating the natural hazard—such as deforestation, land degradation, street pavement, some engineering practices, climate change, etc.

Insufficient capacities to prevent, prepare for, face and cope with hazards and disasters may be separated into:

- *physical weakness*: physical incapacity to resist or recover from a hazard's impact;
- *legal vulnerability*: weak state of the legislative and judiciary regulations to prevent, mitigate, prepare for, face, and recover from disasters;
- *organizational vulnerability*: weak state of the organizational disposals, at all levels, to prevent, mitigate, prepare for, face and recover from disasters;
- *technical vulnerability*: inadequate knowledge and/or use of risk management techniques;
- *political vulnerability*: weakness of the political powers, their legitimacy and control. Inadequacy of the control schemes, policies and planning, or broad political conditions;
- *socio-economical vulnerability*: socio-spatial segregation, large inequalities of wealth and access to the security disposals, misery, anomy and social disorganization, poor social position and social isolation of exposed people, existence of higher social risks undergone by people;
- *psychological and cultural vulnerability*: inadequate security paradigm or risk perceptions; cultural anomy or weakness; attachment to risk zones or risky behaviour, non-willingness or incapacity to protect oneself.

The overall vulnerability of an element (or stake) to one or several hazards is a mix of these particular vulnerabilities. This classification allows to guide the investigation on vulnerability as a reminder of the dimensions to consider. But as all these components are linked, such a list is not useful in forming a comprehensive picture of the state of vulnerability of an exposed unit, because one needs to establish relations.

87.3.4 Trends in Global Vulnerability

Vulnerability is also evolving. The rising number and severity of disasters worldwide shows a tremendous increase in vulnerability. At the global level, the main general trends explaining the rise are the following: a) *demographic pressures*: population growth, rapid and unplanned urbanization, increase of population density; b) *ecological degradation*: pollution, loss of biodiversity, land degradation, deforestation (global change issues); c) *socio-economic deterioration*: a reinforcement of the structures of domination throughout the world. Impoverishment, massive unemployment, rising inequalities, increasing violence, forced migrations, increasing concentrations of misery and extreme wealth, destruction of public collective structures, 'international financial pressures' (structural adjustments, Blaikie/Cannon/Davis/Wisner 1994: 32), etc; d) *disasters*: global epidemics, like AIDS and malaria; e) proliferation of 'low intensity' and high intensity wars. It could be added that the rise of natural disasters themselves constitutes a dynamics that increases vulnerability to future disasters.

At the local level, disasters are clearly linked with a mix of social risks, i.e. a situation of insecurity of the daily life including a state of misery, exclusion of services, goods, networks and rights. It is manifest in the existence of many people living in informal settlements like slums. People are forced to live in the most dangerous areas in poorly built houses. This situation of need and survival hinders capacity in preventing and coping with hazards. Now, how can security studies qualify and encompass this underestimated situation of insecurity? Is human security a possible concept?

87.4 Inclusion of Hazard Threats in Human Security

87.4.1 Requisites of an Integral Conception of Security

Security is never neutral. It is focused on a specific object (e.g. some people, the State), that one aims to protect and secure against specific threats induced by some agents of insecurity. It is evident that in the case of disasters, the threat is not a breach in security brought about by a foreign state or by terrorists. Disasters induce a crisis, or disruption in the functioning of a society in a manner that exceeds its ability to cope through the use of its own resources. It is therefore one of the highest forms of failure of security and stability at the collective level. We have seen the amazing impact disasters can generate, much bigger than that currently caused by terrorism. In terms of numbers of people affected, they are even much more important than wars. The nature of the threat is thus different.

At the individual level, the people to protect also differ from those in the previous vision. In the old State security conception, security meant protection for those people pertaining to the national community, by strengthening the State against one or several enemies. According to Brauch (2003c: 170), there are three main schools of thought in the international security debate: “a) the *Hobbesian* pessimist where *power* is the key category; b) the *Kantian* optimist where *international law* is crucial and c) the *Grotian* pragmatist where *cooperation* is vital.”

The traditional conception of security was Hobbesian, State-centred, and assumed security as a given. There is now a new consensus on the necessity to downplay the role of security and consider it more as a social construct. This means taking it as a normative and moral element dependant on social values (Wolfers’ 1962a definition in 87.4.3), and not as an objective reality. Simultaneously, this implies a reconceptualization of the concept of security by broadening and widening its dimensions according to the following research questions: which security for whom, by whom and with which means (Møller 2003; Brauch 2003)? The necessity for such an approach is obvious in our case, where there is no enemy to fight, but negative social, economic, and ecological forces that induce disasters. These are the agents of insecurity, conveyed by specific social individuals, groups and institutions, sometimes without even realizing it.

Humankind in its entirety is to be protected, but primarily the most vulnerable people. As argued above, they are the miserable or marginalized people, mainly found in the South. These vulnerable people need to be identified as the target of this type of security. Therefore, we need a new vision of security that would:

1. *recognize the threats*: e.g. natural disasters and their various impacts; other related threats;
2. *take into account all different levels*: global, regional, national/societal, intermediate (subregions, groups, communities) and individual;
3. *take into account all different temporal dimensions*: pre-disaster time, impact, post-disaster, short term/long term/future generations;
4. *prioritize what to protect?*: people, goods, livelihoods, infrastructures, networks, ecosystems, etc.;
5. *identify the agents of insecurity*: social, economical, ecological, political, cultural forces and actors involved, and all their interactions. Natural disasters and social risks are intertwined (see classification of vulnerability components below);
6. *propose a desirable state of security*: stability, absence or minimized disasters; and
7. *propose the necessary changes to reach it*: prevention, mitigation, preparedness, precaution, but also the struggle against misery, precariousness, inequalities of wealth and power, domination, ecological degradation, etc.

It is clear that international relations theories alone cannot provide these analyses. The analyses of vulnerability and socio-ecological dynamics required must be interdisciplinary and hybrid, holistic, and with a strong social and ecological focus.

87.4.2 Advantages of the Human Security Concept

Numerous events, factors and trends have challenged the old militaristic, realist conception of security focused on the State. In addition, these factors have contributed to a widening of the security concept: the end of the Cold War, liberal globalization, and economical deregulation, the ecological crisis, the increase of misery and inequalities, the changing nature of conflicts (more internal to States), the eruption of powerful non-State actors (NGOs, corporations, armed groups), the multiplication of disasters of all kind, etc. As we have seen, these trends have forced scholars and practitioners to extend the definition of security. Considerable literature can be

found on this broadening and deepening of the security concept (Wing 2000) to new referent objects (e.g. the individuals, communities, society, etc.; Wæver (1995) and the Copenhagen school), new domains (environment, economy, etc.; see Brauch 2003, 2003c, 2005), new means (conflict resolution, poverty alleviation, etc.), new levels (regional, community, societal), etc. Human security is part of this conceptual trend (Debiel 2004, also in this volume).

The United Nations Development Programme that introduced the concept in 1994 divides it into seven interrelated categories: economic security, food security, health security, environmental security, personal security, community security, and political security (UNDP 1994). The two major components thereof are summarized by “*freedom from fear*” and “*freedom from want*”. Some of the threats to human security include population growth, economical disparities, migration, ethnic disputes, social disintegration, environmental degradation, drug trafficking, poverty, etc. It is complementary to human development, which consists in *widening the range of choices*; human security is about *ensuring that people can exercise these choices* by offering them the necessary stability. It is close to Sen’s *Entitlements theory*. Thus, it is not surprising that Sen himself has become one of the promoters of this concept.

The definition of the *Human Security Commission* is useful and complementary to the one proposed by UNDP: Human Security is a goal to reach in order “to safeguard the vital core of all human lives from critical pervasive threats, in a way that is consistent with long term human fulfilment” (Alkire 2002a).

In our understanding of this emerging concept, human security would be interesting for points 1, 4, and 6, mentioned above, and partly for points 5 and 7. Indeed, the concept envisages security as a desirable state to reach (point 6.) in which disruptions would be avoided (point 1) and stability guaranteed. It also focuses on individuals and communities, i.e. on the human component (point 4), more than on immaterial entities like the State. It seeks to enlarge the narrow conceptions of security, in order to focus on those who really suffer. Thus, it introduces a part of social sciences analysis into international relations (IR), security studies and their networks, providing an interesting strategic advantage for points 5 and 7. It proposes a humanistic revolution in ‘security studies’ and in ‘international relations’.

87.4.3 Shortcomings of the Human Security Concept

Human security has stressed as the main threat the disruption of what is really important in people’s lives: a decent life at reasonable standards (*freedom from want*, i.e. from the most basic needs); and stability, i.e. a possibility to consider life and the future with serenity (*freedom from fear*), exempt from killings, injuries, huge losses, brutal changes, job insecurity, disasters, etc. Interestingly, the UNU/EHS suggests the addition of a third security pillar to the above-mentioned two: “freedom from hazard impact” (Brauch 2005). Both *objective* (“absence of threats to acquired values”) and meanings (“absence of fear that such values will be attacked” Wolfers 1962a: 23) are contained in these definitions of human security. ‘Want’ can be both an objective lack of basic elements for a decent life and a subjective desire, depending on socio-cultural determinations; ‘fear’ is obviously a subjective feeling, but can sometimes be linked to an objective reality (a high probability of being killed or injured for example); ‘hazard impact’ seems primarily to be purely objective, but the difficulties of measuring it, especially for the numerous small-scale and little impacts, show that there is also a strong social component in its determination.

What is implied if one takes this conception of human security seriously, is no less than a huge social change at all levels, including global, necessary to reach such an ambitious goal. But neither does it explain anything to make better diagnostics (points 2, 3 and 5), nor does it propose clear means for the changes and how to obtain their implementation (point 7). To make it useful, its promoters should explicitly recognize these deficiencies and more clearly separate the normative part, i.e. the objective proposed (whom to protect, from what and how; points 4, 1, 6 and 7), and the necessary analyses to be made for it (points 1 to 5).

Human security therefore needs an explicit agenda by which to understand and explain the root causes of human insecurity, by integrating studies of social sciences, ecological and natural sciences, international relations, critical analysis of power struggles and vulnerability, development studies, etc. Only then will it be possible to formulate more adequately the necessary changes to reach the goal of human security, and how to implement them. A tough political work would then remain to be done.

87.5 Conclusion

We have seen that natural disasters constitute a very important threat for millions of people, usually poorly taken into account in security studies, even though their acuteness is constantly growing. They generate social, economic, political, and cultural crises, with enormous human impact, mostly on the poorest and most fragile people of Southern countries. This can be characterized as a situation of chronic insecurity and may be understood only by recognizing the vulnerability of these people and societies, and all the components that are found deep within the social fabric (such as patterns of inequality of wealth and power, the ecological crisis, and political, economic, cultural, or legal frameworks, etc.).

Dealing with this insecurity, traditional security thinking is unable to comply with what we call the “requisites of an integral conception of security” that recognises the threats and analyses all their dimensions. The concept of human security that emerged in the 1990’s is useful in placing these new elements on the agenda, and in its insistence on human suffering. It is more accurate as a desirable objective for security than as an analytical framework, for which the concept of vulnerability is more adequate. Despite these deficiencies, it could be used as a strategic means to elaborate an integral conception of security. For that to happen, a clear agenda of interdisciplinary and hybrid research would need to be elaborated, with a strong focus on critical social science and ecological research. This could serve as a basis to formulate more accurate normative social changes and policies, and the means to achieve them, that is, a truly political task.

88 Environment as an Element of Human Security in Southeast Asia: Case Study on the Thai Tsunami

Surichai Wun'Gaeo

88.1 Introduction

This chapter addresses the research question: How do environmental resources become a key factor of human security for social groups? It poses two hypotheses: first, the state is both a determining and an intervening factor; and second, the affected communities are not passive actors, but are rather active partners in sustainable livelihood recovery.

The catastrophic Indian Ocean tsunami serves points to a need to refocus attention on environmental threats to human security. This calamity that struck the region on 26 December 2004 has prompted a wide range of national as well as international actors to respond to regional environmental threats. The experience of the tsunami in Thailand illustrates the larger picture of environmental threats to human security.

This chapter examines environmental resources as an element of human security by placing the ASEAN region and Thailand into a geographical context (88.2). It outlines a framework for human security from an environmental perspective focusing specifically on how natural disasters can threaten security and create situations of extreme vulnerability. Specifically, the environmental dimension of human security will be analysed for the impact the 2004 Indian Ocean tsunami had on humans and their economic possessions (88.3). The chapter then discusses the empirical findings of a field study conducted by the author and a team in the tsunami-affected areas of southern Thailand in 2006. This case study discusses the coping strategies in facing such extreme circumstances of vulnerability and human insecurity (88.4). Finally, the hazard impacts and social vulnerability are analysed interpreting the event by focusing on hazards posing threats to human security in Thailand (88.5).

88.2 Geographical Context: The ASEAN Region and Thailand

For Southeast Asians, human security has become a very concrete concept, understood unmistakably through the numerous forms of downside risks that have undermined the livelihoods of the millions of its vulnerable people. Southeast Asia encompasses Brunei, Indonesia, Malaysia, the Philippines, Singapore, Thailand, Cambodia, Laos, Myanmar and Vietnam (chap. 79 by Othman; figure 88.1). The region is often identified with the Association of Southeast Asian Nations (ASEAN) that was originally formed in 1967 by Indonesia, Malaysia, the Philippines, Singapore and Thailand. In 1984 Brunei became a member and after the end of the Cold War, Vietnam joined the organization in 1995, followed by Laos and Myanmar in 1997, and finally Cambodia in 1999.¹

Southeast Asia comprises different geographical landscapes, and it is an environmentally diverse region with an abundance of land, minerals, forests and aquatic resources (Focus 2006: 7). More than 500 million people inhabit the region. With the exception of Brunei and Singapore, the majority of the population in still lives in rural areas and earns its livelihood from agricultural activities. Most of the rural communities depend on local resources, such as forests and rivers, as crucial sources of food, medicine and housing.

Despite the immense dependency of these agricultural-based societies on the natural environment, the ASEAN approach to environmental resources tends to be piecemeal, and often contingent on the exigencies dictated by commercial needs (Focus 2006: 8). The region prioritizes economic growth, particularly in sectors such as finance, energy, and infrastructure,

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Figure 88.1: Map of Southeast Asia: **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection. This map is in the public domain; at: <http://www.lib.utexas.edu/maps/middle_east_and_asia/southeast_asia_ref_2007.jpg>.



rather than focusing on long-term human development.

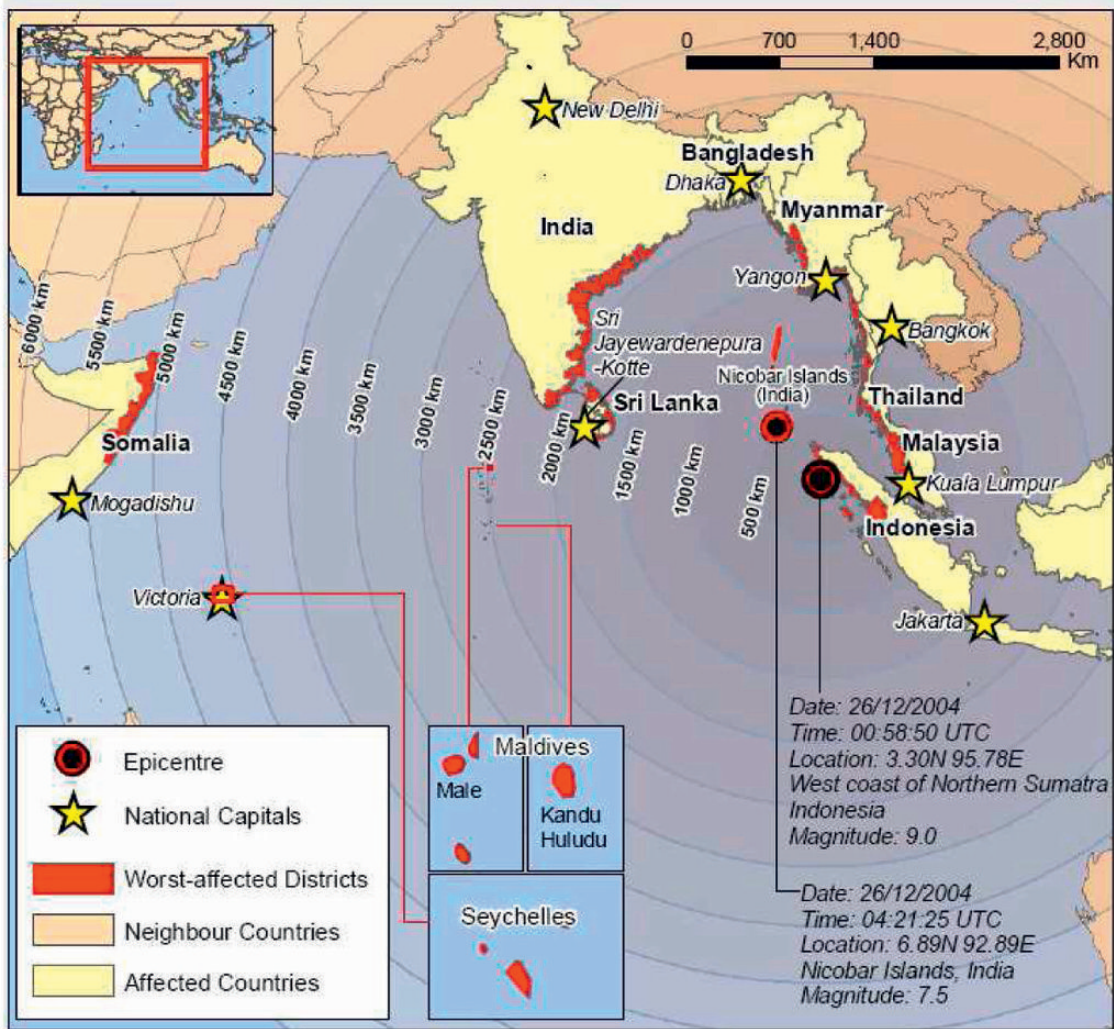
Within Thailand itself, major threats and challenges to human security during the past decade have included the 1997 Asian financial crisis that wiped out jobs, housing and lifetime savings, pushing many Thais into a state of income poverty; and the violent conflict in the southern border provinces, which has worsened in recent years, killing hundreds of innocent people, wreaking emotional devastation on families, and impeding the growth of the local economy. How-

ever, the threats arising from economic and social insecurities that have jeopardized human security are attributable not only to poor human-made policy choices, but also to sudden forces of nature.

88.2.1 The Indian Ocean Tsunami

Another major crisis facing Southeast Asia since 1997 was the tsunami that devastated South (chap. 93 by Ariyabandu/Fonseka) and Southeast Asian countries surrounding the Indian Ocean in December 2004.

Figure 88.2: Impact of the Tsunami in the Indian Ocean on 26 December 2004. **Source:** UNOCHA Situation Report No. 18 (14 January 2005), ReliefWeb Map Centre; at: <[http://www.reliefweb.int/rw/fullMaps_Sa.nsf/luFullMap/B02797119AFBF54C85256F8C005E4894/\\$File/rw_tsu_sitrep18_170105.pdf?OpenElement](http://www.reliefweb.int/rw/fullMaps_Sa.nsf/luFullMap/B02797119AFBF54C85256F8C005E4894/$File/rw_tsu_sitrep18_170105.pdf?OpenElement)>.



The names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Countries affected by the tsunami include Indonesia, Malaysia, Myanmar and Thailand in Southeast Asia, as well as Sri Lanka, India, the Maldives, Somalia and South Africa (Acharya 2007; figure 88.2).

Responding to the destruction, international humanitarian assistance and relief efforts came from countries outside the region, especially from European countries, the United States, Australia, Japan and China. This tragedy focused international attention on natural disasters as a threat to human security. Moreover, it highlighted the need for Asian governments and Asian regional institutions to introduce a human dimension into their approach to security cooperation. In January 2005, a Special ASEAN Leaders’ Meeting in Jakarta discussed coordination of interna-

tional relief efforts and the creation of a regional early warning system. ASEAN proposed a resolution on “Strengthening Emergency Relief, Rehabilitation, Reconstruction and Prevention in the Aftermath of the Indian Ocean Tsunami Disaster,” which was later adopted by the UN General Assembly (Acharya 2007).

The Southeast Asian country most affected by the tsunami was Indonesia. About 165,708 people lost their lives and, over all, more than one million people were affected in Aceh.² However, while the tsunami itself resulted in tremendous negative impacts, it also helped move former conflict parties in Aceh toward reconciliation, not only among the people, but also by

strengthening relations between activists and the Indonesian government.

Thailand has historically had the good fortune of being a relatively disaster-free country, suffering only minor losses from natural catastrophes through the years. However, emerging as a newly industrialized country, it now faces an increased risk of damage to the economy and the public from man-made disasters associated with rapid development (Shook 1997). The 26 December 2004 tsunami was the greatest single natural disaster the country has suffered since 1950. Its impact was primarily associated with the tourism industry, which is the main source of income for the region. In Thailand, the calamity resulted in a confirmed 5,395 deaths, 2,817 missing persons unaccounted for, 3,302 houses totally destroyed, and more than 35,000 families whose livelihoods have been lost (Scheper/Patel 2006). The tsunami catastrophe greatly affected the tourism and hospitality industry.

According to an estimate by Thailand's *National Economic and Social Development Board* (NESDB), the country is assumed to have lost approximately 30 billion baht (equivalent to approximately USD 750 million or EUR 500 million) in revenue solely due to cancellations of holiday bookings. This factor alone would represent a decrease in the *gross national product* (GNP) by approximately 0.3 per cent (Weber 2005: 34). Beyond these economic losses, the destruction and damage to the environment also have far reaching effects on the coastal communities. Out of the affected people, up to 90 percent could be categorized as coastal poor, half of whom lived below the poverty line.

88.3 Environment and Human Security: A Theoretical Framework

The traditional approach to security has focused on the state. According to this traditional concept, the state monopolizes the right and means to protect its citizens. But in the 21st century, challenges to security have become much more complex. While the state theoretically remains the fundamental purveyor of security, it has in many instances failed to fulfil its security obligations. Moreover, sometimes the state has

even become a source of threat to its own people. Therefore, attention must now shift from 'state-centred' to 'people-centred' security (CHS 2003: 2). This shifting referent object of security led to the new paradigm of 'human security' that can no longer be understood purely in terms of violence, conflicts, or wars; instead, it must also embrace economic development, social justice and environmental protection. It first appeared in the 1994 *Human Development Report* of the *United Nations Development Programme* (UNDP 2004; Paris 2001: 89). This report identified seven elements of human security: 'economic', 'food', 'health', 'environmental', 'personal', 'community' and political security.

However, concerns over the linkages between global environmental change (GEC) and security have been discussed since the 1950's (Brauch 2005: 59). Environmental disasters challenge the survival of vulnerable people, and have therefore been perceived as a direct threat to human security. According to the Commission on Human Security, the relationship between human security and the environment is most pronounced in areas featuring human dependence on access to natural resources. Environmental resources are a critical component of the livelihood of many people (CHS 2003: 17). The attention now paid to the complex linkages and interdependencies between environmental risks and impacts on security perception is due to the development of environmental security (CHS 2003: 59).

Environmental security is described by Barnett as a process of minimizing environmental insecurity, in which humans are a major reference points. It addresses the impact of environmental degradation on the individual and people in terms of malnutrition, lack of energy and clean water (Brauch 2005: 24–25). As concerns on the impact of environmental changes on humans have mounted, the environmental agenda itself has become an object of securitization. The inclusion of the environmental security dimension in the framework of human security has resulted in understandings on the necessity of containing environmental threats that are a source of danger. Since human security according to the Commission on Human Security (2003) is 'freedom from fear and want', the attainment of environmental security probably means the achievement of this freedom.

2 EM-DAT. The OFDA/CRED International Disaster Database. Université Catholique de Louvain, Brussels; at: <http://www.emdat.net/disaster/visulisation/profiles/natural-table-emdat_disaster.php>.

88.3.1 Human Security and 'Social' Vulnerability to Hazards

Unlike conventional approaches to analyzing security, human security is centred on people and not on states or territorial boundaries. It focuses on empowering the individuals and communities within and across territorial boundaries, while simultaneously strengthening human rights and human development. According to the *Commission on Human Security*, human security calls for the protection of the vital core of all human lives by enhancing human freedoms and human fulfilment. Human security means protecting fundamental freedoms – freedoms that are the essence of life. It means protecting people from critical (severe) and pervasive (widespread) threats and situations. But it also refers to using processes that build on people's strengths and aspirations. It means creating political, social, environmental, economic, military and cultural systems that together give people the building blocks of survival, livelihood and dignity (CHS 2003: 4).

One key aspect of human security is not only the provision of physical protection of people, but also the creation of an enabling, multi-faceted environment that empowers people to fend for themselves and to have the freedom to determine their own goals and ways of life. Reducing 'hazard impacts' reduces economic damage (aiming at 'freedom from want') and also prevents the kind of social impact that can trigger violence (thus aiming at 'freedom from fear'). Thus, an effective environmental and hazard coping strategy can contribute to both human development and reduce the likelihood of violence occurring.

One of the complexities of human security lies in the scope and interconnectedness of the risks and vulnerabilities with which it is concerned. Environmental degradation and environmental change that render communities more vulnerable to disasters have increasingly been included in discussions on human security, particularly in many developing Asian countries, where agriculture is a way of life for many people in society. Natural disasters unquestionably threaten human security, causing human, economic and environmental losses (chap. 87 by Nathan). They impact on individuals, families and societies by exacerbating the risk of physical human loss and injury. They debilitate the education and health systems, which, in turn, limit the choices and opportunities of individuals to choose their livelihoods. Often resource-limited state institutions are further constrained, weakening their ability to provide physical protection and social safety nets for the citizenry. When a natural disaster takes

place in a country with a populace that already faces various deprivations such as extreme impoverishment and malnutrition, water insecurity, poor health, political powerlessness and environmental degradation, the effect on human security can be unfathomable.

88.3.2 Environment as an Element of Human Security

Two environmental causes of hazard impacts in Thailand dating from 2004 and 2006, respectively, have contributed to a high degree of physical vulnerability in affected areas, namely: a) deforestation of some regions in northern Thailand for agricultural land; and b) removal of the mangrove forests along the coastline for tourism.

In many developing Asian countries, where a disproportionate number of natural disasters have claimed victims during the past 40 years (chap. 87 by Nathan), the environment has an even more significant relationship with human security because of the high dependency of the predominantly agricultural-based societies on the natural environment. For the people living in these rural communities, many of whom represent the economically poorest in society, the environment serves as a comprehensive provider of the sources for life. Families rely on forests for fuel and on subsistence agriculture and fish from the sea and rivers for food (CHS 2003: 17). Furthermore, diversity of environmental resources

gives security and offers survival possibilities, and ... enables multiple livelihood strategies. For example, in a drought, certain foods may not be produced by a family nor be available on the local market, but a comparatively diverse set of wild plants in a local forest can be substituted and thus help people to survive (Neefjes 2000: 47)..

When threats to these environmental resources emerge, such as through land erosion caused by deforestation and agriculture, or pollution from industrial activity, the options for survival become minimized. The effect on the poor is both direct and immediate. Families are forced to "migrate to ever more marginal lands" in hopes of preventing food insecurity, hunger and famine.

The importance of the environment as an element of human security in these societies lies not only in the dependency on agricultural activities as a means of economic livelihood, but rather the environment itself constitutes an integral part of people's cultures and daily practices. For example, food habits, house designs, clothing, musical instruments, and work pat-

Table 88.1: Summarized Table of Natural Disasters in Thailand from 1955 to 2006. **Source:** EM-DAT: The OFDA/CRED International Disaster Database; at: <www.em-dat.net>, Université catholique de Louvain, Belgium; created on 31 March 2007.

	# of Events	Killed	Injured	Homeless	Affected	Total Affected	Damage US\$ (000's)
Drought	5	0	0	0	7,500,000	7,500,000	424,300
avg per event		0	0	0	1,500,000	1,500,000	84,860
Earthquake	1	0	0	0	0	0	0
avg per event		0	0	0	0	0	0
Epidemic	5	212	0	0	4,765	4,765	0
avg per event		42	0	0	953	953	0
Flood	52	2,783	4,085	163,283	30,402,607	30,569,975	4,548,291
avg per event		54	79	3,140	584,666	587,884	87,467
Slides	2	38	10	33,000	100	33,110	0
avg per event		19	5	16,500	50	16,555	0
Wave / Surge	4	8,876	8,457	200	58,550	67,207	405,467
avg per event		2,219	2,114	50	14,638	16,802	101,367
Tsunami, 26 Dec. 2004	1	8,345					405,200
Wild Fires	1	0	0	0	0	0	0
avg per event		0	0	0	0	0	0
Wind Storm	25	1,479	120	110,741	3,063,248	3,174,109	696,539
avg per event		59	5	4,430	122,530	126,964	27,862

terns all reflect the community of plants and animals that surround them (Sachs 2002: 26). Because the environment is an integral part of life for people living in these agricultural-based societies, changes in environmental conditions greatly affect the way of life and therefore impact on human security.

The connection between environment and human security can be illustrated in the pattern of migration in agricultural-based societies. Most migrations in agricultural-based countries are seasonal and cyclical rather than permanent. Both the influx of labour migration from rural to urban areas after the harvest season and during times of famine, in search of income to prevent economic insecurity, clearly illustrate the environmental dimension of human security. Although the environment is not the sole determining factor for the movement of people, it nevertheless exerts an influence on people's decision making. Regardless of whether migration in these societies is driven by push or pull factors, the environment very likely induces the movement, since environmental change interacts with other factors and eventually affects the socio-economic system.

In addition to the phenomenon of environmental changes gradually eroding the socio-economic fabric

of rural communities, natural disasters also cause direct and immediate insecurity in human life. In many developing countries, natural disasters such as floods and earthquakes have socially and economically far reaching consequences on society. Natural disasters have caused food insecurity, shattered livelihoods and shaken economies through the destruction of infrastructure. Moreover, the loss of human lives has left many orphans or single parents, thereby exacerbating the social problems..

Against this backdrop, it is clear that environmental threats have far reaching effects on human life. As mentioned above, according to the *1994 Human Development Report* (UNDP 1994) environmental security is an element of human security. Environmental security aims to protect people from the short and long-term ravages of nature, man-made threats in nature, and deterioration of the natural environment. The report clearly highlights the nexus between environment and human security.

Figure 88.3: Map of Thailand. **Source:** Map 3853, Rev. 1, January 2004. UN Cartographic Service. Department of Field Support; at: <<http://www.un.org/Depts/Cartographic/map/profile/thailand.pdf>>.



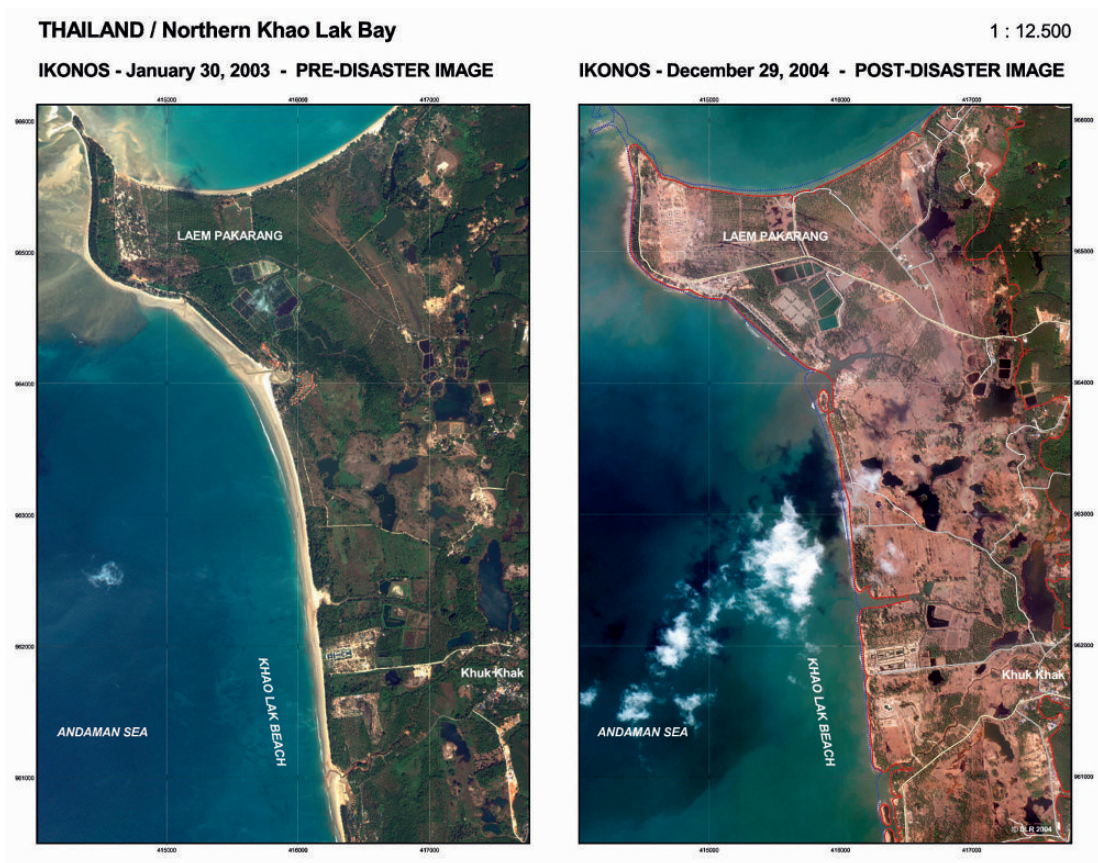
88.4 Environmental Threats to Human Security in Southeast Asia: Thailand and the Tsunami

88.4.1 Tsunami Impacts on Humans and Their Possessions

The Indian Ocean tsunami that struck Thailand on 26 December 2004 was the greatest natural disaster in

the country’s recorded history, causing unprecedented physical, emotional and economic damage and destruction (table 88.1). The tsunami affected six provinces along Thailand’s Andaman coast, namely Ranong, Phang-Nga, Phuket, Krabi, Trang and Satun. It left more than an estimated 8,000 people dead and impacted 407 villages, of which 47 were completely destroyed, including well-known tourist destinations

Figure 88.4: Satellite images of the Northern Kho Lak Bay (Thailand.) before and after the Tsunami. **Source:** UNOSAT, International Charter Space and Major Disasters Product ID: 325 - 14 Jan, 2005; at: <<http://unosat.web.cern.ch/unosat/>>.



such as Phuket and Phi Phi Island (UN 2005e: 9). With regard to specific affected groups, vulnerable fishing communities, ethnic minority groups, migrant workers and workers in the tourism industry were the most severely affected by the catastrophe. Nearly 1,500 children became orphans, suffering the loss of one or both parents (APWLD 2005). In addition to the shocking physical loss of loved ones, there was also a tremendous mental health impact on survivors, as they had to cope with the psychological and emotional trauma inflicted by the tsunami (Mental Recovery Centre in Phang Nga 2006; in: Wun'Gaeo et al. 2007).

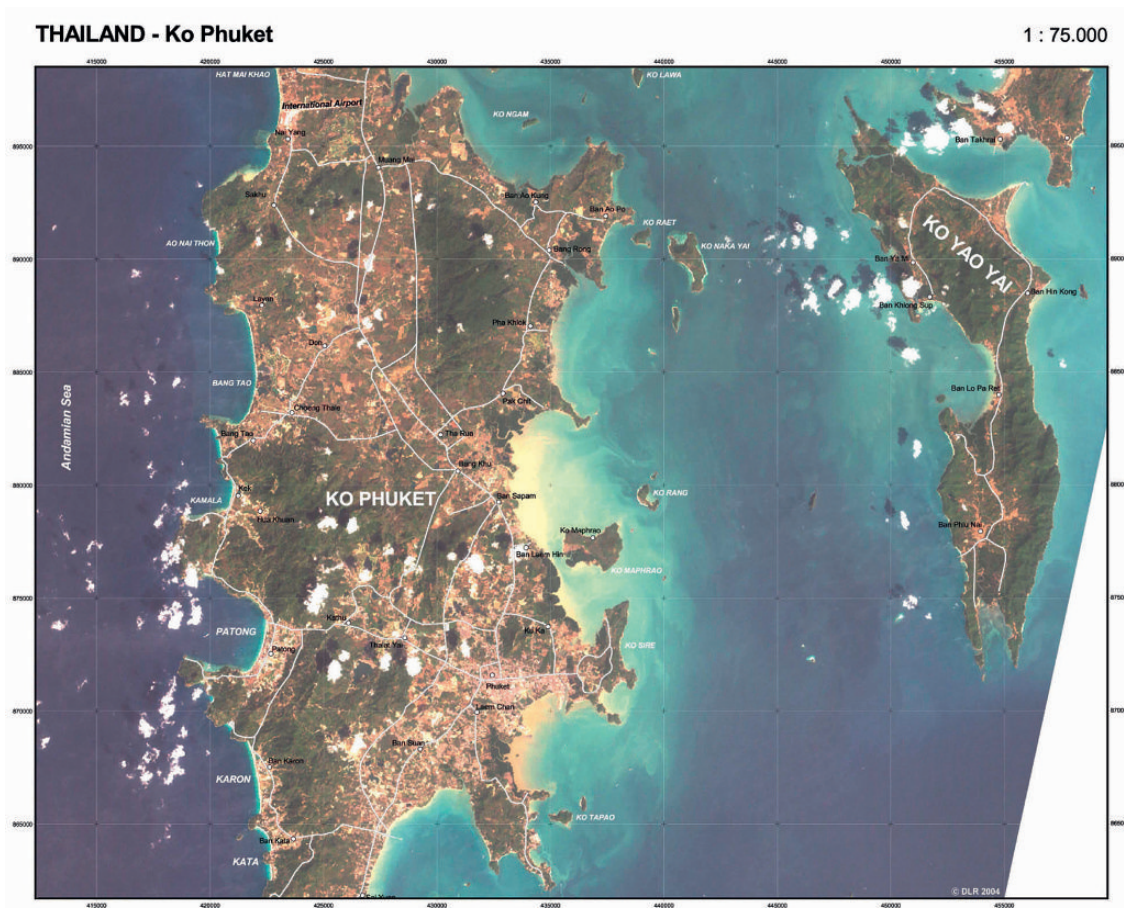
The worst hit area – the central Thai Andaman coast, stretching from Phang Nga to Krabi, with Phuket at the centre – had seen a recent boom in development of interlinked economic activities based on coastal resources (figure 88.3). This development made use of natural resources and the fertile environment as the major driving force behind the rapid expansion of mass tourism (UNDP 2005c).

Prior to the disaster, there was a diversity of stakeholders involved in the local fishing communities. Groups that cooperated in the tourist sector included the entrepreneurs operating resorts and hotels, as well as other groups from the local communities, whose members were very diverse, being composed of Thais, both Buddhist and Muslim, illegal Burmese migrant workers, and three particular groups of ‘sea gypsies’ know locally as “Morken, Morklen and Urak Lawoi” (SAN 2006).

The booming of the tourism industry directly and indirectly created attractive new sources of income and jobs for local people, for example, as staff members and workers at resorts and hotels. It also provided a new market for local production, and subsequent revenues were invested in services and small businesses, mostly oriented toward the tourism industry (e.g., souvenir shops, restaurants, and guided tour businesses).

In terms of the economy alone, the impact of the tsunami was staggering, particularly on the tourism in-

Figure 88.5: Satellite images of Ko Phuket (Thailand.) after the Tsunami. **Source:** UNOSAT, International Charter Space and Major Disasters Product ID: 327 - 14 Jan, 2005; at: <<http://unosat.web.cern.ch/unosat/>>.



dustry. According to the Phuket Tourist Association (PTA), before the tsunami, 80–90% of business in the province was tourism-related. However, after the tsunami, as employers faced enormous reconstruction costs and a massive decrease in revenues, tens of thousands of workers in the hotel and tourism industries became unemployed, triggering a ripple effect on the informal economy as well (ILO 2005: 1). In total, the financial impact of the tsunami was estimated at more than USD 2 billion, representing a fall in overall GDP growth of 0.4% (UN 2005c: 9). In regard to the local ecological system, southern Thailand suffered substantial damage to its coral reefs, mangrove forests and other marine and coastal habitats. Because the tsunami caused inward flooding in coastal areas up to 3 kilometres, inland and surface water was contaminated by sea water, damaging inland potable water sources (figure 88.4, 88.5)

Apart from the tourism sector, coastal fishing communities also made significant contributions to the economy by supplying fish and seafood products

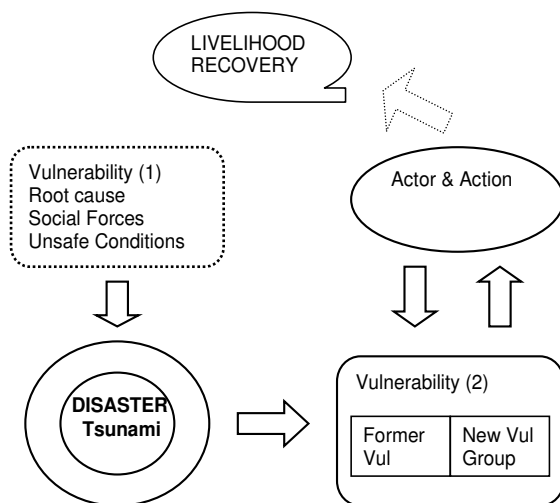
to the hotels and restaurants in the area. Migrant workers from Burma and ‘sea gypsies’ found employment in this complex sector too, but were ‘invisible’ insofar as they lacked official government documents. While casualties resulting from the tsunami among these populations also remain largely undocumented, it is nevertheless clear that prior to the tsunami, they were living in the area and derived benefit from tourism-related jobs, a situation the UNDP described as having “all eggs in one basket” (UNDP 2005c). There is no doubt that the tsunami caused a large loss of income from tourist revenue, fishing and related activities. People lost their productive assets such as boats, fishing equipment and business facilities. It is also expected that it will take time and require major efforts in order to recover from the tremendous drop in demand. Although the government immediately responded to the crisis, it remains unclear whether government officials fully took into account the complex features of the problem, which will require a long recovery and mitigation process.

88.4.2 Hazard Impacts and Social Vulnerability

Natural disasters do not recognize human social constructs such as class, gender, ethnicity and religion. But the social experiences of survivors in the process of recovery do tend to become differentiated along social lines. When disasters occur, it is necessary to locate the convergence of government efforts and external aid in providing immediate relief and assistance in returning to normal everyday life. The complex reality among the variety of relevant social groups (Thai Buddhists, Thai Muslims, Burmese migrants, and 'sea gypsies'), which is a result of the rapid development of fisheries and mass tourism along the Andaman coast, has created a situation in which there is a large mixed and growing population, with a tight interdependency of livelihoods, surviving on a limited range of opportunities. Government policy regarding recovery has paid much attention to the reconstruction of the tourism industry, but state distribution of resources has created many problems of lands rights and displacement, and is the cause of further vulnerability among those affected.

Figure 88.6 was developed based on the tsunami as it affected Thailand. It illustrates the correlation between vulnerable groups before the disaster and those emerging as newly vulnerable groups after the disaster, and the cause-effect relationship between relief actors and vulnerable groups. Relief action can lead people to the recovery phase or place them back again in a vulnerable condition.

Figure 88.6: The Vulnerability Cycle. **Source:** Designed by the author.



The first box (Vulnerability 1) contains the many groups who were socially vulnerable prior to the tsunami, such as illegal Burmese migrants, 'sea gypsies' and stateless persons. They existed but were 'invisible' to the Thai government. When the tsunami struck, the Thai government, NGOs and media discovered their existence. According to data presented by the Tsunami Evaluation Coalition, there are about 60,000 Burmese people who were affected by the tsunami (Scheper/Patel 2006). Burmese migrant workers who lacked legal documents were ignored by both their own government and the Thai government, and received no compensation. Most did not have an income generating capacity on their own. As migrants without official legal status, they had to rely on their employers to provide them with jobs. However, their employers also lost their businesses in the tsunami and therefore lacked the capacity to provide them adequate assistance. These conditions pushed them into a position of vulnerability.

The second box (Vulnerability 2) also contains new vulnerable groups that emerged in the aftermath of the tsunami. Their status relates to their economic position, gender, age and ethnicity. They include, for example, women, orphans and persons with disabilities. These groups of people became vulnerable due to inadequate support and the political opportunism involved in the Thai government's tsunami relief policy. Government actions had a major impact – easing or actually worsening – on peoples vulnerability during relief and recovery. Depending on the particular action, the government in fact brought about resilience and recovery for some, while perpetuating the vulnerability of others.

The tsunami itself frequently induced conditions of physical vulnerability, including, for example, fear of the tsunami aftermath, earthquakes and an unpredictable new tsunami coming. Empirical research reported in *Sociology of Tsunami* (Wun'Gaeo et al. 2007) and information from the Tsunami People's Network (2008) reveals that many problems stemmed from the role of the state and its perception during the period of relief and recovery. The top four problems attributable to the misguided role of state are: 1) land rights and disputes, 2) rights of ethnic minorities ('sea gypsies'), 3) problems of stateless persons, and 4) the negative impacts of mega projects.

The problem of renewed and continuing disputes over land rights between affected communities and business people with interests in tourism clearly reflects the bias in state policy, which was primarily interested in the reconstruction of the tourism industry

rather than being concerned about the livelihood recovery and security of the people affected by the tsunami. Many land disputes occurred immediately in the aftermath of the tsunami. While local people were still in shock from the tragedy of losing their physical assets and their loved ones, wealthy business people came and claimed rights over the land that previously belonged to the local communities. People in these communities consequently became landless. This kind of problem represents the 'double victimization' of some people affected by the tsunami, giving rise to even greater insecurity and vulnerability.

Stateless persons comprise the group perhaps most severely affected by the tsunami, since they were 'invisible' to the Thai government and the public before, during and after the disaster. The origins of the particular group of Thai people in question go back to the pre-colonial era, when their ancestors were living in communities spreaded around. When Britain colonized Burma, the delineation of its territory created the salience of arbitrarily fixed state borders. Prior to their migrating to work in Thailand, these stateless persons lived in Burma. However, both the Burmese and Thai governments, have so far, denied their existence and refused to grant them citizenship. This problem has existed since prior to the tsunami, and continues to this today. For the people in question, lacking an official identity card meant lacking entitlement, so they received no help from the Thai government and were left to suffer in silence.

Learning from the tsunami experience, these stateless and returnee diasporas people have made efforts to join together and form a network of stateless persons. Today, they are coordinating with local NGOs in order to struggle for recognition and citizenship rights.

Our assessment of the strategy in coping with the tsunami disaster focuses on three distinct periods, namely the emergency, recovery and rehabilitation periods. According to the field research conducted in Thailand, the major strength of the strategy in coping with the tsunami disaster was the speedy response of the government in effectively reacting to the crisis. Moreover, the social and community responses should also be regarded as part of the strength of the strategy. This is because cooperation among communities resulted in the creation of a self-organizing system that was more capable of directly reaching target groups. Self-organizing communities have also played an eminent role in planning long-term development measures.

However, the weakness of the plan and strategy lies first in the coping strategy and responsive measures adopted that overemphasized emergency management to the detriment of the recovery and rehabilitation processes. Second, in coping with the tsunami, Thailand put in place a mass tourism-led recovery strategy that aimed primarily to recover economic losses in affected areas by prioritizing assistance to foreign tourists in order to regain their confidence. Many local victims and foreign migrant workers were not registered or included in these efforts, resulting in the sad fact that aid and assistance simply never reached a large number of the victims. Third, there were shortcomings in the official assistance system, so that in practice, it only responded to the political leadership or government policy, and did not coordinate with community networks to assist local people and foreign migrant workers, who were the most vulnerable groups. Fourth, the holistic approach of livelihood recovery was not taken into account. Fifth, efforts in the area of communication tended to emphasize presenting the disaster to the public at large rather than facilitating communication at the community level. Sixth, there were problems in the macro-policy process, which could be observed in the mismatch between emergency and recovery management. Moreover, the policy implementation adopted favoured a mass tourism-led recovery strategy instead of a community-led strategy. Finally, there was no policy coordination, which subsequently caused confusion and conflict between different official agencies. As a consequence, legitimate questions were raised as to whether the post-tsunami relief strategy was designed to facilitate the revival of the tourism industry or to genuinely assist affected communities.

88.4.3 Interpretation of the Tsunami: Focusing on Hazards Posing Threats to Human Security in Thailand, and the State as an Intervening Factor

The tsunami experience in Thailand highlights policy gaps in coping with disasters. Some of these gaps are between sectoral policies, and result from a lack of policy coordination. However, there are also gaps between policies, on the one hand, and implementation measures, on the other. Moreover, gaps also exist between policy and operation, or between policy and the actual needs of affected victims in the stage of recovery and rehabilitation. Included in this latter case are gaps in the interface between policy and the recov-

ery measures initiated by the affected communities themselves.

All of these gaps indicated several problems. First, policy did not adjust to the changing demands of the communities. For example, after the emergency period, affected communities placed an importance on the recovery and rehabilitation processes, yet policy was still focused on emergency management. Second, the measures to cope with the disaster were designed to respond to pressure from high ranking authorities rather than to facilitate the needs of the affected communities. Finally, the above mentioned gaps demonstrate that the affected communities were not given priority in policy. Recently their leadership and creativity has however been more focused by some international agencies (UNDP 2008).

Almost as if underscoring their exclusion, at the memorial ceremony marking the one-year anniversary of the tsunami, the affected people were merely invited as guests of the government rather than being allowed to be the host themselves. Over all, in consideration of the overview of the system detailed above, the Thai political leadership then demonstrated in dealing with the tsunami disaster can rightfully be characterized as emergency management leadership rather than development leadership. At the same time, it must be emphasized that the dynamics of the post-disaster period were not only limited to the exigencies of the emergency period itself, but also extended to the need for recovery and rehabilitation, which are crucial for the sustainable development of the affected communities and areas (Wun'Gaeo et al., 2007: 311-371).

In spite of the actual shortcomings encountered on the ground in responding to the disaster, gigantic environmental catastrophes such as the 26 December 2004 tsunami have nevertheless sounded the alarm and awakened regional as well as national consciousness in regard to environmental threats to human security. Experiences and lessons learned from the Indian Ocean tsunami have vividly illustrated the dependency of the people on the environment, as well as the vulnerability of the country's economy and local communities to the devastating impact wrought by environmental disasters. The loss of income from the tourism industry has caused economic insecurity for the country, while for local communities, the tsunami not only wiped out vital infrastructure, but also created food insecurity and forced many people to alter their way of life.

88.5 Conclusion and Reflections

For the people of Southeast Asia, natural resources are not only a crucial repository of livelihood, but are also an intrinsic part of life and culture. However, the importance of environmental security has not yet been sufficiently acknowledged by policy makers. The resources in the region have been utilized primarily to enhance macro-economic prosperity, even while a majority of the population still lives in rural communities that depend on local resources as a means of livelihood. Failing to understand the importance of the environment and the unbalanced utilization of natural resources will likely lead to further environmental degradation and the destruction of the safety net of rural communities.

The increasing rate of environmental change and environmental degradation constitute environmental threats that bring about enhanced risks and vulnerabilities to people, thereby threatening their 'freedom from want and fear', which is a key element of human security. The experience of the 2004 tsunami disaster in Thailand has clearly shown the linkage between the environment and human security. The tsunami catastrophe has left a devastating impact on the economy, and has made society much more vulnerable. Furthermore, Thailand's experience in coping with the tsunami disaster has indicated a preference for a short-term active response while actually undermining human security over the long-term. This deficiency is unfortunately visible in the Thai state's general neglect of the recovery and rehabilitation processes in local communities.

Human security remains problematic in Southeast Asia today. Poverty and environmental threats continue to stand as obstacles to human development. The increasing frequency of environmental threats confronting the region only serves to underscore the notion that environmental security is a crucial element for the attainment of human security. However, the introduction of the environmental element into the comprehensive human security framework requires the utilization of resources in a sustainable way that will maximize the potential to preserve natural resources for the protection of human security. Finally, the role of the state, in particular, its policy process with clear community-based concerns, and, thereby policy networks in the respective region (Wun'Gaeo 2004), are major factors in coping with such environmental disasters when they occur.

89 The Impossibility of Securitizing *Gender vis à vis* ‘Engendering’ Security

Serena Eréndira Serrano Oswald

89.1 Introduction¹

This chapter scrutinizes the proposition and interest in the possibility of ‘securitizing gender’ that has been formerly present in security studies and discourses. Through a revision of the lineage of occidental science and by discussing the process of identity formation, a paradigmatic shift is suggested for approaching security.

When reflecting on the concept of security from a gender perspective, it is obvious that the problem is not to ‘securitize’ gender if we take the classical definitions of security: ‘state-centred’, narrowly defined and rendering an outdated concept that is marked by androcentric, hierarchical, Eurocentric, positivistic, dualistic and exclusionary undertones. Thus, it is essential to go to the roots of its limitations, revising it from its origin rather than trying to arbitrarily add an extra dimension to a concept that has no place for it at its nucleus. The alternative suggested, is to extrapolate the lessons learnt from the developments in the feminist agenda, both in theory and practice, in order to ‘engender’ the concept of security itself so as to make it viable for an equitable and more secure world. From this point of view, such issues as a) social identity, b) the formation of representations, and c) societal change should be considered as axial for our undertaking, in order to understand the processes through which social knowledge for security is gestated and implemented by social subjects or ‘selves’.

Consequently, the structure of the chapter shall first revise and evaluate the concept of ‘security’ (89.2) and link it to the systemic critique of the exclusionary – dualistic western tradition posed by *feminist political theory* (FPT) (89.3 and 89.4). Then, the impossibility of securitizing gender (89.5) shall be considered. After this, identity and representations shall be addressed in detail (89.6). The final part is comprised of general concluding remarks to integrate all reflections under the heading of women between and beyond (inter)national and human security (89.7), and a brief conclusion (89.8).

89.2 The Concept of Security

The term security derives from the Latin ‘*securitas*’. This word is composed of *si(ne) cura, curare*, etc. The etymological root ‘*cur*’ always implies concern for and a sense of responsibility. *Si(ne)* implies a negation, lack of. Hence, the concept of security should lead to a state of being in which human beings attain a way of life where they need not worry about social insecurity.

The meaning of the concept of security is “the state, feeling, or means of being secure; over-confidence, carelessness (archaic); protection from espionage, theft, attack, etc; staff providing such protection, etc; certainty; a pledge; a guarantee, a surety”.² Another definition identifies security with “freedom from fear, anxiety, danger, doubt, etc; protection or defence against attack and its procedures.”³ Some synonyms for the term are caution, warrant, promise, protection, payment, safety, transfer, safeness, invulnerability, immunity, welfare state, guarantee, sense of security, assurance, courage, rescue, deliverance, tranquillity, conservation, preservation, insurance, cau-

1 The author wishes to express deep gratitude to the editors, Ursula Oswald and Hans Gunter Brauch for their enduring patience and useful comments, as well as to three anonymous reviewers for their stimulating comments. My special tribute is to Jorge Ramón Serrano Moreno (UNAM-Mexico), whose insightful comments and meticulous diligence has been present throughout the development of this chapter.

2 See: *Chambers Dictionary* (Edinburgh: Chambers Har- rap Publishers Ltd, 2001); 1495.

tion, patronage, sponsorship, care, protectorate, guardianship, tutelage and custody.⁴ From this vast linguistic assortment, we can take some basic elements in order to make a rudimentary security compendium to guide our discussion. This is because in the present section we are addressing the very concept of security.

A fitting way to start doing that is first to call upon some of the best known structural thinkers. Levi-Strauss in 1962 coined the notion of '*bricolage*' or 'patchwork' to refer to the basic formation of mythical notions in pre-scientific societies, whereby something new is built using a mixture of existing materials (Bohanan/Glazer 1993; Leach 1970). Secondly, a process of representation and signification in language is thus constructed (Moscovici 2000; Duveen/Lloyd, 1990; Duveen/Moscovici, 2000; Deaux/Philogene 2000); thirdly, it is necessary to identify their implied backbone; fourth, we must consider them more comprehensively, especially if they are as elusive and contested as the 'security' concept.

Core elements in this 'mosaic' are that security:

1. is a state of being (as mythical contents in pre-scientific societies), which ranges from the *individual* (self, e.g. courage) to the *collective* (group or societal, e.g. protectorate) level;
2. is the antithesis of another condition - lack or absence of vulnerability, i.e. *invulnerability*- (something new is built);
3. has a linear timeframe that can range from *preventive* (protection) to *remedial* action (rescue), and can be seen as emphatically *processual* or *teleolog-*

ical, in synchronic and diachronic terms (Waever 2008: 102), (identifying their implied backbone);

4. cannot only be seen in *objective* or *institutionalized* terms (insurance, welfare state), as a 'sense of' it is also *subjective* - tranquillity - (signification is thus constructed);
5. is linked to a negative conception of liberty, 'freedom from', in terms defined by Isaiah Berlin (2002), (should be considered more comprehensively).

As a state of being, whether individually (intra- and intersubjectively), as group (intra- and inter-group/community/region), and at the institutionalized and societal level, security is an identity⁵ process (to be discussed below). As an antithetical proposition, it is framed in antagonistic terms 'that which it is not', an irreconcilable dualistic position that is deeply embedded in western thought since the early Greek philosophers (Arends 2008).⁶

The western notion of security is from its construction other-dependent (the dual model), in a binary exclusionary logic; thus it calls for a paradigmatic shift in terms of autonomy from its conception. This process or revision and critical evaluation of the security concept will also be fruitful for surpassing a functionalist-instrumental outlook, weighting security in-

3 See: Oxford University Press (2005); at: <http://www.oup.com/oald-bin/web_getald7index1a.pl> (September 2007): 1; WordReference.com 2007; at: <<http://www.wordreference.com/definition/security>> (September 2007): 1; AskOxford.com (2007); at: <http://www.askoxford.com/concise_oed/security?view=uk> (September 2007): 1; YourDictionary.com 1996-2007; at: <<http://www.yourdictionary.com/security>> (September 2007): 1. In Spanish it also means certitude, states' sanitary and economic obligations to its citizens, as well as mechanisms that ensure the smooth running of a business, procedure or thing; see: *Real Academia Española* (2007); at: <http://buscon.rae.es/draeI/SrvltConsulta?TIPO_BUS=3&LEMA=seguridad> (September 2007): 1.

4 See: *Roget's Thesaurus of English Words and Phrases* (London: Penguin Books Ltd., 150th Ed., 2002): 660, 767.

5 As an adjective the term *identity* is used technically, it is connected to identity (as a noun), and the way it is organized.

6 From the Minoic Period, 2800 BC the main great goddess, owner of the animals - *potnia theron* - had a male adolescent divinity subjected to her, a hierarchical dualism. In the Micenic Age, the hierarchy was reversed, with a male deity of Indo-European origin - Zeus - leading the celestial vault (Serrano Moreno 2008). With the ensuing turn from myth to logos, theogonic and cosmogonic explanations became less popular in the pre-Socratic Age, with Parmenides of Elea epitomizing the dualism, separating the existing all "*what is*" (*holos estin*) and the void "what is not" (*hos ouk estin*). Being (*to on*) is constant, eternal, whilst not being is nil (later *nihilum*) (Lobato Valderrey 2001: 17-29; Encyclopaedia Britannica 1991: *passim*). The perpetual opposition: either/or, taken up and further developed by Socrates, Plato and Aristotle, prevailing through expressions such as Gnosticism, Maniqueism, Marcionism, Neoplatonism, Scholasticism, Monarchic and Despotism, Colonialism, Christianity, Humanism, and prevalent in most social science discourse. Tracing the evolution of this perpetual dualism throughout the western tradition is a mammoth exercise way beyond the scope of this article (Arends 2008).

tegrally instead of linearly, as a process as well as an end per se.

Within the security debates, security has been seen mainly from two perspectives. A *traditional narrow* approach of state-based security, and recently a *wider security concept* (Brauch 2008, 2008a, 2008b, 2008c) incorporating *human security* and universal rights (UNESCO, UNO) but also *societal security* (Wæver 2008a), *social vulnerability* (the work by the UNU-EHS) and the human, gender and environmental security or HUGE approach (Oswald 2001, 2007d). It has grown together with – although not within – Peace Studies (Wæver 2008; Albrecht/Brauch 2008) and in a recent tradition of late modernity, including also changing societal structures, mass communication and risk society (Beck 1998; Beck 2001; Giddens 1991). The narrow realist security focus has itself been challenged during the post-Cold War period, with processes of *horizontal widening*, *vertical deepening* and *sectorialization* (Brauch 2005, 2005a, 2008, 2008a). On such lines, structural and directional syncretism has also occurred, with North and South facing a plethora of security challenges and debates, voices ranging from individuals, groups and transnational organizations emerging from the grassroots to the glass cusp⁷, enmeshed in an eclectic and fragile 'world order' bound by hopeful yet stilted and slow – in – delivering effective international agreements (Higgins 2006).

As seen from the shifting security concept, it is clear that either proponents of the narrow security concept, or even scholars seeking to widen or deepen the concept, have fallen prey to syncretism in their scientific endeavour. The point is not to add extra dimensions to an outdated concept forging at best a conceptual parallelism and at worse a surface dualism, if the security concept is obsolete from its roots. It needs a transcendental qualitative jump. This chapter does not provide a new security concept; rather it seeks to make visible some of the limitations of the current concept – even in its widest and most novel sense. Instead of focusing on the means to 'most efficiently' enforce peace–military or not, it favours a conception where the guiding outlook is based on a state of being, not on the best out of a number of mitigation and coping strategies. It implies a structural as well as a directional paradigmatic shift.

After having assessed security briefly, there is a need to understand what is meant by gender and from where it stems. Subsequently, taking elements from both strands of security and gender, and looking at the processes of identity and representation, it might be possible to highlight some of the axial elements of the conceptualization of the present author that ought to be addressed with a gender sensitive gaze, in order to achieve the frame for the proposed paradigmatic shift.

89.3 Gender

Given the development of the concept of 'gender equality' within *feminist political theory* (FPT) there is a recurrent bias in science and policy of equating gender to women, often assuming that addressing women's issues marginally, either statistically or rhetorically, means being gender sensitive. Nothing can be further from the truth. Gender has to be understood as an identity referent that builds upon sexual difference but seeks for equity in a world where hegemonic and dialectic 'man–woman' sexual assumptions degrade both diverse women and men. Due precisely to the identity referent, there is not a one universal female subject 'woman' and a universal male subject 'man'; there are women and men in plural, inserted in dramatically contrasting social settings. There can be found as much difference between women of different cultures, age and class groups throughout history, as there is difference between a man and a woman.⁸

Also, identity traits considered feminine are stereotypically equated to female and thus to women, likewise with masculinity – masculine – men (Lagarde 1990). The historical process of articulation of sexual difference is the scope of gender, and although sex is biologically determined and gender is culturally constructed mostly taking sex as a basis, extreme caution needs to be taken in order not to fall into a biological reductionism or a cultural determinism (Lamas 2001; Lamas 2002; Aguado 2004; Goetz 1972; López Austin [1980] 2004). Furthermore, sexuality is the symbolic or signified structure of sex – and it is not the same as

7 Cusp is no English word; it comes directly from Latin, see dictionary at: <http://www.oup.com/oald-bin/web_getald7index1a.pl>.

8 See: Cock (1989, 1992); Le Duc Castro Reguera LSE (2001); Craske (1999); Brydon/Chant (1989); Chant with Craske (2003); Chant/Gutmann (2000); Chant (1991); Chant (1997); Dore (1997); Gutmann/Matos Rodríguez/Stephen/Zavella (2003); González Montes/Tuñón Pablos (1997); Tuñón Pablos (1999, 2000); Rodríguez-Shadow (2000); Marcos (2006); Quezada ([1975] 1996); Quezada ([1996] 2002).

sexual preference or orientation, distinct from a gender identity which is the identitary process of each person bound to a specific context, of which sexuality is but a part.

Identity entails each person's concept of self (who am I?), and also the process of assigning and being assigned identity (and identity traits) to/by other(s) (who is s/he? / Who are they?). Besides, given their identity or identifications, each person is part of a broader *gender condition*, for example as 'woman' or 'heterosexual', etc. Lastly, each subject has a particular and *gendered situation* which is unique, for example as Juana de Asbaje y Ramírez or as Mohandas Karamchand Gandhi (Lagarde y de los Ríos 1988, 2001, 2001-2002; Braidotti 2004).

89.4 A Glance at Feminism

Overall FPT has striven to deconstruct the universalistic presumption on 'man'kind as neutral, universal, and masculine, in order to investigate human diversity. To this is added a false dichotomization in terms of a 'private' or 'domestic' and a 'public' or 'political' realm, historically segregating everyday life and labour according to sex.

Feminism is not the same as gender, just as equality does not mean equity. Feminism entails a political agenda (Phillips 1996), alongside academic discourses and theorizing, it has developed over decades of struggle in its divergent strands that are even conflicting or contradictory. Thus, it is impossible to speak of a single feminism, within FPT there are various types of feminism, the most notable strands are (based on Squires 1999):

- *Liberal feminists* (seek inclusion): focus on equality politics, inclusion of women in the sphere of government, on autonomy and impartiality, claim subjects' neutrality, want a balance between women and men. Identity and equality are seen as neutral and universal, and politics should be neutral too.
- *Radical, maternal or cultural feminists* (seek reversal): focus on reconfiguring the political realm, aiming to strategically affect the political given their specificity as 'women', favour 'difference - inclusive politics'. The political sphere is to open up to include women whose identity is seen as specifically female-gendered. An essentialist female identity is sustained, although oppression can come by re-shaping its contours.
- *Postmodern or post-structuralist feminists* (seek displacement): the latest trend within FPT, it seeks to destabilize the false dichotomy between inclusion and reversal. Subjects' positioning and 'gendering' is taken as verb not as noun, meaning an element of agency even within discursive regimes that ought to be deconstructed. Through this outlook, subjects and discourses being affected are 'engendered'. Diversity politics are embraced, seeking a plurality where no identity position has privilege or pre-eminence over other(s). Thus, gender identities stem from particular political discourses and realities; they are contextual though the social subject is an active agent and not a passive receptacle of essentialism or constructivism. Gender as category ought to be transcended⁹.

It is evident that FPT is a complex web of positions, in terms of academia and discourses as well as practical action even if it is analysed as 'theory'. The apparent opposition is not applicable because discourses have been informed from practical struggles and struggles have been nurtured by theory from the earliest waves of feminism (for example Olimpia de Gouges during the French Revolution or Mary Wollstonecraft in Britain). Also, the feminist agenda has shifted considerably and it remains regionally diverse still today.

First, throughout centuries the women's struggle sought to establish acceptance for women's equal capacity to reason vis à vis men, fighting for women's education, later demanding political emancipation, gaining increasing visibility as workforce after the first world war, demanding labour rights and equal pay, thereafter seeking political representation and executive positions at the same time as demanding public services from the grassroots, linked to racial and ethnic struggles, to liberation and decolonization waves, and to other minority groups and societal struggles such as human rights, environmental concerns, peace processes and even movements that go from pro- tra-

9 It might be pertinent at this stage to explicate that by "engendering" something is meant a usage that is linked to the feminist viewpoint of an active process of making something: "to engender" as 'verb'. Also, it implicates visibilizing that process through which 'something is being made' is marked with a *gender(ed)* identity. It makes a political statement that obviates the "neutrality" fallacy and seeks to deconstruct *gendered* meaning. It aims to elucidate how humans and culture are *gendered*, i.e. how they are constructed as "women" and "men" in specific spatial and temporal contexts.

ditional family lobbies to queer and new age movements. So, as an alternative paradigm, it has sought equality and restitution, but it never has advocated patriarchy or exclusionary gynocentrism.

This said, however, secondly it is primordial to state why the gender lens deriving from feminism is particular and indispensable. The gender element is an irreducible dimension of inequality; linked to other forms of exclusion, but it is the starting point of the gender perspective. *In a patriarchal world, women are primarily oppressed for being women and therein resides the axis of their insecurity, precisely given their gendered condition.* Thus, their particular condition as women must be addressed specifically; it should not be enmeshed with other theories of oppression and subordination (for example in the work by Oswald 2001, 2003, 2004, 2007c, 2008a, 2008d) as an uneasy theoretical concoction that makes theoretical and practical advances even harder.

After revising the core types of feminism and brushing over some of its historical developments and aims (Phillips 1996; Phillips 1999; Nicholson 1990; Amorós 2000; Jackson/Scott 2002; Tietjens Meyers 1997, Varela 2005), it is easier to understand why much of what is addressed under the general banner of 'gender' relates to women. The concept of gender developed within feminism, even if it seems that one of the aims of a gender sensitive gaze today is to avoid rigid sexual categories that establish polarities and can easily become hierarchically exclusionary.

Yet, the importance of diversity is inherent to the development of feminism and of a gender perspective. As said, this does not mean that all minority struggles or societal inequality axes are gender, even if they can be approached from a gender sensitive gaze. It is clear that FPT today, especially in its postmodern stream, aims at transcending binary oppositions that cage social subjects as defenceless victims of biological or cultural determinism (Butler 2004; Chant/McIlwaine 1998; del Valle 2000; Benhabib 2006; Gutmann 2000; Jiménez/Tena 2007; Jiménez 2003).

The false dichotomy that has historically privileged men over women is increasingly being questioned. That is the same reason why it is not recommendable to add an extra cosmetic dimension of 'gender' as a variable to the security agenda, which at best might translate into separating between 'women' and 'men' in research and policy-making. Affirmative action and positive discrimination are important, but they are only a remedial recourse given prevalent disparities. Instead, shifting paradigms (Kuhn [1962] 1996) implies looking at the roots of existing inequity

and its operational mechanisms; transforming mentalities and actions at the identity level, i.e., going to the root representations embedded in every person's world outlook, identifying the social and cultural representational mosaic as individuals and its relation to the cultural milieu where it emerges and is transformed (Serrano Oswald 2003). This means working as overall individual selves and also as members of local and global cultures. Not just embracing a part of our identity make-up being segregated as academics, as policy-makers, as citizens, as community facilitators, as professionals, as members of certain groups and associations, as family members, etc.¹⁰.

89.5 The Impossibility of Securitizing Gender

Reflecting on both the definitions of security and the development and implications of the 'gender' concept, as well as the notion within late-modern feminism of 'engendering' something/someone, the author suggests to 'engender' the security debates, instead of 'securitizing' the gender concept. The later is seen as an impossibility, because gender itself has been so dynamic and diverse that the rigidity inherent in security studies would not fit to it, rendering the enterprise futile, rhetoric at best. The former implies making the depths of the gender dimension visible, becoming sensitive to the way it has been present and shall be addressed in the security agenda as such. Thus, some of the steps that should be taken into account as a way to pave the road to 'engender' security will be outlined in the following pages of this chapter: a) a cautious look at the context and limitations from where we do 'science' (present section), b) the importance of identity, c) of change and social dynamism, hoping to d) transcend exclusionary dualisms (next sections).

First of all, security studies and FPT are scientific endeavours, as such it is important to recognize some of the ideological benchmarks of the development of modern science. Often, the critique has denounced the theory - praxis gap, the fact that historically and hegemonically it is Eurocentric, presently prioritizing

10 At this point, it must be explicitly said that the aim of this chapter is not to make a revision of feminist or gender sensitive works on security or peace studies, or on the scientific studies aiming at 'securitizing gender'. The core aim here is to seek a paradigmatic change in the conception of security itself.

Northern or developed countries' debates. Within FPT, the main argument is that it is a science developed by men for 'man'-kind, where most heads are still male. Important efforts are being undertaken in order to historically render women and 'female' knowledge visible (Bartra/Fernández/Lau 2002; Gutiérrez Castañeda 2002), especially of those not pertaining to hegemonic white and middle class groups in developed countries, and beyond academic groups and intellectual elites. Nevertheless, precisely in order to be aware of the bias inherent in our context as scientists, it is important to situate ourselves as scholars critical of, but stemming from, a western tradition.

One of the most influential philosophies of science emerging in the occident during the nineteenth century was Comte's *positivism*. Following from the earlier British tradition of Locke's *empiricism* (Aristotle; Aquinas; Locke) and closely tied to naturalism (Bacon, Voltaire) during European Enlightenment, science came to be seen as an exercise of universal truth, a neutral enterprise based on unbiased observation mediated by an appeal to reason (Harding 1986, 1987, 1991, 1993, 1996, 1998, 2003; Figueroa/Harding 2003). Although Comte's law of three stages has been demised, some traits of *modern positivism*, to be aware of, prevail as structural underpinnings of mainstream scientific understandings, both in the so-called 'natural' as well as the 'social' sciences: the positive methodology of science (experimental or empirical method) as true (Sophists, Stoics, Epicureans, Hume); research tools are refined rendering new discoveries, but research objects in themselves are and always remain the same without change (*ahistoricism*) (Bentham); complex systems can and must be simplified to simpler units (from the Greek tradition of monist or pluralist essences, atomists, Leibniz's 'monads') in order to be studied (*reductionism*); science and measurements have a logical structure and coherence, which ideally is numerically organized (*axiomization*; Pythagoreans, Spinoza).

Science is unitary, cumulative and transcultural (*universalism*; Hume). Defined in congruence with western scientific tradition, objectivity can be separated from subjectivity, the former having prominence over subjectivity which ought to be discarded or treated with extreme suspicion (following from the Platonian split between 'self' and Cartesian rationality, linked to materialism). The scientific undertaking or measurement is dissociated from the investigator and her/his subjectivity (objectivity, or from FPT 'impartiality').

Besides, it links to the emergence of *instrumentalism* (Epicurus; Bentham; Stuart Mill; Popper; Singer), *pragmatism/cism* (James, Sanders Price; Dewey), and *rational-choice theory* (Adam Smith). (The fact notwithstanding that since Marx the idea of false consciousness or reification - ideology - highlights the power dimension inherent in scientific undertakings, partially discarding 'neutrality').¹¹

Clearly it would be an aberration to generalize and state that science must necessarily contain these elements. Even within mainstream scientific debates over the twentieth century, many of the traits outlined have been critically scrutinized. However, the social subject, object of scientific enquiry and security, often remains a statistic or a gender-neutral universal 'citizen' (Phillips 1996), apparently living in no specific time, pertaining to no specific society or class, ethnically same, without a defined age and life cycle, void of experiences, passive albeit performer of perfectly scripted 'roles', living in an isolated, unalterable and power-free world, in a strangely 'measurable' vacuum. In order to situate subjects, and to explore how and where they *become* processually, and how they interrelate, it is indispensable to address identity.

89.6 Identity and Representations

The importance of addressing identity surfaces when homogenous and unitarian categories of social subjects are problematized, even meta-narratives which have sought to represent a homologous category of 'women' and 'men' (Butler 2006; Benhabib 2006). Precisely as feminism emerged questioning the maxim that 'biology is destiny' (Arizpe 1986: xv), epitomized by de Beauvoir's *Second Sex* firmly stating that "one is not born, but rather becomes, a woman" (de Beauvoir 1984: 276), meaning that it is not possible to reduce the process through which identities develop, nor the contexts wherein they gestate. "Feminine and masculine identities are not natural or given in biology, but must be constructed and should be understood as cultural achievements" (Moore 1994: 42).

The elements that braid in the socialization of social and cultural elements, roles, and practices (Rai 2002) are seen as the collective framework for punctuating and understanding similarity and difference

11 See: Robinson/Groves (1999); *Routledge Encyclopaedia of Philosophy* (2000); Lobato (2001); *Standard Encyclopaedia of Philosophy Online* (2007); Serrano Moreno (2008); Markova (1982); *Encyclopaedia Britannica* (1991); *Enciclopedia Hispánica* (1991).

between people throughout time (Seedat/Duncan/Lazarus 2001). Society becomes a space where knowledge is acquired since early infancy (Lloyd/Duveen 1992; Duveen/Lloyd, 1990; Duveen 1997; Duveen/Moscovici, 2000; Stigler/Shweder/Herdt 1990), where it is constantly negotiated in a power-loaded context (Foucault 1980, 1992, 1998, 2004; Bourdieu 1997; Swartz 1998). A context thus incessantly subject and subjected to change (Gluckman 1968, 1970), where individuals and groups actively interrelate forging identities vis à vis each other.¹² Thus, individuals and groups are seen as agents rather than reactive actors, creating and changing the social and cultural circumstances where they are bound, endlessly *becoming*, and not passively performing pre-assigned roles.

It is particularly important to emphasize that human beings are agents situated in contexts, and mark the distinction between mainstream psychological discourses that address identity as an instrumental and unproblematic process of 'role'-taking. "All the world's a stage, And all the men and women merely players. They have their exits and their entrances, And one man in his time plays many parts..." wrote Shakespeare in 1599 or 1600 in the comedy *As You Like It* (act II, scene vii, lines 139–42). From this Shakespearean quote we get a clear picture of what might be meant when we refer to people's lives unfolding as they enact divergent 'roles'. However, it is also a clear portrayal of the limitations inherent in this viewpoint, as it clearly lacks any *reference to humans being context-bound as well as to people's sense of agency and decision-making capacity*.

Identities are complex and contextualized processes. In social science, and even in FPT, it is too frequent to come across this notion of 'socially defined roles'.¹³ For example a woman pursues a mothering role with her children, another as professional and student perhaps being a nurse with on-going training, another as member of local political activities and fi-

nally one as wife and another as housekeeper. Some of these roles will be deemed 'traditional' (housekeeping, mothering, wife), and others shall be seen as 'non-traditional' (professional, political, educational). Some might be seen as mixed, for example her career as a nurse might be seen as progressive in the sense of economic empowerment and professional credentials, but also as traditional as an extension of her role as 'carer' (Everingham 1997; Langer 1964).

In the last half of the twentieth century, feminist debates denounced how in order to fulfil these different 'roles', women have to work double and triple timetables.¹⁴ The fact that women's working schedules have increased, especially facing recurrent economic crises in developing countries is both true and alarming. Notwithstanding, the notion of women switching different 'roles' is equivocal. People's identities must be understood as highly complex though integrated wholes, in constant flux and with many elements (traits) that come together often heterogeneously and even dissonantly in the representational nuclei (Wagner/Valencia/Elejarrrieta 1996; Wagner/Duveen/Themel/Verma 1999; Jodelet 1991). Furthermore, identities root in social contexts and thus they are not as individualistically fragmentary or as easily interchangeable. Thus, regardless of whether a woman is campaigning politically, attending training, kissing with her husband, breastfeeding her child, doing household chores or tending a patient at work in hospital, activities which are bound to specific time schedules both diachronically and synchronically, her identity is always present and changing as a whole. People are not machines or passive receptacles of identity that get programmed to be active and inactive in different situations, as fragmentary or cyclical task-fulfilling instruments. People have embedded and embodied identities and representational traits, and although they become salient at divergent times, they are constitutive of each *self*.

We are active human beings not passive players, and history is an unfolding project not a given script. Both as individuals and members of different groups our identities are composed of many traits – both conscious and unconscious – that gain saliency at different occasions, these are complex and often enmeshed, and cannot be reduced to the notion of roles or so-

12 See Van Avermaet (1988); Campbell (2000); Campbell/Mac Phail (2002); Campbell/Jovchelovitch (2000); Campbell/Mazdiume (2002); Jovchelovitch (1995, 1996); Jovchelovitch/Gervais (1999); Jovchelovitch/Campbell (2000); Schepher-Hughes (1997).

13 See; Gergen/Davis (1997); Stainton Rogers/Stainton Rogers (2001); Squire 2000; Worchel/Cooper/Goethals (1991); Gilbert/Fiske/Lindzey (1998); Flick (1998); Hewstone/Augoustinos (1998); Himmelweit/Gaskell (1991); Sadava/McCrary (1997); Burr (1998); Seedat/Lazarus (2001); Lloyd/Mayes (1990); Mann (1999); Moghaddam (1998); Balls/Chun/Marín (1998); Calleja/Gómez-Pere-smitré (2001); Kelly/Breilinger (1996).

14 Elu de Leñeros (1975, 1976); Galeana (1989); Oswald (1990, 1991, 2003); Bar Din (1991); Alatorre/Carceaga/Jusidman/Salles/Talamante/Townsend (1997, 1994); Jelin (1994, 1990); Jaquette (1994); Rai (2002), Seider (2002).

cially defined roles. Identities are rooted and respond to changing social contexts, “it is not individuals who have experiences, but subjects who are constituted through experience” (Scott 1992: 26, in: Napolitano 2002: 6). Thus, a woman living in today’s society which still generally ascribes care to women might have internalized the ‘care ethic’ at the core of her identity, and her behaviour, her profession and activities, also her intimate life, all reflect this (Lagarde 1988, 2001, 2001–2002). It is not just a ‘role’ she interchangeably performs; it is an identity axis of her being. Besides, the processes of ‘gendered’ social identity formation do not necessarily entail a cognitive awareness¹⁵ as psychoanalysis has shown, for example violence has deep unconscious seeds.¹⁶

Identity gestates at divergent levels, which are interrelated but cannot be reduced one to the other. It operates at intra- personal (unconscious, subconscious and semiconscious), inter- personal, intra-group, inter-group, social or societal level (national and global), within specific, micro, medium and macro interactive webs (Serrano Oswald 2005). These identity dimensions have to be considered as multi-layered dimensions when addressing security, for identity is a fluid and complex phenomenon that cannot be merely seen in blocks within security dialogues, as has been the recurrent case with ‘ethnic’ or ‘national’ identity (Waever 2008a; Buzan 2008), or even ‘gender’ (Oswald 2008a; Hoogensen 2008). We find ethnic, national, and gendered *identities*, as plural, procession and multi-dimensional. Of course it is also imperative to elucidate the interrelation of identity to other social and discursive dimensions such as security, or gender, where it becomes manifest and is transformed. The above discussion intends to make it clear that a paradigmatic shift in security studies must seriously take into account that identity is:

- *A process*: We cannot speak of identity in absolute or ahistorical terms.

- *Relational*: Identity emerges and is transformed in social exchanges and interpersonal interactions; it defines and is defined in/by social relations.
- *Multi-dimensional*: It operates at intra-individual, inter-individual, intra-group, inter-group and ideological/societal levels (Doise 1986).
- *Contextual*: it does not exist in a vacuum, but is framed according to specific contexts; it is embodied and embedded.
- *Inescapable*: we cannot understand the diversity and complexity of social interaction unless we investigate identity processes, how they are sustained and evolve (Serrano Oswald 2003, 2004, 2005).

The human brain is constantly processing information from the myriad stimuli perceived in everyday life. When the brain ‘identifies’, ‘familiarizes’, ‘internalizes’ or ‘socializes’ information, it either makes analogies or differentiates with existing representations. Cognition does not take place in a ‘blank slate’, as Locke or the Stoics have argued (Farr 1991; Farr/Moscovici 1984; Fiske/Taylor, 1991). Cognition and representation occur in relation to existing representations in two basic processes: a) *generalization* and b) *particularization* (Farr /Anderson 1983).

Given the myriad stimuli that we cognize in everyday life and our need to simplify the universe of stimuli surrounding us, we take cognitive distance or proximity from the object of perception, as we link it to the stock of existing representations through analogies or differentiation (Hogg/Abrams 1988; Goffman 1959). Thus, for example, if one sees a woman begging in the streets, our perception may be *generalized* and linked to our existing prejudices as we categorize a ‘homeless, bohemian, lazy person, perhaps even a thief’. However, if we make an effort to *particularize*, we might find out that she is called Maria Sánchez, a war refugee from El Salvador, for whom it is impossible to work given her migrant status and thus unemployed, actively trying to make a living over 16 hour shifts singing and playing a native instrument in the streets. The source of prejudice is often related to our cognitive structure and its pre-disposition to process information through reductionism (Ichheiser 1949; Allport 1954). However, prejudice is not innate, although it is frequently stimulated by politicians and the mass media surrounding security issues. In the process of cognition, we have the ability to particularize and thus avoid stereotyping and prejudice. This can operate at individual as well as at group level. Social categorization and comparison usually hopes for asserting a positive identity for the self or the in-group in relation to

15 See: Dolto (1996); Dolto (2000); Baldestorn/Guy (1998); Menkes/Daltabuit (2000); Blanco García/Doménech Delgado/López Rodríguez/Marcos Santiago (2002); Debate Feminista, 15, 30 (2004; 2002); Burr (1998); Lloyd/Archer (2002); Duveen/Lloyd (1990); Lloyd/Duveen (1992); Friday (2001); Freyermuth (2000); Oehmichen Bazán (2001).

16 Salinas Sosa (2004); Salinas Sosa/Oswald (2002); Oswald (2004); fundación Gamma Idear (1998); Varela (2002); Barceló/Portal/Sánchez (1995); Panepucci (1995); Barea (2004); Barragán (2001).

others and to outgroups. Merely by recognizing otherness, competitive or discriminatory reactions may be triggered (Tajfel/Turner 1979; Tajfel 1978, 1986, 1982; Turner/Hogg/Oakes/Reaicher/Wetherell 1987; Turner 1999).

However, the process of identifying and categorizing others does not necessarily mean ascribing negative representations to them, -the ritual of exclusion that follows occidental dialectical logic. The same would be the case in low self-esteem cases where the other is privileged over the self or group. Cognition is also an ideological process, but our representations are also the symbolic space of meaning that enables communication and change (Breakwell 1986). Without reference to the 'other(s)', identity could not possibly be particularized; however, diversity does not entail hierarchies (Billig 1982, 1991, 1996; 2002).

Positioning identities need not favour the self or in-group at the expense of marginalizing the other, or the other at the expense of oppressing the self. Otherization does not mean stigmatization, prejudice, discrimination or marginalization (Bergami/Bagozzi 2000). Forging identities is a collective, defined, negotiated and socially legitimated process that cannot be reduced to the biases inherent to cognitive information processing (Augoustinos 2001; Augoustinos/Walker 1995; Howarth 2002, 2002b; Wetherell/Potter 1992; Wetherell/Taylor 2001).

The "necessary condition for social life is the sharing of a single set of normative expectations by all participants, the norms being sustained in part because of being incorporated" (Goffman 1963: 127-128). Acquiescence to these social norms is the universal formula that accommodates plurality from the micro to the macro-level. "Human existence is conditioned existence" (Arendt 1998: 9) and communication involves "institutions to define basic categories" through which to attempt to establish and incorporate the perspective of the other (Douglas 1986: 55). However, the existence of social rules implies the inevitable duality of conformism and deviance, mediating states of order.

Drawing from Mead's social theory of mind or 'social behaviourism', we may address the most pervasive Cartesian self/other dichotomies. For Mead, the mind engages in self-reflection as it 'adopts the perspective of the other', analysing intention and reciprocating symbolic interaction through a symbolic exchange: communication. Meaning in "human society rests upon a basis of consensus" (Meltzer offprint: 7), culture is mediated through language. Through symbolic interaction, given the role of language and social

constructivism, the mind eventually comes to be seen as "social in both origin and function, arising in the social process of communication" (Meltzer offprint: 13). It is thus indispensable to understand the fluid nature of socio-cultural representations, how they change over time as they are institutionalized and as they themselves transform the social institutions wherein they are embedded.

Social representational compounds, for example those pertinent to gender status, are subject to the processes of anchoring and objectification (Duveen 1986, 2001). The process of institutionalization of gender differentiation can be taken as the historical period where social dynamics and practices for coping with 'the other' have been *objectified*, and the mechanisms through which new representational components have been and are *anchored*, both provide evidence of their cohesion and fluidity (Brewer 2001). The individual and particular exist with rapport to the plural and social; institutions exist to confer and mediate individual and social identity. Discourses are mediated as they integrate in societal belief systems (Hewstone/Augoustinos 1998), but access to the *power* to create and spread information contained in such discourses is unequal.

As has been discussed, institutional structures primarily function in order to enable communication by establishing meaning structures (Douglas 1986; Bourdieu 1991). However, meaning necessitates to be socially embedded, and furthermore, the "social conditions of the production and reproduction of the distribution between classes of knowledge and *its* recognition" differentially determine the symbolic power that meaning acquires (Bourdieu 1991: 113). Within the power differentials to access and inform discourses, a great split between mainstream and peripheral representations occur, leading to different claims as to what constitutes security. The social policies and structures that have accommodated the *de facto* presence of militarism remain central for understanding the construction and dissemination of social representations of security. Nationalism has been bound to racist and social Darwinist theories of naturalized supremacy and power exercises (Buzan 2008), it is a process of anchoring identity on the basis of common and generalizable traits to create a psychological bond as overall group - 'nation'. Traits are often language, a defined special territory, an ancestral shared heritage, historical developments, ethnic and racial background crystallized as social contract in institutions and culture (Rousseau; Weber; Durkheim).

The security debate has been strongly influenced by both processes of generalization and particularization, but caution must be exercised as to their usage. For example, generalizing and rejecting all narrow debates on security, instead of revising particular contributions that retain great relevance in today's discourses and policies. Perhaps taking the diachronic or/and synchronic axes, focusing on state-centred or/and human-centred approaches, or even when contextualizing the age of mass communications, realizing the importance of influence instead of resorting to imposition. Returning to the example of motherhood and care, we can go one step further and revise some discursive hegemonies within feminism and security studies. Depending on which traits we generalize and which we particularize in the 'engendered' ideological association: feminine - female - woman, we can fall prey to stereotyping. There is as much diversity within women as group as there is between genders. Thus, to state that all women by virtue of their 'roles' as humanity's carers, or given their life vis à vis violence, are innately more prone to be peaceful, responsible, or eco-friendly, is to undertake groundless *generalization* (Oswald 2001, 2004, 2007, 2007a, 2008d). Instead, it is important to root women in the specific social and cultural context where their identities and representations are gestated and exercised, and thus identify how divergent groups of women are socialized and often even marginalized, so as to map where they stand when societal conflict, violence or disasters emerge and develop, and how they are able and allowed, or constrained, to respond facing them.

If we revise the assertion that 'roles' are assumed to be socially assigned, how can they become quasi-natural then? How can they be legitimized in the process of deconstructing history? How to sustain ecofeminist affirmations of a mystical and natural connection of *all* women to a 'Mother Earth' or a 'sacred mother'? (Mies 1998; Mies/Bennholdt-Thomsen 1999; Mies/Shiva 1993; Warren 1997; Oswald 2004, 2008d). How to take this deep cosmovisional diversity as banner to claim that women are more oriented to peace? Why affirm feminist claims that generalize instead of particularizing intra-women's diversity, contributing to extend gender stereotypes? Outlooks rooted in a context of representational diversity, alluding to very different foundational myths and historical processes, to the many ways the feminine has gestated and is still represented in various cultures, including the ways in which patriarchal cultures have seeded and flourished. So, instead of particularizing the differences between a Mexican 'mother of the world' such as Coatlicue

(Solares 2007), the female half of the lady and lord of duality: Omecíhuatl/Ometecutli and the Greek 'mother earth' Gaia/Sophia (Zimmerman 1971), how can one establish a homogenous rapport based on today's readings of archeomythology between very different female deities, implying *all* women have a mystical connection to a *single* 'Mother Earth' and that patriarchy will be overcome by a *unitary* maternal thinking or mothering? It is like legitimizing the vicious cycle that women by virtue of their being 'discriminated-against' are more just, or given that they face and know violence closely, women promote peace. So in order to forge equitable and non-violent citizens, violence and discrimination against women should be reinforced? Organized collective action surrounding single issues is one thing, establishing a homogenous outlook among such diversity of women might resound as ideological hegemony. Trying to empower women as agents of peace thus can be a painfully ambiguous and oppressive mistake. Although it is important to recognize the contribution of ecofeminism and maternal feminism to highlight some of the processes by which some women have come to be discriminated against and patriarchy disseminated, to theorize about the human-environment interrelation, societal change must necessarily address specific cultures and their cosmovisions; perhaps rooted in millennial agricultural practices or deities that have nowadays become syncretized, and aim to work with diversity among women but *also* within men.

89.7 Women Between and Beyond (Inter)National and Human Security

It has become clear that the processes of identity formation, based on shifting representations, are the processes through which power is exercised and institutionalized. However, exclusion is not inevitable. Subjects are rooted in experience and paradigmatic change is thus possible at the societal level. Trying to revisit our goal, *engendering* security, we can make some important remarks to better visibilize the position of women between and beyond (inter)national and human security.

Women as a group are disproportionately disadvantaged. Nevertheless, binary logics exclude many other disadvantaged groups, men included. Envisaging a secure society entails considering some fundamental aspects.

Firstly, overcoming essentialist dualist postures such as man - woman. This outlook separates along many lines the strong vs. vulnerable, the active vs. passive, nature vs. culture, the male vs. the female, etc. In order to envisage an alternative social order we must first elucidate and deconstruct in our *minds* the dualistic world we inhabit, only then can transformation seed. This outlook does not negate affirmative action and positive discrimination efforts¹⁷, however, emphasis is placed on the process of transformation *in society*. Early radical feminist struggles in the 1960's embraced the slogan 'the personal is political', trying to seek the same public visibility and opportunities for women as men had in the *Women In Development* (WID) coalition. In the 1990's focus shifted to GAD (*Gender and Development*), to include also 'the political as personal', the societal roots of inequality, a process of gender mainstreaming no longer seeking equality but equity: equal opportunities *for all* to live in diversity.

Secondly, the term "socioandrarchy" (Serrano Oswald 2003) alludes to the complex web of hierarchical relations of power and subordination, including both patriarchy and capitalism, within a social system that is typical of (late) modernity. The phenomenon of 'andrarchy', meaning *rule by men*, is only possible given the social context wherein power is exercised. As a global phenomenon it segments into two sub-systems, 'patriarchy' - 'fraternity' for Pateman (1989) - keeps women under the authority of men at home and as political subordinates; and 'capitalism' which keeps women labourers subject to the commands of the owners of the means of production and capital, who are predominantly male (Burr 1998). Seen in terms of state formation and contract theory, subjugation of women and their need for male guardianship was at the core of the emergence of modern states in the seventeenth century, where the patriarchal pact systematically excluded women from the realm of politics and ownership. Subordination of women was ensured by means of sexual difference; being a woman following from a rigid sexual differentiation, was the key to subordination (Pateman 1991) and defencelessness.

17 The framework of international agreements aimed at affirmative action in favor of gender equity include: the "World Plan of Action" adopted at the World Conference of the International Women's Year (1975), the "Convention on the Elimination of All Forms of Discrimination against Women" (1979), the "Beijing Declaration and Platform of Action" (1995) and the United Nations' "Millennium Declaration" (2000).

Subjection can be enforced by subtle as well as overt means; regardless, it constitutes an act of violence¹⁸. In order to understand 'socioandrarchy' as a societal constant, it is important to realize the conditions that have led to its emergence and prevalence in a particular local context and sensitive to the scale of analysis. Within the scope of politics, societal paradigms are produced and reproduced as 'social facts' in the Durkheimian sense¹⁹ through changing social representations, inescapably exerting hegemonic power (Gramsci 2007) over individuals, kins and communities, groups, relations, institutions, government structures, regions, religions, cultural systems, etc. There is a structural and relational dimension to gender, exercised and constructed in complex social webs that pre- and out-date the individuals of a historical époque and mark it. Neither gender, nor violence are neutral.

Thirdly, the world is crippled by inequality. "Justice is the primary subject of political philosophy" (Young 1990: 3). Within early feminism, equality meant securing the same rights and opportunities for women as men had. Later, with a gender lens, equality advocated securing the same rights and opportunities for all women *and* all men. Presently, equity strives for *all* women to have the same capacity as *all* men to assert themselves as subjects, not in order for all to be the same, but rather to empower each subject to take direction and control in the process of *becoming*. That means securing the right for each person to affirming their difference in a context that can accommodate for diversity. However, caution must be exercised. In the discourses of multiculturalism and tolerance, the relation to the other(s) is incipiently segregational, defined in negative terms, instead of a dialogical paradigm of adopting the other's/others' perspective in communication. When difference is recognized merely discursively, the dangers of exclu-

18 Following the Beijing Plan for Action's 12 critical areas of concern for promoting the status of women, gender-based violence came to be seen as a political world issue. The different types of gender violence are sexual, conjugal, family, street-based, labor, patrimonial, psychological, intellectual, symbolic, linguistic, economic, juridical and political violence (Lagarde (1991); Amoros, (1990); Beijing World Conference 1995).

19 For Durkheim defines *social fact* as "any way of acting, whether fixed or not, capable of exerting over the individual an external constraint; or which is generated over the whole of a given society whilst having an existence of its own, independent of its individual manifestations" (Durkheim in Lukes 1993: 59).

sionary representations leading to stereotypes due to lack of knowledge of the other(s), make hierarchies and fear of the other(s) seed. Instead of rejecting the other(s) from the beginning and keeping a safe distance by means of general prejudice and stereotypes (indifferent tolerance), engaging with the other dialogically can give one a more realistic outlook as to who the other is and so if any threat is posed by this concrete other.

Fourthly, coexistence – existing side by side – might be desirable if neutrality would be realistic. However, as we have seen in processes of group identity formation, identities gestate with the other as referent object (subject). Change is not individualistic or instrumental. Objectivity as a state neutral to subjectivism is a rhetorical fallacy. Thus, sociogenetic transitions are collective and negotiated. Embracing diversity means engaging in a dialogue with the self and the other(s), processually overcoming the artificial subject-object dualistic split. Again, security has been constructed in relation to an-other that is a menace. That threat is anchored as an external referent object, as though the process of security and securitization was detached from the subjects of security. A false dichotomy is established, thus security operates at an abstract and often supposedly not alienated level. Power, threat and influence are deemed directly accessible, realistically and objectively assessed, and accurately recognized (Shepherd/Weldes 2008: 2). Absence of security does not necessarily entail an objective threat, or a threat as such; a sense of lost unity or even polyphasia in identity terms can be at the root of insecurity (Moscovici 1976; Wagner/Valencia/Elejabarrieta 1996; Wagner/Duveen/Themel/Verma 1999)²⁰. It is crucial to distinguish between, albeit not separating, ontological and sociological (so-

ciogenetic) security, as well as the fact that security as science pretends to be objective, however it is always understood from a subjective standpoint. Both processes are interrelated and interdependent, but they are distinct. Security is seen as power over ‘other(s)’ instead of a premise of self-sovereignty which is linked to other(s) but not other-dependent. This takes us back to the notion of security as absence of concern – a state of being in which human beings attain a way of life where they need not worry about social insecurity.

Fifth, clearly conflict is inherent to change (Gluckman 1965) and to diversity, nevertheless it does not necessarily lead to violence. Conflict is a constitutive feature of change. Peace does not mean the absence of conflict. Thus, facing a conflict or a deep or multi-layered conflict (a crisis) a new balance must be sought, and in this process violence is not necessary or desirable at all. When a new equilibrium cannot be established, violence is then likely to ensue, but it is not a mandatory outcome, nor is handling conflict or crises with further violence. That is a choice at individual, group, regional, national and supranational level. It seems unwise to polarize the debate either at state level (state-based security), or at the individual or minority level (people-based security). All levels ought to be addressed. The problem is that decision-makers who have been elected into power to address social conflicts are not in a power-free context, nor are they in a social vacuum. They must learn to reconcile divergent interests and stakeholders, accounting for power differences in societies, and for the many voices and choice – options in the public arena. Even when a particular voice is silenced (temporarily or permanently), that does not automatically cancel out the demand or decision – option of that voice or group of interests.

The problem of state-centric security (rationalist and narrow approach) is that it first takes the states and the processes inherent in state formation and group identities as unproblematic, as an overarching given, when clearly the dynamics of modern state formation in each nation are as problematic if not more than inter-state relations. Secondly, security is conceived in unilaterally militaristic-centred terms, with a realist vision of world politics and balance of powers sustained in the Hobbesian thesis of ‘war of all against all’, where a monopoly of military power lies in the hands of the state and men, and the end of enforcing peace justifies the means of securing it (Hobbes 1982). In a way it is the underlying tension of democracy conceived of in negative terms: the democratic social contract forces men to be free (Young/

20 According to Moscovici “‘cognitive polyphasia’ is a characteristic of social representations in which different forms of understanding are able to co-exist... indicating a persistent potential for instability within representational systems” (Moscovici 1976, quoted in: Wagner/Themel/Duveen/Verma 1999: 416) and also indicating the prevalent presence of change. The processes of internalization and externalization of social knowledge imply both a reproduction as well as a refabrication of representations, and this is because in the process of assimilation and transformation, some representational elements are more resistant to change than others (Serrano Oswald 2003). This makes possible the co-existence of contradictory discourses or a double moral, for example the case of terrorism where the discourse of democracy and liberty legitimates violence and prolonged insecurity.

Hall 1997; Young/Barber 2004), and it does so in particular and defined ways, with debates aligned in the strong - weak, centre - periphery, us - them dialectics. Furthermore, Herz' 'security dilemmas' emerged, where organized groups - states, compete one against each other for power and influence (Herz 1951).

Sixth, this takes the author to a further reflection. When security becomes "nothing but the absence of the evil of insecurity, a negative value so to speak" (Wolfers 1962: 488, cited in: Shepherd/Weldes 2008: 530) we can look at the special context of security and its relation to referent objects such as: 'security providers' 'by whom?', and 'security services' recipients' 'for whom?', always in terms of an antagonist threat 'dangers posed by' / 'against what?' (Brauch 2008a). Even if the broad definition of security is embraced, all the different conceptions of security that include military (Buzan 2008), political (da Costa 2008), societal (Waever 2008a), economic (Mesjasz 2008a), environmental (de Wilde 2008) and even gender (Oswald 2008d; Waever 2008a) and discursive dimensions (Shepherd/Weldes 2008) take this negative liberty conception of the interplay between objects of security, *to be secured 'from'*: a security provider and a receiver, and if at all the securitizing process seen emphasizing the security agent, the receiver or the threat. The frame is an on-going negative liberty dialectic. So long as something is framed as a restricted choice, as a residual agency exercise, it is seen in terms of a negative liberty concept - *freedom 'from'* coercion (originally in Berlin 2002 [1969]); later developed as 'positive' and 'negative peace' by Galtung²¹ 1969, 1969, 1996).

Nevertheless, in order to return to Berlin's conceptions, in order for freedom to be 'positive', liberty ought to be framed as *liberty 'to' something*. It implies *a choice* that is contextualized but not delimited - it means liberty to do and be, within a system which implies subjection to legitimized norms, but not subjugation and oppression. That is the thin line that distinguishes exclusionary dialectics of tolerant co-existence (either/or) vis à vis inclusive dialogics (both/and), life in diversity. It implies an original choice, a starting point that fixes a direction towards which work is aimed, instead of a residual option. A paradigmatic shift in the sense that security is seen as

a maxim, perhaps a realizable yet distant utopia from its conception, but thus security dynamics are not framed within the least possible life quality -survival dilemmas (Brauch 2003, 2008, 2008a), but as overarching goals of agentic well-being.

89.8 Conclusion

As indicated in the author's introductory remarks, it is appropriate to distinguish between exclusionary scientific patchwork and dialogical paradigmatic societal shifts à la Kuhn (1996), linked to the distinction between legitimizing everyday life within the status quo through science and a critical social science, actively involved in setting the agenda for the progression of societal change. Perhaps the purpose of revising the concept of security drawing from FPT is based on the fact that the concept of security is rooted in the occidental development of critical and instrumental reason, the process of state formation, the historical justification of war and exclusion, the evolutionary legitimation of power and survival of the fittest, and the development of the social sciences and security and peace studies (Albrecht/Brauch 2008). If the analysis of power relations concentrates in exclusionary oppositions (dualisms) framed in terms of dialectics which are irreconcilable, instead of opening the possibility for complementarity in a shared social space, our social science shall endlessly be confined to its traditional and structurally positivistic limitations. Feminism in its process of studying gender and patriarchal relations has addressed the ways identities and agency have been defined and change. It seems important to be critical of access to power, but it is important to transcend the limitations of universalizing interests and to see that although marginalization has forced groups into certain types of submission and even activism given mainstream discourses, many alternative definitions and goals inform agency gestating autonomy.

After centuries of struggle, feminism has earned a stigma as radicalism, leading to many activists in favour of equity not wanting to be associated with feminism. "Feminism, especially at its narrowest watershed, appears to be no more than a theory on, by and for women, when it should be a theory of society from the perspective of women" (Arizpe 1994: xix). Nevertheless, feminism has also transformed society and women's place and agency in society, with an undeniable impact lasting for generations. Despite prejudice and radicalization, one cannot deny the impor-

21 For Galtung, negative peace is seen as absence of violence, the end of overt conflict, a ceasefire. Positive peace is seen as social justice, an elimination of the causes at the root of war and violence, creating the social systems that enable conflict resolution.

tance that the revolution of women's position has had in modern society, how it has transformed our everyday lives, from the most intimate to the most inaccessible public spaces.

Today, as FPT has evolved from the radicalism and dialectical logic, inherent in its occidental scientific roots, to addressing and revising the specific forms of subordination and the ways these have been institutionalized for both women and men through a gender sensitive gaze, there are important lessons to be drawn from FPT for social science and praxis. The process of *engendering* democracy (Phillips 1996) and security, means developing gender sensitive representations in both men and women, all of which opens the possibility for social, cultural and political identities and relations in just and equitable terms. Returning to the initial reflection surrounding the possibility of 'securitizing gender', it may seem rather more urgent and desirable to commence '*engendering* security' now, vis á vis the hereto discussed real and futile impossibility of securitizing gender.

90 A HUGE Gender Security Approach: Towards Human, Gender, and Environmental Security

Úrsula Oswald Spring

90.1 Introduction¹

Gender violence is still an invisible aggression that occurs primarily within families, and is often socially accepted and sometimes even promoted. The origins of this subtle and sometimes brutal discrimination are complex, and closely related to the social representations (Moscovici 1976; Herzlich/Graham 1993) of gender construction.

On the background of manifold new risks and threats due to climate change, scarce and polluted resources, increasing poverty in Africa, Latin America (Boltvinik/Hernández Laos 1999) and in some Asian countries, as well as physical violence related to transnational crime, human trafficking and undemocratic governments and of failed states, this chapter develops a broader security concept of *Human, Gender and Environmental Security* (HUGE). HUGE represents a widened concept of security (Wæver 2000, 2008; Brauch 2005, 2005a, 2008, 2008a, 2008b, 2008c; Moeller 2003; Dalby 2008), which combines a broad gender concept that includes children, elders, indigenous and other minorities with a human-centred focus on *environmental security* (ES) challenges, peace-building and gender equity. *Gender security* (GS) reflects livelihood, food, health, and public security issues as well as education and cultural diversity.

The most frequent exclusion, discrimination and violence is related to gender, nevertheless there are almost no theoretical developments on gender security. This chapter asks why this happened. As gender security is related to human and environmental issues ag-

gravated by regressive globalization (Kaldor/Anheier/Glasius 2003) and climate change (IPCC 2007, 2007a), women and children are the most vulnerable. They are highly exposed and their security is threatened in multiple ways. This chapter explores further how gender security can be theoretically understood within the existing diverse evolution of feminist studies. Further, it searches how gender security is related to human and *environmental security* (ES), starting with the GECHS and UNU-EHS approach, who have addressed the environmental dimension of *human security* (HS), but without a gender dimension.

This chapter starts with a brief discussion of the links among human, environmental, and gender security for a peaceful and nonviolent livelihood (90.2). As GS has only recently been discussed in the social science literature and in *international relations* (IR), the analysis focuses on the development and limits of this concept that are imposed on gender epistemology by the prevailing patriarchal mindset in science. It then reviews the theoretical elements that are contributing to the evolution of GS (90.3). Four main feminist currents are reviewed: epistemological feminism (90.3.1), feminist empiricism (90.3.2), postmodernism (90.3.3), and standpoint feminism (90.3.4).

As a historically and socially constructed concept, the author explores four phases of GS studies (90.4). The first phase is linked to the analysis of identity and social representation (90.4.1), where the historical process of GS can be perceived as being in difficulty (chap. 89 by Serrano). The second phase discusses postmodern feminism (90.4.2), and links it to the gift economy of Geneviève Vaughan as a peaceful process to overcome the present discrimination and gender violence, transforming the *homo sapiens* into a *homo donans*. The third phase addresses the parallels established by ecofeminism (90.4.3) on gender violence, and nature, and environmental degradation. The fourth phase expands to new social movements (90.4.4) focusing on peace movements, antiwar ef-

1 This chapter builds on ideas by Oswald-Spring (2001, 2007e) for the online publication of EOLSS published by UNESCO. The author would like to thank Navnita Behera-Chadha (India), Patricia Kameri-Mbote (Kenya) and Hans Günter Brauch (Germany) for valuable and critical comments that are partly reflected in this chapter.

forts, environmentalists, feminists, and the 'March of the Women' with indigenous and other social movements against exclusive globalization (Oswald 2008).

In the conclusions (90.5), the HUGE concept takes up the research question and discusses gender links with HS and ES in order to stimulate a new economy of solidarity and a democratic, 'glocal' and participative model of governance that guarantees for the most vulnerable persons equity, and peace with quality of life and prospects for a future.

90.2 Human, Gender, and Environmental Security: HUGE

From a constructivist approach, the conceptualization of security has evolved focusing on the relationship among different security concepts. The 'Copenhagen school' systematized the links among several security approaches (Wæver 2000, 2008, 2008a; Buzan/Wæver/de Wilde 1998). The different security dimensions and levels of analysis are interrelated: often military security directly affects societal and economic security by causing for individuals and groups a fear for survival. Møller (2003) combined these different security concepts, thus widening the narrow concept of *national security* used in realist security studies (Albrecht/Brauch 2008), and in the intellectual tradition of Tzun Tzu, Thukydides, Machiavelli, Hobbes ([1658], 1952), Clausewitz, Morgenthau (1948), and Waltz (1979)².

These national security concerns still prevail in the Middle East (Selim 2003; Kaim 2003; Aydn 2003) and recently, in the 'war on terror', by defending in a globalized world specifically national borders, the transnational economy and their social achievements that have increasingly been challenged by migration and a process of cultural homogenization resulting from instant communication, fashion, and consumption.

Among the extended concepts are *societal security* (Wæver 2008a), labelled by Møller (2003) as 'incremental'; HS described as 'radical' and ES termed as "ultra-radical" (table 90.1). Going beyond the tra-

ditional realist approach of Wolfers (1962), the security definition of the Copenhagen school distinguished between different referent objects (state, nation, societal groups, individuals, humankind, and ecosystems), depending on the security concern where the values at risk are sovereignty, national unity, survival, and sustainability (Ullman 1983; Brauch 2008, 2008a). Asking for *security from whom* or *what*, *risks from whom* and *threats from whom* and *from what*, the sources of threat have changed since the late 20th century. This classification has offered a specific heuristic contribution that has inspired subsequent modifications (see table 90.1).

90.2.1 Human Security

Why do more than 24,000 persons, basically children, die each day of hunger, and why only in Sub-Saharan Africa has the number of undernourished children augmented from 29 to 37 million during the last decade? Why do three billion persons lack access to basic sanitation systems? Why did the globalization process and scientific progress create more than 2 billion extremely poor people? Why do 55 million Latin Americans not have enough to eat while living in the most biodiverse region on the planet that provided the world three of the five basic food crops (corn, beans, and potatoes)? How did this situation develop and get worse during the globalization process and in different countries of the south? What is happening with the UN *Millennium Development Goals* (MDGs) and the related process of development, modernization, efficiency, and justice? The present situation of severe gaps existing in a world of plenty together with absolute poverty requires a deeper and wider approach to GS (Bellamy/McDonald 2002), and an epistemological shift from a techno-centric, isolated or individualist perspective to a transdisciplinary, holistic approach (Oswald/Brauch 2008).

These social inequalities exist globally, but are accentuated in developing countries, where they create social vulnerability. The concept is related to unsatisfied human needs and limited access to resources (Melillo/Suárez/Rodríguez 2004), so therefore the lack of human security is understood as 'freedom from fear' (chap. 83 by Black/Swatuk) and 'freedom from want' as described by Ogata/Sen (2003; chap. 84 by Shinoda). The three or four pillars of human security (Annan 2005; Bogardi/Brauch 2005; Brauch 2005, 2005a, 2008, 2008a, chap. 74) should be organized in such a way that the minimal access to basic resources in the community is guaranteed for the poor-

2 Militarism and militarization describe the control of a state by force using weapons and armies to exercise power, internal repression, and external defence of the borders against potential invaders. The second meaning is related to the political culture or ideology, where military values such as patriotism are promoted together with national heroism, strength, capacity of armed response, WMD, superpower behaviour, military structure, and armed interventions.

Table 90.1: Human, Gender, and Environmental Security (HUGE): A Transradical Approach. **Source:** Møller (2003: 279); Oswald Spring (2001, 2004, 2007e). This table was compiled by the author.

Degree of expansion	Denomination (security of what?)	References object (security of whom?)	Value at risk (security of what?)	Sources of threat (security from whom and for what?)
No expansion	National Security (political, military)	The State	Sovereignty, territorial integrity	Other states, terrorism, sub-state actors, guerrilla
Incremental	Societal Security	Nations, societal groups	National unity and identity	Nations, migrants, alien cultures, mass media
Radical	Human Security	Individuals, humankind	Survival, quality of life, livelihood	State, globalization, elites, terrorism
Ultra-radical	Environmental Security	Ecosystem, Humankind,	Sustainability	Nature, global change, global warming, humankind
Trans-radical	Gender Security	Gender relations, indigenous, minorities, children, elders	Equity, equality, identity, solidarity, social representations	Patriarchy, totalitarian institutions (governments, religions, elites), dominant culture, intolerance, violence

est. This procedure would avoid both under- and over-consumption and could secure the basic needs for anybody (Altwater 2004; Altwater/Mahnkopf 2002), irrespective of geographical, social, age or gender relations, and with fewer impacts on natural resources. It would assure security for the weakest human beings, changing the threats from survival³ to the impending fears linked to the impacts of global change.

90.2.2 Environmental Security

Due to global and climate change, environmental security (Mathews 1989) is not only an issue of scientists (Dalby 2008; chap. 59 by Dalby/Brauch/Oswald) but increasingly also of politicians (Stern 2006). Resource depletion (water, land, air, minerals, and fossil hydrocarbons) and their pollution are limiting the offer for productive processes and life quality, worsened by higher demand due to population growth, urbaniza-

tion, more food demand, and the claim of an ongoing process of modernization in developing countries, particularly in China and India (The Economist 2007; IPCC 2007, 2007a). These factors are pressuring on the demand side, reducing at the same time the supply due to scarce and contaminated resources. Besides oil and gas, another geopolitical factor threatening ES⁴ (Dalby 2008; Brauch 2003, 2005, 2007, 2008, 2008a) is water and its surface reserves in the Amazon region (chap. 70 by Lopez), in Venezuela and Argentina, in the Baikal Lake (chap. 55 by Rakel, chap. 56 by Wunderer), and underground water such as the Guarani Aquifers in South America. Water transformed into food is traded worldwide as virtual water (Allan 2003, 2007 and chap. 41) and can increase the 'food power' of these countries, especially when global warming will gradually threaten the food security in the USA, Canada and Australia (UNESCO 1998), today's major food exporters, due to drought and extreme weather events (Alcamo/Endejan 2002; Brauch 2002, 2002a, 2003; chap. 33 by Oswald).

3 The World Bank (1998b) documented empirically that, for example, in Mexico for a decline of 1 per cent in GDP due to induced socio-economic crises, the rate of homicides increased by 1 per cent and robberies with violence by 2 per cent. Something similar occurs with global environmental change and the new threats of extreme hydro-meteorological events or the growing poverty in countries of the south, linked to soil erosion and urbanization due to the abandonment of fields by peasants.

4 In this chapter the security term is widened and deepened, overcoming the narrow approach of military security. The author is convinced that human, gender, and environmental security (HUGE, Oswald 2001, 2004, 2006c, 2007e) is a security concept that is able to deal with the new risks and threats (Beck 2001, 1998) from global and climate change (Crosswell 2005).

Disasters due to climate change will further reduce available resources. This requires special efforts for mitigation, adaptation, and sustainable development to improve environmental protection, environmental services (World Bank 2007), food sovereignty (Karremans/Radulovich/Lok 1993), the conservation of nature as well as higher efficiency in collecting, recycling, and re-use of waste. While environmental changes, and more precisely resource access, are stressors on social systems, they are not the sole or even the dominant cause of political violence and social vulnerability (Kahl 2006). Scarcity alone is not what kills people or causes political violence; numerous other factors are important in the destruction of the social networks that ensure survival (chap. 4 by Brauch). Likewise, the current dynamic changes in human affairs, encapsulated in the term globalization (Oswald 2008b), are uprooting traditional societies and displacing people that render them vulnerable, while also requiring them to rapidly learn and adapt to new circumstances (Myers 1989).

There is no reason to believe that states are necessarily acting in ways that ensure the security of their populations, despite official rhetoric. The critical development literature and discussions of political ecology emphasize that state actions in support of development may be a contributing factor to the vulnerability of social and ecosystems, which are then incapable of ensuring survival when disaster strikes. Neither are states the innocent arbiters of disputes, nor necessarily benign agencies primarily interested in the welfare of their populations; they may be involved in the violent suppression of resistance to central rule or to the dislocations of economic globalization and the concomitant commoditization of items essential for survival. The broader approach in terms of the human, environmental security, and peace (HESP) project (Brauch 2003, 2003f, 2005, 2008, 2008a), focuses on the complexity of political violence, and on the understanding of the underlying interrelations. This represents more than the traditional inter-state violence that pre-occupied security experts in the 20th century.

Therefore the shift from the 'holocene', the present stage of earth history, to an 'anthropocene' (Crutzen/Stoermer 2000) suggests that the link between human and ecological matters must be understood in a way that transcends the divisions between the 'natural' and the 'human' that have structured the thinking on security and especially identity since the emergence of modernity (chap. 59 by Dalby/Brauch/Oswald and 98 by Oswald/Brauch/Dalby).

Geological actions in one part of the planet may have consequences for supposedly remote peoples elsewhere making an '*Anthropocene ethic*', which focuses on these connections, and hence on social responsibilities, stressed by both HESP and HUGE. This emphasizes the importance of comparative research. This also implies a shift in our understanding of the context of our own lives so that we start from a concept of ourselves within an ecosystem which we are actively changing, rather than as urban 'civilized' dwellers manipulating an external environment which is in some ways 'threatening' to that mode of living (chap. 59 by Dalby/Brauch/Oswald).

Such an analysis also requires transdisciplinary comparisons for understanding in detail the human-nature interrelationship in different geographical contexts and historical settings.

90.2.3 Gender Security

90.2.3.1 Gender as Analytical Concept

Several organizations within the United Nations systems that collect data (UNSC Resolution 1325⁵; UNIFEM 2007; FAO 2002a, 2005d, 2006b) have confirmed that the violence against women and girls is the most frequent form of violence on earth (Riviere/Cominges 2001). Each third woman in the world is being beaten, and each fifth is being sexually harassed or violated (UN 2006). This violence against women includes 20 million abortions where 78,000 women die each year; 80 million women get pregnant against their will each year; 2 million women are affected by HIV/AIDS (Muthien/Combrinck 2003); 60 million girls are denied life due to gender abortion, infanticide or negligence; 2 million girls are forced into sex traffic; 130 million girls suffer from genital mutilation, and 4 million girls are sold each year as slaves for marriage or prostitution (UNFPA 2002a, 2002b). Sen (1990) speaks of about 100 millions girls that are missing.

Normally, this violent behaviour happens inside the house; however, in research surveys men who were responsible for committing these crimes have claimed innocence. They declared that men from other cultural backgrounds, different regions, and lower social classes are guilty of these crimes. These offences that are usually not reported by the affected women and their families are not punished by the tra-

5 See: United Nations Security Council Resolution 1325 on "Women, Peace and Security"; at: <http://www.un.org/events/res_1325e.pdf> and: <<http://www.peacewomen.org/un/sc/1325.html>>.

ditional system of justice, since intra-familial violence is often not yet recognized as an aggression, even less as a legal issue, because it is taken for granted from a male perspective (Meyers 1997). In addition, most countries in the South still lack laws against this type of violence, and even if they exist, they are not being enforced by male judges due to a patriarchal practice of law and power exercises.

Thus, gender security is normally taken for granted, socially identified, and represented within society. During millennia, society as a whole has forgotten that gender relations were socially constructed and reinforced through habits, ideology, and political systems. The world has been organized for at least five thousand years based on patriarchal patterns, where the male gender (the strong sex) dominates the female (the weak sex), creating inequity, exclusion, violence, and submission.

Female powers were considered marginal and merely delegated. They can only be exercised with permission of the dominant group (the father, husband, brother or boss). The main control on material goods remains in the hands of men who decide on family expenses, property, productive activities, inheritance, and gifts. The lack of the right to own property has reduced the negotiation capacity of women and increased their high insecurity. If they try to transgress the assigned social and family roles, they are exposed to interfamilial and social violence. Once married, the margin of manoeuvre has been further reduced by both their own family and the relatives of their husband, where she normally lives, and for whom she works.

Gender insecurity is often not perceived as such, due to the existing interdependence between patriarchy and female submission that are anchored by personal identity processes (care-giver) and social roles that have been induced and trained during millennia. As a result of this long-standing process, female identity gets obliged morally and socially to care for the others as her process of socialized self-identification.

Subjectivity of women is constituted in the pedagogy of gender to care about others, to maintain life from feeding on, from the intimate space through affective reproduction and the erotic one... In this function of caring about others with their affections we can find the sense of our existence: the mother when she is breast-feeding; the lover when she makes love. These facts permit the affirmation in the field of identity (Lagarde 1990).

Gender is also an analytical tool, socially constructed, and the axis of classification is linked to genital difference (sexual dimorphism: female-male),

facts that permits a biological explanation of social representations of gender, rooting still more the mechanisms of distinction, and with them the process of discrimination. Macela Lagarde (1990) correctly criticized this process of gender construction as bio-social-cultural) based on the sexual differences. Each culture recognizes sexual differences and specifies the characteristics that classify the sexual beings in diverse genders (Skjelsbaek 1997; Rosales 2002; Szasz/Lerner 1998; Foucault 1996). The number of sexual characteristics varies inter- and intra-culturally, although the generic classification is manifested in all known societies, and for this reason is considered a universal classification.

As the relationship between men and women implies complex interlinks (Jiménez/Tena 2007) and relates to human and societal security (Wæver 2008a), the threats are not always perceived as purely confrontational. Nobody is born as a man or woman; everybody is born with a body which acquires a generic significance in this world (De Beauvoir 1949; Lama 2002, 1996). From early childhood on gender is socialized (Lloyd/Duveen, 1992; Piaget 1950) and consolidated during the personal life history. Family structures, schools, work, and clubs are organized to subsume gender identity into daily life, avoiding that gender discrimination get perceived and combated.

Religions in East and West are strongly reinforcing the existing gender differences (Oswald 2008c); however, similar to the division of gender also religious roles and norms are socially constructed. Thus, the world has been organized for millennia along gender lines (Urrutia 2002), able to create a complex and partly unconscious process of gender identity. Worldwide, the results are social difference, exclusion, and discrimination between genders, similar to the gap between rich and poor. Both processes create long-standing insecurities.

The key role of women is in caring about the well-being of children, family, and animals, and is considered a *homo domesticus*. As the supposedly weak sex, women require protection from man and his physical force (military capacity in case of a state). Therefore, in moments of catastrophe, conflict and war, women became the highest vulnerable group, are an appreciated commodity for the aggressors, and an object of blackmail among the men in dispute. Recent reports on war show that the body of women is increasingly getting transformed into a battlefield due to forced pregnancy, HIV-AIDS forced infection, rape, genital destruction with arms, violent abortion, trafficking,

obliged prostitution, etc. (Rehn/Johnson; Hynes 2004).

90.2.3.2 Gender Security Studies

Nonetheless, this violence against women did not yet lead to a consolidated theory on gender security (GS). As a scientific issue it is still in evolution and requires discussion and clarification. GS is a complex concept developing slowly in social and gender sciences. Through a historical approach it is appropriate to integrate some past theoretical inputs. Betty Reardon (1985) was among the first who related gender perspectives to security concerns, peace-building, and peace education. She traced back the root causes of gender-related violence to occidental masculine behaviour, its institutions, and organization-building. The UN Security Council referred to it in Resolution UNSC 1325 separately to 'gender, security, and human rights'. Tasneem, Jayawardena. Shrestha, Siddiq, Qudusi, Bhatt and Anarkoly (2007) related it to social security issues, and they work to ensure the enhancement of the rights of groups to maintain sustainable living conditions. Several UN agencies have focused on livelihood, well-being, and food security (UNESCO 2002, 2003c; UNDP 1994, 2004; UNEP 2007a; UNFPA 2002, 2004; UN 2006, 2006b; USSD 2005; UNMP 2005a).

Key elements point to the economic security of women with respect to property rights, education and training, equal access to paid work regardless of ethnic, religious, and caste differences, and the encouragement of small-scale business within local areas (Beijing Conference 1995). IFAD (2005) found out that women face external and internal pressures⁶ and given variables (the entitlement base). In Latin America first and later in South Asia gender insecurity was linked to survival strategies and household marginalization, later to environmental concerns (Agarwal 1992).

Hoogensen (2005a: 1) argued that "global gender perspectives can in many respects transcend the constructed barriers and stereotypes between the Global North and South, thereby reducing if not eliminating

the hierarchical and unequal relationships that have often been a result of human security efforts."

In analytical terms and linking up human and ES to GS, this author proposes a transradical level of expansion (table 90.1). An initial definition of GS refers to the process of socialization to 'become' a gendered human being; a man or a woman, depending on the position of the social structure. Thus, GS is socially constructed and systemic within the present patriarchal society, and it is normally taken for granted. The relations are linked to gender status - ethnicity/race, class, age, and minority status - in relation to the model of reference. Equity and identity are values at risk, and the source of threat comes in first instance from the patriarchal hierarchical and violent order, characterized by exclusive, dominant, and authoritarian institutions such as non-democratic governments, churches, and elites; secondly, from the established and developed social relations of violence and prejudice. They are penetrating the most intimate space of a couple and family, affecting labour relations, political and social contacts, and primarily also the exercise of power where a system of exclusion, discrimination, and stigma dominates, threatening equity and personal or group identities.

90.3 Evolution of Gender Security

As any concept, GS has a long history and complex analytical processes behind it. The struggle for gender visibility and later participation as an integral part of GS was first oriented to raise conscience for equality, later to improve women's opportunities, and today to reduce social vulnerability and violence (Meentzen/Gomáriz 2003). The European Union refers to GS as the systematic examination of the differences in "conditions, needs, rates of participation, access to resources and development, management of the patrimony, of the power, of decision and images among women and men relating to their roles assigned in the function to their sex"⁷. Structural inequity (Werlhof 1983, 1983a; Mies/Werlhof 1983) is reduced in some progressive countries through quota systems⁸, which

6 The external vulnerabilities are caused by the macro policies with which individual units of poor and powerless women are unable to deal (i.e. with regard to food supply), and the internal are challenges from within extended households in the form of traditional power hierarchies, be they patriarchy, caste or religious norms, apart from practices such as alcoholism or indigenous rituals (the allocating process).

7 See at: <<http://wwelacitoyennete.com/magazine/mots/glossaireegaliteHF.php>>; a glossary from the European Union>.

8 It gives priority to woman in a process of selection of candidates or for labour positions, when both gender show similar profiles and competences. It is a concession of patriarchy that alleviates symptoms without changing the root causes.

can improve the participation of women, but it still remains discrimination, although a positive one with the goal to achieve greater equality. Clear political norms and roles supported by institutional actions that note existing differences could improve the gender balance, and therefore may reduce gender insecurity and violence.

The historical evolution of feminist thinking and the diverse practices had a strong influence on the deconstruction of the GS concept. Feminist studies have evolved through several phases: from theoretical feminism to the desire for female voting and greater equality during the 1960's and 1970's. It was a response to the evident gaps due to gender differences. Long before Kate Millet (1969) and Juliet Mitchell (1972) raised these issues, several social movements in the Third World, including those representing peasants, indigenous peoples, trade unionists and those struggling for national independence, have fought for greater equity. Elise Boulding (1992, 2000) and Betty Reardon (1996; Reardon/Nordland 1994) introduced gender issues into peace research, and since 1980 gender analysis reached a third wave, also called neo-feminism. Adrienne Rich (1986), Maria Mies (1982, 1998), Vandana Shiva (1988), Shiva and Mies (1997), Veronika Bennholdt-Thomsen, Faracloud and Werlhof (2001; Bennholdt-Thomsen 1994; Bennholdt-Thomsen/Mies 1999), and Oswald Spring (1990, 1991, 2000, 2006c, 2007e) linked social movements, environmental destruction, and peace requirements with subsistence perspectives and survival strategies, thus offering a process of diversification and an 'epistemology of opposition' (Ritzer 2002: 391).

The relation between GS and HS started with the debacle of five decades of failed and misguided development, directly linked to the omission of gender considerations. The exclusion of women and other minorities from science, technology⁹, history, and public life have implied and continue to cause enormous costs for the political process, the economy and the environment, for peace-building, and culture of the world (Reardon/Nordland 1994). The myths in traditional societies reflect the complementary roles of women and men in all sectors of life, and show the

equality that existed in productive and ritual processes. Patriarchy destroyed these complementary processes, and its origins are linked to social stratification in irrigation societies and to tribes of armed warriors organized around clan leaders that threatened agricultural settlement and incipient cities, conquering their food reserves, women, other commodities, and religious goods¹⁰.

These social changes caused adjustments in the social organization of gender cooperation, and the patriarchal system constituted the base of gender insecurity. It is characterized by male dominated extended households, patrilineal inheritance and patrilocal housing for married women (the Roman *paterfamiliae*). Community owned property became private property, and a system of norms was created that obliged society to legally consolidate the changes in the context of the *pax romana* (Oswald 2002, 2008c). Male kings or leaders strengthened their power due to conquests of new territories; they developed better weapons and armies, and made slaves out of the conquered people, and exploited nature. The leading elite established monarchies of absolute power ruling their land, commodities, resources, and subjects. With supernatural forces (in some cases they became divinities: Egypt, Inca) or as divine deputies of god on earth (pope, prophet) they consolidated empires (Spanish, French, Austrian, Ottoman). Military control stabilized their empires externally and internally. Social unrest obliged them to legitimize the hegemony of elites (Gramsci 1977), and democratic institutions and a division of power consolidated economic and political power. A system of rule justified the legal use of physical force in the hand of the state (Max Weber 1987).

9 During the evolution of the human species, women generated the first technological or agricultural revolution. Besides collecting plants and animals for food and shelter, women observed the process of plant growing and started the selection of seeds and their domestication, thus improving the nutrition and health of their families during the long absence of men who went hunting.

10 An ideological fight among gods and goddesses started in Olympus, where a former secondary half-god Zeus emerged as the victor, now subjugated with lightning and thunder both terrestrial and heavenly beings. As an authoritarian father he exercised his dictatorial will. These mythical origins of patriarchal power have permeated for thousands of years the relationship between genders, subjugating women into the symbolic space of the household, away from public affairs (Graves 1985; Eliade 1963, 1965). This religious-ideological base of patriarchy justifies violence, wars, conquest, intra-familial discrimination, social inequality, slavery, social immobility, and accumulation in the hands of small elites (Oswald 2003). Greek philosophy on the polis and democracy justified the organization of religion and policy through male intelligence. This established the pillars for exclusion, discrimination, and violence against women and their role as career.

This summarized process of the rise of patriarchy was further consolidated by the three monotheistic religions (Judaism, Christianity, and Islam). The belief in one father god and the only truth relied on male priests, representatives of god on Earth. Female exclusion, subordination and discrimination of the marginalized, and warfare expanded their religious beliefs. Also in Eastern religions with social stratification, goddesses and women were submitted to male control (Oswald 2008c). Without going deeper in analysing the origins of patriarchy (Robins 1993; Watkins/Rueda/Rodríguez 1999; Mies 1983; Mies 1998), this chapter tries to understand 'gender security' as a historical process that is able to comprehend the root causes of dominance, oppression, violence, and invisibility. Only one part of society (usually a few men) dominates and exploits the other part (primarily women and poor men, sometimes also children) for their own benefit. Hierarchical orders and repressive mechanisms maintain control, and mass media and religion the hegemony. They create social representations and identity processes to maintain the status quo. Therefore, only the overcoming of patriarchy related to other systemic factors of control and violence could overthrow the present unjust system of global society and liberate everybody, men and women.

Existing social representations also excluded women from science and technology; particularly in IR, where the dominant theories justified warfare. Nevertheless, an increasing number of men and women have been involved in deconstructing assigned social roles and patriarchal thinking. Epistemological feminism (91.3.1) criticized the so-called scientific objectivity, and feminist empiricism (91.3.2), postmodern feminisms (91.3.3), and standpoint feminisms (91.3.4) opened the field for gender security analyses.

90.3.1 Epistemological Feminism

Feminist epistemologies have analysed the ways in which metaphors of masculinity operate in the construction of ideals of rationality and objectivity (Bordo 1990; Lloyd/Duveen 1992). Sandra Harding (1986, 1988, 1991; Harding/Hintikka 1991) argued that dualism such as nature-culture, subject-object, and masculine-feminine supports modern epistemological analyses, and that feminist epistemology should deconstruct this dualism (Stuart 1990). Scientific theories contain also a gender bias, not only due to the under-representation of women, but also in the construction of objectivity and underlying values. Therefore, a GS approach proposes the incorporation

of explicit gender-related values, represented by the selection and delimitation of the object of study¹¹, the empirical work, the justification, the methodology, and a theory-building with ethics.

An explicit value-oriented approach could overcome these constraints, and make explicit the underlying values and simultaneously create higher validity. Therefore, the analysis on GS must critically understand the diversity and values in a so-called rigorous or objective scientific analysis. It scrutinizes especially the narrow concept of military security, the related military complex, and its economic interests (Valenzuela 1991).

90.3.2 Feminist Empiricism

Feminist empiricism criticizes the 'androgenic' (male-centred) mainstreaming in science, where the stereotypical masculine mental approach excludes emotions. Scientific knowledge in physics and biology (Harding 1986, 1988, 1991) are also permeated by these gender biases, and methodologies and scientific methods have themselves androgenic limits (Harding/Hintikka 1991). GS studies promote a shift and ask for cognitive 'equality' or 'sameness' with the patriarchal thinking. This approach insists that feminist methodology sticks also to qualitative techniques, where the investigated are included in the analysis as subjects (Mies 1983). It creates methodological diversity and pluralist theories and practices (Harding 1986; Shiva/Mies 1997; Haraway 1988, 1997). On the other hand, the position of gyno-centrism with opposition to male scientific analysis, stigmatized as 'bad science' (Longino 1990; Keller/Longino 2006; Daly 1982), avoids a deepening in GS. Therefore, the new approach of GS shifts from opposition to collaboration. It creates a common front of the multi-disciplinary that allows dealing with the present

11 In male sciences the same process occurs, but they do not make it explicit. Before starting with any research and particularly empirical studies, scientists must make numerous choices, not only on the delimitation of the object of analysis, but also on the questions they will pose and try to answer, on the terms they will use in their analyses, the instruments used, and the methodology they will employ. All these decisions orient the research to a certain direction and to specific goals. These choices constrain in advance the hypotheses and limit the results. They predispose the future research agenda. Values and mindsets enter at this stage of the investigation, and values influence also the choice of preferred theories.

threats and the coming challenges of climate change, which will affect both genders and the planet as a whole.

90.3.3 Postmodernism

Postmodern perspectives (Butler 1990; Alcoff 1996; Alcoff/Potter 1993; Giddens 1991, 1994; Nicholson 1990; Persram 1994) have established radical critiques by rejecting any gender category, due to the fact that every individual is unique. They also oppose possible coalitions between women and other suppressed groups, because most of them would repeat the patriarchal conduct within these groups. For the GS analysis, their critiques of theories justifying sexist practices, where women are treated in an essentialist sense or as objects, are useful. Postmodernism is not monolithic but diverse and extremely critical of other currents. Harding (1986, 1988, 1991) believes in objectivity and 'accuracy', and Haraway's (1988) view of science is analysed as fallibility, minimalism, anti-realism, and opportunism.

These currents avoid in GS studies a bias of androcentrism, super-generalization or super-specialization, insensitivity to gender analyses and issues, the normal elimination of sex and sexuality, double evaluation standards for men and women in scientific achievements, sexist dichotomies, and a formalism limiting the unity of analysis (Bartra 1998). However, a postmodern approach limits also the deepening of GS, due to its influence on occidental individualistic thinking. By postulating that each woman is unique, they conclude that there are no possibilities to generalize the existing differences and to establish wider categories. There exist also limits due to the Western individualism of postmodernism. Further, they create contradictions by promoting the schooling of girls in an increasing jobless world or with salaries lower than those of men. By undercutting communal enterprises, traditional food production, and collective child caring, they take away from the state the responsibility of these services and launch it into private hands. Would this tendency imply a shift from state patriarchy to private patriarchy, and therefore increase gender insecurity?

90.3.4 Standpoint Feminism

A third approach to GS is related to *standpoint* feminism. It was initially developed in the social sciences, particularly in political science by Hartsock (1983, 1983a, 1988, 1990, 1993), Harding (1988), Chodorow

(1978) and Collins/Pinch (1998), and in sociology by Dorothy Smith (1974). Women and other oppressed groups are better trained and sensitive to deconstruct the mechanisms of exclusion, domination, violence, and submission. With these epistemic privileges they can deepen their analysis and better understand gender differences. Their analysis does not glorify women in research nor does it introduce gender issues in a collateral way into international studies, but promotes a transversal and gender-clear approach, where both quantitative and qualitative methods should deconstruct the processes of identity formation and consolidation of stereotypes, thus generating, reproducing, and anchoring the present situation of inequity. A GS approach observes that there could be no single standpoint, since women and marginal groups are differently situated within diverse social positions, cultural backgrounds, socio-economic conditions, race, class, ethnic group (Warren 1998), sexual orientation and geographic location, and that it is precisely this diversity which can enrich their analyses (Hooks 1988).

Harding suggested that science has to be 'socially-situated' and in perspective, and that women and especially marginal ones dispose of an 'epistemological privilege' because they can better understand the process of marginality, having lived in underprivileged situations for a long time¹². Therefore, they know the complexity of the processes (Oswald 1991).

Starting from these local empirical situations, novelty, heterogeneity, complexity, and interaction opens GS a systematic perspective of analysis. Accuracy, perspective, normative consistency where political correctness is criticized, permits to include moral and political values (Habermas 1998, 2000) and to analyse sexuality (Szasz/Lerner 1998) and the power mechanisms related to human trafficking (chap. 92 by Perpiñan/Villareal/Oswald).

To guarantee these critical interactions an epistemic community is able to a) establish public fora for criticism; b) adapt theories and analytical approaches in response to these criticisms; c) take into account shared critical public standards of science; and d) recognize a 'tempered' acceptance of intellectual authorities among the inquirers, allowing to understand the existence of cognitive virtues or vices, but above all

12 This does not imply that other persons with critical empirical approaches could not understand and rigorously analyse these marginal situations when they acquire the ability to listen and patiently reflect on this empirical reality.

disallowing a social position of power as a ground for discussing seriously with somebody (Longino 1993: 128–135, 1990: 76–81).

The critical advance of the standpoint epistemology lies in its “logic of discovery” (Harding 1991: 56) where “marginalized lives provide the scientific problems and the research agendas – not the solutions – for standpoint theories” (Harding 1991: 62). Furthermore, there is a potential for understanding the marginalization from a bottom-up perspective, where new paradigms can rise and systemic disadvantages be overturned. Anyone, men and women with sensitivity, can engage in the process of systematizing problems.

Such an advance permits to situate knowledge socially by anchoring it in local interests and values. When oriented to a liberation perspective, the disadvantageous situation induces learning processes that are able to free them from their situation of oppression (Freire’s liberation methodology, 1998). In relation to GS studies, a clear distinction between the context of discovery and the context of justification would avoid confusions. Harding insists further that modern science is “deeply and completely constituted” by “local resources” (Harding 1986: 157) and bottom-up processes. This approach offers not only a theoretical and empirical link to HS, but includes also ES concerns when resource appropriation and distribution are incorporated.

In this phase of analysis, empiricism, postmodernism, and standpoint feminism are intensely influenced by history (Falco 1987). The concept building of traditional feminist currents started from a liberal approach, where patriarchy was analysed, including concerns of Marxists for class and reproduction (Carrasco 1999). From a radical perspective sexuality and its power relations are at the centre of scrutiny (Gutierrez 1991). The psychoanalytical currents are concerned with personal development and sexual liberation (Braidotti 2004). For the anarchists freedom is a key element (Letelier 1980), while for the phenomenologists it is the body and its sexuality (Dankelman 2002). The ethical philosophers insist on values and ethics, while the epistemologists study knowledge and processes of construction of science (Harding 1986, 1988; Haraway 1988; Hartsock 1983, 1988). Finally, there are the currents focusing on race (on Afro-Americans see: Hook 1988), sexual identities, age, deep feminism (Kheel 1985), which are concerned with religious and philosophical worries. Other currents stress the HS components through training the physical and psychological conditions of women,

which could strengthen the unequal and long-lasting struggle against patriarchy. In summary, an epistemology of GS is searching for integrating different social currents, represented by ecofeminism, environmentalists, and peace movements, where traditional processes of identity are being transformed.

90.4 Four Phases of Gender Security Studies

By linking logically and empirically (Bronfman 2000; Pedrero/Rendón/Barrón 1997; Bar Din 1991; Cano/Valenzuela 2001; B. García 1999; E. García 2004; INEGI 1999) *human* (Oliphant 1993; Montoya/Frazier/Hurtig 2002) and *environmental security* (Velázquez/Merino 1997; Steffen/Sanderson/Tyson/Jäger/Matson/Moore III/Oldfield/Richardson/Schellhuber/Turner/Wasson 2004) with *gender security*, the process of the construction and visibilization of the invisible, of the reproduction of injustices (Mortera 2000; CLOC 2002, 2004), and of the production and ideological circulation process (León de Leal 1980; Aranda 1988) can be understood.

Four phases are involved in the consolidation of ‘GS’: *first*, the process of identity building and social representation; *second*, the gift economy; *third*, the evolution of ecofeminism; and *fourth*, the emergence of social movements.

90.4.1 Analysis of Identity and Social Representations

Gender identity refers to the process of socialization to ‘become’ a gendered human being: man or woman, depending on the position of the social structure. Sociology defines gender identity as “a social construct regarding culture-bound conventions, roles and behaviours for, as well as relationships between and among, women and men and boys and girls” (Krieger 2001: 693–700). It is a constructed reality and explains how a person is socially identified, or how the society perceives him or her as a man or a woman. The concept refers also to the process of how other persons define a person based on roles and behaviour (hair, clothes, norms, social position). The formation of gender identity is a complex procedure that includes processes of gestation since birth, of learning during the first infancy, and later the socialization and acquiring of social roles. Multiple researchers determine the fixation of gender identity in the first infancy, even when subsequently differentiated and new roles were ob-

tained (Piaget 1950; Freud 1923, 1927; Doise 1986). It is distinct from the concept of sex, which describes only the biological differences. Since it is socially constructed it can be changed, although habits have been socially consolidated during millennia, using gender distinction for social discrimination and oppression as something given by physiology (bio-physiological determination). In the symbolic field it represents cultural ideals and stereotypes of masculinity and femininity (Oakes/Haslam/Turner 1994; Lacan 1985; Foucault 1996) reflected in the institutional environment, in the opportunities of job, the levels of salaries, and the workloads.

Identity¹³ generates roles within society where a systematic process of identification establishes the differences between status, needs, positions, and privileges of each gender (Falco 1987). These roles have two explanations. First they articulate the totality of ways through which oneself expresses gender identity, and secondly it defines the roles in relation to the type of activities that a society determines as adequate for a person with specific gender identity. As these processes are socially developed, these behaviours are not fixed, and greater equity inside a society through a systematic analysis of gender relations, understanding how a woman and a man deal in specific social contexts, can be achieved. The result of this long-standing gender discrimination has produced historical inequality and inequity.

Exclusion and discrimination normally menace more women and girls, creating higher social vulnerability. They are highly exposed in daily life to gender-related violence, and their labour inside the house and in childrearing is not considered productive, neither is quantified in the global GDP of a country. This creates economic dependency from men, socially identified as 'breadwinner', whenever half of the food in the poor countries is produced by women and also economic income depends increasingly on women's labour outside the house.

During disasters and conflict situations women are extremely vulnerable, and recent disaster studies have shown that the death rate of women has been

between 68 to 85 per cent. During armed conflicts and wars, bodies of women are increasingly transformed into a battlefield. Nevertheless, these facts have remained invisible in official statistics and in most public policies (Ginkel/Velásquez 2001). This creates a high degree of social vulnerability, and gender insecurity, understood as a historical and accumulative result of poverty and unequal access to material and cultural consumption (Oliver-Smith 2004). It increases susceptibility of communities or persons confronted with hazard impacts or wars.

But a crisis situation creates also conditions for resilience-building and empowerment, reinforcing gender security. The affected people prepare themselves through their experiences, preventing further disasters and adapting to difficult life situations. Women who are heads of single households are at greater risk, due to stereotypes developed in any specific society, and as a result of generally accepted social representations based on identity processes.

Thus, the security dynamics, related to climate change and socio-political processes, represents threats for individual identity and social representation, where not only the physical survival is at danger, but also the cultural one, often reinforced by religious concerns. Linking Gramsci's 'ideological apparatus of state' with identity and role theories, the past decades of impoverishment in the South and in Arab countries (El Kayat 2004), and recently also in the North, environmental destruction, migration, depopulation due to disasters, wars and desertification, have pushed survival strategies increasingly into the hands of women (Oswald 1991, 2008d).

Tajfel (1981: 31) argued that social identity¹⁴ means how "we live in a world in which processes of unification and diversification happen with gigantic steps and with a rapidity never ever before seen in history." Hogg and Abrams (1988: 78) argued that "persons have a basic need to simplify and to impose an order to their reality"; a reality that induces them to categorize their socio-natural environment through social comparisons. This process supports, affirms and, maintains self-esteem in a positive way, but it explains also how this individual self-esteem depends on belonging to a group, not necessarily within its own social system of reference.¹⁵

Moscovici described social representations as "systems of value, ideas and practices" that simultaneously "establish an order that permits an individual to get familiarized and to arrange its material and social world" (Moscovici 1976: xiii). Without discussing the identity analyses in more detail, (chap. 89 by Serrano),

13 There also exist processes of *inverse identification*, when social comparisons of the proper groups are rejected and the person relates itself for identification with external groups, due to a low self-esteem which cannot be improved inside its own group of reference. Diverse influences also intervene into the social practices characterized by collective or individual history, linking with cultural practices and creating a self-induced process of victimization or feeling of guilt.

the “deconstruction for deconstruction” (Behnke 2007: 105) increases the self-reflection in a critical manner. At the same time, social representations enforces the communication among members of the community, providing them with a socially shared code of interchange where names are classified without any ambiguities, including world-views, mindsets, and personal and social histories. Their cognitive poliphasia¹⁶ characterize social representations, where different forms of understanding may coexist, what indicates a persistent potential for instability within representational systems (Moscovici 1976a: xiii). According to the same author, social representations are systems of ideas, values, and practices fulfilling a dual function: a) establishing a framework of order where the subjects are oriented in their material and social world where they live; and b) permitting the communication with a common code among the members of a collective, where all objects are named and the processes precisely classified (Moscovici cited in: Herzlich/Graham 1993). The process of individualization implies a contradiction: on the one hand the men and women that seek to appropriate a life are *liber-*

ated from traditional gender adjudications. On the other hand, people are subtly *coerced* into seeking love and happiness through partnerships within increasingly impoverished networks of social relations (Serrano 2003a: 9).

Social representations originate in daily life, where the society is the thinking system (Flores 2001). They could be reinterpreted as an equivalent for contemporary myths (Eliade 1965; Graves 1985) of belief systems in primitive societies (Moscovici 1984: 181, 1990, 1998, 2000). For this reason, identity is *processual*, since its gestation it changes permanently; it is *relational*, given that it is transformed by exchanges and interactions; and *multidimensional*, because it operates in intra-individual, inter-individual, intra-group, inter-group, and ideological environments (Doise 1986). Identity is also *contextual*, given that it is forged into specific contexts, and *essentialist*, because the diversity and the complexity of the social interactions are sustained and transformed through identity processes (Serrano 2004).

Duveen explains how the two basic processes of historical production of social knowledge are linked to ‘anchoring’ and ‘objectification’. *Anchoring* is a process that permits integrating the unknown situation within the existing representation (internalization). *Objectification* permits that these new representations are projected into the world as concrete objects (Duveen 1997: 87). The acquisition of these control mechanisms (Maslow/Frager/Fadiman 1987) permit in independent situations to internalize in society two basic psychological processes, which works as control mechanisms and therefore generate gender insecurity: a) women *should be*: assigned identity (social facts); and b) women *should be available for others*: self-identity (socialized).

‘GS’ represents gender relations (men and women) as its object of reference, and the values at risks are precisely identity and social representations (table 90.1). Thousands of years of experiences have permitted to consolidate a system of social representations that has been able to control all elements in the specific socio-historic context of a society. Symbolic elements of identity were developed – such as class, ethnicity (Charles/Hinthens 1998), age, religion, race, nationality, professional ascription, political ideology, education, and others – which are in permanent change, reflecting a large diversity and capacity for adaptation, while conserving the outstanding historic attributes (gender, sex, and race) and the material conditions of late capitalism: poor and rich (Giménez 1999, Habermas 1995, 2000; Van Dijk s.d.).

14 Identity should not be confused with subjectivity; it includes all elements constituting a person, influenced by the socio-historical surrounding and the former process of establishing social representations where class, ethnicity, race, nationality, professional ascription, ideology, policy, education, experiences, and culture (Braidotti 2004). All these factors influence the constitution of behaviours, inducing also permanent changes. These processes can include a phenomenon of depersonalization of the ‘self’, because the categorization of the ‘other’ signifies simultaneously a socio-cultural exclusion of the proper personal or social story, tending to promote an apolitical theory building. “Our social history is full of familiar examples and horrors dehumanizing other groups, and more subtle forms of discrimination and depersonalization of them” (Tajfel 1981: 241). “The accentuation of stereotypes reflexes the perceptive selectivity from which it results more appropriated to perceive persons in contexts of level of social identity categorization instead of particularizing their personal identity” (Turner 1990: 26).

15 Thus, the vote of fear by a majority of Americans for President Bush and his war policy may only be understood in this sense, although in their personal life Americans oppose violence, war, terrorism or actions of uncontrolled masses. Another example is the fanaticism during sports events which may end with violence in the stadium. The peripheral information is used to define and to be congruent with the proper group, thus understanding the differences with other groups of reference (Archer/Lloyd 2002).

16 Multiple significance, sometimes contradictory.

The exercise of *power* is the basis for a privileged access to socially valued resources, such as commodities, money, status, leadership, group membership, education, and knowledge. Power implies the necessary control or change of mentalities of others to impose the proper ones. All dominant groups tend to create homogeneous identities and social representations within their subjects, where the oppressed decide to support and maintain the oppressive situation in the name of their supposed own interests. Gramsci described this process as *hegemony*, giving the ruling class a stable process of power¹⁷ exercise and domination, where *domination* is defined as the (ab-)use of social power by elites, institutions and dominant groups, producing social inequities such as political, cultural, class, ethnic, race, and gender discrimination.

90.4.2 Identity and Gift Economy

Any process of classification and choice implies relations of identification, inclusion or refusal and exclusion that constitute the basis for power exercise and gender insecurity. As any social organization relies on sexual differences, humans are soon getting an identity as man¹⁸ or woman. This implies specific identity conditions, as well as particular mechanisms of power exercise and processes of differential *gender empowerment* (GEM). Therefore identities show complex processes: they are developed (Moscovici 1990), confronted with realities, permanently resisted through existing representations within the group of reference, and projected as objects to the exterior (Du-

veen/Lloyd 1990; Duveen/Moscovici 2000a; Richards 2000; Richards/Schwanger 2004). The '*theory of social identity*' (TSI) sees the structure of the self in relation to three continua: *first*, the continuum of behaviour from interpersonal to inter-group; *second*, the continuum of identity from a personal to a social identity; and *third*, the continuum of beliefs from social mobility to social change (Tajfel/Turner 1979; Haslam/Oakes/Turner/McGarty 1995). These processes create GS processes that produce different behaviours in daily life, which are, however, able to consolidate a common behaviour worldwide, called 'gift economy'.

Genevieve Vaughan (1997) deconstructed post-modern feminism, including women's free labour for child rearing and work in the household as a 'gift economy'. This free gift is related to maternal thinking (Ruddick 1995) or mothering (Chodorow 1978), producing collective social changes which go beyond capitalism and communism, both systems with clearly patriarchal roots (Nikolic 2004). Capitalism is based on the 'exchange paradigm' in a free market society, where even justice has become a commodity. Communism exercised its power through a central state within a state economy. Both belong to the logic of exchange, opposed to the logic of gift. Both economic paradigms – logic of exchange and logic of gift – coexist today. "One is visible, the other invisible; one highly valued, the other under valued. One connected with men; the other with women. "Exchange puts the ego first and allows it to grow and develop in ways that emphasize me-first competitive and hierarchical behaviour patterns...What we need to do is validate the one connected with women, causing a

17 Multiple interactions of power exist: allied, confronted, aligned, subsumed or annulated, nevertheless the real power in the present neo-liberal world is in the hand of a few men, the managers or CEOs of multinational enterprises, supported by Presidents and Prime Ministers of industrialized governments (OECD countries), that have created a global hegemony based on military, financial, political, and cultural power (Beck 1998, 2001; Sen 1992, 1995a; Arizpe 2004; Strahm/Oswald 1990; Forrester 1999; Castells 2002; Nussbaum/Sen 1993). They discriminate not only against women, but also against poor men. There are structural impediments which stand in the way of transforming this reality, such as central and peripheral imperialism (Galtung 1971; Senghaas 1973) with associated anchorages, such as names (progress, modernity, development); images (white occidental young men); myths (free market); formal institutions (governments and the UN); formal organizations (foundations, NGO), and informal networks (professional associations, clubs).

18 Homosexuality represents in the present world an exception, and in most cultures these persons are discriminated and repressed socially, because they are questioning from inside the dominant system of patriarchy. If this group grows within the existing dichotomized occidental world, its practice could become a direct threat for patriarchy (Foucault 1996) and therefore homosexuals are socially punished and persecuted by majorities. When these groups ally with other protest movements, they have achieved in some countries an acceptance of marriage among the same sex and in exceptional cases, the right for adopting children, subverting the traditional family pattern. Although, there are some ethnic groups which have developed both female or male sexual characteristics, such as the 'mujes' in the Zapotecan culture (Bennholdt-Thomsen 1994), giving them special roles and using their abilities. In others they are conferring different social representations such as that of a healer, a witch or a shaman.

basic shift in the values by which we direct our lives and policies” (Vaughan 2004: 11). Thus, the invisible, considered as being without value has to be valued.

There is a second triggering process related to the exchange paradigm. Markets are creating artificial scarcity to reevaluate goods and services. Usually this scarcity is artificially created in order to maintain control and increase power, but induces simultaneously processes of depredation in social and environmental terms. This scarcity is increased by wasting resources, invested in armament. Only 17 billion US dollars would feed everybody in the world during one year. The same amount is spent in one week on the military, a typical example of waste that creates artificial scarcity. Further, gift giving by big ‘exchange-ego’ in the form of aid from industrialized countries to developing ones is not functioning, due to the strings imposed by the donors which often impoverish the poor countries.

Thus, the gift agenda implies to liberate “everyone – women, children and men – from patriarchy without destroying the human beings who are its carriers and the planet where they live” (Vaughan 1997: 23). These women-based practices started with a criticism of language, emphasizing the need-oriented satisfaction, rather qualitatively based, which creates emotional bonds between givers and receivers. Especially raising young children, mothering requires kindness and creativity, sometimes self-sacrifice, and for this reason it is an important gift for the child and society. The author emphasized especially the gift of goods through ‘communication’, what deeply challenges the patriarchal economy of exchanges, profits, and interests. “Giving and receiving word-gifts organized in sentences and discourses creates a human relationship among people with regard to things in the world” (Vaughan 1997: 38). By this intentionality of giving, the caretaking is more important than the objectivity of an account, satisfying the constant social communicative needs, where reality is represented and reinterpreted without competitiveness, transforming *homo sapiens* into a *homo donans*.

The gift-economy visualizes also the invisible passivity and receptivity of women not as a mechanical concatenation, but as a creative process, where always equal exchanges not only are self-reflecting, but also self-validated by reciprocity. These processes would change the dominant system of existing social representations by creating new identities, increasing GS, and reducing violence and exclusion.

The gifts of nature, such as air, water, sunlight, food, biodiversity, biomass, that are used by humans

unconsciously permitting them adaptation, evolution and well-being (Diamond/Orenstein 1990) coexist alongside human gifts. The present system of trade, deregulation, and private appropriation is concentrating temporary money in small elites, sacrificing humans and nature by pulling these natural gifts in trade, and invading the traditional areas of natural gift-giving. The extreme expression of this invasion is represented by the biogenetic industries, where *bio-projection*, or better named *bio-piracy* (Shiva 1993, 2002; Foyer 2005; Oswald 2002a) is turning thousands of years of human gifts in the form of food and seeds into genetic modified organisms. The ‘exchange paradigm’ privatizes these collective natural goods, protected by the Trade-Related Aspects of Intellectual Property Rights (TRIP’s) of the World Trade Organization (WTO). Similar processes are occurring with the privatization of water, health care, and education (Illich 1976a). All these processes have been reinforced by General Agreements on Trade and Services (GATS) agreements guarded by WTO (Arroyo/Villamar 2002).

Thus, the gift economy creates transitional structures to HS and ES, and criticizes the patriarchal capitalism and the position of power over other human beings and nature. This top-down vision (see later social movements) identity processes and social representations have to be challenged from the root causes, including the Euro-American construction of gender and of the environment. In this process subsistence economies from the South, often in the hands of women, are questioning the dominant way of understanding earth and life.

The symbolic understanding of male power (skyscrapers, monuments, jewels, arms, bank accounts, supermarkets, and malls) transforms social processes into private property. Nevertheless, gender identities of men and women are based on these processes, and mothering is threatened by narrow military security concerns. Thus, GS understands this mothering not as a self-sacrificing process leading to victimization and control, but as an integral human process and an especially intense moment of gift giving, which is able to increase human and gender security with care for the environment.

90.4.3 Ecofeminism

The gift economy and ‘ecofeminism’¹⁹ are deeply interrelated and complementary, and are interpreted here as the third pillar of GS studies. Ecofeminism is understood as a convergence of environmental, so-

cial, and feminist movements, where mothering spirituality is caring about nature and society, about the vulnerable above all. It represents a movement which is applying feminist modes of analysis and concepts to the environment (see 91.3.1). The key values are equality and equity, including care, inclusion, solidarity, and respect for other humans and for nature. The principle of sustainability and concern over the coming generation gives the philosophical approach and the activist a theoretical background to link up with human and environmental security. Ecofeminists see the oppression of women and the exploitation of nature as interconnected. The dominant patriarchal system in late capitalism is affecting human, environmental, and gender securities with the same root causes. Control and commoditization of life and goods in favour of a small bourgeoisie are destroying the livelihood of billions of people, pushing them into extreme poverty. Also, human health and environment are affected when toxic waste is dumped into seas, waters, the ground, and the atmosphere. As a result, anthropogenic reinforced GEC causes more and stronger disasters. Human and economic losses are affecting differently geographical regions with higher impacts in the Tropics, the Arctic, the Andes, and the Himalayas, and lower social classes (poor and marginal) and gender (highly women, children and elderly) are the most vulnerable.

When ecofeminists integrated several social theories, and cooperated with philosophers of ethics and morality (Zimmerman 1987) and social movements, they deepened in the analysis of the differences between gender and sexuality (Szasz/Lerner 1998). With regard to environmental destruction, food scarcity, and women's discrimination and violence (Pickup 2001), they found an analogue process of exploitation between gender and nature.

19 The term was originally coined by François d'Eaubonne (1974) as a philosophy and a social movement emerging from the union of feminists and environmentalists. It was related to eco-anarchism and bioregional democracy with a strong involvement of feminism and deep feminism. According to Warren (1997: 218): "Since 1974, ecofeminism has surfaced throughout the globe in the form of both women-initiated, grass-roots environmental actions and interdisciplinary perspectives on the inextricable interconnections among human systems of unjustified domination – both of humans and earth. The distinctiveness of ecofeminism, then, is that it is a feminist environmentalism and an environmental feminism." See also Eaton/Lorentzen (2003) on the debate in the US, Brazil, and Japan on aspects of the relationship between ecofeminism and globalization.

Ecofeminists were inspired by proposals of the Club of Rome, and later by the results of the Earth Summit in Rio de Janeiro (1992) on sustainable development, and the Food Summit in Rome (1995). The depletion of nature through a pillage of natural resources²⁰ and the exploitation and repression exercised against woman during thousands of years resulted in both environmental and gender insecurity. Both are victims of the same patriarchal system characterized by domination, appropriation, violence (Maier 2001), exclusion (Pickup 2001), and destruction (Warren 1997; Mies 1989).

A special focus was addressed to the results of the green revolution, genetically modified seeds and agribusiness that have been promoted by private and multilateral organizations (FAO, IFAD) and have created pollution of the air, land, and water. Biodiversity and local food cultures were damaged by free market practices and high subsidies in the industrialized countries. Southern countries were induced to adopt new legal systems. In both cases the critical points were the loss of communal land rights and the transfer of these property rights to male landlords and agribusiness. Further privatization of water and seeds threatened livelihood and biodiversity. Community owned land formerly used for food self-sufficiency went into private hands, and poor peasants started a massive rural-urban migration into shanty towns (Dore 1997; Dore/Molyneux 2000). Ecofeminists argued that colonization, plantation, and monocultures have also destroyed the mystical connection with 'Mother Earth'²¹ (Shiva 1988, 2002; Shiva/Jafri/Bhutani 1999; Plumwood 1991; Vaughan 1997; Howard 1999).

20 Since the 1970's, several ecofeminists claimed that new technologies such as genetically modified seeds, cloning, nanotechnology, modern communications, and genetic medicine created new relations of subordination for human beings (Throsby 2004; Schumacher 1973). A world network of female researchers organized as *Diverse Women for Diversity* (DIWO) has studied locally in different parts of the world the effects of these technologies for women, poor countries, minorities, and biodiversity. They concluded that these scientific advances are part of new mechanisms of exercising power that may subsume in a more subtle and probably also more efficient way all non-hegemonic groups, nature, and social relations. Health, education, water, biodiversity, and the assumed welfare of all human beings are now under attack by mercantilist interests, and human development is limited to specific social classes, reflected clearly in the *Human Development Index* (HDI), and directly linked to *Gender Empowerment Measures* (GEM).

The complexity of the interlinked processes brought ecofeminists to criticize neoliberalism and regressive globalization that was supported by politicians such as Margret Thatcher when she proposed in the 1980's her 'TINA' (There is No Alternative, Mies 1998) concept. In her mind the free market and transnational enterprises were the unique and inevitable productive and trade system for the whole world (Baldwin 1993). When ecofeminists recognized that the impacts of these neo-liberal initiatives were disastrous for the well-being, for social security, and jobs in many parts of the North and South (Tickner/Mason 2002), they offered deeper analyses. Due to the global and regional socio-economic crises (Renner 1989), internal violence (Mason/King 2001), environmental destruction (UNDP 2005; Cheney 1987), poverty (Campos 1995; Dos Santos 1978; Oswald 1989), and in some cases even worldwide terrorism (Thieux 2004), the ecofeminists related these global processes to the exploitation and discrimination of gender. They understood that it was inherent in the existing patriarchal system and their exchange paradigm.

Confronted with effects of globalization, comparative studies from North and South, undertaken by peasants (Via Campesina 2005; CLOC 2002, 2004) and intellectuals (Saxe Fernández 1999; Eaton/Lorentzen 2003; Brauch/Oswald/Mesjasz/Grin/Dunay/Behera/Chourou/Kameri-Mbote/Liotta 2008) pointed to alternative processes of transversal, multi-local, and decentralized efforts. Several of them were related to political activism and social mobilization (e.g. in the World Social Fora - WSF) as part of a dynamic process of scientific reflection and the search for other possible worlds that is reflected in the slogan of TAMA (there are multiples alternatives; Oswald 2008, 2008d).

From a transradical perspective, some proponents of ecofeminism (table 90.1) linked approaches and theories to ecoindigenism and cultural resistance, and then to GS (Oswald 2004, 2008a). This trans-local analysis facilitated a comparison of diverse geographical conditions; all of them have been subjugated to the same exclusive globalization process that was controlled by multinational enterprises and the G-8 governments.

With other movements of women, peasants, indigenous groups and environmentalists, ecofeminists par-

ticipated in a campaign against multinational oligopolies of genetic modified seeds, pointing to their potential negative impacts of contamination and genetic erosion of biodiversity on society, nature, health, and the economy. The central factor was the destruction of rural economies and the resulting migration of peasants to shanty towns within or outside of their country (Oswald 2002c, 2001; Shiva/Jafri/Bhutani 1999; Shiva 1993; CLOC 2004; Garcia 2004).

By promoting cultural and biological diversity, ecofeminists overcame the Cartesian relationship between subject and object. They deepened this interrelationship, including a critical revision of traditional cultural postulates that contain patriarchal roots. They opposed the dichotomy between liberty and emancipation, and showed the fallacy of a globalization process that excludes local sustainable development. They argued that only by a 'glocal' approach - internationally linked and locally anchored - supported by affected people, will it be able to counter the imposition and assignation of roles and identities promoted by multinationals, TV channels, and information agencies. The universality of Western thought was deeply scrutinized, especially by ecofeminists from the South. In their view, only a culturally diverse and environmentally sustainable self-reliance and food sovereignty can offer real alternatives (Via Campesina 2005; CLOC/Via Campesina/ANAMURI 2002). Diverse cosmo-visions, several of them which survived for hundreds of years within the communities, bloomed again and thus reinforced the cultural plurality and biodiversity, especially in towns and rural communities in poor countries.

Ecofeminists portrayed as a fallacy the paradigm that only modernization and progress will permit to reach a similar development as industrialized countries, and therefore HS. It is not only impossible to achieve (see data on the increase in poverty and marginalization), but also undesirable, since it would create new pressures and domination on gender and nature (conflicts in Bali for emission-cut of CO₂ in 2007). The industrialization, modernization, and agribusiness has increased natural hazards in number and intensity, and these often became societal disasters (see figure 90.1; chap. 15 by Wisner).

The growing urbanization process with chemical contamination, industrial toxic accidents, the exhaustion of aquifers, soil erosion, loss of biodiversity, chemical changes in the atmosphere (Crasswell 2005; Dankelman 2002; IPCC 2007), have also reduced the survival possibilities of peasants and contributed to growth of shanty towns (e.g. Accra, Cairo, Lagos, Ma-

21 Similar processes occurred several thousand years ago, when patriarchy evolved and expropriated the holy places in the hands of priestesses, such as the oracle in Delphi (Warren 1997).

nila, Mexico City, Mumbai or São Paulo, Loster 2007), where poverty and risks have increased. Further, urban slum dwellers are generating unprecedented environmental degradation, and survive in adverse life conditions which force women and children to develop their own 'survival strategies' (Oswald 1991, 2008d). Simultaneously HS and ES are triggering gender insecurity that could be aggravated by GEC and its unforeseeable global effects.

90.4.4 New Social Movements

The author proposes as a fourth pillar of GS studies the processes of confluence of diverse social movements. Historically, after the explosion of the atomic bomb, feminist movements allied with pacifists and supported the establishment of peace institutes and promoted nonviolent social behaviour (López 2004). Since the 1970's, these social groups have cooperated with ecofeminists, indigenous people and ecologists on issues of environmental and social deterioration. When the neo-liberal model spread everywhere, workers, trade unionists, the displaced middle class in many countries in the South, the unemployed, the young without a future, and many elders joint. All of them lacked a worthy alternative perspective for their life and future, and were forced to survive as self-employed in the informal economy.

During this fourth phase, questions related to GS acquired greater visibility, especially in Mexico when the Zapatistas, an indigenous movement in Chiapas, launched their 'conflict against neo-liberalism' on the same day (1 January 1994) when the *North American Free Trade Agreement* (NAFTA) entered into force (Oswald 2008e). The use of the internet by representatives of progressive church groups converted this armed movement into the first global cybernetic conflict.²² These movements create grass-root ethno-feminist and ethno-ecologist alternatives (Warren 1998; Stephen 1997), based on local self-reliance²³ (Benholdt-Thomsen/Mies 1999), economy of solidarity (Cadena 2005), and participative governments (MST 2003, 2005a). These concrete examples show how the poverty trap can be defeated, but explain also the underlying economic links of transnational culture of consumerism, promoted by multinational enterprises and their mass media. Further, they visibilize the gift-giving and solidarity, are able to care for social vulnerable and the environment, and therefore reinforce HS, GS, and ES or HUGE.

This phase of GS also coincided with the rise of international postmodern social movements (Melucci

1996). In Latin America they started with the opposition to free trade agreements, especially against the *Free Trade Agreement of the Americas* (FTAA). The global connection among social movements emerged during the protest against the WTO in Seattle. The alliances were strengthened during the World Social Fora in Porto Alegre, Brazil (2001–2003, 2005), in Mumbai, India (2004), and in Nairobi, Kenya (2007) as well as regionally in different parts of the world (Oswald 2008e).

They created extensive coalitions and networks of groups and persons against the dominant neo-liberal model. Their agenda included environmental destruction, cultural homogeneity, social exclusion, gender discrimination, social stigma, racism and others. They adopted a common agenda for a world struggle that should be able to alter programmes of multilateral organizations that have been consolidating this model of an unjust world order (World Bank, FMI, WTO, and G-8). Sara Larrain (2005) named these new social movements – consisting of indigenous, women, peace, and ecological groups – as *altermundism*²⁴.

As diverse social movements they are training inside their organizations processes of democratization and sustainability (Brundtland 1987, 1987a). Although differences exist among these social movements,²⁵ they agreed on specific themes such as the decentralization of power; even though they still have not yet determined how social and territorial decentralization should be implemented, and which could be the institutional options (Kaldor/Anheier/Glasius 2003). The social imaginary, once explored how to transform their legitimate demands – human rights, gender rights (Peters/Wolper 1995) welfare, food sovereignty, peace, environmental care and poverty relief. These movements questioned the hegemonic development agencies with their technological modernizing para-

22 Responding to international pressure, the Mexican government had to negotiate a nonviolent solution of the conflict and an armistice, although it has not yet fully implemented its commitments negotiated in San Andrés Larrainzer in Chiapas in 1994, and the indigenous laws adopted by the Senate and House of Deputies in 2002 do not reflect the negotiated agreements nor the self-determination claims of indigenous groups. This local rebellion had global repercussions, and worldwide solidarity groups for EZLN were created. Their ideas of dignity and cultural integrity spread and generate in different parts policies to improve the situation of their marginalized and poorest citizens, similar to the indigenous population of Chiapas, where a war of low intensity is still going on.

digms, using political power and economic pressure (IMF, WTO) to privatize public services at any costs of social conditions in developing countries and poor social sectors.

Social movements promote transparent public administrations with decentralized power exercises able to stimulate gender and regional equity within a framework of socio-environmental sustainability. Especially the improvement of GS has to overcome thousands of years of hegemony (March of Women), where women have lost the notion of being dominated and submitted (objectification, anchoring). This associative approach could prevent an alternative world superstructure (a kind of anti-UN). It conserved its cultural diversity both in thinking and in practice.

23 For more than 10,000 years, women and peasants have selected the best seeds, improving the performance in the field, developing diverse culinary cultures, and protecting harvests and animals from plagues and illnesses. After governments and the FAO abandoned these traditional practices with the spread of the green revolution and genetically modified seeds, hunger has remained an undeniable reality. One person dies each 4 seconds, 24,000 deaths per day due to lack of nutrition (FAO/IFAD/WFP, 2005a). In Mexico, as elsewhere, children are the major victims of this unjust system: 27.2 per cent of children less than 5 years and about 50 per cent between 10 and 22 years suffer from anaemia; 18 per cent of the children have not developed due to chronic undernourishment, and there are three times more rural children suffering from growth deficiency. More than half of those exhibit iron deficiency before they enter school. Industrialized sugar is the third food among children of 5–11 years, frequently provoking degenerative illnesses such as diabetes mellitus (Chávez/Martínez/Soberanes 1995). This food pattern provokes overweight in 5.4 per cent of the children, increasing to 18.8 per cent in kids over 5 years (23.5 per cent of urban children compared with 11.2 per cent in rural areas). Mexico is one of the countries with the greatest incidence of child diabetes (INNSZ 2001, 2003). These facts do not reflect the productive reality of the world. In spite of the population growth during the last two centuries, nowadays there is sufficient food to feed the whole human population 4.2 pounds per person (Lappé/Collins/Rosset 1998). Nevertheless, only 64 per cent of the agricultural products are used for human food. The rest is transformed industrially or is utilized as feed for animals and livestock (FAO 1996, 2005, 2005d, 2005e; FAO/IFAP/WFP 2000, 2002, 2005, 2005a), and increasingly for bio energy.

24 Atermundism is the self-defined term of the networks of different social movements working with the slogan: “Another world is possible”.

Respect for the diverse ideologies and practices of any social movement or group is a key to their success.

These social movements asked for social representation with greater harmony among human beings and nature, coherence between public and private policies, between political offers and public policies, and a relationship based on reciprocity and cooperation, as well as on solidarity. The convergence among paradigms and perspectives of gender, sustainability, equity, vulnerability, and positive peace has promoted a “conception centred on human beings, questioning the patriarchal paradigm and searching for coherence among the public and the private; the coherence among equity and democracy between gender, generations, cultures and territories” (Larrain 2005: 3). Their demands are based on social power without privileged access to resources socially valued such as goods, status, leadership, education, knowledge and power, but in a process of sharing tasks and ‘mandating obeying’ (EZLN), capable of generating an extensive base of diverse, but not antagonistic interests that can challenge the homogenizing neo-liberal rules of identity, social representations, and social cognition.

Habermas (1995) correctly mentioned that this phase aims at an ideological and discursive struggle. It is expressed clearly in the strategies of the Zapatistas. They struggle against the control of the mind by mass media, thus imposing socio-cultural representations (Castells 2002; Chomsky 1998). This process explains also why dignity and critical thought of ecofeminists, of social movements, and social actors are crucial for establishing new equilibria of power (Kothari 1990). It implies a social consensus, where existing processes

25 The ideological diversity of these movements spread from Marxism and anarchism to deep ecology and spirituality, and their methods from violence to contemplation. These movements with proper interests have built one common agenda and they democratically agree on a programme for a culture of social sustainability, granting synergies among feminists, ecologists, indigenous people, promoters of human rights (ethnic women, children and elderly; Tomasevski 1993; Muthien/Taylor 2002), activists against war, free trade agreements, the WTO, repression calling for debt relief for poor countries (Jubilee 2000) and the construction of an economy of solidarity (Cadena 2003, 2005). They were able to mitigate locally some impacts of exclusive globalization (Lopezllera 2003; Campos 1995), and to put the processes of liberalization and poverty alleviation (Richards, 2000) on the policy agenda in different parts of the world (Chile, Venezuela, Brazil, China, India, South Africa). These movements offered new energies and hope for alternative futures for the poor.

are deconstructed, re-interpreted, argued, criticized, and substituted with real alternatives.

This fourth pillar of GS offers an understanding of the interrelationship and mediation processes of different social levels: of micro and macro; of individuals or groups: of relationships among discourses and power domination, and deconstruction where the raising of local consciousness for a global struggle emerged. In strategic terms, the social representations, shared socially, permit the establishment of new identity patterns able to create wider alliances with greater achievements and increasing capacity for alternatives (CLOC 2004; Via Campesina 2005).

In summary, the transformation of identity patterns, the creation of alternative social representations, and the visibilization of the gift-giving economy reinforce cooperation and nurturing of humans and nature. Ecofeminists and social movements have criticized the Euro-American power exercises and ideological domination through propaganda that are able to threaten human, environmental, and gender security.

The multiple risks and threats inherent of their global neo-liberal economy and post-war progress brought concentration of wealth in a few hands, violence, armed conflicts, and *global environmental change* (GEC). To achieve mechanisms contrasting these growing insecurities, this author has proposed an integrative HUGE security concept consisting of *Human, Gender, and Environmental Security* (Oswald 1992, 2001, 2008a). This HUGE concept responds both to the scientific debates reviewed above, but also to the critical political questions of women and men who want to explore alternatives to the present exclusive globalization model.

90.5 Human, Gender, and Environmental Security: HUGE

The revision on bibliography on the three security concepts has shown that there is still a predominant disciplinary, male and Western approach in security research (Buzan/Wæver/Wilde 1998; Kaldor/Anheier/Glasius 2003; Steffen/Sanderson/Tyson/Jäger/Matson/Moore III/Oldfield/Richardson/Schellnhuber/Turner/Wasson 2004; Wæver 2000) deepening and widening in one or another aspect. The evolution of HS has broadened the discussion from protection of anti-personnel mines (CSH 2003) to poverty alleviation, human rights (UN 2006), governance, gender participation (IFAD, 2005, UNFPA 2004; Whitehead/Lockwood 1999) and dignified jobs and

social protection through income and governmental services (UNMP 2005a). Substantially more environmental concerns (UNDP 2007) appear in HS reports (UNDP 2004, 2006; World Bank 2007); food and livelihood issues (IBRD/WB 2007; World Bank 2007); peace and conflict resolution (UNESCO, 2002), and on the regional level new actors and triggering situations are analysed (BID 2007). The five lost decades of development and the increase of poor people worldwide reorientated the discussion also towards ethical concerns (Ogata/Sen 2004).

GECHS (Matthew/Fraser 2002) and UNU-EHS (Bogardi/Brauch 2005) have linked social vulnerability (Birkman 2006) with a loss of wealth as a result of the increasing and more severe disasters (MunichRe 2005). UNEP (2004) included the potential conflict situation due to scarce and polluted resources, and the chronic neglect of governments in poor countries (IFRC-RCS 2006, 2007). Economic concerns were widely debated when the Stern Report (2006) appeared, and critics in favour and against obliged the UNFCCC (2007) in Vienna to quantify future investments for mitigation and adaptation. After the appearance of the IPCC reports (2007, 2007a) and the G-8 Meeting in Heiligendamm (2007)²⁶, ES studies deepened in the transversal process of interrelated social problems with the environment²⁷ (UNEP-PCAU 2004), but few gender-related issues, mostly without any implicit reference to security (United Nations, 2006a; WECF 2006) were discussed.

Diverse publications appeared searching for protection of vulnerable social groups (youth, gender, minus valid, elderly; Villagrán 2006; UNDP 2007), animals, coral reefs, and specific ecosystems such as the dry tropical forests, whenever the GS aspect was missing. Before the Bali Climate Summit in December 2007 different networks organized and started lobbying with multilateral and governmental representatives for a more integral vision. Gender issues related to GS were implicitly managed (e.g. in the gender disaster network; the gender and climate change network, and among women for climate justice). Nevertheless, an integral concept, linking HS, GS, and ES is still missing, particularly when risks inherent in the model of development are growing (Beck 2007a).

26 G-8 Meeting in Heiligendamm, Germany on 8 June 2007"; at: <http://www.g-8.de/Webs/G8/EN/G8_Summit/SummitDocuments/summit-documents.htm>.

27 The concept of sustainable development has a base of ES that originated from the Brundtland Report on a clear social component.

Such an attempt is herewith introduced with the HUGE concept. The combined *Human, Gender, and Environmental Security* (HUGE) concept will contribute more both analytically (as a scientific tool for analysis) but also by putting new concerns on the policy agenda (as a policy tool for action by social movements, NGOs, as well as by governments and international organizations) than the three isolated HS, ES, and GS concepts introduced above (9I.2).

As discussed before, HUGE relies on a wider gender concept - and thus differs from the narrow approach focusing on the male-female relationship prevailing in many feminist discourses in the North (Bordo 1990; Butler 1990). This wider gender concept includes other vulnerable groups such as children, elders, indigenous and minorities (see above 9I.2.3), with a human-centred focus on ES challenges as well as peace-building and gender equity (Oswald 2001, 2004, 2006c). As 'GS' is still in incipient concept, it was necessary to explain the different components (9I.3) that permitted the creation of a GS reflection with some solid theoretical bases.

The historical evolution of the constituent elements (9I.4) also revealed the deepening and widening analysis of GS from socio-psychological identity concerns, to gift-giving, ecofeminism and social movements, where livelihood, food,²⁸ health and public security, as well as education and cultural diversity (Stephenson 1992) are interacting. Therefore, the HUGE proposal simultaneously aims an epistemological critique and a policy advice at several levels, and from institutional and grass-root perspectives.

Through the HUGE concept the patriarchal, violent, and exclusive structures within the family and society are scrutinized and focused to overcome the consolidated gender discrimination, where an alternative 'femininity' and 'masculinity' establish a field of experimentation, based on equality and mutual cooperation. Theoretical and empirical diversity permits on one side a deeper understanding of GS linked up with social deterioration and growing poverty, GEC,

and armed conflicts in many countries of the world (Muthien/Taylor 2002). Confronted with increasing risks and threats, multilateral organizations (FAO, UNDP, BID, WB) have launched a discussion on empirical standpoint studies and possible alternatives (Mason/King 2001).

Within these processes of change, a wider security paradigm was accepted and developed further within the United Nations (Rupasinghe 1998, Ogata/Sen 2003, Annan 2005), exploring first human security and later environmental (Rønnfeldt 1997, 1997a), health, food, and economic security (UNDP 1994; FAO 1996c, 2000a, 2000b, 2005, 2005d; Fuentes/Rojas 2005a). More recently GS was added to the policy agenda (Tasneem/Jayawardena/Shrestha/Siddiq/Quddusi/Bhatt/Anarkoly 2007; Hoogensen/Rottem 2004; Hoogensen 2008; Sullivan 2006; chap. 93 by Ariyabandu/Fonseka 2008) for overcoming the epistemological barrier of the patriarchal worldview (Lorber 1994; Lagarde 2000) and Eurocentric imposition (Preiswerk 1984; Slater 1997).

A general agreement crystallized in the *Millennium Development Goals* (MDGs) that was approved unanimously by the member countries of the United Nations. They established specific gender policies, first reversing the present situation of inequality through gender quota as a process of positive discrimination, specifically in rural and traditional societies, where the conventional roles are still very rigid and the process of gender differentiation is still taken for granted (UNMDG 2000). But this is not enough. Also in progressive and gender sensitive societies, differences and inequalities exist as socially constructed phenomena and must be eradicated. This means not only reducing the explicit factors of oppression (time, money, preferences, see: Green 1999; Damian 2002), but also to deepen in the social and individual unconsciousness, where psychoanalysis and Marxism both have tried to show the structural disadvantages of women in any existing society (Basu 1995; Muñón 1999; Muriel 1982; Oswald 1990; E. García 2004; B. García 1999). This process is challenging the present identity processes, consolidated in mass media and anchored by the existing social representations.

In this sense, HUGE reorientates 'human security' against structural discrimination processes, where specific governmental policies, institution building, and legal reinforcements should stimulate political and social participation of women, the young, and elders (Jelin 1998; Kaji' 2001). It deepens GS concerns by transforming existing processes of social representation-building and traditional role assignment, linking them

28 Women generate between 60 to 80 per cent of the food in poor homes, and half of the world's food requirements. In Mexico only 17 per cent of women own land property or have access to agrarian land rights. In Africa women in agriculture represent 33 per cent of the labour force. They account for 70 per cent of the rural daily wages, 60-80 per cent of the subsistence, 100 per cent of the transformation of food, 80 per cent of food storage, 90 per cent of weaving and 60 per cent of the activities of the market, but they only own 2 per cent of communal land rights (FAO 2002a).

up with HS and ES processes. During the past years empirical research on disasters in different parts of the world (tsunami in the Indian Ocean, earthquake in Pakistan, Turkey, Iran, floods in Mozambique, hurricanes in the Gulf of Mexico) has shown that a higher number of the dead and displaced people are women and girls (chap. 93 by Ariyabandu/Fonseka 2008; Oswald 2008a). Social vulnerability increases during and after disasters and conflicts by transcending the existing violent conditions in daily life and make women to victims of human trafficking, rape, and sexual exploitation (chap. 92 by Perpiñan/Villagran/Oswald).

HUGE focuses on 'ES' concerns where a healthy environment and resilience-building for highly vulnerable groups can reduce the impacts of risks associated with hazards (Brauch 2003, 2005, 2005a). In hazard prone areas, social movements, NGOs, and governments are enabling women and other exposed groups to reinforce their own resilience through a bottom-up organization. If combined with top-down policies, through institution building and specific tools (such as disaster funds), they are able to guarantee effective early warning, preventive evacuation, disaster help, and reconstruction. Thus, social vulnerability²⁹ in the recovery phase can be reduced. A complex and varied world implies political and cultural diversity that may contribute to nonviolent conflict resolution processes, thus possibly reinforcing peace-building in conflict-prone regions (Ameglio 2004). Aceh and Sri Lanka showed different outcomes after the tsunami impact in the Indian Ocean. In the first case international support after a serious disaster permitted a peace agreement, while in the second case struggle among foreign aid distribution aggravated the existing civil war situation.

Resilience-building is related to horizontal interchange of experiences that strengthens the empowerment of the vulnerable. When supported by disinterested world solidarity, the international aid after crises and disasters can take out countries and specific social groups from poverty and marginality (Galeano 1980; UNEP 2000–2006). It induces also sustainable development processes. In synthesis, HUGE integrates social, environmental, human, and cultural and identity concerns, offering solidarity, resilience, sustainable peace-building (Söderberg 2004),

and equity in an increasingly insecure and risky world (Beck 2007).

HUGE put on the agenda questions related to structural inequality (Galtung 1971, 1975; Senghaas 1973) and dependency (Marini 1973; Quijano 1970; Dos Santos 1978). The relationship between the centre of the centre and the centre of the periphery (elites in the North and South) may create a common social relationship of identity among the peripheries of the centre and the peripheries of the periphery (see *Via Campesina*), associated and anchored to images (Ramona, women commandant of EZLN), names (Zapata and Che Guevara as revolutionary symbols), histories (Durito, a reflexive animal used by EZLN to promote care about environment and social justice), myths (mother earth), generating formal and informal organizations capable to coordinate through a minimal format of institutionalization. Linking these movements simultaneously across the international levels (through the internet and web pages) and localities (through myths, symbolic acts, protests and daily struggle), the associative function of the anchorage is guaranteed and the processes of communication can be expanded. From this process of micro-genesis onward it is feasible to consolidate a wider social identity, motivating the participants to plan, participate, and develop creatively alternatives, taking as social norms the unconformity against the established model and their methods of domination, violence, discrimination, and exclusion. Once social facts have been transformed into normative and practical processes of alternatives, the structure of social representations is changing in daily life (Haslam/Oakes/Turner/McGarty 1995; Hartsock 1983, 1983a; Harding 1988). Simultaneously, in different parts of the world diverse processes of autonomy and political alternation (Bolivia, Venezuela, South Africa, and Liberia) are arising and are able to consolidate participative and more equal models of societies.

Thus, conflicts can be positive motors of change and development (Gandhi 1996; Galtung 1998); but when conflicts are tied to personal ambitions and geopolitical interests, mismanaged conflicts and change dynamics can affect the entire world (Gluckman 1965, World War I and II). The HUGE concept is therefore based on a sustainable culture of peace, but goes a step further by including widened security concerns (ES and HS), that were discussed in April 2007 for the first time in the Security Council, although more from the vantage point of international and national security than from a HUGE perspective (Wisner/Fordham/Kelman/Johnston/Simon/Lavell/Brauch/Os-

29 Immediate and efficient support for isolated regions affected by social and natural disasters could prevent long-term effects such as famine and violent conflicts (Denov 2005).

wald Spring/Wilches-Chaux/Moench/Weiner 2007; Brauch 2008c).

Thus, HUGE complements the top-down policy approach on official human security approaches (UNDP 1994) by extending the traditional scope of security (*widening*), the actors (also including grass-root perspectives), the referent objects and institutions (*deepening*), and the sectors (*sectorialization*) of security concepts. Since the Rio Earth Summit in 1992, the dangers posed by Global Environmental Change (GEC) – due to anthropogenically induced production and consumption patterns and waste (Dalby 2008) – were added to the international political and security agenda for the survival of humankind and for global and human security (Brauch 2008c).

Thus, a *horizontal widening* from national military security to political, economic; social, environmental security; a *vertical deepening* from “state” to “human” and “gender” security as well as from “national” upward to “regional”, “global” and downward to “societal”, “local” and “grass-root” security *sectorialization* from arms and military industry to energy, food, health, water, and livelihood security is included (Oswald/Brauch 2008: 941–942).

90.6 Conclusions

As population and environmental stresses increase conflicts and struggles about natural resources (land, water, oil, gas, genetic resources and food; Gleditsch 1997; Oswald 2006c, 2006d), complex strategies are required from governments and international organizations, but also from all organized groups at grass-root level to prevent, mitigate, and resolve them. Thus, the interrelationship of HS, GS, and ES is not simply a sum of three security concepts with their proper development; HUGE is more than the sum of these three concepts.

HUGE links together in theoretical terms the social, physical, and ideological components of the three concepts, establishes levels of analysis with system and sub-system relations, and revises the capacity of the system consistence by self-regulation (see figure 90.1). In policy terms it orientates the proposals in the direction of a desirable future for everybody, but especially for the highly socially vulnerable. The utopia is a decentralized, diverse, sustainable world with equity and dignity, where ecofeminist and ecoindigenist paradigms care for humanity and nature.

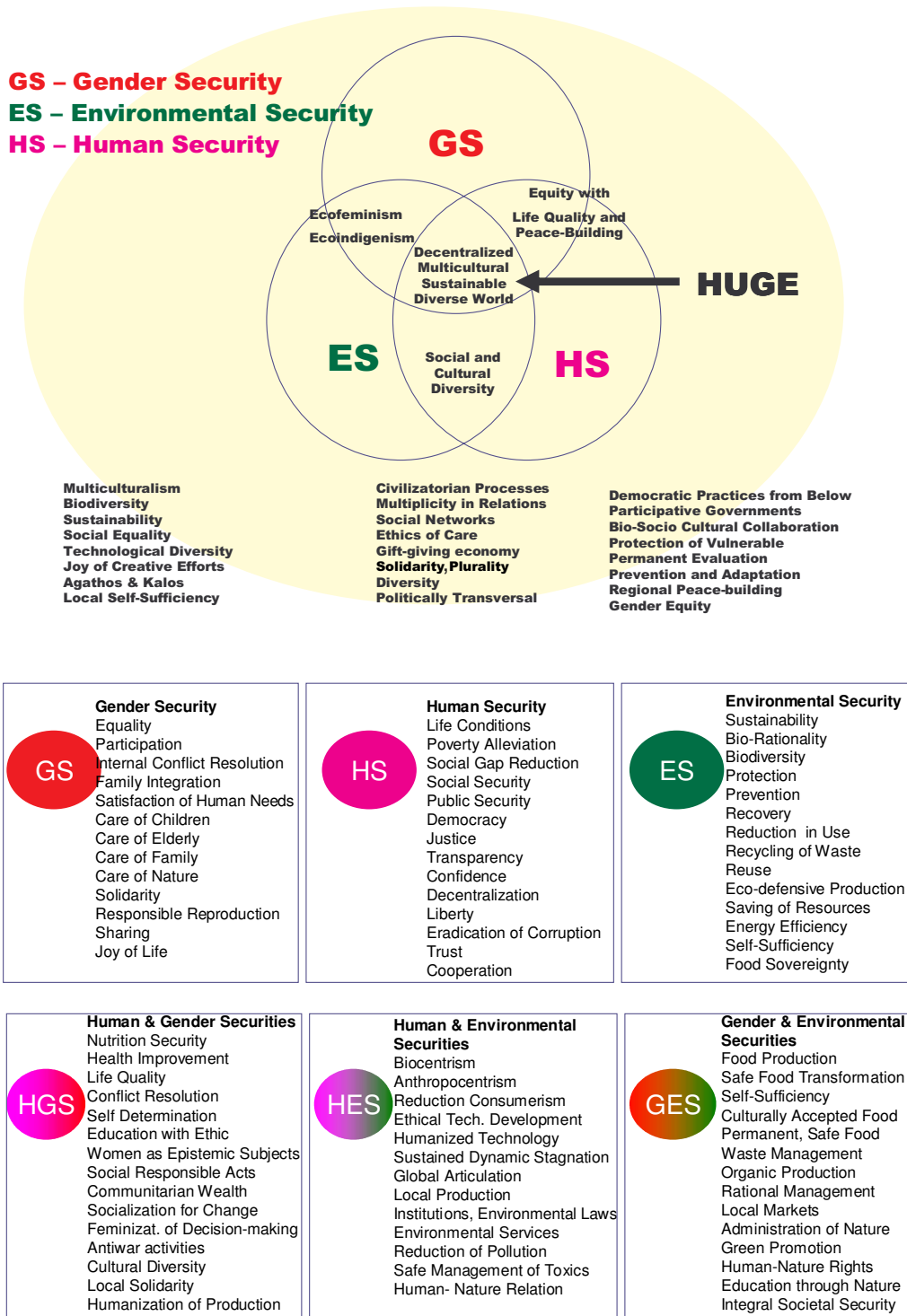
Growing complexities related to GEC are impeding the prediction of future scenarios and risks (Beck

2007) that are growing exponentially and in direct relation to the non-action and immobility of powerful nations (Stern 2006; UNFCCC 2007; Oswald 2007). The theoretical and ethical parameters are clear (Brown 2005). What is missing is an agreement of action (Post-2012) where all nations, social groups, and levels of society are co-ordinately involved and create a multicultural, diverse, and sustainable development for everybody. This means that nations with historical accumulation of greenhouse gases and high technological and economic development (USA, EU, Australia, and Canada) have a moral obligation to support poor nations in their efforts to mitigate and adapt to GEC. A diverse world implies also political and cultural diversity, able to establish fragile equilibria and to generate nonviolent conflict resolution processes that can be reinforced by peace-building and prevention in conflict-prone regions.

On the policy side, horizontal interchange among social movements, organizations, and experiences could strengthen the empowerment of the vulnerable. Solidarity with the poorest countries and social groups, financial aid, debt reductions, and genuine support for development (Sachs 2005) are pillars for sustainable peace (Oswald 2008), able to reduce threats and fears, and to strengthen the HUGE perspective. The concept could scrutinize at least five historical experiences of alternative movements and associations where there experiences are rooted:

- a) *the nonviolent resistance of indigenous societies* (Gaitán 2003, 2004; Gil 2004; Menchú 2004; Stavenhagen 2004; De la Rúa 2004; C. Rojas 2004; Armendariz 2004);
- b) *the nonviolent liberation struggle of Gandhi* (1993, 1996), later the feminist fights for equity and safe environment in India (Agarwal 1992), the struggle of Martin Luther King (1998) in the USA for human rights and race equality, the peaceful transition from the Apartheid regime by Nelson Mandela (1994), and all the peace movements over all the world searching harmoniously for conflict resolutions, such as nonviolent peace movements in India related to Jaina monks, the Buddhist anti-war campaigns in Myanmar, the Quaker’s peace-building process (Boulding 2000), the ‘gacaca’ in Burundi and Ruanda, and multiple others;
- c) *the tradition of independence fights and liberation of military regimes through guerrilla movements* (Che Guevara, EZLN, Shining Path, FLN, IRA, FAR, etc.), which negotiated peace agreements, truth commissions, and later power sharing processes through democratic elections;

Figure 90.1: Human, Gender, and Environmental Security: A HUGE scientific concept and an approach for action to face the security issues of the anthropocene era. **Source:** Designed by the author.



d) *grass-root mass organizations offering alternatives to exclusion* through an economy of solidarity, locally integrated enterprises, popular banks for

small local savers, movements of solidarity and alternative economy (the other stock market, Lopezllera 2003; Cadena 2003, 2005), and sustainable

mixed agriculture with self-reliant small businesses, represented by the *Movimento Sem Terra* (MST 2003; Dos Santos 2004) in Brazil which has organized more than two million landless peasants and regionally articulated chains of productive schemes (MST 2003; Santos de Morais 2002);

- e) *organized religious solidarity communities* such as the Christian Grass-roots Movement (*Movimiento Cristiano de Base*), inspired by the *Theology of Liberation* (Sergio Mendes Arceo, Camilo Torres, Samuel Ruíz, Fray Betto), as well as by Buddhist, Jaina and Hinduist monks.

The confluence and diversity of these different strategies, ideological and political struggles and activities, share common basic ethical principles such as plurality, diversity, equity, justice, sustainability, and social equality. They dream about globalization with a human face, social integration, gender equity, peace-building, nonviolent conflict resolution, environmental care, and risk reduction. They have maintained a flexible structure and alliance, avoiding the imposition of homogenizing ideas and hegemonic strategies of struggle, such as co-optation processes and male power hierarchies within global organization (Oswald 2008).

On the contrary, their respect for diversity, voices of the voiceless, and empowering of the socially vulnerable were explored in different ways. The varied strategies of survival and resistance-building processes have been collectively analysed through diverse past experiences (Moreton-Robinson 2000; Miall/Ramsbotham/Woodhouse 1999). Understanding of root causes, new threats and experiences are permitting new alliances and alternative grass-root strategies, linking peaceful conflict resolution, environmental care, and recovery to social development with self-reliance and food sovereignty, where interchanges and traditional technologies merge with modern ones (UNDP 2000-2006; UNEP 2003; Bennholdt/Farclas/Werlhof 2001; Bennholdt/Mies 1999; Oswald 2006). As a result of a dignified employment and conciliation of conflicts, migration as well as informal and illegal labour market was reduced when solidarity and a gift-giving economy (Vaughan 1997) is strengthening also international solidarity.

Less violence and more cooperation means that the hard security and related sectors of the military and police can be trained for civil protection and disaster management, enabling them to guard citizens from hazard impacts by reinforcing early warning, evacuation, and rebuilding processes. Arms complexes can be transformed into sustainable energy.

New investments in education and culture would help to consolidate a sustainable development process with environmental restoration in high-risk areas (islands, coastal areas, coral reef, mangroves, forests, savannas, mountain regions threatened by landslides and active volcanoes (Brown/Green/Hansen/Fredricksen 2004). This would reduce threats and consolidate security in hazard-prone regions. Confronted with new threats – generated by global and climate change, nanotechnology, and genetic modified organisms (GMOs; Beck 2007; Oswald Spring 2000b) – conscious communities and social groups are enabled to create resistance and resilience³⁰.

Bringing together human, environmental, and gender security with peace-building and risk reduction, the concept of the “Anthropocene suggests the interconnection of human and ecological matters (which) needs to be understood in a way that transcends the divisions between the natural and the human that have structured thinking about security and especially identity since the emergence of modernity. We are not on earth; we are part of an ecosystem we are changing.” (Dalby 2008; chap. 59 by Dalby/Brauch/Oswald).

The positive outcomes of these processes create larger ‘freedom from fear’, ‘from want’, and ‘from hazard impacts’, consolidating peaceful behaviour that is supported creatively by active and equal participation of women (Kameri-Mbote/Anyango Oduor 2007) and children (UNICEF 2000), bringing new energy to decentralized developing models that can consolidate nonviolent daily interaction. Emerging conflicts are resolved through negotiation and conciliation; where the vulnerable receive an opportunity to express their concerns and the solutions are proposed in equal terms, offering the conflicting parts a win-win opportunity.

Physical and structural violence is inherent in the present highly competitive free market system and its present mechanisms of regressive globalization. The Socialist utopia was destroyed by a repressive and bureaucratic communist regime in the USSR. Which utopia is left to develop ethic principles, communitarian responsibility, gender visibilization and environmentally sustainable development, in order to induce a

30 Latinos during Hurricane Katrina have shown that they have learnt to deal with hazards and new threats in a preventive manner by evacuating themselves. As illegal migrants from hurricane prone countries and later the illegal crossing of a dangerous and militarized border created experiences of how to deal with dangerous situations, and how to use marginal opportunities in order to achieve goals.

‘postmodern democracy based on consensus’, with equity, real citizen representation, and quality of life?

The history of wars, domination, and destruction brought poverty and death (Boltvinik/Hernández Laos 1999; Campos 1995; Strahm/Oswald 1990); will such an emerging civilization guarantee diverse, just, equitable, and sustainable coexistence, with tasking care for the vulnerable (Bonfil 1987)? This is the challenge for scientists, peace researchers, feminists, environmentalists, socialists, educators, politicians, and actors, and HUGE has to be developed locally to find concrete answers to these new challenges (Bennhold-Thomsen/Faraclas/Werlhof 2001; CLOC 2002), but also globally to change the root causes of violence and destruction.

91 Human Security and the Governmentality of Neo-liberal Mobility: A Feminist Perspective

Thanh-Dam Truong

91.1 Introduction

Transnational migration and its implications for human security as a policy field constitute one of the most complex issues of our time. Current experiences of displacement and security span between a cyber world – characterized by hyper mobility of finance, technology, information and the ‘cosmopolitan’ values of a ‘flexible citizenship’ (Ong 1999) – and the world of human trafficking and smuggling of migrants and refugees – a mode of mobility adopted by people who cross borders on foot, by boat, trucks and planes and who are often abandoned to die when arrangements break down (Carling 2007; El-Cherkeh/Stirbu/Lazaroiu/Radu 2004; Eschbach/Hagan/Rodriguez 2001). The extant legal vacuum reflects unresolved conflicts of interest at different levels and poses a great challenge to the right to mobility as an expression of the liberal ideal of individual liberty.

Current defining of international migration – for policy-making particularly – has tended to fragment the entirety of cross-border movement as a process. This fragmentation has led to much tension between different policies and their goals – of public order, economic competition and efficiency, human security and rights. Formally defined as the “movement of persons who leave their country of origin, or the country of habitual residence, to establish themselves either permanently or temporarily in another country” (IOM 2004: 33), international migration is legally and socially differentiated, tending to reflect the ‘anatomy’ of a stratified global society¹. The last three decades have witnessed the erosion of regimes of international migration based on welfare and humanitarian concerns, and the concomitant ascendancy of multilateral initiatives in migration management guided by the logic of trade and finance, foreign policy and national security – often shifting the seat of decision-making away from labour and welfare departments (Pellerin 2004). Gender and age appear significant in determin-

ing who participates in what regime of migration and for which types of work (Kempadoo/Doezema 1998; Agustin 2003; Dølvik/Eldring 2006). Regulatory regimes tend to be shaped by labour market demands, selective preferences of states and practices of intermediaries (Lucas 2006). The demise of the Refugee Convention² has opened the scope for market-based smuggling of refugees and migrants. The implementing of anti-trafficking policy has brought to light the degree to which a given social and cultural setting is conducive to human trafficking, smuggling and re-trafficking. Reviewing the evidence Truong (2005; 2003a) points to some broader social processes that either disrupt livelihood systems (such as militarized conflict) or gradually erode their sustainability (such as unsuccessful institutional reforms, or financial crisis and capital flight).

The legal view treats differing social worlds of transnational migration as mutually exclusive categories; this chapter offers a perspective on their recipro-

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- 1 Four bodies of international legislations are directly relevant to the mobility of people across borders. They are: (1) The Convention Relating to the Status of Refugees (1951) and the 1967 Protocol Relating to the Status of Refugees which extended the geographical scope of refugee law (henceforth the Refugee Convention); (2) The United Nations Protocol to Prevent, Suppress, and Punish Trafficking in Persons, Especially Women and Children, supplementing the Convention against Transnational Organized Crime (henceforth the UN Trafficking in Persons Protocol); (3) International Convention on the Protection of the Rights of All Migrant Workers and Members of their Families, henceforth the UN Migrant Rights Convention; and (4) Mode 4 of the *General Agreement on Trade in Services* (GATS) of the *World Trade Organization* (WTO).
 - 2 The introduction of the categories of ‘asylum seekers’ and ‘voluntary return’ in the European Union for management purposes has undermined ‘*non-refoulement*’ as the core principle of the Refugee Convention (Samers 2004).

cal implications. It draws Foucault's insights on governmentality and emphasizes the significance of thoughts underlying political discourses, practices of discipline and control over mobility. We highlight the nature of intersectional domination of gender, class and race as being contingent on a one-dimensional vision of liberty in neo-liberalism as a political rationality. We argue that a concept of human security as a project that seeks to address the daily security of the most vulnerable – of which people on the move constitute a significant group – can no longer afford to remain locked in a positivist framework of interpretation. It needs a combination of methods and a genealogical approach to the '*dispositif*' of human security³. This means probing into a historically formed ensemble of institutions, procedures, supporting knowledge and their relationships with political economy, migration and security on different social scales. Exploring the notion of 'security' in respect to 'freedom' and questioning the context of, and capacity for, social transformation would bring new lights to the exercise of power in this domain. Sensitive to relations of inter-dependency and intersectional domination, feminist theory can contribute to an understanding that does not treat different categories of security as distinctive and self-contained, but as elements in a web of mutually implicating relationships and, also, as matters of social justice systemic to global capitalism as a whole.⁴

91.2 Neo-liberal Governmentality, Gender and Culture

Foucault has contributed to analytical practices regarding the historicity of specific discourses – the concrete questions concerning the institutional complexes of power. His concept of neo-liberal governmentality – first introduced in 1979 – is an important bridge connecting analyses of micro power and the reordering of reality at the macro level. Broadly defined as a complex network of relationships between thinking and ruling, governmentality has been identified by as a shift in the rationality of the mode of governing premised on the active con-

sent of the governed to subjugation through discreet techniques of control (Foucault 1991). Understanding governmentality requires excavating the hidden elements in the definition of what '*we*' are – something entirely political and historical, reflecting both the politics immanent in history and a history indispensable for politics (Foucault 2005).

This analytical disposition provides a bridge between the study of governmentality and gender and cultural studies – by which to trace the historical production and reproduction of gendered and cultural subjects as intersecting processes shaped by movements in structures of political economy and security systems. Beckwith (2005) proposes two meanings of gender appropriate in the study of governmentality. As a category gender has multidimensional the meanings, consisting of socially constructed identities, values, conventions and practices conceived as masculine and/or feminine – often overlapping with other categories such as race, class, age and religious affinity. Gender as process is manifest in differential effects of structures and policies (seemingly gender-neutral) upon women and men, and in the codification of the meanings of 'gender' in public institutions.

Processes of the (re-)codification of the meanings of gender under neo-liberal governmentality began with what Hindess (2004) regards as the mutation of liberalism as a political rationality and what Lemke (2001) refers to as an epistemological shift on three accounts: (a) the relationship between the state and the economy, (b) the basis of government, (c) the notion of the individual. Neo-liberalism in the reigning version of the Chicago school inverts the classical role of the state from a controller of the market to an object of control by the market, based on the claim of the market being a superior organization principle. The neo-liberal political project seeks to create a society characterized by the cultivation and optimization of socially grounded differences (Lemke 2001). The basis of its government is the concept of self-government articulated through notions of 'personal responsibility' and 'self care' in an 'entrepreneurial' culture – an artificially created form of behaviour tied to rational calculation, economic prosperity and well-being in a personal and institutional sense. The meaning of freedom becomes predominated by market freedom. The aim is to reform what was considered as "the devastating consequences of public sector growth" (Sal-skov-Iversen/Hansen/Bislev 2000), change the "dependency culture" among the dispossessed (Cannan 1995) and reshape social welfare policy (Hancock 2004).

3 The French word *dispositif* has no single direct English equivalent; it can mean any or all of 'socio-technical system', 'device', 'mechanism' (Lianos 2003).

4 See also chap. 90 by Oswald Spring, chap. 89 by Serrano Oswald, chap. 92 by Perpinan/Villareal/Oswald Spring and chap. 93 by Ariyabandu/Fonseka.

The subsuming of society (perceived as an entity made up of autonomous individuals and institutions) under the market (as a controller of the state) allows neo-liberalism to link the entrepreneurial action of individuals and institutions to the rationale of governing. The social domain – *per pro* this submission – becomes encoded as an economic domain⁵ and allows a systematic expansion of what market norms address – from criminality and penal administration to development of human capital. This eventually colonizes the entire social world with criteria of economic efficiency, including that of public administration. Empirical studies on governmentality in many fields have produced rich and fascinating findings on the current structural reforms worldwide (Dean 1999; Rose 1999; Cruickshank 1999; Rankin 2001; Larner 2000; Triantafyllou/Nielsen 2001; Larner/Walters 2004). Finely-grained differences apart, a convergence of views exists on how the application of values and practices of the private sector to the public sector gradually erases a century-old tradition of distinction between the two spheres, and creates ambivalent meanings of ‘empowered’ subjects.

From the standpoint of everyday life, by way of transferring the care for citizens’ well-being as a duty of the state to ‘self-care’ as an obligation of individual entities (person, firm, family) neo-liberalism undermines the intrinsic worth of societal care as an essential aspect of human relationships in several ways. The epistemological grounding of the human subject in the market gives emphasis to his/her entry and pays scant attention to what happens to him/her before or after. The neo-liberalist concept of care omits the relational dimension between people – something feminist ethics of care insist is significant. Feminist perspectives on the ethics of care have been built on the recognition of dependence as a universal feature at various stages in the human life (infancy, illness, old age, death). Caring for dependents is a feature commonly associated with women’s social role in the family, often ‘naturalized’ in theoretical and policy discourses (Himmelweit 1999; Engster 2007). Feminist attempts to extend the social value of care beyond the family and gender relations and to provide a broader perspective on care have offered a view of care as the enactment of other responsibilities of citizenship relevant to democracy and professional practices: being concerned for one another, and the civic virtues of em-

pathy, patience and solidarity (Sevenhuijsen 1998; Baker/Lynch/Cantillon/Walsh 2004).

On the empirical level Jenson and Sineau (2001) have illustrated how the redesign of the welfare state in Western Europe over the last decades has been characterized by the demise of family values due to a mixture of forces, including feminist demands for gender equality, shifting political configurations, and changing labour markets and employment needs. Contradictory tendencies – of reducing the role of the state in the care sector while simultaneously stimulating the participation of women in the labour market (as a means for empowerment) – has led to serious care gaps (Anderson 2001; Kurian 2006; Razavi 2007). State response has, in effect, resulted in the introduction of the principle of ‘work/family balance’ – enacted through care leave entitlements (applicable to both genders) – to be arranged through the work place, and the encouragement of horizontal forms of care provision in communities. The co-optation of the feminist language of has not equalized contribution to care arrangements (Risseuw 2006; Stratigaki 2004).

The gendered reality of care remains problematic, primarily because of its time-use and commoditization – an issue omitted in the neo-liberalist equation on self-government and efficiency (Williams 2002; Baker/Lynch/Cantillon/Walsh 2004). Care in all forms requires social time, something that the market cannot accommodate unless such time is mediated through the cash nexus. The diversion of social time to cash-related activities remains guided by gendered priorities and cooperative conflict because the biological time remains outside neo-liberal reasoning – except via the family as a mode of self-government. A consequence of the emphasis on self-care and de-emphasis on dependence is the devolution of the responsibility for social care from the state to an ill-defined realm occupied by voluntary associations with competing agendas and no constitutional obligations. The market does offer care – often circumventing state regulations – to those who can afford the price, when the family and community fail. Niches of market-based care provision as a commodity have emerged and been incorporated in global circuits of labour and production (Sassen 2000; Parreñas 2001; Hochschild/Ehrenreich 2002; Tyner 2004).

Turning to post-colonial societies, an establishment of the state along Western lines has taken different courses. In some social formations – such as the ‘developmentalist’ states in East and South East Asia – the family remains crucial, in the early stage of industrialization, in facilitating flexible accumulation, re-

5 In other words the notion of ‘society’ becomes equated with the notion of ‘market’.

gional and global competitiveness. High growth rates achieved through labour discipline have forged a four-tier system of industrial work. The first is the waged earner, normatively male under a formal wage system with social protection. The second is the casual worker, normatively female and confined to temporary or part-time contracts, piece rates and irregular work without protection. Such norms can be applied irrespective of the gender of the worker. The third is the dependent housewife – responsible for care work, nurturing and maintaining the workforce – who may or may not combine her unpaid care work with paid work⁶. The fourth is the paid ‘reproductive workers’ who take up sexualized services in prostitution and entertainment, or domestic service (Truong 1999). Semi-formalization of work in commercial sexual services and care provision arose in parallel with the growth of a consumer society (Lim 1998, Chin 1998; Li/Findlay/Jones, 1998; Chang/Ling 2000). These trends in consumption in high-income countries have led to the formation of intra-regional and international networks of labour transfer to meet demands. Increased use of private domestic services by double-income middle-class families has become the rule rather than the exception. The expansion of commercial sexual services – originally contingent on military bases of the United States – has transmuted such services into a sex business supporting tourism as an export-oriented industry.

In fragile states – as in parts of Sub-Saharan Africa and countries in transition from state-led communism to a market-led form of governance – the harshness of the neo-liberal discipline is manifest in the growing social polarization, poverty and the collapse of local care systems, affecting mostly the young and elderly (Holzner/Truong 1996; Truong 2005). The experiences of transition and structural reforms in the greater majority of countries in Central and East Europe and Sub-Saharan Africa indicate a different articulation of neo-liberal governmentality – premised on the disciplines imposed by international financial institutions, requisite for integration in the competitive environment of the global market. This has produced new regimes of insecurity in a continuum of unjust social structures leading to a crisis in the social reproduction process. The prolonged economic and social destabilization of these regions has induced massive

population movements and facilitated the formation of trafficking and smuggling networks, targeting those eager to search for a secure life space (Hughes 2000; Kligman/Limoncelli 2005; Keough 2006; Adepoju 2005a; Brachet 2005).

A shift of incentives in resource allocation based on price – and without due attention to the ways in which care relations and sexual relations are organized – has undermined the care systems based on traditional norms of kinship, friendship and neighbourhood. The consequence has been a strengthening of market norms in commercial sex. A serious structural distortion of values has occurred: work in the sex sector yields higher returns than in the care sector. An alteration is occurring in conventional patterns of livelihood: many women who migrate in search for respectable work must accept the provision of sexual services with stigmatization as the mean to provide for both themselves and their loved ones (Truong 2003a, 2003b).

Neo-liberalism has obliterated classical liberalism’s construct of the ‘free’ agent as inclusive of economic, social, political and cultural interests. It limits the concept to the basic ability to compete, accordingly narrowing the measures of individual choice and personal empowerment. While classical liberalism and state-led socialism did offer political projects inclusive of family security under the rubric of welfare – though often containing latent repressive structures – neo-liberalism offers post-colonial and post-communist societies a notion of an ‘entrepreneurial self’ based on risk-taking and irrespective of the social location in a stratified global society. The spread of neo-liberalism worldwide, plus its interactions with local forces, have contributed to the formation of locally specific versions of political rationality⁷ in which context the construct of the new ‘subjects’ of mobility (as having agency) and the interpretation of choice (autonomous or forced) must be analysed.

6 Under certain current conditions (job losses, pursuit of further education, international migration) the dependent ‘housewife’ has become de-gendered: a new category of househusband has emerged.

7 These may range from a rationality that sees the dependency on migrants’ remittances as an efficient means to solve national fiscal burdens or redress the decline of foreign investment, or the dependency on the trade in narcotics, small arms and organized crime to maintain the apparatus of state-security.

91.3 Countering Neo-liberalism: Human Security as a Political Rationality

The representation of human security as a field of intervention first emerged in conjunction with concerns for ethics in resource use in development activities. Within the disarmament and development nexus Ul Haq (1995) queried the ethics of those governments which gave budget allocation to armaments priority over provision of milk for children. 'We need today a new concept of human security - reflected in the lives of the people, not in the weapons of their countries' (Ul Haq 1995: 116). He posits that switching spending from military to development activities constitutes an ethical action which all governments should be encouraged to pursue. In an endorsement of the neo-liberal principle of individualism he argues that channeling resources in the direction of human development - enhancement of human capabilities - would contribute to a levelled playing field; one which is currently made uneven by factors of class, gender, ethnic and religious affinity. An improved degree of human development will *ipso facto* lead to better economic performance by developing nations and a more healthy competition in the global market.

Since this intervention the concept of 'human security' has been subject to new debates from various angles. Rather than treating peace and war as binary opposites Thomas (1999) views the proliferation of forms of human insecurity since the 1990's (such as intra-state violence, forced migration and environmental destruction) as the result of a newly polarized global social structure. She regards the worldwide neo-liberal reforms in the 1980's and 1990's as a phase of transition of capitalism - from national to global - which has generated new forms of human insecurity and for which collective responses are required. In her view an improvement in human security cannot succeed if based on neo-liberal individualism, which she defines as the problem rather than the solution. Her way of resolving the human insecurity question would involve a reining-in of the neo-liberal ideology at global level along with fostering collective efforts to protect vulnerable groups and improve their human development - *per pro* a rights-based approach to extant political systems.

Lodgaard (2001) sees the links between state security and human security as a matter of legitimacy. Failed states, he suggests, are states that no longer provide effective governance; nor, therefore, adequate human security. His view on human security is based

on the rule of law, public order and peaceful management of conflicts. To maintain its legitimacy the state has to comply with an expanding body of international law that seeks to provide - from a plethora of rights-platforms - protection of citizens from torture, arbitrary arrest and detention, gender-specific violence, child abuse, mishandling of refugees, organized crime and the results of armed conflict between factions within a state (Lodgaard 2001: 3-7). He places the concept of human security within the framework of governance, wherein it is defined as the daily security of groups of people vulnerable to violence during conflict situations. Ensuring human security is, to him, a matter of identifying and targeting problematic states; then protecting groups of people living under conditions generated by a failure of governance. Lodgaard considers policies for security (state as well as human) as being future-oriented, and therefore the basic objective should be prevention of human instigated violence. The concept of human security in his view should be narrowed down to direct and personal violence (Lodgaard 2001: 8). Global economic disorder as does not appear very prominent in his argument. He places economic security in the definitional boundaries of human development, which he believes cannot be mixed with human security. This position is backed by a nine-point agenda of the Human Security Network which is a group of like-minded countries: Austria, Canada, Chile, Costa Rica, Greece, Ireland, Jordan, Mali, the Netherlands, Norway, Switzerland, Slovenia and Thailand; South Africa is an observer. This agenda covers land mines, International Criminal Court, Human Rights, International Humanitarian Law, women and children in armed conflict, small arms proliferation, child soldiers and conflict prevention. Feminist scholars have argued that the human security discourse must consider everyday experience of security and cannot ignore the gendered nature of the state, civil society, market and the structural tendency for power differentiation (Blanchard 2003). Ensuring human security requires a process of transformation of values, conventions and practices sensitive to the intersection between different forms of social vulnerability derived from overlapping identities.

From the perspective of societies in Asia affected by the 1997 financial crisis and subsequent economic meltdown, the experience of human security depicts a vision of inter-connectedness rather than compartmentalization. Human security policies must strive beyond protecting human life in conflict situations and encompass such objectives as ensuring the survival and dignity of families and individuals (Acharya

2001).⁸ This view is also echoed by Amartya Sen (1999) in an approach to development policy, which he labels “development as freedom”. He brings out the indivisibility of the three ‘generations’ of human rights (political, socio-economic, and cultural) and provides empirical illustrations for the causal relationship between freedom and human flourishing, and that between the absence of freedom and misery.

East and Southeast Asia’s experience of the social and political impacts of the financial crisis does reveal a reality of human security that is systemic rather than compartmentalized. In the aftermath of this crisis these societies experienced the effects of a downward spiral of economic failure. At one level the crisis has set back the high performance in human development achieved through previous years of growth and investment, causing new forms of poverty and re-enforcing old forms (Lee 1998; Truong 2000). The rise in communal violence, illegal migration, human trafficking and organized crime in the region – as exacerbated by the economic downturn – has brought to the fore the inter-state character of human security.

Against this backdrop governments and civic groups have become increasingly aware of economic and societal security being more than just assured income and physical protection for particular individuals and groups. The experience of the Asian crisis shows that human insecurity in daily life can be the result of economic insecurity that intensifies both inter-community competition and personal insecurity. Violent responses for self-protection or self-enhancement have gone as far as annihilating the ‘Other’ and in consequence generated a process by which different identities – religious, gender, ethnical – one by one became an object of attack and a rallying point for oppositional politics and violence which can spread like bush fire, quickly spilling over to new issues and new states.⁹

8 Statement by Director-General Yukio Takasu at the International Conference on Human Security in a Globalized World, Ulan-Bator, 8 May 2000; at: <<http://www.mofa.go.jp>>.

9 Religious tension in Indonesia initially erupted between Muslim Indonesian and Christian Chinese, initially targeting Chinese women as objects of sexual violence. Gradually, all women including Muslim women became the epicentre of male violence. The attack on Bali in October 2002, and threats of similar attacks in tourist resorts in Thailand allegedly linked with Al Qaeda, reveal the weakness of a secular approach to human security which ignores how the constructs of religious identity can seed acts of violence.

Security policy (state and human) cannot but take serious notice of issues such as structural inequality, unstable economic systems and identity politics. To follow Lodgaard’s definition of the objective of security policy (state or human) as prevention, the experience of the Asian crisis tells us that prevention strategy does not concern only ‘problematic’ states nor just the violation of rights of groups of people living under ‘problematic’ conditions. Prevention must also be concerned with the ‘problematic’ environment of the global political economy, characterized by the ease of capital mobility that can abruptly destabilize the performance of economic systems and the livelihoods of populations. The issue is not just a matter of the failure or legitimacy of individual states; the failure of neo-liberalism as an economic doctrine is also an issue (Stiglitz 2002).

Placed in its original context of development ethics, the equation in the human security framework would extend beyond the choice between armament and human development to cover the choice between a widening of economic liberalism and improved social protectionism. To rephrase Ul-Haq’s equation, we need to fashion the concept of human security so that it is reflected not just in the fluctuation of our stock exchange, but as well in the consolidation of harmony and cooperation between different communities in society; appropriate locally-rooted social arrangements can assure income and protection for the most vulnerable, particularly in times of economic distress.

The cultural politics of resistance, which insist on the recognition of differences, have tended to overemphasize the bearings of history and to offer no alternative referent for what constitutes the human being when undressed of history and culture. Such politics have adopted a socially-embedded approach to ontology based on a definition of a self, having knowledge and action, encumbered by historical bearings (gender, race, colonial and post-colonial experience). By this approach an attempt is made to *integrate experience, insight and the contentions of particular social groups – deprived of recognition and respect by wider currents of social interaction – into alternative visions of egalitarian politics. There is resistance to assigning a standardized definition of the human person. This seems to stem from the collective awareness of how variants of biological reductionism have historically justified social domination on the basis of gender and race (Sayers 1982).* Regrettably, this resistance has also rather made a vacuum of the political arena. There is a shift towards cultural reductionism or a line of argument characterized by an over-emphasis of the role of

culture. An absence of consensus on what constitutes 'culture' led to a neo-liberalist form of pluralism by which the idea of multiculturalism has become nothing more than "a vague metaphor for a coalition of separatisms" (King 1996: 18).

Advocating the diversity of identity without a core referent runs the risk of discontinuity in the search for sameness as an intellectual and social project. A socially-embedded approach to ontology for the purpose of psychological emancipation and the political empowerment of disfranchised groups shows its limits when unable to recognize the human being (female or male, coloured or white) beyond the cultural subject. The stress on uniqueness of specific groups and difference from other groups has led to inward turns among cultural movements based on identities (Giri 2005). In a conflict situation the assertion of uniqueness and rights can become internally repressive – more concerned with the collective identity than individual members, irrespective of intra-group domination – or externally destructive – capable of fuelling cleansing campaigns once identities become intertwined with issues of material power (such as resources and territoriality).

Against this background 'ontological insecurity' may be considered a two-dimensional problem: simultaneously psychosocial and historical. At this juncture the issue is what art of government best assures ontological security, resolves cultural conflicts – as problems of overt as well as discreet processes of domination – and addresses intersectional discrimination. The ethical equation in human security may then be framed as a choice between 1) plurality of standpoints amongst the cultural subjects, and 2) a common referent which recognizes capability and vulnerability as two sides of human nature, and values practices of epistemic humility. A new conduct of knowing and valuing is much needed to allow reciprocity to rule together with autonomy under the overarching framework inter-connectedness.

91.4 Conclusion

Neo-liberalism has created a new style of governance. Economic values are more and more inscribed in the social domain without a corresponding inscription of social values. The emancipation potential of the new market-led society is fragmented; it is also effectively foiled by concepts of self-government and citizenship where there is no effective state as an equalizer. The key political question for codes of human security to

include the protection of people on the move is how to address the now obsolete but still affective demarcation between the 'domestic' (self) and the 'foreign' (distant others). Processes of global production, reproduction and consumption have intertwined 'self' and 'others'. There is need for new concepts capable of addressing the transnational nature of misery and wellbeing.

Foucault's insight on a historical conception of the art of government may help to fulfil the task ahead: to assess the philosophical underpinnings of human security and also the strength of the historical and ethical forces invoked. An art of government that seeks to promote human security as a means to global peace cannot avoid a dialogue on the cross-cultural concepts of compassion and autonomous spiritual capability to appreciate the inter-relatedness of being, having and loving – as well as the reciprocity involved¹⁰. These are significant human qualities (unfortunately overwritten by self-centred rational calculation) that can transform mutual negation into mutual recognition.

10 The term compassion in Buddhism is inclusive of meditation as a set of practices that promotes what is called *prajna* or penetrating insight. In this regard compassion cannot be taken as a given; it is a form of knowing that can be released through the will to discover inter-being.

92 Gender Security in South East Asia and Trafficking of Children for Sexual Exploitation in Central America: HUGE Security Challenges

Mary Soledad L. Perpiñan, María Eugenia Villarreal and Úrsula Oswald Spring

92.1 Introduction¹

Confronted with new risks and threats due to climate change; scarce and polluted resources; poverty in Africa, Asia and Latin America, increasingly survival lies in the hands of women (Oswald 1991). Military, political, economic, social, and cultural challenges are menacing the precarious life conditions and livelihood of the majority of human beings, and thus create insecurity for the people who aim at both 'freedom from fear' and 'freedom from want' (Brauch 2005, 2005a, 2008a, 2008c).

The central question of this chapter is how do women analyse and survive in very specific deprived situations in South East Asia and in Central America? How is the global unsecured environment triggering the subjective situation of threat for women and children, especially when transnational crime is promoting child trafficking for sexual exploitation? To answer these questions, the chapter uses a wider approach to 'gender security' (chap. 90 by Oswald; also Oswald 2001, 2007, 2007b, 2008a). It discusses how threats affecting women and children are resolved collectively by women and marginalized

groups, relying on their own capacities. This can enhance a holistic gender security approach, where often human and environmental security is also involved.

After a few theoretical reflections (92.2), two case studies on gender insecurity (Dore 1997; Dore/Molyneux 2000) will follow, one on South East Asia (92.3) and the other on Central America (92.4). While the first case study is based on participative research (Oswald 1992) the second reviews the trafficking in children for sexual exploitation in Central America. This is not only a challenge for human and gender security, but also for institutions and international organizations. While 'gender' in a narrow sense refers to roles given to men and women, the term 'gender security' focuses - from a narrow perspective - on how women view security, and what issues affect their sense of security and - from a wider view - how new human security challenges impact on the most vulnerable: women, children, elders, indigenous people and minorities (chap. 90 by Oswald).

The first case study on South East Asia conceptualizes security from the perspective of grassroots women based on Paolo Freire's (1974, 1974a, 1998, 1998a, 2000) '*Conscientizing Inquiry*', while the second case study on Central America reviews the social vulnerability of children, above all of girls and women to pornography and the sex trade, in contexts of post-war poverty and organized crime.

In the conclusions these human and gender security challenges are integrated, combining a bottom-up perspective with a top-down legal support through international conventions and national laws that should support gender education and the empowerment of women. This mutual support should enhance achieving human security as 'freedom from want', offering women conditions to live in dignity. Simultaneously it counters the root causes that impede their longing for 'freedom from fear' based on transparent international, national, and local police and judicial

1 This chapter is a collective work of three peace researchers on gender security, related to sexual abuse through child and women trafficking and women in war and in post-war as well as in unstable political situations. M.S. Perpiñan supplied the empirical data from Asia and M.E. Villarreal those from Central America. Ú. Oswald integrated the chapter with some theoretical and methodological reflections that are relying on a wider concept of gender. It includes also children, old people, indigenous and other minorities. This text has been carefully edited by Hans Günter Brauch who added boxes 93.1 and 93.3 and the three maps to enhance the understanding for readers from outside the regions analysed in this chapter. The authors are also very grateful to Ronald Lappin for his efforts to improve the English of three non-native speakers.

systems that efficiently combat organized crime and related money laundering and drug trafficking.

92.2 Some Theoretical Reflections

The term 'security' has too long been confined to 'national security' and only slowly entered *human security* (HS). When anthropogenic effects on *global environmental change* (GEC) were scientifically analysed and based on comparative empirical material, the *environmental security* (ES) concept evolved (chap. 59 by Dalby/Brauch/Oswald; Brauch 2003). GECHS and UNU-EHS have analysed the interrelation between HS and ES, but until 2007 they have not discussed the gender dimension (Oswald 2008a). Nevertheless, "violence against women and girls is a problem of pandemic proportions. At least one out of every three women around the world has been beaten, coerced into sex, or otherwise abused in her lifetime - with the abuser usually someone known to her" (UN GA 2006). This violence is not only a perverse human rights violation, but it devastates lives, creates future insecurity as a result of rape, it fractures families, communities, and takes lives and undercuts development. Nevertheless, it is interesting that gender security is still in an incipient process of theoretical consolidation (Hoogensen 2008; chap. 89 by Serrano and chap. 90 by Oswald).

Gender violence is part of the systemic discrimination, exclusion, and exploitation of women and girls. It is still a covert aggression, happening mostly within families. It is often socially accepted and sometimes promoted in the form of sex trade and pornography. The origins of this brutal and subtle discrimination are complex, and related to the identity process of gender construction. The term discrimination is understood as harmful as well as an unfair treatment of a person or a group, based on prejudice. Thus, discrimination is based on 'rejection processes' of the other, emphasizing critical attributes such as gender, sex or race among the most visible processes. Indirect discrimination occurs when apparently through neutral behaviour special groups get disadvantaged and are obliged to justify their legitimate aims and the means to achieve them (Argentine NGO 1995).

The complexity of daily life often induces people to identify themselves with the ideology of a group and to reject the other. This often creates stereotypes of how to think, to believe, and to act (free market ideology inducing development aggression). Thus, a system of values, ideas, beliefs, and practices underlies

discrimination and insecurity. It is acute and discerning, able to oversimplify complex life situations. In a discriminative behaviour mind and action can be distinguished. People who discriminate derive both emotional and material benefits, also understood as malice (IFRC-RCS 2007). It establishes and uses cultural stereotypes such as race or colour for justification. Gender discrimination is probably the most common, where the differences and behaviours based on gender discrimination were socially constructed during more than five thousand years (Oswald 2004), and are taken for granted by almost every society worldwide.

To answer the key question an integrated concept of *human, gender, and environmental security*: HUGE (Oswald 2001, 2004, 2007 and chap. 90 above) is proposed. It relies on a broader gender concept that includes, besides women, other vulnerable groups such as children, elders, indigenous and other minorities, with a human-centred focus on environmental security challenges as well as on peacebuilding and gender equity. It is a concept that analyses different levels, social relations, and identity processes, but proposes also policy tools from both top-down and from grass-root levels. The two empirical studies explore the policy part. South East Asia starts from a bottom-up empowerment process, while the case of Central America's child trafficking requires top-down international tools to deal with organized transnational crime and pornography.

Both empirical cases have as background situations of wars, internal conflicts, economic crises, disasters, and other social disruption. During this conflictive times social networks often get disrupted, and structural discrimination such as poverty, undemocratic power structures, and behaviour of neglect become manifest (IFRC-RCS 2005), increasing the existing social vulnerability of these groups. Often, it is triggered by long-term emergency situations such as famine, physical or sexual violence, water scarcity and pollution, economic crises, cast and class behaviour. It reduces efficiency of preventive actions, restricts aid during an emergency, and limits holistic development processes. It also facilitates criminal behaviour such as sex trafficking and pornography.

Rape in war has reached epidemic proportions.² Militaries, militias, men carrying arms, governments and non-state actors, neighbours, trusted leaders and men in position of power have all perpetrated violence against women and girls in times of conflict and displacements. Although rape, sexual assault, sexual slavery, forced prostitution, forced sterilization and forced pregnancy are crimes under national and international laws, the

guilty commit these crimes with complete impunity. The international community is doing too little to protect women and girls from these heinous acts (Egeland 2007: 8).

Reproductive health is a very sensitive issue for women. Each year 35,000 women and babies die in Nepal alone due to unsecured conditions of birth and neonatal management (IFRC/RCS 2006). In Afghanistan each 20 minutes a woman dies due to insufficient health services, the second highest rate of maternal deaths in the world³ that is only worse in the war-prone Sudan. These data show how governments are neglecting half of their population, as a result of patriarchal structures.

Sex trafficking is related to *gender-based violence* (GBV) as part of “extensive domestic violence, early/forced marriages, wife inheritance, property ownership, child custody, arbitrary incarceration, female genital mutilation and sexual harassment and assault” (Elia 2007: 39). Women remain invisible and often girls escape from domestic violence, take revenge, join partners and have been recruited by force in guerrilla movements. As women combatants “they have transgressed traditional gender norms and for most the prospect to return to their families is out of the question. ... [They now live] in Bogotá and Medellín, anonymous urban environments which offers them some small degree of security” (Schwitalla/Dietrich 2007: 58).

During emergencies and hazards, among the vulnerable people women are the most vulnerable. After the tsunami of 25 December 2004, in the Aceh Besar district, the surviving men outnumbered the female population with a 3:1 ratio (Oxfam 2005); in a case study from Sri Lanka women represented 65.3 per cent of the dead (Birkman/Fernando/Hettige 2006); “while there is no gender disaggregated information

available on the Kashmir quake casualties of autumn 2005, there are reports... [that] more women and children died [rather] than men” (chap. 93 by Ariyabandu/Fonseka). Both authors found that women in traditional societies did not get any first aid training, were never taught to swim due to cultural taboos, stayed inside their houses, and did not get any early warning. When they perceived the danger, their social identity of career obliged them to save lives at the cost of their own.

Gender discrimination also refers to different social treatment and life opportunities that are based on sex, including different connotations of values which change among cultural contexts. However, in most societies a married woman’s civil identity is now covered by her husband’s. In many parts of the world, irrespective of the property women bring into marriage, they are often segregated within the family, and due to lower wages women remain dependent on men. For professional and better trained women the barriers for upward mobility and better pay are often limited by the ‘glass ceiling’. Worldwide only 14 per cent of women are represented in parliaments and only 11 per cent have been in a ministerial or sub-ministerial post. Niger had only one per cent of women in parliament and in the Sudan there was no female minister. About 61 per cent of women between 15 and 64 are in the labour force but 86 per cent of men. However, in the manufacturing sector in Sri Lanka their salaries equal 85 per cent, in France 79 per cent, in Mexico 71 per cent, in Brazil 54 per cent, and in Bangladesh 50 per cent of the wages for men (UNSTAT 2006).

Thus, social representations are the root causes of any gender specific performance (Serrano 2004 and chap. 89 above). The traditional role assigned to women is to be a housewife who cares for children, family, old people, including domestic animals and orchards. This was one of the reasons during the tsunami disaster why women were inside their houses, busy with domestic work. The self-identity acquired by women, their social pressure, and life-learning processes have internalized a role of career for the others. They become morally self-obliged to be concerned with all family members and their livelihood. Small babies and children require this gift-giving from mothers. In a moment of risk or crisis, their first reaction is to save their children, elders, handicapped and domestic animals, often at the cost of their own life.

Similarly a man may reach the highest level of honour by offering his life as a hero for the ‘fatherland’; a woman gets her sublime self-realization by giving her life for others in a silent way. Thus, a widened under-

2 Obaid (2007: 5) reported some 40,000 cases of war-related rapes in Bosnia and Herzegovina: “In Rwanda, 39% of women surveyed reported being raped during genocide and in one study, two in three women who were raped were HIV-positive. In Burundi, 19% of a sample of women reported being raped.” The bodies of women are getting more and more transformed into battlefields (Rehn/Johnson 2002). Their reproductive organs are destroyed by machine guns. Forced pregnancy during ethnocide conflicts is frequent, such as violent abortion to reduce ethnic reproduction.

3 Due to gender discrimination, a buffalo is valued higher than the life of a woman, and money is often used to increase livestock instead of bringing a woman to a hospital during birth complications. Furthermore, hospitals are very rare and normally far away from rural villages.

standing of security is not only theoretically attractive, but also necessary to overcome the narrow focus of security related to military violence, and gender discrimination and aggression.

Finally, the methodology that was used in conducting the grassroots workshops was influenced by Paulo Freire's '*conscientizing inquiry*'. It refers to his methodology of having the people themselves researching their daily life and questioning the root causes of their situation of poverty and marginalization. This type of research enables them to seek the answers and thus to be enlightened during this process. The term is derived from 'conscientization', a type of learning that permits to understand the social and political contradictions in which people are living. Through the process of understanding, collective actions against oppressive elements can be taken. This learning process also places people in a direction of feasible alternatives that is able to change their longstanding situation of poverty through collective organization. In this sense, the transformation of real life conditions can be understood as a process of liberation. With their proper actions the involved people get 'freedom from fear' when they improve their life conditions with an economy of solidarity and cooperation. They also get 'freedom from threat' by collective organization and concrete actions against oppression (Freire 1974, 1974a). Later, the same author, when he was confronted with neoliberal globalization and mass media manipulation and consumerism, pointed to a global loss of hope and resulting depression. His last book in 1998 was '*Pedagogy of Hope*'.

In Brazil and Latin America his pedagogy was reproduced in diverse workshops, and is one of the key elements of the success of the *Movimento sem Terra* (MST), a mass movement of landless rural workers with an affiliation of more than 3 million persons. MST today produces three of five basic food crops for the biggest country in Latin America. The methodology of learning through the proper concrete experience is also being used in Africa and Asia.

It is a technique that transforms the male-oriented and supposedly neutral scientific enquiry (Bordo 1990; Lloyd/Duveen 1992; Harding 1986, 1988, 1991; Harding/Hintikka 1991) into a complex social analysis of daily life of exclusion and oppression. The concrete situation of daily life is no more an abstract object of research. Explored by grassroots participants, they become subjects of their own transformation, when they understand the origin of the problem and seek for collective solutions. Their active involvement strengthens the cooperation and reinforces the soli-

arity among the affected. The culture of silence and abuse of those in the lower ranks of society - especially women - is broken, when the marginalized are given respect and space to voice their opinions. This process improves their 'empowerment'.

This participative methodology is often reinforced with group dynamics and the consolidation of groups of economy solidarity. Today, more than one third of Latin American's GDP depends on this type of self-employed economy.⁴ It is able to articulate the productive activities at the local level and redistribute scarce resources at decent prices for marginalized communities. This permits vulnerable groups to ensure their food sovereignty and livelihood with dignity and perspective for the future (chap. 33 by Oswald). It enhances the cultural seed capital for freedom, empowerment, and liberation.

92.3 Field Work and Case Studies on South East Asia

Freire's '*conscientizing inquiry*' was employed in several peacebuilding workshops in South East Asia. They dealt with: a) displaced indigenous women of the Cordillera, in northern Philippines; b) Burmese refugees in a Thai camp along the Burmese border; c) the urban poor of Phnom Penh, Cambodia; d) the rural poor of Siem Reap, Cambodia; e) the Lumads (Manobos and Banwaon tribes) of Agusan del Sur, Mindanao; f) with Muslims, Christians, indigenous peoples from conflict-ridden areas in North and South Cotabato, S.K. Pendatun, Maguindanao, Sultan Kudarat, Sarangani, General Santos City, Mindanao; and g) with Muslims in Marawi City, the Islamic city of the Philippines (93.3.1).

The second part takes up some of the issues that have contributed to create fears and insecurities for marginalized women, such as aggressive development, armed conflict, and military juntas, in the aftermath of the killing fields, neo-colonialism, Muslim law, militarization, and US military presence, and the process of consciousness-building for women (93.3.2).

4 It integrates chains of micro-businesses, where saving practices, productive and trade activities are interrelated and directly in the hands of poor people. This process avoids intermediaries and thus the profit remains within the productive sector.

Box 92.1: Conflicts in South East Asia Affecting the National, Human, Gender, and Environmental Security of the countries and their people. This text was written by Hans Günter Brauch.

During the Second World War (1942–1945), South East Asia was the battlefield of the war between Japan and the Western allied powers, many of them were colonial countries (UK, France, USA, and the Netherlands). After the wars of liberation against their former colonial powers and obtaining independence, this region experienced with the Vietnam War one of the longest, most violent, and cruel proxy wars between the USA and the Socialist world (Soviet Union, China, North Vietnam).

In this region these conflicts and their impacts can neither be fully understood from a narrow military, political, and national security perspective of the major external country (the United States of America) nor of the states and regimes in the region. This narrow military security perspective using simplistic models and explanations (domino theory, geopolitics, and geostrategy) ignores the long-term impact of the Vietnam wars (of liberation against Japan and France and of North Vietnam against South Vietnam, the USA and its allies).

The HUGE approach (chap. 90 by Oswald) to security analysis widens the scope of analysis to the perspective of and impact on human beings and victims in the region ('human security') who did neither achieve 'freedom from want' nor 'freedom from fear' and who were not given the 'freedom to live in dignity (Annan 2005), nor did the most vulnerable and marginalized poor people in the region experience a 'freedom from hazard impact' (Bogardi/Brauch 2005; Brauch 2005, 2005a).

During World War II and the Vietnam War, as a result of the many wars and conflicts in this region over the past 70 years and the massive military presence of first Japanese and allied troops and later of French, British, US and allied soldiers, many poor women in the region were forced to become 'comfort women' for the Japanese soldiers, or later 'sex workers' for US and other soldiers, and often 'sexual slaves' to serve the sexual needs of millions of foreigners – coming first as soldiers and after the war as tourists, and thus creating a demand that was increasingly satisfied by organized crime networks. The 'gender insecurity' and the crimes against the dignity of these victims is a direct side effect of the geo-strategic power plays that were legitimized with the requirements of the 'national security' of external powers, be it by the regional 'colonial powers' (Britain, France, the Netherlands), the 'occupier' (Japan) or the 'liberator' (US and its allies supplying troops).

This massive use of military force and the employment of cruel weapons – in the name of peace and national security – did not only negatively affect the 'human' and 'gender security' of its people, it also became a testing ground of a crime against 'environmental security'. The massive use of herbicides (Agent Orange, Agent White et al.) by US troops and their allies had also long-lasting effects on the environment in Vietnam, Laos and Cambodia, and on the food chain affecting directly the human security of both the victims and their children in the region but also the soldiers and their offspring who were ordered to use these weapons (Westing 1972, 1976, 1980, 1984, 1989, 1997, 2000; Brauch 2000b, 2000c).

The HUGE approach that has been suggested and developed by Oswald (2001, 2007, chap. 90 above) widens the scope of security studies and puts the victims (human beings, women, children, old and indigenous people as well as minorities) but also the damaged environment on both the scientific agenda of 'security analysis' in international relations (Baylis 2008), in security studies and in peace research (Albrecht/Brauch 2008) but also in international law (Bothe 2008) and even in philosophy (Coicaud 2008), but hopefully in the future also of international relations and of international judicial bodies such as the International Court of Justice and the International Criminal Court in The Hague. This HUGE approach may enable both to sue the countries committing these crimes against humanity and bring the responsible politicians to justice. However, from the latter perspective, this HUGE approach may be perceived as a threat by those politicians responsible for committing these acts and for the elites in the respective countries supporting them and benefiting from their outcomes.

The *Uppsala Conflict Data Program* (UCDP) offers a comprehensive list of both minor internal and international conflicts and wars that were fought on the territory of the ten countries of South East Asia between 1946 and 2005, and that cost the lives of millions of people.⁵ However, the most devastating and costly conflict was the Vietnam War (1961–1975) that affected the territory of North and South Vietnam, Laos and Cambodia, and indirectly also the neighbouring countries, especially Thailand. According to estimates of the *US Civil War Center*⁶, as an American war, the Vietnam War involved some 8,744 million Americans who were fighting there, of whom 47,369 persons died in combat, 10,799 died otherwise, and 153,303 were wounded. This American war cost 111 billion current US dollars or 346.7 billion real US dollars (base of 1990). According to another source, this war "cost the United States 58,000 lives and 350,000 casualties. It also resulted in between one and two million Vietnamese deaths".⁷ The total cost and impact of this major war during the Cold War era on the human, gender, and environmental security in South East Asia may never be fully estimated. However, after the end of the Cold War all ten countries became members of the Association of South East Asian Countries (ASEAN), thus permitting closer cooperation within the region (chap. 79 by Othman).

5 This list of armed conflicts may be directly accessed at: <http://www.pcr.uu.se/publications/UCDP_pub/Conflict_List_1946-2005.pdf>. A survey of the other sources of the *Uppsala Conflict Data Program* (UCDP) is at: <<http://www.pcr.uu.se/research/UCDP/>>.

6 See: "Learn lessons about the Vietnam War", at: <<http://www.cwc.lsu.edu/other/stats/warcost.htm>> that was compiled by S. Mintz (2007); in: Digital History; see at: <<http://www.digitalhistory.uh.edu>>.

7 See at: <<http://www.digitalhistory.uh.edu/modules/vietnam/index.cfm>>.

92.3.1 Peace Building Workshops

During several peace and security workshops, organized by the *Catholic Office for Emergency Relief and Refugees* (COERR), activities such as ‘dreams of peace’, followed by ‘transformative action’ and concrete plans to replicate the workshops in the respective communities of the participants reinforced ‘trauma healing’. It opened the way for self-reliant and situation adapted solutions that enhanced the conditions of daily life for women. In terms of human security they improved their livelihood, and in terms of gender security they found support and created a special collective group or community security.

92.3.1.1 Displaced Indigenous Women in the Cordillera of the Philippines

After the Fourth World Conference on Women in Beijing (1995), the *Third World Movement Against the Exploitation of Women* (TW-MAE-W), in partnership with the *National Commission on the Role of Filipino Women* (NCRFW), conducted a peacebuilding workshop in Baguio City, Philippines in 1995. This was attended by indigenous women from the mountain province of Benguet who had been displaced from their ancestral land because of development aggression.⁸ They were then living as squatters in the mountains of Pacdal where they experienced many threats to their human security, lacking jobs, housing, food, and money to send their children to school. Furthermore, their environmental security was threatened by open-pit mining with hazardous emissions, which has been dangerous for their health and biodiversity. One outcome of this workshop was the decision of the group to meet regularly and get organized to engage in transformative action to improve their livelihood.⁹

8 It refers to the bad effects of the so-called development such as mining, logging, and dam building that trample on the rights of indigenous peoples to their ancestral domain and cultural heritage. “Development is development aggression when the people become the victims, not the beneficiaries; when the people are set aside in development planning, not partners in development; and when people are considered mere resources for profit-oriented development, not the center of development. ... Development aggression violates the human rights of our people in all their dimensions – economic, social, cultural, civil and political” (The Philippine Alliance of Human Rights 1996).

92.3.1.2 Burmese Refugees in a Thai Camp

The *International Office of Migration* (IOM) in cooperation with COERR and TW-MAE-W held a workshop at the border of Thailand and Myanmar in the Mae Sot district where Mae La, the largest Burmese refugee camp with 30,000 people, was located. The Karen tribal women had escaped the military rule after experiencing life as fugitives in the jungles. They role-played the dangers they had experienced. By building their ‘dream world’, they discovered that they had found security in the refugee camps. Four out of the five groups built villages that had everything in place – houses with gardens, a school, church, meeting hall, and infirmary – practically a replica of the camp. One group showed the rugged terrain of a Burmese landscape with winding paths and a forest. For them, going back to the land of their birth was their dream, which was worth pursuing at the price of all insecurities.¹⁰

92.3.1.3 Urban Poor of Phnom Penh

One of the poorest countries in the world, Cambodia, was emerging in 2003 from the remnants of the ‘killing fields’. In spite of all foreign aid and the presence of many international NGOs who are there to help, most Cambodians still live in dire poverty. Community organizers and grassroots leaders living in the slums took part in a peacebuilding workshop. The participants began by choosing a theme song ‘O Cambodia’. They danced and sang to the melody with lyrics depicting rustic images of peace and security. This reflected their romantic longing to overcome the nightmare of genocide, systematic torture, and starvation under the Khmer Rouge. Among the very poor were the Vietnamese settlers who lived in shanties on stilts by the waterways.

Their answers to the question ‘when do you feel secure?’ were given in the negative sense: no war, no kidnapping, no poverty, no robbery, no drugs, no

9 More funding for another research project would be needed to assess the impact on the lives of the participants and subsequent actions taken. However, after the Baguio workshop, the displaced women of Benguet who squatted in the hillsides of Pacdal, Baguio, organized themselves and focused on economic security by opposing the open-pit mining.

10 More funding for another research project would be needed to assess the impact on the lives of the participants and subsequent actions taken. The Karen refugees in Mae Sot undertook efforts to reach the other women of Camp My Lai.

Figure 92.1: Map of South East Asia. **Source:** This map provided by Relief Web on 24 January 1997 is in the public domain; at: <http://www.reliefweb.int/mapc/asi_se/reg/seasia.html>.



gangsters, no terrorists, no corruption, no domination, and no conflict. The most common answer was an understanding of security as the absence of war. The participants acted out the situations when they felt insecure: motor robbery, kidnapping, house robbery, domestic violence. The Cambodian urban women dwelt much on violence in the household. Furthermore, good governance and the problems of corruption were at the forefront of their minds.¹¹

92.3.1.4 Rural Poor of Siem Reap

In a village in the vicinity of the historic temples of Angkor Wat, poor rural women gathered with Concern, a local NGO. During several sessions on peacebuilding, economic insecurities were aired, as well as political fears remaining from the days of siege. In the countryside the isolation of the villages made the par-

ticipants construct their 'dream world' with roads, thinking that they would be more secure if they could be closer connected with progress and development. Later, independent and full of initiative, the village women took upon themselves the task of running peace workshops, dividing themselves into groups, accepting responsibility for taking charge of particular localities, and working out a time frame.¹²

92.3.1.5 Lumads in Militarized Agusan

During 2005–2006, peacebuilding workshops were held in Mindanao, in the southern Philippines, in Tuburan, Agusan del Sur, where the Lumads, the indigenous peoples composed of Manobos and Banwaons were most apprehensive of the militarization of their areas. In the role-playing they repeated military operations, when soldiers in uniform attacked their husbands, accusing them of being rebels. Arrests were

¹¹ The community workers replicated the workshop in Phnom Penh and the villagers of Siem Reap by dividing the area among themselves. The funding was only for the running of the workshop. The local women pursued peacebuilding on their own initiative, relying on their own resources.

¹² They received funding from the *South East Asian Conflict Studies Network* (SEACSN) and from SIDA for the *Alliance for Conflict Transformation* and the *Third World Movement Against the Exploitation of Women* (TW-MAE-W).

made even without warrants of arrest. Two groups portrayed the economic connections: one with the palm oil plantation and another with the logging activities of local landlords and their business cohorts. The fourth group had a skit about a dysfunctional family and their attempt to work out reconciliation among its members.

The responses of persons interviewed by the participants were full of fears because of the martial law-like situation that made it dangerous for them to walk alone. The workshop ended suddenly because of news that a military contingent had ransacked the houses in one of the areas where some of them lived. This human insecurity was vividly felt by the Lumads.

92.3.1.6 Muslims, Christians, Indigenous Women Affected by Armed Encounters

A few years ago a 'total war' was declared by the Philippine government in Mindanao. Government forces used bombs and guns to quell the rebellion of the *Moro National Liberation Force* (MNLF), the *Moro Islamic Liberation Front* (MILF), and the *New People's Army* (NPA). Communities of Muslims, Christians, and indigenous peoples were caught in the crossfire. They were victims of the armed encounters, suffering death, violence, and displacement for months and even years.

Representatives from the *Women's Federation of Barangay Fatima* of General Santos City, of the *Multi-Purpose Cooperative, Women's Livelihood* of Pikit, North Cotabato, the *Blaan* of the *Imbaika Kutawato*, *Moro Next Generation* leaders of S.K. Pundatun, and Muslims from Sarangani, Maguindanao, Sultan Kudarat shared first-hand experiences.

Three groups played roles. On militarization, the group showed the abusive acts of the military in their place. They were afraid to fight and voice out their rights. Their farms were ruined by the military, and they were accused of being rebels and were detained without warrants of arrest. The second group on land feud portrayed the relationship of Muslims and Christians in the community. A Muslim family suffered from financial difficulty and sold their land to a Christian. The skit showed how the Muslims tried to get the land back when they had money to do so. The third theme was on family problems, where the group acted on domestic violence, where a husband who was a womanizer was left by his wife who fought for her rights. Through these activities the participants showed their insights on what gender security means. As a positive result, peacebuilding activities continue

to take place among the grassroots indigenous, Muslim and Christian communities of Mindanao.

92.3.1.7 Muslims of Marawi, Islamic City

A TW-MAE-W workshop in Marawi City, organized by Samira Ali Gutoc, the Secretary General of the *Philippine Muslim Council*, brought together heads of women, non-governmental and student organizations from Mindanao State University. The perspective of Muslim women on security was related to being discriminated against, of being deprived of the rights of the *Bangsamoro*¹³ in culture and religion, of being in a place where there are no Muslims. They felt secure when they were in the midst of their families and when their economic needs were met (money, electricity, stable livelihood). Their utopia was symbolized by a 'sarimanok', a rooster which stood for the Maranao culture, standing side by side with the Cross and the Virgin Mary. The symbolism of the veil differed. For all, the veil is some sort of security blanket. It gives identity and social belonging to the group. It creates security as a woman and it represents a protest and resistance to Muslim-bashing Westerners.

92.3.2 Results of a 'Conscientizing Inquiry' on Security

This 'conscientizing inquiry' on security in the Philippines, in a Burmese refugee camp in Thailand, and in Cambodia brought to the surface an understanding of security beyond the perspective of the state. In all meetings, the female participants came up with a holistic, comprehensive view. From the personal and family perspective, the meaning of security expanded in ever widening circles to include the role as women and wives, the community, nation, region, world, and cosmos.

Thus, the perception of security by women - or of 'women's security' as a specific form of 'gender security' - forms an integral part of human security. This goes beyond the individual and embraces people's security as well as global and planetary security. Using the Jungian approach¹⁴, the deep feelings of security expressed by these women in concrete terms signifies moving from the effects of failed personal relationships inside family to contextual factors like tensions

13 *Bangsamoro* or Moroland is the name for the 'homeland' of the Moro in the Philippines. The term comes from the Malay word *bangsa*, meaning *nation* or *people*, and the Spanish word *moro*, a term for Arabs or Muslims.

Figure 92.2: Map of the Philippines. **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection; at: http://www.lib.utexas.edu/maps/islands_oceans_poles/philippines.gif. This map is in the public domain.



caused by job, food, housing, health, and other domestic insecurities. At the social level, the security of social groups of an ethnic and religious nature was scrutinized especially in Mindanao by the groups so as

to understand the complexity of the interrelationship with regard to security.

A more comprehensive approach to security, including ‘gender security’, was expressed based on the

experience with the military, e.g. with the military junta in Burma, in the aftermath of the 'killing fields' in Cambodia, and militarization due to aggressive development policies in the Philippines. Although the sessions on security focused primarily on aspects of economic security, the political, gender, and socio-cultural elements were also expressed. Finally, concern with the security of the planet Earth led these women to take environmental factors seriously.

92.3.2.1 Impacts for 'Gender Security'

While all issues addressed by women in these workshops are issues affecting women directly, contextual challenges such as aggressive development practices, armed conflicts, and military rule, the militarization of Mindanao, the aftermath of the killing fields, the experience of neo-colonialism, the practice of Muslim law, and the US military presence are all highly relevant and contribute to 'gender insecurity'. The existing situation of gender insecurity in daily life got worse through the presence of the military, frequent rapes, and the experience of having lost loved human beings during the massacres. This confrontation with the loss of 'freedom from fear' was reinforced during the time in the refugee camp with the loss of 'freedom from threat'. Both insecurities influenced their identity process and created highly vulnerable women. Through the collective analysis, social representations were changed, and this gave women an opportunity to create higher resilience that enabled them to deal better with the newly emerging uncertainty.

92.3.2.2 Aggressive Development Practices and Neocolonialism

For the subjective insecurity of the women participating in these workshops, poverty prevailed. As a former colony of the USA that was conquered in 1898 mainly for economic reasons, the Philippine economy is still under foreign control. Transnational corporations have enriched themselves by exploiting the country's natural resources - minerals, coal reserves, timber, rubber, sugar, pineapple, banana, palm oil plantations - contributing little to the economic security of the country and to the human security of its people.

The last area is the Liguasan Marsh where a war in Pikit was launched to facilitate the exploitation of natural gas, a kind of biofuel coming out from the decomposition process. Even Marawi City, the capital of the province of Lanao del Sur in Mindanao that is considered as the 'Islamic capital' of the Philippines has suffered from development backwardness. Just a few kilometres away from the booming industrial city of Iligan, the capital of Lanao del Norte in northern Mindanao with heavy-powered industries, lies Marawi that often lacks electricity in the evenings and during weekends, in spite of the fact that it has the resources of Lake Lanao and the Agus River (figure 92.2). In contrast, new industries, corporate farming, and agribusiness corporations enjoy hydroelectric power at the expense of the inundation of hundreds of thousands of hectares of previous farmland which belonged to the Moros and Lumads.

The original owners of the land, the Moro people, now own less than 17 per cent of it and suffer immense poverty. Because of the feminization of poverty, the Moro women, as well as the Lumads, have become economically insecure. Indigenous women clearly pointed out how they have become victims of 'development aggression'. In the name of progress and development, the Philippine government has favoured large foreign corporations and given them access to the country's natural resources. Laws have been passed by the parliament of the Philippines to the detriment of the security and well-being of these people. The Mining Act of 1995 offers land to foreigners to engage in large-scale mining without respecting any health and environmental protection standards.

The right to life of people is inseparable from their right to sources of food and livelihood. Allowing the interests of big mining corporations to prevail over people's right to these sources amounts to violating their right to life. Furthermore, mining threatens people's health and environmental safety through the wanton dumping of waste and tailings in rivers and seas (The Catholic Bishops' Conference of the Philippines (CBCP) 29 January 2006).

As nurturers of life and caregivers, indigenous women suffer most from these consequences. Furthermore, logging concessions - whether legal or illegal - have caused havoc to the safety of the people. As direct consequences, flash floods and landslides have increased, claiming hundreds and even thousands of lives. Whenever natural disasters occur, women once again bear the heavier brunt of these tragedies. A strong statement was drafted by the *Regional Alliance Against Mining and Large-scale Commercial Logging*

14 Carl Jung developed the 'collective unconsciousness'. The study aimed to explore the collective unconscious of marginalized women, especially in conflict-ridden areas, with reference to their dreams and insights on peace and security.

and Corruption (RAMILCOR). This alliance firmly stressed that “it is the mandate of the Gospel that we oppose the scheme of the government to allow more foreign and local companies to devastate the land and its biodiversity and desecrate the integrity of God’s creation in our land.”¹⁵

92.3.2.3 Armed Conflict and the Military Junta

Ninety per cent of all casualties in contemporary armed conflicts are civilians, mostly women and children. They are most vulnerable to violence and have difficulty to get food, medical care, and education. The major participants in peacebuilding efforts are mainly survivors of wars and ethnic conflicts, as experienced in Burma and Cambodia in the workshops referred to above. The Free Burma Coalition presents an incisive analysis of Burma’s conflict. After freeing itself from 125 years of British colonial rule in 1948, Burma could not fully develop due to ideological and ethnic conflicts and foreign interference from Thailand, China, and the United States during the Cold War era. The pre-World War II period left the marks of a) political domination, b) psychological subjugation, c) economic exploitation, d) over-ethnicization¹⁶, and e) devastating years under Japanese occupation and militarism. Then followed 40 years of a Burmese Communist insurgency and of Kuomintang resistance supported by the US Central Intelligence Agency.

To complicate matters, in Thailand some circles benefited from the armed ethnic minority insurgencies and their trade in arms, teak, gem stones, agricultural and forest products. The government of India offered ideological and financial support to both pro-democratic revolts and to the nonviolent resistance of Aung San Suu Kyi and of the *National League for Democracy* (NLD). In 1990 the NLD won a landslide victory in the elections, gaining 82 per cent of parliamentary seats but Aung San Suu Kyi and the elected parliamentarians were never allowed to assume office.

The case of Burma shows the ideological divide in the understanding of security. The *State Peace and Development Council* (SPDC), the ruling military junta, and the armed forces refer to ‘national security’.

15 The Church statement sounds strong, but the implementation was weak, mainly because of a lack of political will and moral integrity of those who got elected to government positions.

16 ‘Over-ethnicitization’ means that ethnic uniqueness, superiority or differences have been disproportionately stressed.

The civilian democratic forces led by Aung San Suu Kyi as well as the ethnic minority groups stress “political reforms, economic liberalization and human rights”. The great challenge is to establish a common political language enabling dialogue.

After the savage army crackdown of the student-led revolt in August 1988, many militants fled to the jungles and went into exile. But anti-government demonstrations continued. On 9 September 1999 Burmese exiles staged protests in Thailand, Australia, Japan and Malaysia, while in Burma the military rounded up suspected opponents, mainly high school students, who were taken away and subsequently disappeared.

What impact has all this had on women and on their perception of security? The Burmese women are strong, brave, and resolute. In the international arena, many valiant Burmese women are working for the liberation of their country. The solidarity movement has grown due to their passion for peace, freedom, and justice. A strong example was a video presentation by the Nobel Peace Prize Laureate, Aung San Suu Kyi at the NGO Forum on Women in Beijing (China) in 1995 (box 92.2).

92.3.2.4 Aftermath of the Killing Fields

The women’s perspective of the Cambodian experience was highlighted during the Asia-Pacific Peace Research Association (APPRA) Conference in Siem Reap in 2003 by the Secretary of State of Cambodia, Madam You Ay, who also is the Minister for Women and Veteran Affairs. She addressed the impacts of the ‘Killing Fields’ and of the Khmer Rouge. The participants felt the pain and anguish of how women suffered and coped with their fears and insecurities. Secretary You Ay explained how the present Cambodian government has worked out reconciliation with its ‘win-win’ policy to enable all Cambodians to move on as a nation by understanding the deep wounds of complex situations, such as:

- 1863-1953: Cambodia was a protectorate of France;
- 1953-1970: Sihanouk rules first as King, then as Prime Minister, finally as Head of State until he gets deposed in a coup;
- 1965: North Vietnamese guerrillas set up bases in Cambodia against a US-backed government in South Vietnam;
- 1969: The US bombs North Vietnamese in Cambodia;

Box 92.2: Nobel Peace Laureate Aung San Suu Kyi on gender security. Presentation to the UN World Conference on Women, Beijing (1995). **Source:** NSW HSC online; at: <http://hsc.csu.edu.au/english/advanced/critical_study/2471/Speech_Aung.html#speech>. This text is in the public domain.

There is an outmoded Burmese proverb still recited by men who wish to deny that women too can play a part in bringing necessary change and progress to their society. 'The dawn rises only when the rooster crows.' But Burmese people today are well aware of the scientific reasons behind the rising of dawn and the falling of dusk. And the intelligent rooster surely realizes that it is because dawn comes that it crows and not the other way round. It crows to welcome the light that has come to relieve the darkness of night. It is not the prerogative of men alone to bring light to this world: women with their capacity for compassion and self-sacrifice, their courage and perseverance, have done much to dissipate the darkness of intolerance and hate, suffering and despair.

Often the other side of the coin of tolerance is insecurity. Insecure people tend to be intolerant, and their intolerance unleashes forces that threaten the security of others. And where there is no security there can be no lasting peace. In its *Human Development Report ... UNDP [1994]* noted that human security 'is not a concern with weapons - it is a concern with human life and dignity'. The struggles for democracy and human rights in Burma are a struggle for life and dignity. It is a struggle that encompasses our political, social and economic aspirations. The people of my country want the two freedoms that spell security: freedom from want and freedom from fear. It is want that

has driven so many of our young girls across our borders to a life of sexual slavery where they are subject to constant humiliation and ill-treatment. It is fear of persecution for their political beliefs that has made so many of our people feel that even in their own homes they cannot live in dignity and security.

Traditionally the home is the domain of the woman. But there has never been a guarantee that she can live out her life there safe and unmolested. There are countless women who are subjected to severe cruelty within the heart of the family which should be their haven. And in times of crisis when their men folk are unable to give them protection, women have to face the harsh challenges of the world outside while continuing to discharge their duties within their home.

Many of my male colleagues who have suffered imprisonment for their part in the democracy movement have spoken of the great debt of gratitude they owe their women folk, particularly to their wives who stood by them firmly, tender as mothers nursing their newly born, brave as lionesses defending the young. These magnificent human beings who have done so much to aid their men struggle for justice and peace - how much more could they not achieve if given the opportunity to work in their own right for the good of their country and of the world.

- 1975: The Year Zero with the Khmer Rouge under Pol Pot taking over and killing some 1.7 million people;
- 1977-1989: Rule of the Vietnamese;
- 1985-2006: Hun Sen usurps power and becomes Prime Minister;
- 2006: King Norodom Sihanouk is head of state.

Cambodia's bloody past is enshrined in the museums of skulls and remnants of land mines and the killing fields. Faced with sex trafficking and the spread of AIDS, the women and children have little security to speak of. The women suffer illiteracy with 43 per cent of those aged 25 and over who have had no schooling at all except for a few who did not even get to complete grade one (Cambodia Socio-Economic Survey, 2004). One bright light, however, is Cambodia's temples of hope. A tribute to women is the temple of Apsara in Banteaysrei, Siem Reap, the Temple of Women. It is about 40km from the main Angkor complex and predates it by about 400 years. It immortalizes the role of women seen in the beautiful apsara carvings, where apsara represents the female spirit of clouds and waters in the Hindu and Buddhist religion.

This sanctuary represents an inspiration and support to struggle for improving gender security.

92.3.2.5 The US Military Presence

The people of Mindanao, particularly the Islamic population called Moros, have resisted the US military presence since early 1900. In 1906 the Filipino Muslims, armed only with swords and spears, fled to the crater of the volcano Bud Dahu, where they were brutally annihilated by American troops (Sun Star Zamboanga, March 2006). Among the victims of this carnage were women and children who belonged to the community which refused to submit to American rule. Through the *Visiting Forces Agreement (VFA)* signed in 1998, the US Forces are allowed today to access any part of the Philippines for training exercises called 'Balikatan'. After 11 September 2001, President Bush extended his 'Operation Enduring Freedom' to the Philippines that has been considered by his administration as a frontline state in the 'war on terror'. However, the VFA has become a basis of new insecurity. The 'Long Term Security Assistance Plan' includes night flying, intelligence fusion, light infantry tactics,

command and control, combat, hostage retrieval, and sniping in training camps.

How does this affect 'gender security'? One example of many is a gang rape by five US marines of a 22-year-old woman from Zamboanga who was visiting Subic on 1 November 2005. This case has stirred up widespread opposition to America's military presence in the Philippines. Based on the dreadful experiences of sexual exploitation and abuse of women during the height of the US military presence in the 1980's, TW-MAE-W has rendered direct services to the sex trade survivors. In this case, the foreign military presence has created a higher degree of insecurity for the host country, and for many of its women.

All workshops had as a key theme the violence and discrimination against women, where material and emotional benefit was taken away by creating highly susceptible women. Their social vulnerability increased through the conflict and post-war situation, and was triggered by structural phenomena such as extreme poverty and GBV.

HUGE as an analytical tool may help to understand the interrelationship between environmental destruction and pollution due to war (Orange Agent in Vietnam, Napalm and chemical warfare, Westing 1972, 1976), destruction of livelihood and the GBV during fleeing and in refugee camps. Triggering structural effects with conjuncture of war and extreme poverty, women's bodies were often transformed into a battlefield (Rehn/Johnson 2002).

The resulting gender insecurity can be combated by external pressure, where genocide is today sued at the International Court of Justice in The Hague. Post-war corrupt governments can be sanctioned internationally, but also denied re-election by organized citizens. The South East Asian workshop took the bottom-up approach. Through Freire's 'conscientizing inquiry', all women exposed to GBV and extreme poverty analysed their situation, established networks, and started to transform their role from victim to actor. Conscience raising, identification of common situations and goals permitted their initial organization. They were able not only to understand the root causes of their situation, but to start searching for solutions. As the situations are complex and encountered at different levels - from the family to the international level - each level asks for a different strategy. The first step toward liberation was starting with 'freedom from threats' by reinforcing collectively the physical and emotional variables required for their own safety and that of their families. Closing polluting pit

mines and safe refugee camps were some of the alternatives.

Through interchange and alternatives they began also to work on 'freedom from fear'. New economic activities, orchards, and micro-businesses slowly changed their processes of identity, reinforced entrepreneurship, and thus empowered women. Thus changed social relations and women gained greater freedom to act and to provide part of the family's livelihood, without losing their care-giving capacity. The next step would be the interconnection of local levels with the national and international ones, an experience that will be explained with the trafficking of children for sexual exploitation in the case of Central America.

92.4 Case Study on Trafficking of Children for Sexual Exploitation in Central America

Several military coups, internal conflicts, guerrilla wars, revolts, foreign military presence of advisers, and intelligence agencies in the context of the Cold War and of several proxy wars, and more recently peace agreements have left deep wounds in Central America between the 1950's and the 1990's. The violence has destroyed basic infrastructure, familial links, created gangs (*Mara Salvatrucha*), often from child soldiers, organized crime, extreme poverty, deep social gaps, and social resentments. While the poor are left without job opportunities, schools, and basic health, elites have linked up to the military during the war situation and consolidated their business internationally. They consolidated their fortunes with military help and external investments. This is also the violent background for femicide, sexual exploitation, and sex trafficking that have evolved and got recently related also to gangs in charge of illegal migration, and arms and drug trafficking to Mexico and the USA (box 92.2).

Central America is composed of seven small countries. As they are economically very small, they established in 1960 the *Central American Common Market* (MCCA) that was replaced in 1993 by the Central American Integration System (*Sistema de Integración Centroamericana*: SICA) to pursue common economic and political activities. When in Cuba in January 1959, the guerrillas won the revolution against the Batista regime; this region, together with South East Asia, was converted into a strategic zone against the fight of communism. The US promoted major arms

Box 92.3: Overview of military rule, guerrilla wars, and foreign military presence in Central America.

During the Cold War and in its aftermath, several of the seven countries of Central America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama have experienced periods of intense violence due to

military rule, guerrilla wars, the presence of foreign military advisers, and repeated direct foreign intervention into their internal affairs.

Table 92.1: Violence in Central America (1946-2005) due to military and authoritarian rule, guerrilla activities and foreign intervention into their internal affairs. Some events before 1946 were included that had impacts on the post World War II conflicts. **Source:** This table was compiled by Úrsula Oswald Spring based on histories of Central American governments, on the historic literature (in Spanish) and on data taken from the Uppsala Conflict Data Programme (UCDP/PRIODATA data set); at: <http://www.pcr.uu.se/publications/UCDP_pub/Conflict_List_1946-2005.pdf>.

Country	Military/authoritarian rule, revolts, guerrilla conflicts			Intervention, consequences, facts and foreign presence	
	year	Type and intensity	History, causes and parties to the conflict	Date	Effects
Belize	1840		Since 1840, colony of UK on former territory of Guatemala	1964	Self-government
	1950- 1981	minor	Independence struggles	1981	Independence, UK
Costa-Rica	1948	civil war	National liberation army	1948	Abolition of the military and democracy
	1948-2008				
El Salvador	1920	conflicts war	Social pressure	1920	Immigration from Honduras, land conflicts, poverty
	1969		'Soccer war' of 100 hours vs. Honduras		
	1972	minor	Military factions ERP, FAL, FARN, FPL, PRTC, FMLN,	1980	USA support assassination of Mons. Romero
	1979-1982	minor			
	1980-1990	civil war	Guerrilla offensive FMLN	1992	USA support Peace agreement
		CAFTA	2004	First ratification of CAFTA	
Guatemala	1944	minor	transnational fruit companies, workers, progressive military junta general strike,	1952	Revolutionary junta, first democratic election of Juan José Arévalo Bermejo United Fruit Company
	1954	minor	Forces of Carlos Castillo Armas	1954	President Arbenz was toppled, CIA involved in coup and assassination of Arbenz, military regime
	1957-1987	civil war	UNRG (Nacional Revolutionary Unity of Guatemala, guerrilla), military, elite, USA	1972	USA: 'domino theory' and violence accelerated Political instability Repression, civil war Guerrilla war
	1965-1967 1968-1974	minor	Purge of right and left extremists; short political stability	1970	Military dictatorship

Country	Military/authoritarian rule, revolts, guerrilla conflicts			Intervention, consequences, facts and foreign presence	
	year	Type and intensity	History, causes and parties to the conflict	Date	Effects
	1974-1976	civil war	Electoral fraud	1974 1976	Volcanic eruption Earthquake
	1980-1984	civil war	Guerrilla, military junta, elite, USA	1982	Massacre in Spanish Embassy, ethnocide, internal displacement and refugees to Mexico
	14 January 1986	minor	Peace agreement, Truth Commission	1985	Election, new Constitution
	2004-2008	minor	Óscar Berger Perdomo, president	2004	Corruption, drug dealers, mara, crimes, public insecurity, poverty
Honduras	1957	minor	Border conflict with Nicaragua	1974 1982	Military coup Constitution
		minor	Domestic impacts of Hurricane Mitch	1998	80 per cent of food production is destroyed, migrants, dead, neoliberalism, poverty
		minor	Social unrest and poverty	2008	Integration into ALBA joining Venezuela, Cuba, Nicaragua and Bolivia
Nicaragua	1909-1933	minor	US occupation, land conflict with Colombia	1925 1933	US left country Dissolution of the army, assassination A. Sandino
	1936-1979	civil war	Corrupt government of Somoza		Military support and aid from USA
	1979	victory	FSLN (Sandinistas)		support from Cuba and URSS, destabilization
	1979-1982	minor	Civil government	1979	Violeta Chamorro elected President
	1983-1988	war	Sandinistas vs. Contras (paramilitary group)		Support for Contras from USA and Honduras
	1989-1990	minor	Peace agreement	1990	Carter, UN, PAS
Panama	1989	minor	Military faction	1989	US intervention to oust president Noriega

sales, military aid, and assistance. They repeatedly launched covert interventions justified with the domino theory that claimed if in one country a revolution would succeed, then the whole region would turn to communism. Therefore, progressive governments were ousted by coups (e.g. President Arbenz in 1954 in Guatemala), and military governments imposed a wild form of capitalism with high levels of repression. The guerrilla war broadened and the civilian population suffered much from this repeated oppression.

Guatemala experienced a long war with an ethnocide against the Mayan population. During three decades of civil war and military repression, extreme

cases of gender violence rose with the abduction of women and girls, not only supported by the military. As in any war situation, women and children were the most vulnerable group, and in Guatemala more than a million displaced persons fled from organized genocide by the military and a special elite group trained in atrocities, the so-called 'kaibiles'. Social networks were destroyed and family members killed. Others joined the guerrillas who were fighting in the mountains against these atrocities. As in any war, and especially in internal conflicts, the most affected people were the socially vulnerable, such as women, children, elders, and youth, who lost their livelihood, job, often

Box 92.4: Background data on Guatemala. This text is in the public domain.

Guatemala is a country of contrast and contradictions. Its inhabitants live in a multiethnic, pluricultural and multilingual nation. It has seen periods marked by beauty and dignity, however, Guatemala also experienced disgrace and terror, pain and grief due to 36 years of armed confrontation. With the start of the internal armed conflict in 1962, Guatemala experienced enormous human, material, and moral costs. In the documentation of human rights violations and acts of violence connected with this armed confrontation, the Commission for Historical Clarification (Truth Commission) stated that the number of persons killed or disappeared due to the fratricidal confrontation reached over 200,000. The conflict affected particularly the indigenous population of the north-western region, where over 150,000 were killed, 50,000 people were abducted or missing, 440 villages were destroyed, more than 100,000 people became refugees, 75,000 children died, 200,000 became orphans, 150,000 children suffered physical disability and 1 million people were internally displaced.

With the signing of the Peace Agreements on 29 December 1996, new possibilities for a reconciliation of the Guatemalan society emerged. The end of the armed conflict facilitated a slow and complex socio-political process, since democracy fostered the reconstruction of state institutions and the transformation of civil society institutions. Nevertheless, there is a misconception that when the fighting stops, war is over, that there will be no more bloodshed,

no more insanity, but the reality shows that when the war is over it does not mean that the psychological effects of the war also end.

This is especially true for the more than 100,000 traumatized, killed, and disappeared children. The report of the Truth Commission reported a much greater number of victims among children and adolescents. The violence against children was a strategic decision and tactic in the counter-insurgent conflict. These young victims were a consequence of the large number of massacres and murders committed against them, many children, babies, infants and even unborn babies were brutally massacred. It was during the displacement and flight that the greatest number of children lost their lives; about 60 percent of the people that died during flight were under eighteen.

These 36 years of the internal armed conflict in Guatemala caused high levels of violence: poverty, migration, systematic violations of human rights, and massacres, where child victims of war participated in these atrocities. Thousand of indigenous girls were raped by the Guatemalan military during this conflict, mostly young girls from Mayan communities who, under the arrogance of the armed uniformed perpetrators, were the spoils of war. The raping of the children was collective and perpetrated under order. Rape was used as a mechanism to trigger terror, by using women and children as instruments of victory and by using their bodies as battlefields.

also their health and family support. The lacking rule of law and its improper implementation permitted the emergence of criminal gangs, many of them now linked to transnational organized crime, where child trafficking, pornography, illegal migration, arms, and the drug trade are closely intertwined. In Guatemala, after the peace agreement many of the girls and boys who were orphans or victims of rape were seduced or captured by sexual exploiters and traffickers who have been involved in the sexual exploitation trade.

Guatemala is an extreme case where both *human security* (HS; Fuentes/Rojas 2005, 2005a) and *gender security* (GS) were threatened, and climate change, desertification, deforestation, and population growth after the war were contributing to a HUGE insecurity among the different indigenous groups and an extreme social stratification. The following analysis reviews one of the most dramatic forms of gender insecurity, the forced abduction of girls and boys for the sex trade. This is not a new phenomenon, as it started during the war with the support of the military. Similar to South East Asia's and Africa's war situation, the military introduces in any society forced sex and sex trafficking (Reardon 1996), not only for male foreign armed forces, but also to humiliate the dominated na-

tion. Therefore, sexual abuse is often part of military activities to destroy the enemy in its deepest concerns. But this has happened also during peace time and sexual trafficking is a major illegal activity generating profits of billions of dollars (UNODC 2003). It is permeating the whole social tissue of post-modern societies and the gangs related to this crime often get governmental and military protection not only in Central America, but also in neighbouring Mexico (Cacho 2005), and in several Asian and African countries.

According to a report by the *Special Representative of the Secretary-General for Children and Armed Conflict*, Olara A. Otunnu, the experience in many armed conflicts is that women and girls - even the very young ones - are raped, abducted by warring parties, and forced into sexual slavery. Rape may be followed by murder. Sexual violence is so widespread in contexts of conflict and displacement due to the vulnerability of women and girls. The abuses committed against children and women during armed conflicts were among the worst phenomena of the past and present century that are referred to in UN Security Council Resolution 1325 on "Women, Peace and Security" (UNSC 2000).

92.4.1 Commercial Sexual Exploitation of Children

Violence against women and girls continues unabated in every continent, country and culture. It takes a devastating toll on women's lives, on their families, and on society as a whole. Most societies prohibit such violence – yet the reality is that too often, it is covered up or tacitly condoned.

UN Secretary-General Ban Ki-moon, 8 March 2007

The *commercial sexual exploitation of children* (CSEC) is a global problem that has existed in some countries for centuries, and was embedded in historical and cultural practices.¹⁷ However, the growth in the trade of children began to attract public attention in the mid 1990's. Children were kidnapped and trafficked across borders for sexual exploitation, adults travel abroad to have sex with children, countless children are sold as sex slaves, and people are flooding the internet to contact sexual exploiters and to collect and distribute pornographic images involving children.

Since 1980 there has been a rise in sexual crimes against children, the sexual abuse and exploitation of children was further facilitated by the internet. There has been a development of organized crime and other networks of people exchanging and selling images of sexual abuses with children (UN 2001d). After the tsunami of 2004, just as after Hurricane Mitch in 1998, the CSEC increased in the aftermath of natural disasters due to the destruction of the social order and a disruption of safety nets for the most vulnerable. This created a fertile ground for predators.

The sexual exploitation of children is described by the United Nations as a “modern form of slavery” and as “the most severe form of violation of children's fundamental rights to survival, dignity and healthy human development” (Report of the Second ECPAT International Assembly, September 2002, Bangkok, Thailand; Muntarhorn 2002). The physiognomy of the CSEC is changing, mutating, and increasing. The CSEC is a global scourge affecting both rich and poor countries, and this has become a borderless phenomenon that is national and transnational; regional and inter-regional, although the extent of the problem varies by country and region (ECPAT 2001).

The commercial sexual exploitation and child pornography are carried out through sex trafficking and

Figure 92.3: Map of Central America. **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/americas/camerica_caribbean_95.jpg>. This map is in the public domain.



sex tourism. Child sex trafficking exists when a young person has been kidnapped, recruited, transported, transferred, across borders for sexual purposes, coerced into the sex trade or sold as a sex slave (UNODC 2003, 2003a; UNHCR 2000, 2003). Trafficking is a process which selects vulnerable children, and then exacerbates their vulnerability (through violence, forced movement, slavery, servitude, coercion, threat and/or deceit) and then subjects them to severe exploitation.

The *International Organization for Migration* (IOM 2003) stated that 700,000 to two million women and children around the world become victims of trafficking every year. It is estimated that 1 million children are being recruited, coerced and trafficked each year as sexual commodities for sale and human trafficking. The use of the word ‘children’ often really refers to girls since there is less research on trafficking of boys.¹⁸ Sex trafficking is a very lucrative activity for criminal networks, amounting to an estimated global annual business of US\$7 billion. Actually child trafficking is a major issue of our time, as it is a fast, low cost, low risk and profitable revenue activity. It represents the third most profitable illegal enterprise after the sale of guns and drugs, and organized crime groups have used the same routes for

17 According to the ‘United Nations Convention on the Rights of the Child’ (1989), a child is a person under 18 years of age.

18 Boys do not seem to be obvious victims of trafficking for sexual purposes, but there are known cases of boys who have been trafficked for sex and used in pornography.

human trafficking, as for the trafficking of drugs and weapons (World Tourism Organization Report, 2004). The sexual exploitation of children is a recognized problem in South and South East Asia, Latin America, Africa and Eastern Europe.

GBV is also a major cause of death and disability. A World Bank study (1994) selected risk factors facing women aged 15 to 44 years. GBV ranks much higher than cancer, motor vehicle accidents, war, and malaria. There is also an increasing link with HIV infection. The economic costs of GBV are considerable and the US *Center for Disease Control and Prevention* (CDC 2003) estimates that the costs of intimate partner violence in the US alone exceed US\$ 5.8 billion per year (1.4 billion for direct medical and health care and 1.8 billion for productivity losses).

92.4.2 Sex Trafficking in Central America

In the case of Central America, the sex trafficking of children has increased recently. In 2002 it was estimated that more than 50,000 children may be involved in it or at risk of sexual exploitation in the region (ECPAT 2001a, 2002). According to a report of ILO (2004: 5), among the activities that children are involved in and receiving economical compensation for are as follows: agricultural work (70 per cent), manufacturing (8 per cent), street vending (8 per cent), domestic work (7 per cent), children being sexually exploited (3.5 per cent), and from other purposes (3.5 per cent). Most victims are trafficked from Honduras and El Salvador to Guatemala, from Nicaragua to Costa Rica, and from Guatemala to El Salvador (see figure 92.4).

Figure 92.4: Trafficking Routes in Central America.
Source: Casa Alianza, Guatemala (2003).



The root causes behind this phenomenon are manifold. At the structural level Central American countries are facing the consequences of armed conflicts of the past decades with high levels of violence, political instability, extreme poverty, exploitation, and family disintegration, compounded with social inequalities that help to generate social crises. This violence is often reproduced at home and in the community with women and children as the main target groups, particularly in the lower strata of society. Sexual violence inflicted upon girls, boys, and adolescents in their own home is part of everyday life for many families in the region.

92.4.3 Causes of Sex-Trafficking of Children

The combination of poverty and violence at home implies that children and young people become very vulnerable to other forms of violence and exploitation. These vulnerabilities are also rooted in the age, class, ethnicity, and gender discrimination of children, making them more susceptible to being trafficked for sexual purposes. At least 40 per cent of sexually exploited girls found in brothels are below 18 year of age,¹⁹ most of whom suffered rape and sexual abuse by a family member (Cicchetti/Cummings/Greenberg/Marvin 1990; Malinosky-Rummell/Hansen 1993). Thus, the road that leads to the commercial sexual exploitation of children is built on mistreatment, sexual abuse, and lack of affection, permanent exposure to physical and moral risk, unmet basic needs, family instability and breakdown. Other factors of risks for children are the lack of access to information, education, and health services. They are unable to defend themselves against unwanted sex and are powerless to insist on condoms.

At the social level the sexual exploitation of children is 'hidden' because there is a deeply seated social permissiveness of these phenomena. Some studies argue that there are many motives for hiding reality, perhaps from fear or from the conviction that it is impossible to have an alternative to this situation, society accepts it and assimilates it as part of its dark side. Trafficking is facilitated by the ability of traffickers or exploiters to trick or lure children into the sex trade, and for the relative impunity to exploit people's needs to escape their dire economic and social situation.

A brothel in Guatemala which detained under-age girls from Nicaragua was raided and closed down by the

19 See: ILO, 2001: Bulletin No. 1 (San José Costa Rica: ILO).

National Civil Police. One of these girls reported as being tricked in her own country – explained how she was lured into coming to Guatemala with the offer of a job as a waitress, but when she arrived in Guatemala, she was forced into prostitution.²⁰

Young children and adolescents are highly desirable sexual commodities; clients will pay higher prices to brothel owners or pimps to get access to them. There is a diversity of exploiters to be identified. The notion of an exploiter encompasses not only the pimp, the procurer, the industry, the owners of bars and brothels, the negligent authorities, but also the client of CSEC. The demand or driving factor (Klot/DeLargy 2007: 24) is the critical part of the equation in the sex trafficking of children and youth, the supplier justifies his or her actions because of the demand, and the fact that clients are willing to pay money for their service (Villarreal 2002).

This factor goes hand in hand with the supply factor. The demand is a predominant concern because it is interlinked with the pattern of patriarchal society and male behaviour, because the majority of cases of CSEC are related to men who perpetrate these crimes against children. This does not neglect the fact that women are also involved with sexually exploiting children, but the major concern is to address the issue from the demand side, and the role of males in relation to CSEC (UNICEF 2001: 57). Male behaviour is intrinsically linked to educational and socialization processes, where regrettably the knowledge base, attitudes, and behaviour are not adequately nurtured to respect the rights of children.

It is recognized that ‘there is no sex exploiter’ as such. Instead, there are people (adults, children, male, female) who sexually exploit children in many different ways, for many different reasons, and in many different social contexts (UNICEF 2001: 63). The demand for sex with children appears to be growing. This is caused by a combination of increasing tourism and fear of HIV-AIDS from adult sex workers. Child victims of trafficking suffer extensively. Regardless of the reason for leaving home, the worst damage starts as soon as they are forced into sexual exploitation.

As more information comes to light, it becomes tragically clear that the CSEC is devastating for child victims, because these children are exposed daily to physical, emotional, and mental abuse. They suffer *psychological traumata and post traumatic stress dis-*

order (PTSD), which is a psychological reaction to extreme physical and emotional trauma. They are at high risk to get sexually transmitted diseases and HIV-AIDS, and they have a higher rate of adolescent pregnancy than their peers who are not sexually exploited. Besides, they are exposed to consume drugs and alcohol in part, because they are obliged to do it and/or because they want to minimize the awareness of the consequences of the life they must endure.

92.4.4 Legal Instruments to Counter the Trafficking of Children

Several international legal instruments exist that protect child victims of trafficking, especially:

- ‘*Convention on the Rights of the Child*’ (20 November 1989, in force since 2 September 1990) is the main frame of reference for the promotion and protection of the rights of children;
- ‘*Optional Protocol to the UN Convention on the Rights of the Child on the Sale of Children, Child Prostitution and Child Pornography*’ (25 May 2000, in force since 28 January 2002);
- *International Labour Organization* (ILO) ‘*Convention 182 on the Worst Forms of Child Labour*, which includes trafficking of children’ (entered into force on 17 November 2000);
- ‘*UN Convention against Transnational Organized Crime*’ (15 November 2000; in force since 29 September 2003);
- ‘*Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children, supplementing the United Nations Convention against Transnational Organized Crime*’ (15 November 2000; in force since 25 December 2003).
- UN Security Council Resolution: UNSC Resolution 1325 that was unanimously accepted on 31 October 2000 promotes gender equity and abolition of sexual violence.

92.4.5 Problems of Legal Implementation in Central America

All Central American countries have ratified these international legal instruments, according to which they must take the necessary measures to prevent commercial sexual exploitation, provide care to its victims, and prosecute and sanction abusers. But despite these efforts, children are not yet adequately protected from trafficking, because the national legislations do

20 El Periódico, 2004: “La Explotación Sexual de Niñas y Adolescentes en Guatemala”, Editorial, in: *El Periódico*, Guatemala City, Guatemala, 9 October 2004.

not adequately criminalize and penalize sexual exploiters, and in very few cases laws are enforced and criminals arrested. The access to justice and to the judiciary is very limited generally, and even worse for children's crimes. Other factors are the inefficiency, corruption, and impunity of some customs officials, policemen, judges, and governmental authorities, the lack of mechanisms and institutional procedures in the national police for an effective persecution of exploiters and offenders, and the lack of extraterritorial legislation and agreements among countries to fight the trafficking of children.

While trafficking is a rampant problem in the region, the reporting and conviction rates are low, as is the delivery of justice. The governments must face this changing social phenomenon that presents new challenges such as:

- The age of sexually exploited children seems to be decreasing.
- The situation of sexually exploited children is becoming more violent in terms of physical and sexual violence, and forms where children are forced to engage in high risk sex.
- It is difficult to monitor the number of sexually exploited children because the exploiters change girls and boys from one country to another and from one place to another.
- There are insufficient services to provide sexually exploited girls with the opportunities and support that would allow them to leave and recover from sexual exploitation and other abuses.

Therefore, this problem requires innovative and integrated responses among each country of the region. Any interventions to prevent and to protect the victims must be based on governmental commitments of needed measures, and more cooperation between Central American states and other partners to:

- give higher priority to action against CSEC with adequate resources;
- promote stronger cooperation between states and all sectors of society, and strengthen families against CSEC;
- enforce laws, policies, and programmes against CSEC, and strengthen communication and cooperation between law enforcement and authorities;
- implement comprehensive laws addressing the issue of trafficking;
- apply extradition treaties and bilateral agreements to facilitate prosecution of traffickers;
- work for speedy delivery of justice;

- ensure that court procedures be made victim/child-friendly;
- coordinate responses from the various law enforcement agencies;
- provide victim protection;
- decriminalize the child victim;
- provide social welfare facilities to help the child victims rather than placing them in detention;
- practise restorative justice and compensation for child victims;
- protect witnesses;
- engage in training and capacity-building of law enforcers to help children;
- aim at cross-border and in-country cooperation between government officials, NGOs, the private sector, and members of civil society.

Trafficking is not only complex, it is also dynamic. Traffickers change their methods of operation and routes constantly in response to changes in the demand for commercial sex, and clients' demand for ever younger girls. Shifting economic conditions, conflict, and natural disasters gives rise to new trafficking patterns. Operations and trafficking routes also evolve in response to pressure from increased law enforcement of community awareness.

It is necessary to forge strategic alliances between government agencies, civil society, and international organizations to address trafficking issues. This will improve and expand services by enabling organizations to form regional, national, and local networks to reinforce each other's work. The networks must respond and prepare to tackle the trafficking immediately; they must enforce the protection of victims, reintegrate these victims, and prevent them from being re-trafficked. This also requires an increase in awareness of the perils of trafficking among vulnerable groups and the general population. Furthermore, governments must consider the sexual crimes against children as high priority areas, and allocate adequate resources and efforts to fight sexual exploitation of children, and a systematic follow-up must be maintained.

92.5 Conclusions

The central question of this chapter analyses how women survive in violent war, and in post-war situations in South East Asia and in Central America. Both regions represented strategic zones during the Cold War where both superpowers fought proxy wars. In both examples the fight against communism brought

about environmental disaster due to chemical warfare (loss of ES), guerrilla war, and a large number of displaced persons. Once a peace agreement was achieved, the destruction of the social networks and the militarization of wider regions maintained economic and physical insecurity (loss of HS) that was triggered by GEC and increasing natural hazards, which often led to social and political disasters.

The Guatemalan case also illustrated how a global insecure war context and later an unstable post-war situation with still high physical insecurity has triggered a negative subjective and physical situation for women and children, especially when transnational crime has promoted the trafficking of children for sexual exploitation. These new threats, often as a mortgage of previously induced military GBV, are triggered by international organized crime rings. This requires a global response by international organizations and a tightening of the rules of the nation state. Nevertheless, the involvement of the military, politicians, and sometimes even church members, has created a state of impunity where these illegal activities have grown rapidly (Cacho 2005). Due to the high profits, the traffickers used highly sophisticated technology and modern transportation systems to take the children far away from their home.

In South East Asia, the bottom-up empowerment of affected women has created consciousness and reinforced their own capacities to resolve highly complex situations. This resilience-building through understanding their life and the surrounding difficulties, permits them to act at the local level, improve their proper livelihood and that of their family members. In the long-run it has generated wider social networks among women, but it also fostered a preventive behaviour to avoid new violent conditions.

In both cases with the integration of wider concerns such as those of HS, GS and ES, the attractiveness of a HUGE paradigm has been exposed at different levels. This may also enhance a holistic gender security approach, where also human and environmental security considerations are simultaneously included (e.g. by closing open-pit mines, by cleaning of polluted regions from warfare, child trafficking, improvement of income and livelihood).

Thus, the above analysis of the loss of 'gender security' in South East Asia (92.3) and in Central America (92.4) is linked to the structural causes of social, physical, cultural and environmental security as a result of proxy wars, regressive globalization (Oswald 2008b), of militarization, cultural alienation, and intra-familial violence, all related to long-standing patri-

archal behaviour within authoritarian institutional frameworks.

The loss of 'gender security' has to be understood from a complex perspective and countered accordingly. The South East Asian case study discussed a tool (e.g. workshops with female victims of violent conflicts) for raising their consciousness that may contribute to a process of democratization, empowerment, and self-reliance. The design of these workshops was inspired by a bottom-up approach using Freire's (1974, 1974a, 1998, 1998a, 2000) liberation theories through a self-analysis of their situations by the affected people. Freire's 'pedagogy of hope' started with the achievement of internal peace (Boulding 1992, 2000), nonviolence within the family and community (Amgelio 2002, 2004), and continued with a process of creative reorganization (Sánchez 2001; Duque/Pastrana 1973) of the complex relations between the social economy,²¹ physical security (Zibechi 2006; Ouviaña 2005; Sader 2005), political stability (Brauch 2007c; Kaplan 2003; Annan 2005; Cordera 2003), cultural diversity (Lópezllera 2003; Arizpe 2004; De la Rúa 2004;), gender equity (Salazar 2003; Alcoff 1996; Alcoff/ Potter 1993), and environmental protection (Dalby 2007, 2008; Oswald 1999).

Such a collective identity-building permits to share hopes, experiences, doubts, and projects anchored in their proper social realities. They are free of prejudices and interests. Therefore, this "sociological imaginative" (Freire 1974) complements the individualistic approach of Freud's psychoanalytical catharsis. It creates social and cultural networks that are able to raise and consolidate an action-oriented conscience. These processes enable subaltern groups to overcome their internal contradictions and to start a transformation process with their own forces. For Freire it is clear that the enemy is external, being a part of the system of repression and exploitation, but is also internally expressed by personal obstacles which through threats, fears, hopelessness, apathy, and depression avoid the achievement of an integral security and freedom (Freire 1978).

This double strategy of liberation is also required in the second case on Central America, where the focus is on a top-down approach with international, national, and regional support through conventions and laws among governments. As the post-war situation in

21 See: Santos de Morais (2002); Collin (2004); Verano (1997); Martínez Alier (1995), Cadena (2003), 2005; Parrilla/Mario/Bianchi/Sudgen (2005); Bennholdt/Faraclos/Werlhof (2001).

Guatemala had destroyed the system of rule during three decades, from outside and from inside it is necessary to strengthen all security concerns, and therefore HUGE as an analytical tool and as policy means can be convenient. The creation of conventions, resolutions, and agreements may globally address complex problems related to transnational organized crime, money laundering, and sex trafficking. However, there has been hardly any improvement in the 'gender security' of the victims as long as the demand for young girls is rising internationally, and gangs of traffickers as part of global criminal networks can offer poor and badly educated women future fulfilments of their dreams.

Furthermore, so far there has been no comprehensive policy approach to deal with gender-based violence. A seminar organized with the support of UNFPA proposed a complex approach to GBV. The problem of war-related sexual violence has slowly been reaching decision-makers, most of them being men. However, the UNSC Resolution 1325 that was unanimously accepted by all member countries has created a promising international process that has been launched with the support of the countries of the Human Security Network.²² Therefore, Holzner and Mair (2007) proposed:

to abolish the notion that women are male property, by including them actively in peace talks; separate religious representations of women in civil laws; establish policies able to increase gender equity; bolster human security networks; apply in all its extension UNSC Res. 1325; stress the necessity of gender mainstreaming with concrete productive projects; changing roles and participation of women during and after conflicts improving their empowerment, serving for prevention of conflicts and strengthening their peacebuilding capacities in conflict areas; punishment for human rights violations; establishing clear boundaries among victim/perpetrator/protector and train mass media for denouncing GBV (Holzner/Mair 2007: 14-15).

Violence against women in conflict zones has been accepted as an inevitable 'side-effect' of conflicts, and this patriarchal behaviour was even reproduced in UN

peacekeeping operations. Thoraya Ahmed Obaid, the Executive Director of UNFPA, insists on the

necessity to address sexual violence as a crime and a major challenge to all development efforts... (GBV) is an indicator of the most severe breach of human security. ... Punishing perpetrators would contribute to restoring trust in the judicial system. Preventing it would spare disproportionate human and financial costs... reducing sexual violence in all war-affected countries will be a true sign of national recovery" (Obaid 2007: 6).

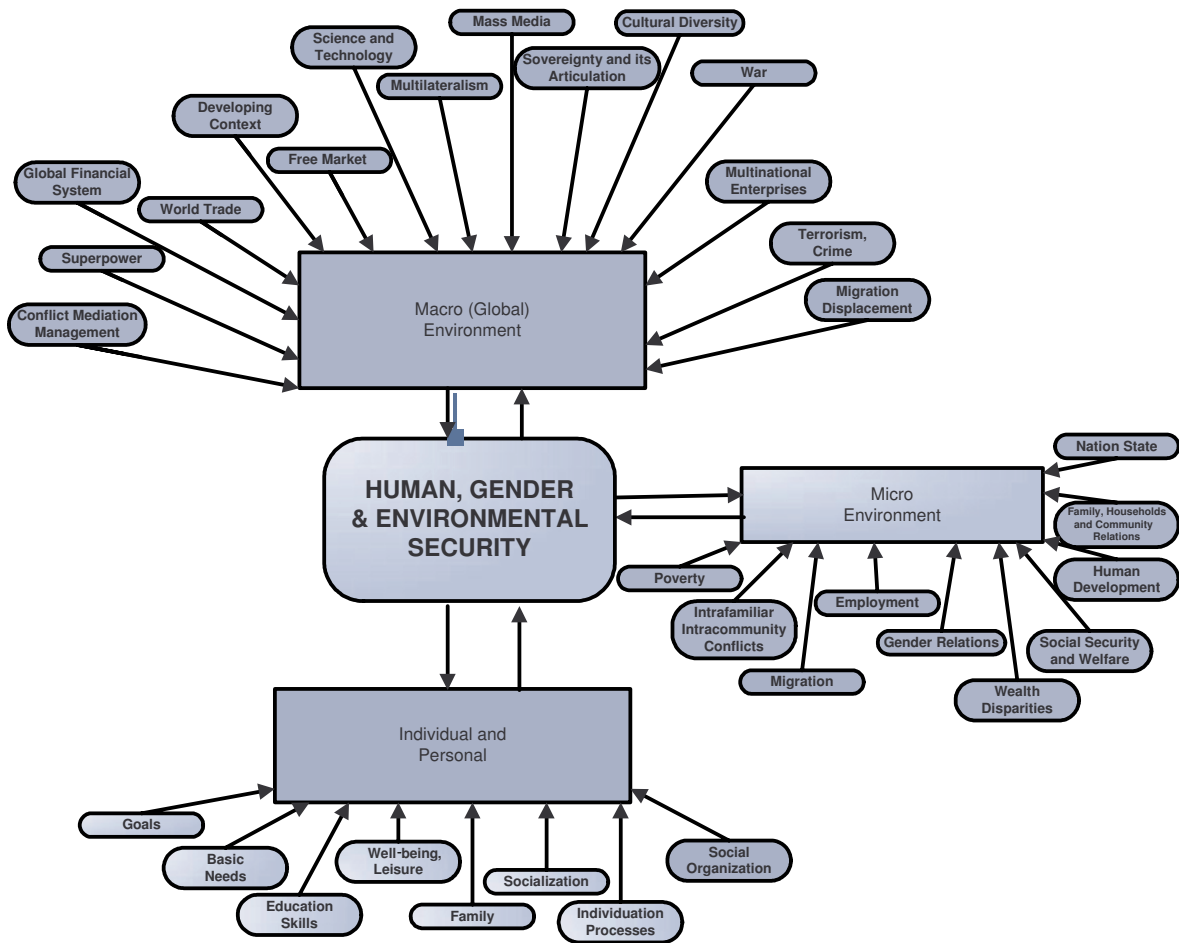
Further, in Guatemala, as in most post-war regions, there is a lack of the most critical and specialized health services. A *Comprehensive Reproductive Health in Crises* (CRHC) should include: emergency obstetric care; family planning; prevention of and attention to sexually transmitted infections and illnesses, including HIV-AIDS tests and drugs; surgery for reconstruction of sexual organs of abused women; advocacy; technical assistance and support; clinical training on-site; emergency funds and research (McGinn/Guy 2007: 70-71).

Finally, in Central America there exists the problem of reintegration of former women combatants into their community. This is a complex situation, while these women have broken gender stereotypes still valid in remote communities. The complexity of the related theme to GBV, war, and extreme poverty require a holistic gender-focused approach. Public acknowledgement is required with specific services for sexual and reproductive needs, psychological assistance, including the capacity to denounce former abuses and support for women and girls who have given birth. All these necessities require complex reintegration programmes and greater attention to sexually transmitted infections, with HIV-AIDS tests, medical care and drugs (Schwitalla/Dietrich 2007: 58-59).

In theoretical terms, HUGE is an analytical concept that helps to link human, gender, and environmental concerns in post-war situations. It distinguishes among different levels and it is a tool to integrate international and national actors, but also grass-root activities. As a policy tool it analyses the activities related to GBV, the role of social movements, of organized women groups, and NGOs for reducing the existing violence, and to create legal bases for a transparent system of rule. A HUGE approach to security is also suited to address global problems related to child and gender trafficking, where missing transparency in national governments, but also international demand of pornography and prostitution in industrialized countries, is triggering the possibility to

22 [7] UNSCR 1325 is an 18-point framework for the protection of women and girls. It promotes women's participation at all decision-making levels and peacebuilding processes; it promotes gender training, guarantees protection of the rights of girls and women, and strengthens gender mainstreaming. It highlights to end impunity for GSV, holding governments accountable for the actions of their armed forces and police.

Figure 92.5: Human, Gender and Environmental Security from Bottom-up and Top-down. **Source:** Úrsula Oswald Spring (2004a).



combat the root causes. This is especially valid when these rings of traffickers are further integrated into illegal migrant, drug, and arms trafficking and money laundering. Particularly the last point returned the ball to industrialized nations and transnational financial systems, including big banks and industry. However, the complexity of the issue and the established links with other illegal activities reduces the prospects for women at risk.

Therefore, a model of bottom-up empowerment and economic alternatives will be able to protect poor women from the temptation to search for a well-paid ‘job’, and thus becoming victims of a criminal ring from where there is often no return. The relationship between the two empirical cases has shown that only a combined methodology of a *top-down* institutional management with transparency and a *bottom-up* consciousness rising is in a position to be able to combat effectively the so frequent, but mostly silent, crimes

related to GVB, supported or at least accepted by patriarchal institutions and behaviour.

In theoretical terms, HUGE can be linked to three levels of analysis: the individual and family; the micro environmental, and the macro or global one. These three levels interact and reinforce each other (see figure 92.5). On each level specific identity-building processes have created social representations that often reinforce unconsciously the patriarchal mindset (chap. 89 by Serrano; chap. 90 by Oswald). Thus, a bottom-up approach using Freire’s methodology in the workshops in South East Asia might transform these social representations from within. Once the root causes have been understood, these women empower themselves.

In the case of Central America, a dual approach has been addressed: a *top-down* approach – referring to norms and legal and institutional changes – but also a bottom-up approach dealing with personal insecur-

rity in Guatemala after the war. But none of the mentioned strategies alone can resolve the complex problems of the trafficking of women and children. The solution to GBV and to related prostitution is so multifaceted and anchored in the existing system, that the top-down results alone will be necessary but insufficient.

International organizations are complex: first they have to combat within their own organization problems of patriarchal structures and mindsets, where often the vulnerable have been excluded from power. Later, they struggle to overcome the difficulties at the national level of their member states where they have to launch reinforcements of the rule of law and the system of rule in post-war situations.

Finally, there is the control at the local and intra-familial level that is beyond their reach. Therefore, the HUGE approach offers a methodology to work simultaneously at the three levels with different stakeholders. This underlines a need to create alternative processes of identity-building for highly vulnerable and exposed groups, but also different social perceptions within governmental institutions (second level). It is national governments that are responsible to implement the adopted conventions and treaties, and to pass national laws. Further, they also have to find ways to apply these laws in a hostile socio-economic environment, where weak institutions exist and brutal behaviour and GBV from former war situations are still remaining. Finally, they are also in an economic recovery phase that is characterized by high unemployment, social stratification, and poverty, where above all women are at high risk of accepting so called well-paid jobs. Confronted with these multiple obstacles, women and vulnerable groups and individuals have to find their own way for protection and empowerment. Through the HUGE methodology they may understand the complexity of their situation and the impact of the triggering of global and national negative reinforcements. Getting organized at the local level, they can start with small actions, and by doing so they slowly start to understand the greater complexity, and then they can undertake wider action.

Therefore, the methodology can also help social movements and NGO's first to situate and later to find ways out of the triggering situations. Once women groups are consolidated locally, the affected people can develop protection mechanisms. They also help to exercise greater control over the national governments by using international support and denouncements. Better national control reinforces the state of law at the local level, and gangs, criminal

rings, and politicians involved in illegal activities are getting denounced by media (Cacho 2005). Further, affected women and children are entitled to demand governmental protection. But thousands of years of exclusive and violent patriarchal structures cannot be abolished by law or local empowerment alone. This requires a longer-term integrated strategy that links both analytical tools and policy means, where the HUGE concept may be helpful to distinguish levels and activities.

93 Do Disasters Discriminate? A Human Security Analysis of the Impact of the Tsunami in India, Sri Lanka and of the Kashmir Earthquake in Pakistan

Madhavi Malalgoda Ariyabandu and Dilrukshi Fonseka

93.1 Threats to Human Security - Vulnerability and Disaster Risk

Although the traditional definitions of human security are confined to mean those threats posed to individuals by war, terrorism, genocide and human rights abuses, the compendium of literature on the subject has expanded to also include those threats posed by factors like hunger, disease and natural disasters. The *Human Development Report 1994* identifies seven interrelated dimensions of human security; economic security, food security, health security, environmental security, personal security, community security, and political security (UNDP 1994: 24)

Exposure and vulnerability to natural disasters pose a major threat to human security, by virtue of exposing individuals to the threats of physical, economic, social, health, personal, cultural and psychological insecurities. Disasters take lives away, displace people and make them socially and economically insecure. Frequently, post-disaster contexts further threaten human security, as political and institutional structures in disaster-hit countries are unable to deliver relief and recovery in a speedy, efficient, democratic and equitable manner. Further, the impact of a natural disaster is compounded in communities that are already hard-hit by past or continuing natural disasters or human conflicts.

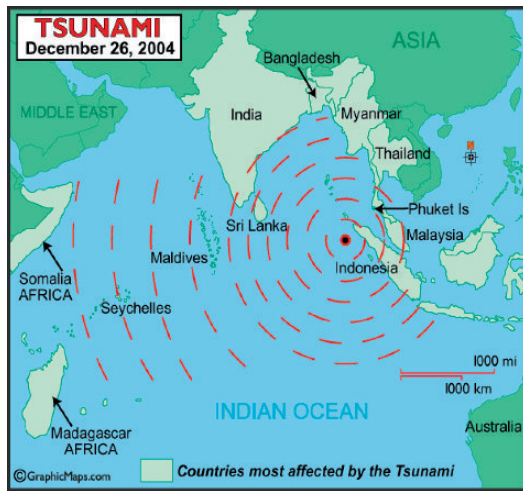
South Asia is one of the most disaster prone regions in the world, affected by a variety of natural hazards such as floods, drought, cyclones, windstorms, landslides, and earthquakes. According to the World Disaster Report (IFRC-RCS 2006) 210,610 persons were killed and more than 779 million persons were reported to be affected from natural disasters during the decade of 1996-2005 in the South Asian subcontinent. The subcontinent is also home to a very large number of resource poor people whose income levels

and assets are barely sufficient for survival. A large majority of poorer populations inhabit the most risk prone locations, such as flood plains, mountain slopes, arid and dry lands, and the coastal belt. Poor governance, institutional and policy frameworks, weak infrastructure, lack of social protection and security all lead to high levels of disaster related insecurity. Livelihoods with a poor asset base are fragile, insurance and other forms of protection are non-existent, literacy is low, access to information, health and other services are poor, markets are often exploitative, and the local governance structures, both formal and informal are dominated by the landed elite. Socially and economically imbalanced mega developments in the region which can lead to environmental degradation and higher intensity and frequency of hazards further increase levels of risk for impoverished people. Thus, the region effectively brings together the two main parameters of the disaster equation; hazards and vulnerability. Natural hazards frequently turn into disasters with large numbers of human casualties and displacement (Duryog Nivaran 2006).

This chapter proposes that the degree and extent of an individual's human security risk vis-à-vis natural disasters is contiguously related to the multiple and intersecting identities he/she subscribes to or is assigned to (i.e. gender, ethnicity, class, caste, religion etc) as well as to the physical, structural and attitudinal violence that is inflicted on these multiple and intersecting identities by his/her community.

The chapter looks at how different groups of people in India, Sri Lanka and Pakistan have been affected by the December 2004 Asian tsunami and the October 2005 Kashmir earthquake; unfolding vulnerabilities, the degrees of disaster risk and threat to human security from the immediate, natural hazard impact, and through disaster responses (93.2). Despite

Box 93.1: Map and figures in the Impact of the Tsunami in Sri Lanka and in India. **Source:** <[http:// worldatlas.com/aatlas/infopage/tsunami.htm](http://worldatlas.com/aatlas/infopage/tsunami.htm)>.



Sri Lanka

Number of people killed 35,322
Number of people injured 21,441

India

Number of people killed 10,749
Number of people injured 6,913
Number of people missing 5,640

some progress made on disaster risk reduction approaches¹, these two most recent mega disasters demonstrate deep rooted problems; exposing the failure to understand and address causes and effects of vulnerability (93.3), and a recovery process devoid of risk and vulnerability reduction (93.4).

93.2 Vulnerable Identities Unfolded

Both the Asian tsunami (box 93.1) and the Kashmir earthquake have clearly demonstrated that while hazards themselves do not discriminate between the various cleavages in society (i.e. between rich and poor, men and women, high and low caste etc.), the severity of impacts has vastly differed. Natural disasters both expose and exacerbate vulnerabilities; existing socio-cultural, economic, institutional and political structures and systems make the impact of the disasters more severe on more vulnerable groups and individuals. Resource poor people, women and children, the disabled and old, men and women in ethnic, religious and caste minorities are more susceptible to the impacts of natural disasters by virtue of occupying vulnerable physical, socio-economic and cultural environments.

93.2.1 Denominators of Identity and Differential Impacts of the Disasters

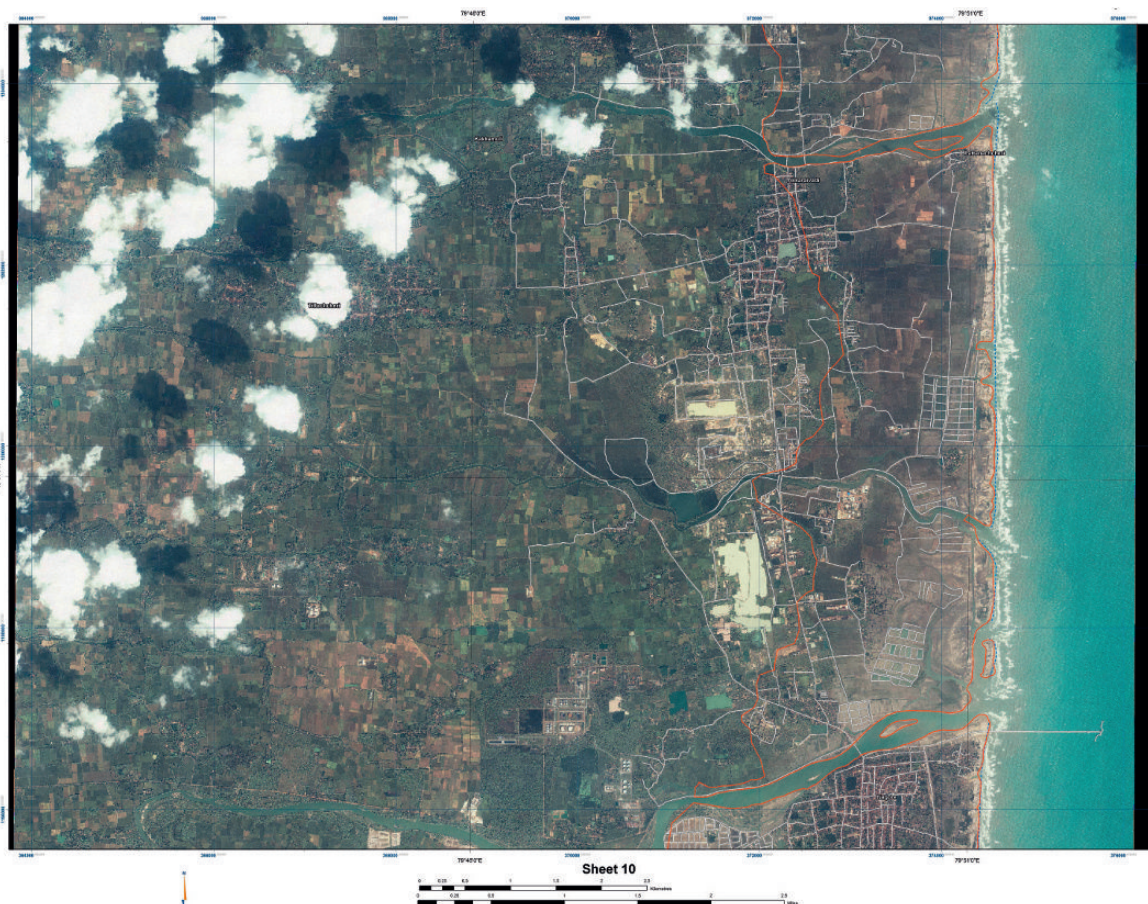
The tsunami that struck the coasts of India and Sri Lanka offers many examples of identity-based vulnerabilities. Within affected populations, certain ethnicities, minorities and castes appear to have been more affected than others, and within caste and ethnic groups, the poorer classes, and women of all ethnic groups and social classes have borne the heavier burden of both the disaster and its recovery. This is true of the so-called lower castes and tribal groups in India, and the Tamil and Muslim minority communities in Sri Lanka and other religious minorities in both India and Sri Lanka. Those most affected by the tsunami were fishing communities and primarily the more impoverished belonging to majority and minority ethnic and religious groups living in close proximity to the sea.

In India, the populations of the affected coastal-belt belong to three main castes, the *Meenavars*, the Dalits ('Scheduled' Castes) and *Pazhankudi Makkal* ('Scheduled' Tribes²). These castes subscribe to economic, social and cultural hierarchies and live in almost complete geographic segregation. The *Meenavar* community comprises primarily fishermen, while a majority of Dalits and tribal groups work as

1 Such as efforts have been undertaken through the *International Decade for Natural Disaster Reduction* (IDNDR) and the *Hyogo Framework for Action 2005-2015 for Building the Resilience of Nations and Communities to Disasters*; see at: <www.unisdr.org>.

2 The Scheduled Castes and Scheduled Tribes are communities that were historically excluded from the social superstructure of Hindu society in India, who have been accorded special status under the Constitution of the Government of India.

Figure 93.1: Damage assessment map of the Tsunami on the coast line of Tamil Nadu, India (29 December 2004).
Source: UNOSAT/Infoterra; at: <http://www.respond-int.org/Respond/viewmapdetails.html?map_id=266>.



day labourers and coolies in the service of these fishermen. A good percentage of Dalits do not lay claim to land, capital or other assets and live in conditions of poverty. Despite India's legal and constitutional advances in safeguarding the rights of its 'lower' castes, in reality, caste-based discrimination is rampant and deeply-entrenched.

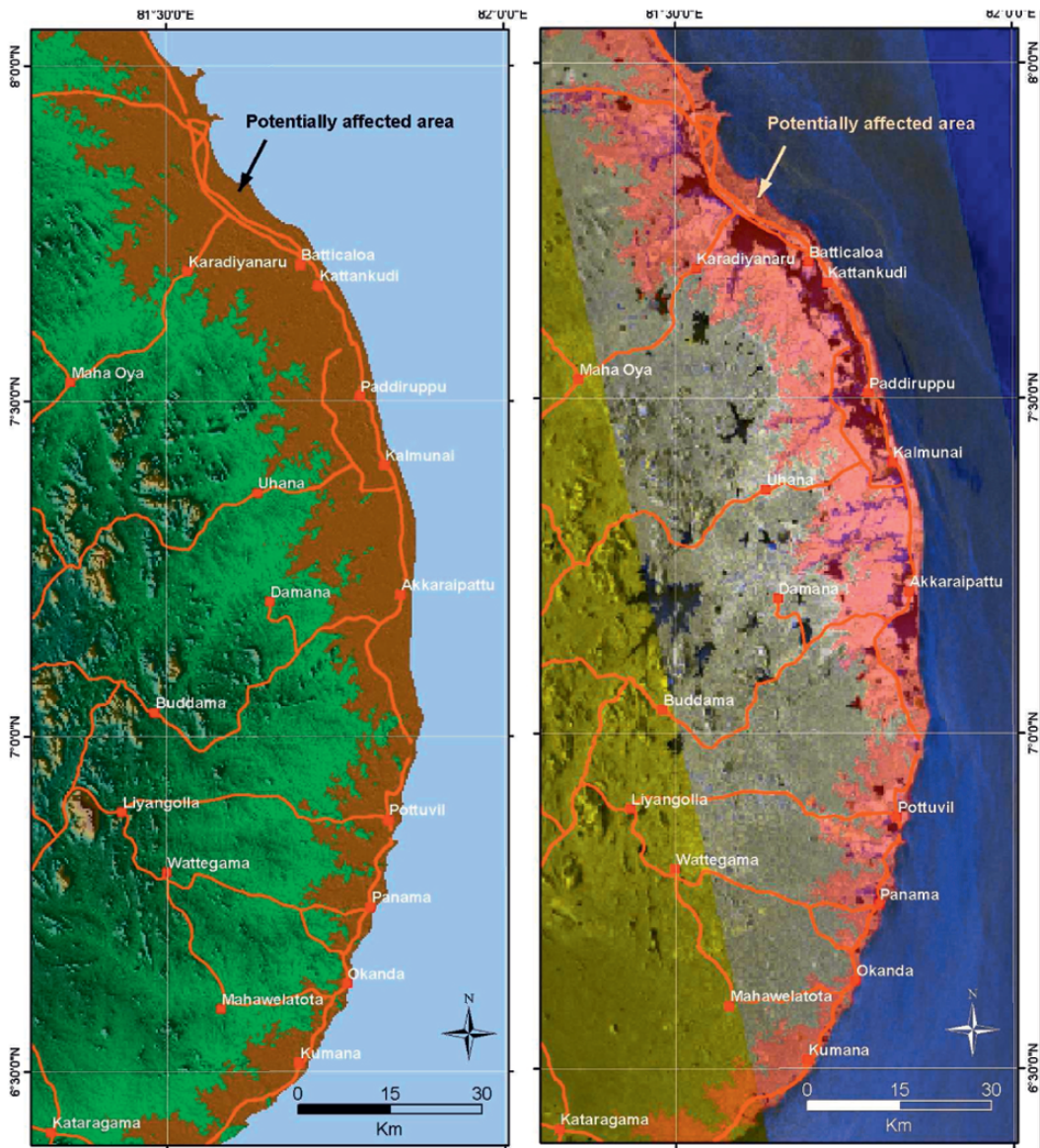
When the tsunami struck, the Dalit population was more vulnerable on a number of grounds, namely their existing impoverishment and the continued discrimination faced by Dalits at the hands of the state and other caste communities. As their livelihoods are inextricably linked to the coast, a high percentage of Dalits live in shanties along the seashore. When the tsunami struck, these shanties were simply washed away along with their occupants. The intersection of geographic proximity and impoverishment resulted in high death tolls among the Dalit communities (Duryog Nivaran 2005b: 45).

In Sri Lanka, the populations of the North and East Provinces are considered more vulnerable, both

through their conflict-affected and ethnic minority status and the prevalent conditions of poverty and underdevelopment in these war-affected provinces (figures 94.2, 94.3, 94.4, 94.5). This part of Sri Lanka is predominantly inhabited by Tamil and Muslim populations who live in relatively segregated communities. Those living in the North and East already bear the consequences of Sri Lanka's armed conflict, including massive displacement, economic disempowerment, socio-cultural upheaval and democratic deficits. The people of the North and East continue to live under the threat of violence (including child recruitment, civilian-military clashes, paramilitary flare-ups etc.) and suffer from underdevelopment (including unemployment, poor infrastructure, feeble local government institutions etc.).

Over half of total tsunami deaths and total tsunami displacement took place along the eastern and northern coasts where the tsunami waves hit with highest impact, and the highest incidences of death and displacement were recorded among impoverished

Figure 93.2: Sri Lanka East Coast. Potentially Affected Areas of the Tsunami (2 January 2005). Comparison Tsunami Pre & Post Crisis Image Comparison in Sri Lanka. **Source:** Produced by SERTIT: at:<http://sertit1.u-strasbg.fr/documents/asie/mid/p32_potentially_affected_area_eastcoast_midres.jpg>.

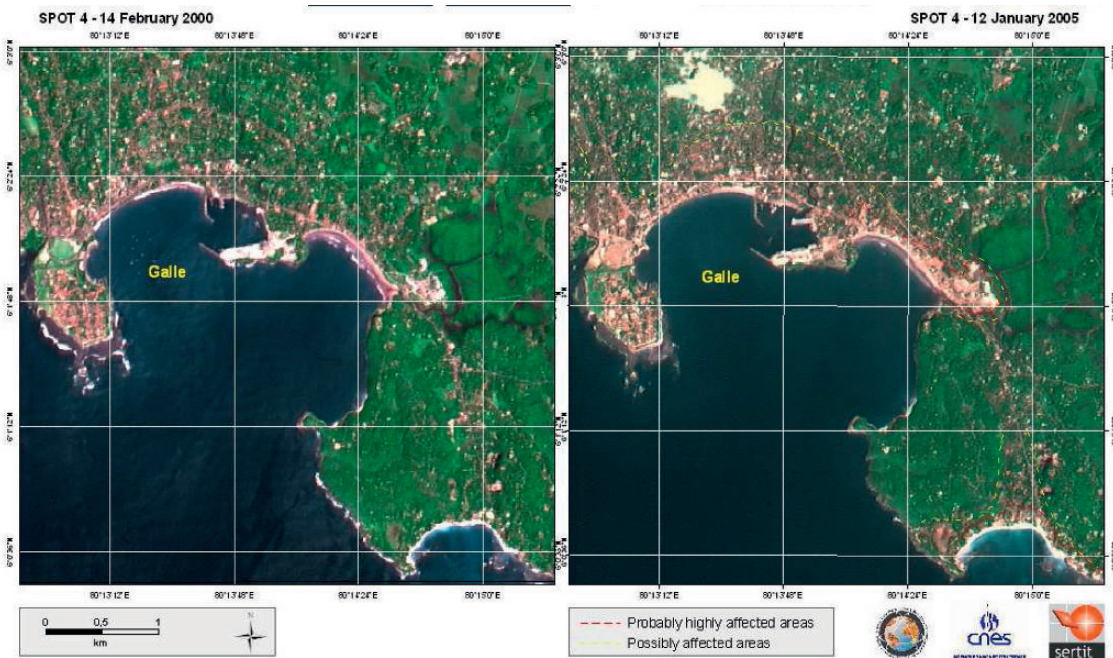


fishing communities living in shanties along the sea-shore. The perception of some was that the natural impact of disaster itself was more severe because “[security] forces had prevented the rebuilding of damaged coral reef in the affected seabed under the guise of security” and that this had robbed the coasts of their natural barriers and left them more vulnerable to the tsunami. Others believe that the North and East recorded higher incidences of injury “...due to lacerations and cuts as a result of people washing up against the barbed wire placed at coastal military posts” (Donor/Civil Society Steering Committee 2005: 63–76).

93.2.2 Vulnerable Within the Vulnerable

The death toll of women is estimated to be three times more than that of men in the Asian tsunami, and in the Kashmir quake it is estimated that more women perished in comparison to men. In both India and Sri Lanka more women than men died. Women and children constitute the majority who died in the tsunami in all locations in Sri Lanka (Oxfam 2005a: 9). The reported casualties in Sri Lanka among the fishing community clearly spell out the disparity; with 63 per cent of the deaths are those of females (3101

Figure 93.3: Satellite images on the Impact of the Tsunami on the South West Coast of Sri Lanka, Galle Area (before and after the disaster). **Source:** UNOSAT; at: <http://unosat.web.cern.ch/unosat/freeproducts/Tsunami/Sertit/Latest/P79_SriLanka_SW_Galle_lowres.jpg>.



deaths of women in comparison to 1769 men GOSL: 2005). In all the tsunami affected 14 administrative districts of the country, except in 3 districts the female death rate among fishing community is more than 60 per cent of the total (GOSL 2005).

In India, Tamil Nadu's worst affected district - Nagapattinam - reported 2406 female and 1883 male deaths (Oxfam 2005: 6). In an overall estimate in India the number of women killed by tsunami is 1.42 times the number of men, while the number of girls killed was 1.65 times the number of boys among children under 15 years of age (Krishnamoorthy 2005: 739).

While there is no gender disaggregated information available on the Kashmir quake casualties, there are reports which indicate that in *North Western Frontier Province* (NWFP) and in Azad Kashmir in Pakistan, more women and children died than men (APWLD 2005a).

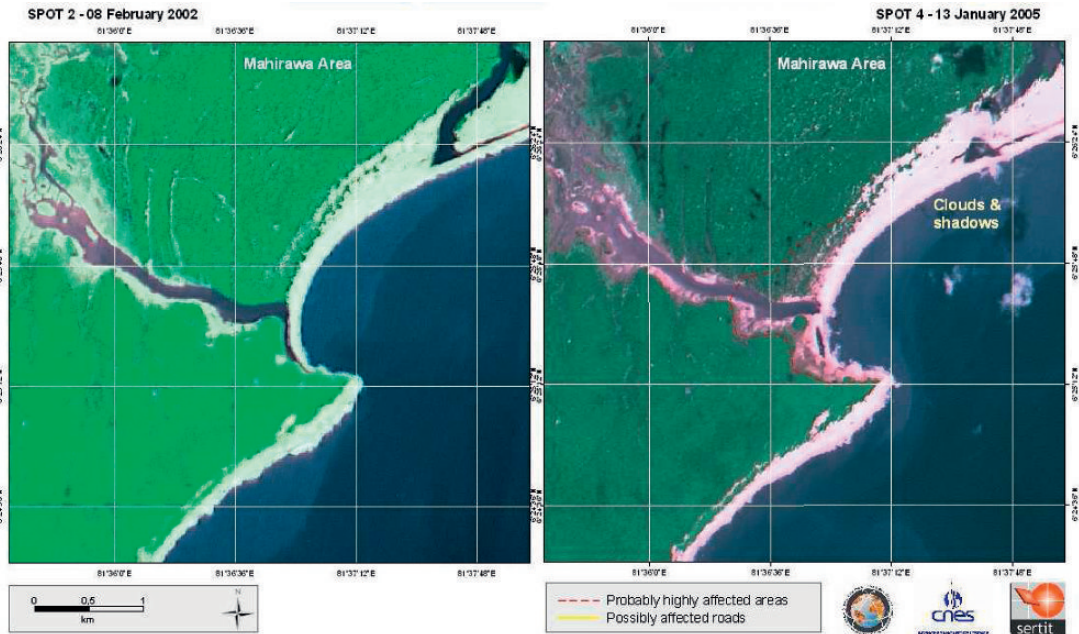
The reasons are largely attributed to gender based socio-cultural differences which guide behaviour patterns. Women had less survival possibilities in the tsunami disaster due to their attire and long hair which became impediments to swiftly moving to safety, their inability to climb and swim, the timing of the disaster and their related location at the time. Men were reported to have been mostly outside, and could see the

wave and run to safety; some were out fishing or away from home, while women were inside tending to morning household chores. It is also widely reported that women were trying to save children, elderly and others in need of help during the first wave and were washed away with the second. It is also indicated that their weaker physical strength made it harder for them to hang on to things while carrying children in their arms.

In the Kashmir quake, APWLD Forum News (APWLD 2005a) indicates that in urban areas, social conditioning and patriarchal rules apply, and many women find it difficult to leave the shelter of their homes due to cultural norms of *purdah*.³ In certain areas of the *North Western Frontier Province* (NWFP) women would never leave their homes and run to the streets despite the violent shaking of buildings and concrete walls tumbling down. Such social conditioning and expectations, and the resulting behavioural patterns of both men and women lead to women having less survival or life saving skills and less chances of survival in disaster situations.

3 Purdah is the observance of the concept of veil, where men and women in the community are segregated, women are allowed to interact only with the male members of their immediate family and blood relations.

Figure 93.4: Satellite images on the Impact of the Tsunami on the South East Coast of Sri Lanka, Galle Area (before and after the disaster). **Source:** UNOSAT; at: <http://unosat.web.cern.ch/unosat/freeproducts/Tsunami/Sertit/Latest/P86_SriLanka_SE_mahirawa_lowres.jpg>.



93.3 Disaster Recovery Responses

Variations in the speed of recovery of various individuals and groups are easily traced back to existing vulnerabilities and capacities. Relief and recovery systems and institutional structures discriminate against the more vulnerable and already disaster affected people by design or by ignorance.

93.3.1 Inequalities in Relief Delivery - Disparities, New Divides and Deepening Conflicts

In India, there is evidence of continued institutionalized discrimination and social prejudice directed at Dalits and tribal communities in the delivery of emergency relief. Given their low social status and illiteracy, Dalits found it difficult to register their losses and receive compensation.⁴ According to Human Rights Watch, "...the greatest source of trouble seemed to be discrimination against Dalits by other victims of the tsunami, notably the communities of

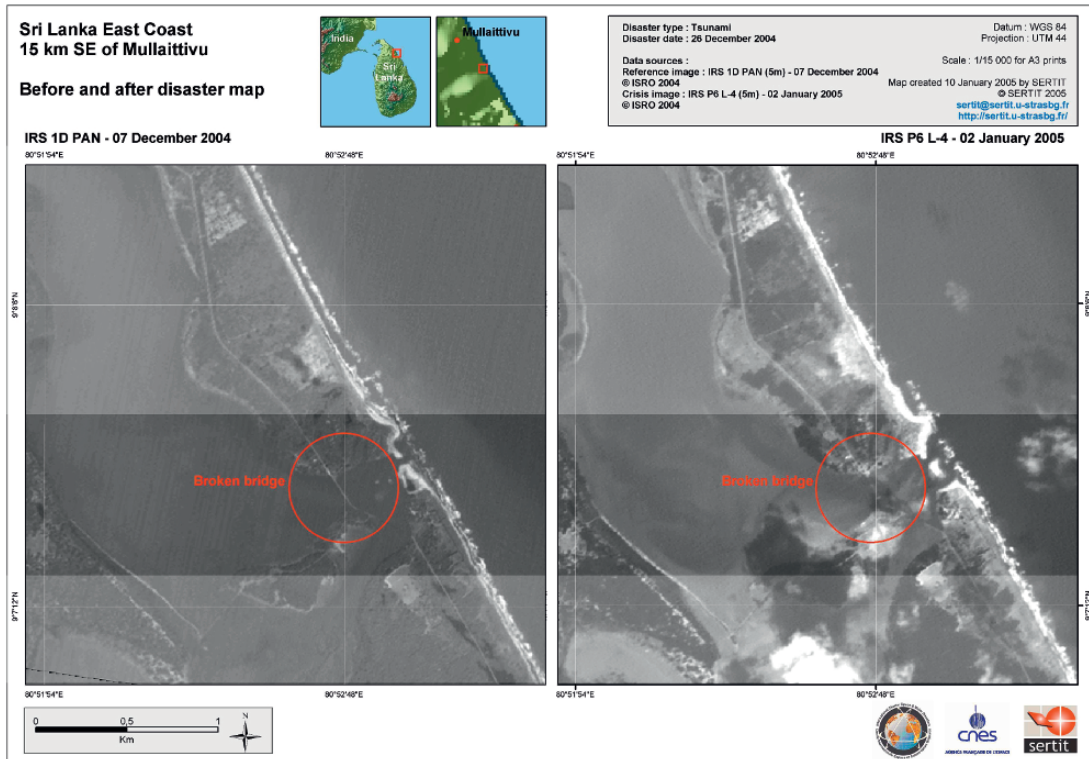
fishermen, who view themselves as belonging to a higher caste" (HRW 2005: summary page). Dalits and tribal groups such as the Irular community also came face-to-face with exclusion and discrimination when seeking shelter. Media reports highlighted that government officials were segregating relief camps by setting-up Meenavar-exclusive camps and dividing Muslims, Dalits and other lower castes into camps of their own. Authorities were divided about segregated shelters for different castes. Some believed that this was the only way to avoid caste conflicts; others thought it would reinforce divides and worsen caste relations.

In Sri Lanka, tsunami-affected communities in the North and East had greater difficulty accessing emergency relief than their country-folk in the South. Physical, social and organizational vulnerabilities played a role. Poor infrastructure and communication facilities, under-developed local government institutions and competing lines of authority between the *Government of Sri Lanka* (GoSL) and the *Liberation Tigers of Tamil Eelam* (LTTE) due to the protracted civil war meant that the emergency relief effort was far slower in reaching the North and East (Donor/Civil Society Steering Committee 2005: 63-76). Communities living in the North and East not only felt that poor infrastructure and strict security impeded delivery of relief to their areas, but also that their conflict-

4 "The After Effects of the Tsunami on Affected Dalit Communities", in: *National Campaign on Dalit Human Rights*, at: <<http://www.indianet.nl>>, January 2005.

Figure 93.5: Satellite images on the Impact of the Tsunami on the East Coast of Sri Lanka (before and after the disaster).

Source: UNOSAT; at: <http://unosat.web.cern.ch/unosat/freeproducts/Tsunami/Seritit/Latest/P63_se_mullaittivu%20irs_before_after_highres.jpeg>.



affected and minority status made them more vulnerable to discrimination and unequal treatment at the hands of government officials. They perceived a media bias to tsunami reporting which also contributed to an influx of emergency relief to the South at the neglect of the North and East (DRMU/HRCSL 2005a: 2-6). Inside the North and East, discrepancies between entitlements accorded to the new tsunami-affected compared with the existing entitlements for communities affected over many years by the conflict also created new divides, deepening schisms between existing divides and breeding fresh anger and resentment among already alienated communities.

93.3.2 Housing Insecurities – Delays and Discriminations

For already vulnerable groups, tsunami displacement turns out to be both protracted and difficult. Fishing families not only bore the brunt of the tsunami's natural impact, but given their existing vulnerability due to poverty, they also faced greater difficulties in recovering their homes and regaining their livelihoods. Those relatively better off were able to procure alter-

nate housing while the more impoverished had no choice but to languish in transitional shelters.

In Sri Lanka, the rebuilding of 100,000 houses for tsunami-displaced families has been long and arduous; one that has been complicated by the scarcity of land, bureaucratic procedures, political manoeuvring, donor inefficiency and apathy. While the rebuilding delays affected all displaced persons, its impact is most severe on communities living in the North and East. Half of total tsunami displacement occurred on the Eastern coast and the predominantly Muslim communities were most affected (DRMU/ HRCSL 2005: 2-6). The Government's buffer zone policy⁵ – prohibiting the construction of new houses and other buildings within 100 meters of the southern coast and 200 meters of the northern and eastern coasts – proved more detrimental to finding housing solutions for coastal communities in the East, given the very high numbers of displaced and the pre-existing land scarcity (Shanmugaratnam 2005). There was also a preva-

5 This policy was subsequently revised and the buffer zone was determined on a case by case basis according to the geographical contours of the coastal belt.

lent impression that the variations on the buffer zone policy were a further act of discrimination against communities in the North and East (Donor/Civil Society Steering Committee 2005: 63–76).

There was a clear ethno-regional variant to the pace of housing construction. The vast discrepancies cannot be entirely written-off against physical or organizational vulnerability alone, and have to do with the electoral and ethno-political realities of the country. As potential vote banks, the predominantly Sinhala tsunami-affected in the South commanded much greater leverage than their predominantly Tamil and Muslim counterparts in the North and East. As a result of becoming a tool for political mileage, tsunami resettlement in the South happened at a far more accelerated pace, and not to the same extent in the North and East.

Table 93.1: Post-tsunami Construction Status – Donor-built Housing Projects (December 2005).
Source: RADA (2005: 12).

District	Total houses damaged	Total units assigned to donors	Total under construction
East	50460	12208	2242
North	10953	3621	878
South	24,329	10298	6157

93.3.3 Poor Protection of Women’s Property Rights

Lines of inheritance and property rights are not in favour of women in many South Asian countries. In the aftermath of any disaster this issue comes to the fore when widows, female headed households and daughters of deceased parents are confronted with the problem of providing proof of ownership of land and other properties.

In Pakistan, there were incidents reported of male relatives of the dead seizing houses and property, and many women in Pakistan with no adult, male children face potential seizure of property, usually by male relatives. Similarly in Sri Lanka, a report by the *Women’s Division of the Human Rights Commission in Sri Lanka* (DRMU/HRCSL 2005b) highlights some particularly serious consequences for women in the North and East of Sri Lanka where the *dowry* system is practiced. Dowry (or property) under this system is passed through the matrilineal line as a type of collateral for marriage.

In the tsunami recovery activities it was observed that when issuing new deeds, some government servants were giving preference to male heads of households despite properties previously being in the name of the women. The report also indicates that in cases where land was not owned outright by tsunami victims but was state property, loss of documentation can lead to discrimination against women through the law. The existing law in Sri Lanka discriminates against the female relative by giving priority to the elder male (DRMU/HRCSL 2005b).

93.3.4 Regaining Lost Livelihoods at the Cost of Creating Opportunities and Strengthening Livelihoods

In livelihood recovery, those most-affected were those already lacking access to property and capital. These same persons were excluded from many economic livelihood programmes that focused on restoring lost economic opportunities without taking into consideration those who had none to begin with. As a result, the recovery process/recovery assistance is largely unable to provide livelihood security for the most vulnerable, which can not only increase their levels of risk and insecurity for future disasters, but also pull them further down in the levels of poverty.

In Sri Lanka, the brunt of the tsunami’s socio-economic impact has been borne by the fishing communities and large sections of this population are regarded as already underprivileged. According to government estimates, the country lost over 50 per cent of its fishing vessels and over 100,000 fishermen lost their livelihoods, with the largest concentration of estimated losses recorded from the North and East. Here, the lives and livelihoods of fishing communities were already hampered by fishing bans and restrictions in the *High Security Zones* (HSZs), incessant security checks and permit procedures (by the Government and the LTTE) and limited retail, all on account of heightened security conditions of the armed conflict. The socio-economic impact of the tsunami added another layer of vulnerability on these already vulnerable fishing communities. The issue of the buffer zone has serious implications for the livelihood security of fishing communities in all parts of the country, who have not been able to re-settle close to the coast and their source of livelihood. Here too the consequences are especially severe for communities in the North and East given that in the Jaffna district for example, 20–25 per cent of fishermen were

already conflict-displaced and lived in camps away from the coast (ADB, UN & WB 2005).

Similarly in India, the impoverished fishing communities of Tamil Nadu and Kerala bore the burden of the tsunami's socio-economic impact. Dalits suffered proportionately greater losses both directly and indirectly; it is estimated that Dalits lost over 1700 boats in Tamil Nadu; and over 600 catamarans in Kerala, plus fishing nets and other gear. Dalits also suffered significant losses to livestock and agriculture (National Campaign on Dalit Human Rights 2005). Given that a majority of Dalits worked as day labourers in the service of fishing communities their livelihoods were affected by the fishermen's losses.

Livelihood recovery interventions in India and Sri Lanka have adopted owner-centric policies, i.e. addressing the losses of registered owners of property, business, vessels and equipment. This approach neglects the poorer communities who did not own means of production, but depended on their physical labour for sustenance. In India, this largely excludes Dalits and tribals. Many of the livelihood interventions in both contexts seem to focus on 'regaining' lost socio-economic opportunities of those affected instead of seizing post-tsunami reconstruction as an opportunity to better the socio-economic opportunities of the marginalized and to close existing gaps between various groups in the affected regions.

93.3.5 Invisible Capacities and Denied Participation

Disaster management capacities of women and men differ due to their gendered social construction. Women perform multiple roles in day to day life; reproductive, productive, and social. These roles and functions are extended to risk management as well as to emergencies and recovery situations (Enarson/Hearn Morrow 1998; Ariyabandu/Wickramasinghe 2004).

In disaster aftermath, the impact and recovery of men and women is a reflection of the balance between capacities and vulnerabilities, both the actual and perceived. Within the prevailing gender relations in South Asian societies, disaster recovery dynamics work simultaneously to highlight and exacerbate women's vulnerabilities, and to ignore and downplay their skills, potential and capacities.

In disasters and emergencies women are often perceived, portrayed and treated as weak, incapacitated victims who wait for external assistance, despite the fact that in family and community spheres they successfully carry out multiple functions; as household

managers, giving leadership to community initiatives, and managing environmental resources. Capabilities, skills, and what women actually do in preparing for, in managing emergencies and in recovering from crisis is neither recognized nor given space in formal emergency and recovery operations, nor facilitated with resources and skill development opportunities. In most cases women's real and potential contributions are invisible.

Women's subordinated social status within the existing gender relations clearly became an impediment in accessing emergency and recovery relief. In Sri Lanka, government relief schemes effectively excluded women since the basis of all relief packages is the 'householder list' where it is the norm that the 'head of household' is male. This has proven to be a barrier in effectively reaching the affected, and to women directly accessing relief and recovery packages. This barrier is further exacerbated by women in general not having sufficient formal documentation required by government and many NGOs to access relief packages.

It was widely observed in Sri Lanka that women's participation in relief operations and in recovery planning was extremely low from the camp level to the various assessment and planning committees appointed by the government and other agencies. Similarly in Pakistan it was observed that women were not involved in camp management, especially in the camps run by the religious organizations.⁶ Low participation of women has multiple implications; it can lead to ignorance and neglect of women's needs, concerns and priorities, and teams comprised entirely of males may use their power and authority to harass, particularly sexually harass, women. Recovery plans made only by men may not sufficiently include women's perspectives, skills and experiences. By excluding women from recovery teams women are denied opportunities to contribute and to develop their skills and leadership qualities. The cycles of gender biased unequal power relations are further intensified and conditions are created for the perpetuation of the same. It is a tremendous loss to women as individuals, as well as to their families and communities.

Such lost opportunities have implications for women for attaining long-term economic security in terms of accessing better, more diversified and secure livelihood options, accessing credit, savings and insurance, denying them of skill development and empow-

6 Based on field observations by the Rural Development Policy Institute, Islamabad, Pakistan

erment opportunities. Vulnerability of women therefore will remain and intensify, with implications for risk and insecurity of children, elderly and other family members.

Similarly, gender-based social expectations isolate men in the aftermath of disasters, leaving them to deal with their own loss and grief. The formal aspects of psycho-social support bypass men. The gender based social conditioning does not give men and boys space to develop the skills of domestic chores and care giving, facts which are often overlooked in gender blind disaster recovery interventions. The gaps in coping capacities of men in such circumstances can victimize them within the recovery process. There are reports that alcohol consumption and depression among men has increased, leading to more violence in general and domestic violence in particular.

93.3.6 Swimming Through the Tides of Violence

A factor specific to women and girls in disaster situations is sexual violence. In the chaos resulting from the disaster and the disruption of the social and family protection, vulnerability of all women increases in terms of security of person. There is evidence across the globe that violence against women increases in the wake of disasters and that the increased risk is associated with gender inequality and the limited representation of women in disaster responses (Enarson 2000). A study of South Asian legal systems finds that ‘perpetration of gross forms of violence against women through state agencies, in the community and in the family is a manifestation of women’s unequal status and/or perceptions of their inferior status in the family and the community (Goonsekere 2005).

Owing to fear of stigma, cumbersome reporting procedures, and the perception of it as normal, formal reports of rape and other forms of gender-based violence including domestic violence are few. However, it is a fact that gender insensitive post disaster arrangements have created conditions that further exacerbate the pre-existing tendencies of gender-based violence against women. Tsunami affected women in a number of districts in Sri Lanka mentioned that they constantly lived in fear of their own safety and that of their children within and outside camps (UNCT 2005). There were reports of sexual abuse, including gang rape, molestation, and physical abuse of women and girls in the course of unsupervised rescue operations and during the early months in transitional shelter (CATAW 2005; APWLD 2005;

Fisher 2005; Rees/Pittaway/Bartolomei 2005). Although in Sri Lanka sexual harassment is a criminal offence, many women are not aware of this legal sanction and implied protection, and do not have the social and economic standing and status to pursue a legal case.⁷

In Pakistan, similar observations are reported from the camps where Kashmir earthquake victims were residing (APWLD 2005b). Muslim women found the situation specifically difficult given that their culture requires the separation of women from men. Camp conditions increased the levels of risk and vulnerabilities of displaced women who under the circumstances were living in unfamiliar locations and among strangers. Such gender insensitive arrangements encouraged harassment and violence against women (Tsuk 2005). Women living in the tent villages all over the earthquake affected areas stated that they did not feel secure while staying in the camps since there were no proper security arrangements.

93.3.7 Gender Blind Livelihood Recovery

In Sri Lanka, post tsunami livelihood recovery interventions show all the signs of gender blindness. Plans were made without adequate analysis and understanding of the complexities of the livelihood systems of coastal and other affected communities and without a sound base of gender disaggregated data. Mainstream recovery programmes take a sector-based approach, looking at fishery, tourism, agriculture sectors based on damage and needs assessments conducted from a macro point of view. Such assessments cannot capture the subtle dynamics within the sectors, particularly small scale production which the majority of poor and vulnerable communities were involved in prior to the disaster.

The majority of livelihood recovery programmes invest in large-scale infrastructure such as damaged harbours, road networks, larger multi-day boats, cooler trucks, freezers, and fishing gear for large scale fishing. Assistance to the poorer groups in the fishing sector is minimal. Women’s fisheries activities (which often include cleaning and sorting catches, small scale vending, processing fish, repairing nets, and in some places, lagoon fishing) remain invisible and, except for *ad hoc* interventions by NGOs and local *commu-*

7 See: “Women Living Under Muslim Law”, at: <<http://www.wluml.org/english/newsfulltxt.shtml?cmd%5B157%5D=x-157-18552>> (8 September 2005).

nity based organizations (CBOs), are neglected in sector recovery plans.

Women's home-based activities classified as 'informal sector' have received similar treatment, and women are largely absent or marginally represented in the livelihood recovery planning exercises. Thus women are unable to have any substantial influence on these programmes so that they more fully address women's livelihood options, related skill development and other needs. As a consequence, in the aftermath of a disaster, women are generally only able to find work in casual, daily-labour activities.

Most livelihood recovery interventions in Sri Lanka suffer from lack of imagination and drive for 'building back better'- the motto of the national recovery programme. Instead, most efforts are placed on getting back to normalcy. Income generation options and skill development programmes are stereotyped and lack gender sensitivity to encourage women to obtain new skills and facilitate innovation in home-based work. Due to socio-cultural constraints, particularly concerning their mobility, women usually do not get the opportunity for skill improvements unless efforts are specifically targeted at women in a socially appropriate manner. This requires imagination on the part of the recovery planners. Ill-informed and poorly planned livelihood recovery activities deepen poverty levels of women. Only a few exceptions can be seen in cases of individual women who defy tradition and challenge existing norms in order to survive within the circumstances into which they were pushed by such disasters (Koster 2006).

Although there is a renewed focus on gender issues since these two major disasters, willingness to address gender concerns is marred primarily by two factors; not having sufficient cadres of gender sensitive professionals (from the lowest to highest levels of planning and implementation and both at national and local levels), and lack of continued commitment at the policy and implementation levels.

93.4 Breaking the Vicious Cycle of Vulnerability – Securing Lives and Livelihoods

The interrelationship between development, poverty, vulnerability and disaster risk has been well established both conceptually and in practice (Duryog Nivaran 2005c; UNDP 2004; UN/ISDR 2005). Pre-existing vulnerabilities are compounded by insensitive relief and recovery efforts, reinforcing oppressive sys-

tems and structures, deepening levels of vulnerability and effectively strengthening the vicious cycle of vulnerability. The key to both poverty reduction and disaster risk reduction lies in reducing vulnerabilities. To secure people from poverty and disaster risk, the dynamic interlinkages which lead to vulnerability have to be tackled. Increasing levels of security in a sustainable manner needs to be approached through strengthening livelihood security and reducing income insecurity, to build more resilient livelihoods.

Recovering and replacing lost assets and factoring in disaster risk is an integral part of ensuring security of vulnerable groups. People with stable and secure livelihoods develop economic, food, health securities, and have better abilities to face disaster risk and recover from the losses, and therefore are less vulnerable to the impacts of hazards. Building disaster strong livelihoods is an outcome of appropriate development and disaster recovery interventions; which is a combination of responsive governance, responsive policy, socially responsible markets, disaster resistant community physical and social infrastructure, and collective community initiatives (Duryog Nivaran 2005b).⁸ These same principles can guide larger recovery and development programmes; making the investment longer lasting, leading to resilience rather than aid dependency – helping to ensure that vulnerable people are not pushed further down in the spiral of poverty and vulnerability.

Those mandated or inspired to respond to disasters should do so bearing in mind a few salient points.

- *There needs to be awareness of significant inequalities, imbalances and discriminatory practices in pre-disaster situations that render certain groups more vulnerable to disasters.* Also on a related note, there is sometimes a tendency to make recovery interventions armed with a set of assumed vulnerabilities and formulaic responses. However each disaster situation is unique; and alongside the more traditional and visible vulnerabilities there could also be new and subtler vulnerabilities that might be overlooked or ignored. Therefore it is important to carefully analyse the ground situation to assess the vulnerabilities that are specific to each situation instead of entering the post-disaster phase with a pre-determined and pre-programmed list.

⁸ See for a detailed discussion on the *Disaster Resistant Sustainable Livelihoods (DRSL) Framework* that was developed based on extensive research and field applications in South Asia in: ITDG/RDPI (2005).

- *There needs to be consultation with the affected communities.* In most cases, recovery planning takes place at the macro-level with little or no consultation, the consequences of which are most detrimental to already vulnerable groups, leading to heighten the levels of risk and insecurity. A systematic process of consultations – for example through town hall meetings, opinion surveys, focus group discussions etc. – will ensure a greater correspondence between recovery needs and recovery interventions, will reduce the likelihood of wastage and corruption and minimize feelings of isolation and victimization among the affected. It is imperative to ensure that the processes by which the affected are consulted do not themselves exclude the vulnerable and marginalized. For example, it is important to be sensitive to identity hierarchies and how they affect people’s participation in consultative processes.
- *Recovery interventions cannot be identity-blind.* Recovery interventions will serve better if they take into consideration the existing socio-economic hierarchies and cater to the needs of those at the very bottom of such hierarchies.
- *Recovery offers an opportunity to change existing vulnerabilities.* Recovery interventions that are focused on restoring the losses of those affected do little to help those that had little or nothing to begin with. Disaster recovery efforts should, at minimum, be geared towards not worsening the inequities of vulnerable groups and should optimally be geared to empower such groups and weaken the vicious cycle of vulnerability.
- Research and investment on context specific gender and vulnerability analysis, developing analytical frameworks and application tools for the benefit of the humanitarian community.

93.4.2 Challenge the Gaps

- Parallel to awareness building, develop accountability mechanisms, indicators for monitoring how the identity related concerns are addressed in humanitarian response and early recovery.
- Develop enforcement mechanisms for accountability on the sensitivity on identity issues tied with investment plans.
- Include the identity issues into the education curricular (primary, secondary, and tertiary), support the process with knowledge products, expertise, investment.
- Facilitate forums and networks to support changing the attitudes with identity based facts.

More specifically, in order to make significant changes in gendered and other identity related imbalances and discrimination in ensuring human security the following recommendations are proposed aimed at the policy, donor and academic community:

93.4.1 Develop Knowledge, Awareness and Capacities

- Action research and analysis for conceptual clarity on development – socio economic vulnerabilities – disasters.
- Application of the conceptual knowledge available when investing on disaster reduction and development programmes and encourage national stakeholders to do the same.
- Awareness programmes on identity-based vulnerabilities targeting donor agencies, national and local governments and civil society actors.

94 Failed Narco-state or a Human Security Failure? Ethical and Methodological Ruptures with a Traditional Read of the Afghan Quagmire

Shahrbanou Tadjbakhsh

94.1 Introduction

In international relations theories, the notion of 'security' is primarily codified as the prerogative of states (realism), and of states and institutions (liberalism) to be free from what Buzan, Wæver and de Wilde (1998: 5) call any danger that presents "an existential threat." Yet, the supremacy of states and institutions as the designated referent objects of security has been increasingly questioned by constructivists, feminists, and critical theorists who paved the way for the emergence of individuals as the main focus of the object and subject of 'security'.

The term 'human security', coined in the 1994 UNDP *Human Development Report*, reminds us that the individual is just as exposed to the risk of a nuclear power plant disaster, an epidemic or of starvation as to the threat of an interstate conflagration. Although the academic and political community is divided in its competing definitions of human security¹, the UNDP definition, described as "freedom from fear and freedom from want" (UNDP 1994), debunked the question of 'security' from its traditional conception of the safety of states from military threats to concentrate on the safety of people and communities. Since then, the central tenets of human security - the interdependence of security, development and human rights and the imperative of protecting and empowering individuals - have been echoed in various foreign policy documents (Japan and Canada), the UN (2004; Annan 2005), international commissions (ICISS 2001; CHS 2003), in regional organizations

such as the EU² and in exploding academic debates (Tadjbakhsh/Chenoy 2006).

Since the mid-1990's, similar interest grew in the concept of 'failed' or 'fragile states' among academic circles, an interest which then magnified among the international political community, especially those in the West, after the 11 September 2001 attacks made them imminently familiar with the global threats emerging from the failure or vacuum of some states³. In a rapprochement of experts of security and development studies, underdevelopment and gross human rights violations were explored in ways that these could lead to state failure and violent conflict, which would present dangers for international security and the institutions of weak, poor states.⁴

The concept of 'human security' is anything but neutral from a political or an intellectual point of view, as it implies a renewed look at existing paradigms of security and responsibilities. So is the concept of state failure and fragility. Similar to the human security concept, analysts do not agree on precisely what the terms of 'failed' or 'fragile' states mean. In both instances, the task of definition is further complicated by the opprobrium by government officials, political leaders and development agencies. A com-

1 For a detailed analysis of the various definitions, critiques and counter-critiques, see Brauch (2008, 2008a) and for an extensive bibliography, see Tadjbakhsh and Chenoy (2006).

2 Through the Barcelona Report presented by the Study Group on Europe's Security Capabilities, 2004: *A Human Security Doctrine for Europe* (2004) presented to Javier Solana.

3 For extensive discussions on the concepts and features of fragile, failing or failed states in the academic literature see: See Brown (1996), Rotberg (2002), Rice (2003); Crocker (2003), Fukuyama (2004); Rotberg (2004), Krasner/Pascual (2005)

4 In the previous volume of this book series the development and security linkages were addressed by Brauch (2008a), Uvin (2008), Sending (2008), Katseli (2008) and by Klingebiel/Roehder (2008).

mon analytical approach to both debates is to forego definitions in favour of characterization, of what constitutes the nature of failed states and what human security entails. This author proposes a constructivist view of the political and normative usage of these terms to see whether these two ultimately political concepts are compatible. Does the application of the concept of human security, used in this chapter in its broad definition of 'freedom from fear, freedom from want and a life of dignity', both as an analytical framework and as an end goal, help to recognize, understand and respond to the structural fragility within states?

94.1.1 Purpose of the Chapter

Using the case of Afghanistan, this chapter seeks to demonstrate the differences, both in the conceptualization and the operationalization of fragile states as 'dangerous' from the state-based, institutional based and human based point of views. The human security approach is proposed as a critical, analytical and operational framework which refutes the instrumentalization of societies and states, and people within them for a good called 'international security', on the one hand, and the focus on the viability of institutions as ends by themselves as the other.

By 2007, five years since they had been driven out of power by the US and its allies, the rearmed and revived Taliban and their Al-Qaeda partners had begun a major offensive against NATO and US coalition troops, using suicide bombers and roadside bombs. Afghanistan had come to be considered a failed 'narco-state', with an impoverished and dissatisfied population, renewed violent insurgencies, and once again the largest production of opium poppies in the world. A window of opportunity on peacebuilding and stabilization seemed to have closed and, like the Russians and British invaders before them, the American and their NATO allies were in danger of suffering defeat in the rugged land of Afghanistan. This chapter makes the case that the post-conflict reconstruction and peace-building process in Afghanistan was doomed to fail because of the fixation of the international community on the traditional 'national security' paradigm within the state-building process and the lack of proper attention to the people, their needs and their perceptions.

94.1.2 Structure of the Chapter

The chapter is divided in two parts: it first proposes an ethical rupture by reviewing the differences between a traditional (security based or institutional based) approach and a human security approach to 'conceptualizing' fragile states (95.2). It will scrutinize differences in terms of evaluations of failure, strength and weaknesses, as well as motivations for engagement from the three different points of views. It will argue that the human security framework poses an ethical challenge to realism and institutional liberalism by introducing the element of human dignity. It then suggests a methodological rupture with traditional approaches to responses and responsibilities of the international community (95.3). Questions of interventions, stabilization, aid, and a liberal approach to state-building are scrutinized from the realist, liberal and human security viewpoints and as applied in Afghanistan, before proposing an alternate framework of engagement. It will argue that the human security framework proposes different solutions to the problems of efficiency and legitimacy of states and their institutions, specifically in the cases of 'failed states' (95.4).

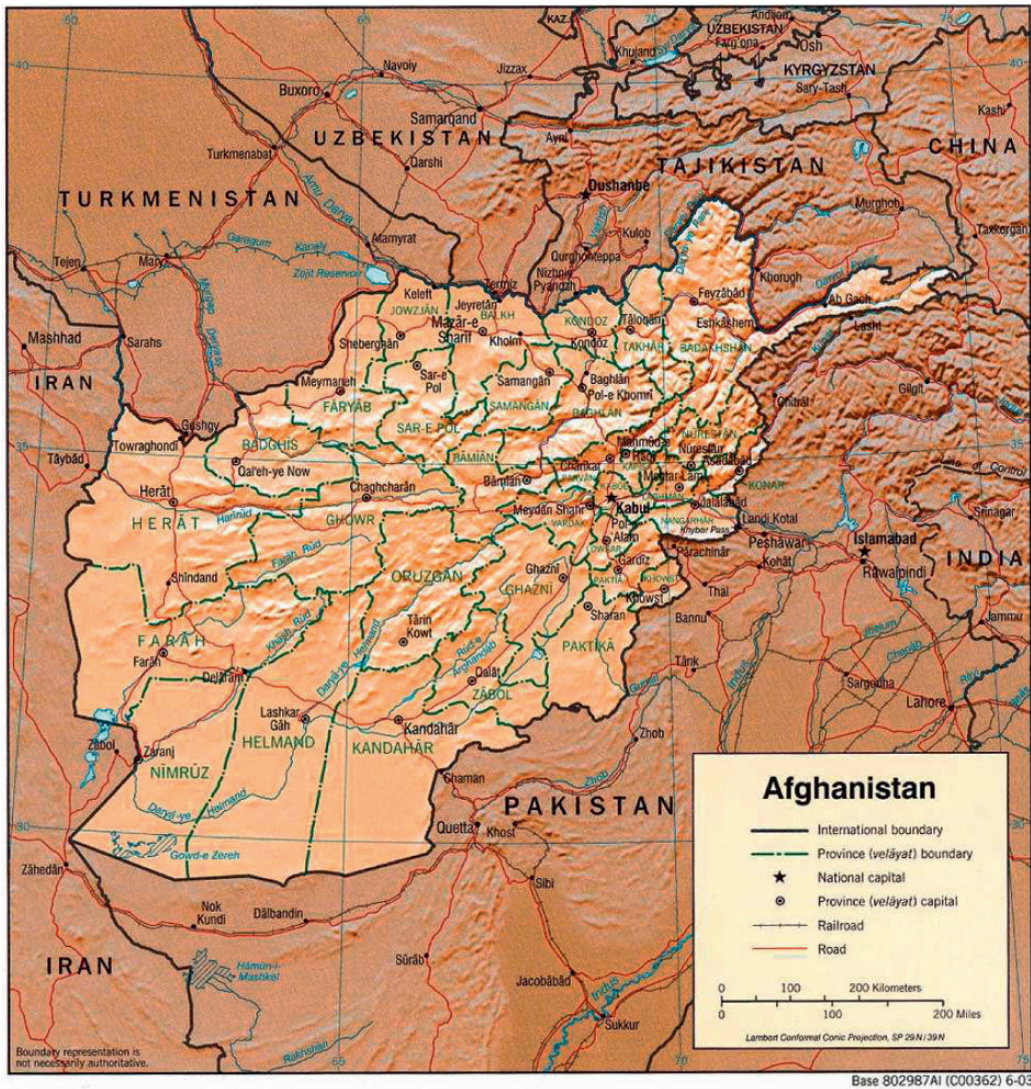
94.2 Conceptualizing the State and Its Failures, Motivations and Evaluations

94.2.1 The Realist View of 'Danger to International Security'

Security is considered by realists as being almost synonymous with military power (Møller 2001: 41). Since the peace treaties of Westphalia in 1648, the Hobbesian model of the state has said to provide security for people living within its borders in exchange of the monopoly of the legitimate means of use of physical force within this territory, that is to say in exchange for state sovereignty. However, a large number of states today are partly or completely failing to fulfill their social contract to protect people (Mack 2004a). In lacking the ability to provide for security, the failed or failing state has endangered its sovereignty, and as a consequence, is considered "utterly incapable of sustaining itself as a member of the international community" (Helman/Ratner 1992: 3).

For realist experts, threats to international security stem from *weapons of mass destruction* (WMD), terrorism, non-state actors who misuse their access to

Figure 94.1: Relief Map of Afghanistan (2003). **Source:** University of Texas at Austin, Perry-Castañeda Library Map Collection; at: <http://www.lib.utexas.edu/maps/middle_east_and_asia/afghanistan_rel_2003.jpg>. This map is in the public domain.



means of violence and some non-traditional but nonetheless potentially destabilizing threats as narcotics and arms trafficking. From this constant has come a consensus that weak or failing states, which are a breeding ground of those phenomena, have implications for international security in that their very weakness can ‘spill over’ and threaten neighbours, in the classic security dilemma, in the form of refugees, arms, diseases and conflicts coming over the borders. This view can be labeled as ‘functional’ as it sees the problem of fragility from the point of view of potential spill-overs and triggers for conflict: terrorism, weapons proliferation, organized crime, regional instability, global pandemics, and energy insecurity, etc.

This thinking has led to the conceptualization of ‘failed states as dangerous’. Fukuyama writes for example that “weak or failed states are the source of many of the world’s most serious problems” (Fukuyama 2004).

For realist security experts and nations portraying themselves as custodians of collective security, i.e. the 5 members of the Security Council, threats are to international and regional security, as well as to the national security of faraway nations which can become victims, as the US was on 11 September 2001.

The danger of failed states for international security was propagated for example in the UN Report of the High Level Panel on Threats and Responsibilities,

which maintained that the neglect of non-traditional threats could be detrimental not only to the people's existential survival but also to that of the state as the basic unit of the international system (UN High Level Panel 2004). Threats to regional security prompted Javier Solana to solicit a *Human Security Doctrine for Europe*, which claimed that "In an era of global interdependence, Europeans can no longer feel secure when large parts of the world are insecure" (Study Group on Europe's Security Capabilities, 2004)⁵.

This thinking was also reflected in the position of the US which came to equate its own national security with stability and order in the world's poorest regions. The Report of the *Commission on Weak States and US National Security* raised the alarm on states that "mattered to US national security, American values and the prospects for global economic growth" (Center for Global Development 2004: 1).

The mostly northern government-led designation of some countries as 'fragile, failing, or failed' however raises concerns over the conflation of the military security agenda of Western nations engaged in a 'War against Terror' with the security needs of civilians suffering violence and injustice. It has also hinted at the fallacy of a conceptualization of danger linked with geopolitical factors. The 11 September 2001 attacks shifted security preoccupations away from threats emanating from powerful states, a danger that had dissipated with the collapse of the Cold War alliances, toward those emanating from weak states (Simpson 2007).

94.2.2 The Liberal Institutional View: Underdevelopment as Dangerous

In the liberal literature on fragile and failed states, strength is measured by the state's ability and willingness to provide fundamental political goods associated with statehood; notably physical security, legitimate political institutions, economic management, and social welfare (Patrick 2006: 29). From the liberal/institutional point of view, failed states can no longer perform the basic functions of providing for these basic goods usually due to the weakness or inexistence of institutions as a result of violence or extreme poverty. Strong states are distinguished from weak ones, and weak states from failed or collapsed

states, Rotberg asserts, "according to the levels of their effective delivery of the most crucial political goods" (Rotberg 2003: 4). Failed states are defined by the patterns of governmental collapse within a nation, and also by the degree to which they have lost their monopoly on violence to non-state actors.

From a liberal standpoint, threats emanating from failed states have primarily negative impacts on institutions. Terrorism, trans-national crime, trafficking of people, arms and drugs, as well as communicable diseases, are said to emanate from the breakdown of law and order institutions, porous borders, breakdown in public health care, and the general contagion effects of chaos. These threats are said to cause direct impacts, such as the loss of lives, public health epidemics, and indirect ones through the imposition of high economic costs. The liberal view is especially concerned with the threats to financial institutions, be they to the flow of the capital markets, to the potential for investments, and, increasingly, to the global energy market by increasing the volatility, costs and risks of interruption of supplies of oil and gas. From a liberal point of view, fragile and failed states are also a threat to institutions such as democracy. As the *Commission on Failed States* in the US notes, even "the human costs of state failure - when governments cannot or will not meet the real needs of their citizens - challenge American values and moral leadership around the globe" (Center for Global Development 2004: 2). Within this conception, even the human costs are not a 'bad' by themselves but specifically because they render major powers powerless.

If the realist political community conceptualized 'fragile states as dangerous for international security' per se, development specialists, bilateral aid agencies and international financial institutions influenced by the liberal school, concentrated on 'underdevelopment as dangerous'. When conflict was seen as a de-developing process (Collier/Elliott/Hegre/Hoeffler/Reynal-Querol/Sambanis 2003), then underdevelopment was also potentially dangerous, because it not only potentially led to intra-state conflicts, but also to the export of new non-traditional threats to a wider geography than the territory of a state to other more affluent societies.

If underdevelopment was seen as potentially 'dangerous', then development was therefore reconceptualized as a security strategy (Duffield 2001). From this stemmed interest among international development and financial institutions in the question of aid effectiveness in 'difficult environments'.

5 In the Barcelona Report *Human Security Doctrine for Europe*, human security refers to freedom for individuals from basic insecurities caused by gross human rights violations.

If previous contention was to avoid such countries where aid could be wasted, new thinking revolved around using aid precisely to strengthen weak states' institutions and policies, in order to ensure the achievement of the *Millennium Development Goals* (MDGs).

This approach prompted the OECD to seek aid coordination and harmonization in 'difficult partnerships' and define fragile states as "countries where there is a lack of political commitment and insufficient capacity to develop and implement pro-poor policies" (OECD/DAC 2005: 2). It also permeated through the work of the British Department for International Cooperation (DfID) which recognized weakness where "the government cannot or will not deliver core functions to the majority of its people, including the poor," (DfID 2005: 7) and the World Bank, which set up a Conflict Prevention and Reconstruction Unit to assess the causes, consequences and characteristics of conflicts.

In terms of measuring fragility, two measures are often used in liberal institutional literature: (1) poor economic performance, measured by the GDP and (2) bad 'governance', measured of by the World Bank's *Country Policy and Institutional Assessment* (CPIA) ranking, an aggregate quantitative indicator of the quality of macro-economic management, of the government and public sector, and of structural and poverty-reduction policies. The focus is on the strength of institutions and on the 'soundness' of policies, judged against liberal norms.

The *Failed State Index* for example, uses 12 criteria such as mounting demographic pressures, economic inequality and decline, human flight and displacement, criminalization of the state, progressive deterioration of public services, fragmented political power, and widespread violations of human rights and intervention of other states among others to rank 146 nations according to their viability as states. These indicators are based mainly on the threats to the states and their institutions but not on the more subjective measures of empowerment, such as participation in political process, or subjective feelings of security from the point of view of populations, admittedly difficult to obtain and calculate at aggregate levels.⁶

94.2.3 The Human Security Alternative: Legitimacy from the Point of View of Populations

From a human security point of view, the primary threat in weak or failed states is to the survival, livelihood and dignity of the population, whether these threats induce destabilizing conflicts or not (Tadjbakhsh/Chenoy 2006: 167). Thus, for example, poverty is conceptualized as a 'threat' to human dignity, even though it may not lead to conflict, or may not necessarily be directly linked to aid or institutional effectiveness. The emphasis is therefore on the people within a state rather than the existence, power or nature of the state itself. Institutions become means and the individual become both objects and 'agents' of change. By human security definition, a weak state is one which cannot exercise its primary function of social protection and therefore fails in its duty to protect, care for and empower its citizens (Hampson/Daudelin/Hay/Reid/Martin 2002). It thus loses its most important asset: legitimacy, echoing Rotberg's claim that when nation-states fail to deliver positive political goods to their people, "[t]heir governments lose legitimacy and, in the eyes and hearts of a growing plurality of its citizens, the nation-state itself becomes illegitimate" (Rotberg 2002: 85).

Within human security discourses, fragile or failed states, and the underdevelopment that stems from and within them, are not only 'dangerous' to the international security, or a challenge to the institutions of good governance. Threats to the security of the states (their power, territory and sovereignty), to markets (their solubility and vulnerability), and to democracy (its sustainability and process) are recognized as vulnerabilities because they ultimately affect the dignity, well-being, capabilities, opportunities, and freedoms of people.

It is not a matter of judging weakness or strength normatively but against the outcomes they are able to achieve from the point of view of the population. Furthermore, while the human security approach also recognizes that various threats can spread within a given country, bleed into other regions, and negatively impact global security, the inter-connections of threats is viewed from the way that these are mutually linked in a domino effect within the human geography: health insecurity could lead to poverty, which could lead to education deficits, etc. Responses to insecurities stemming from environmental degradation could contribute to population displacement, deterio-

6 The Failed State Index for 2006 calculated by the Fund for Peace (2006), gave a value of 99.8 for Afghanistan, considerably better than the 112.3 value of Sudan, ranked first in the index. See at: <http://www.fundforpeace.org/publications/profiles/cp_afghanistan.pdf>.

ration of health, hunger, loss of livelihoods, and so on.

To recognize fragility, therefore, instead of measuring the effectiveness of institutions (such as bad governance) or their performance through monetary indicators (such as GDP), it is necessary to take the query to the level of individuals, to look at indicators of poverty, inequality, access to health services, literacy, participation etc. in short, human outcome indicators. It is also necessary to measure human security through qualitative studies that assess people's own evaluation of how secure, provided for and empowered they really feel. Weakness is ultimately judged through public opinion.

Engagement in failed and fragile states, from a human security point of view, is therefore based on the principle of ethics, and not the purely functional of achieving a good for international security or institutional stability. Additionally, from a human security point of view, the reason why a state is failing would also be scrutinized. The realist or institutional focus on 'failed states' locates failure in the state itself. Yet, global arms trade, unfair trade regimes, and conditioning loans and grants on structural adjustment policies that minimize state functions and social service spending would also be seen as 'dangerous' to the local populations as would be the nature of their states' viability. When the international system is locked in a pattern of 'mutual vulnerability' through the core-periphery model, no region in the international system is immune to the risks that affect the human security of others (Nef 1999). Responsibilities for inducing failure, including through externally-led regime change, would therefore need to be shared.

94.2.4 Alternative Reads of the Afghan Quagmire

From a realist and liberal point of view, Afghanistan under the Taliban regime was an optimal example of how non-state actors like al Qaeda used the government of a failed state to carry out a campaign against a state adversary, the US, with global consequences.

A realist read of the motivations of the international intervention would therefore argue that the initial preoccupation with creating stability in Afghanistan was for selfish reasons and that the intervention was based on self-interest and power politics. Only when instability in Afghanistan began to bleed into insecurities for the Western world did the world community, led by the U.S, respond through military force.

A document called *Securing Afghanistan's Future* prepared for a donor Conference in Berlin in 2003 for example argued that unless the international community provided adequate assistance, Afghanistan would become a narco-mafia state. The traditional security discourse, as well as the traditional economic and institutional views which perpetuated in the documents prepared for donor conferences in Tokyo (2002), Berlin (2004) and London (2006), identified regional stability, territorial security for the nation-state, and even security of political and economic systems (the presidential elections, the potential for investments, democracy) as units of consideration.

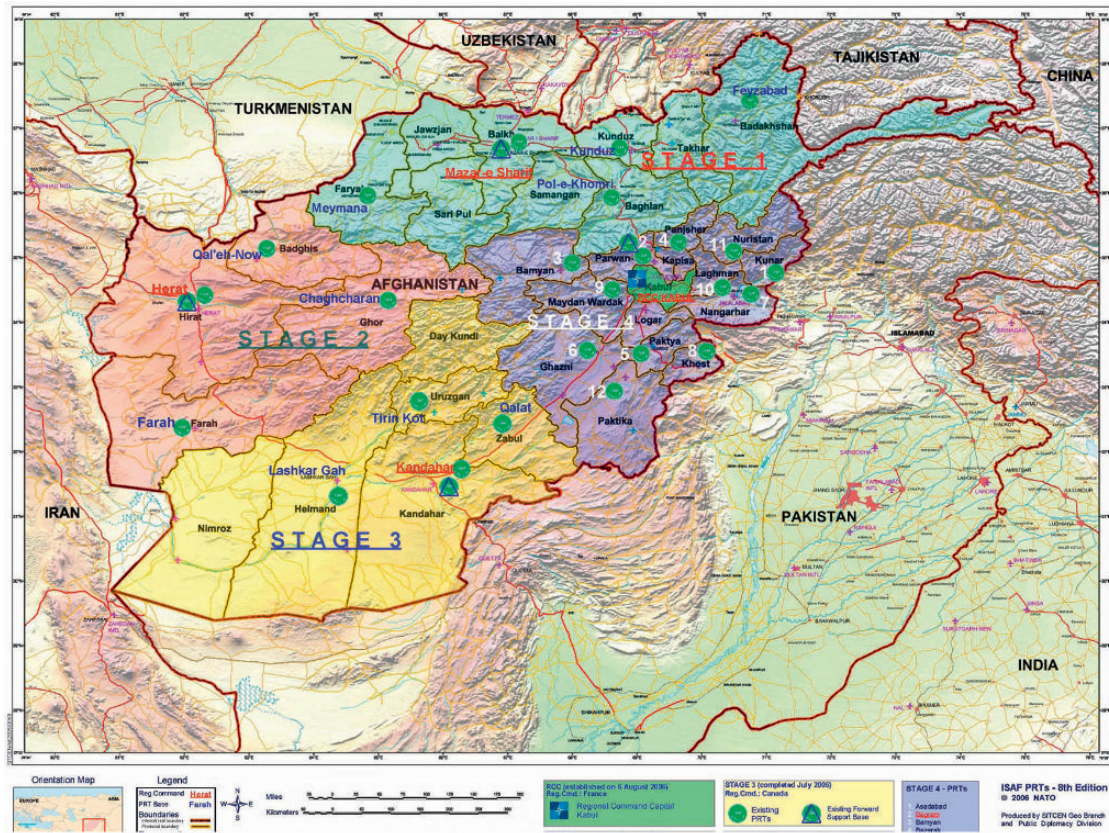
The human security point of view breaks in five respects with this traditional read of the 'security problem' of Afghanistan.

First, a human security approach would require an ethical motivation for international engagement on meeting the needs of the Afghan population, and not a functional view of the potential cost that a narco-mafia state would have on the international and regional regimes. Given that insecurities, conflicts and state failures were the result of decades of conflicts compounded by foreign interference, the ethical responsibility would be to restore the long denied human security of the people of Afghanistan based on the welfare needs, as well as the rights, of the Afghan population, not as an indication of concerns for global and regional insecurity. This view would be critical to the self-interest of the West, both during the Cold War which saw the politicization of aid to overthrow the Soviet-backed regime, and the post-Taliban period, where winning the 'War against Terrorism' often led to the blurring of certain humanitarian principles and codes of practice (Barakat 2002).

Second, the Taliban regime, which had the monopoly of violence and security before the US intervention in October 2001, could be considered in fact a strong realist state. From a human security point of view, however, the Taliban regime would be considered a willing weak state which could not provide the necessary development and human rights needs of its population. The post-intervention Afghan 'state', could further be considered a weak incapable state which was challenged in its functions to provide, protect and empower its citizens, beyond being a threat to citizens of other countries through exporting instability and hosting terrorists.

Third, indications of 'insecurity' would not only focus on the presence of terrorists or Taliban groups and narco-trafficking, but instead on the lack of jobs, food, housing, education services, healthcare, civic

Figure 94.2: NATO in Afghanistan: International Security Assistance Force (ISAF) and Provincial Reconstruction Teams (PRTs). Data valid as of 15 November 2006 **Source:** NATO; at: <<http://www.nato.int/issues/afghanistan/graphics/e040628a.jpg>>.



amenities etc. The failure of security would not be then blamed on the national army, the police or NATO troops, but on the fact that the reconstruction process had not generated the means to provide services and jobs and protect human rights in the country, especially in rural areas. In 2004, for example, when international discussions concentrated on the expansion of NATO troops throughout the country, Afghanistan had the worst education system in the world, with nearly three-quarters of all adult Afghans illiterate and fewer than one in five girls in school (figure 94.2). Half of all Afghans were poor, only thirteen percent had access to safe water, and average life expectancy loomed at 44.5 years (Tadjbakhsh/Saba/Zakhilwal 2004).

Fourth, inequalities in access to goods and services would be deemed more ‘dangerous’ to the local population than the presence of insurgents. From a human security point of view, the potential for further cycles of instability and conflict in Afghanistan were because of the continued existence of ‘horizontal inequalities’ between groups within society (Stewart

1999) whether ethnic, religious or social. Inequalities persisted not only in income distribution but also in political participation (in parliaments, cabinets, armies and local governments), in economic assets (in land, human capital and communal resources) and in social conditions (in education, housing and employment). Because these grievances had been manipulated to lead to and sustain conflicts in the past, their continued existence in the Afghan society was, in fact, dangerous.

Finally, using the human security approach would require looking not at the forms of good governance and democratic institutions existing in Afghanistan (i.e. elections, constitutions, parliaments etc.), but more about the legitimacy of their contents and the legitimacy of their provenance. Could these institutions, and the new state that had been created out of the intervention, provide for public goods? Did they have the capacity to regulate, distribute and empower? Were they deemed as legitimate by the majority of Afghans? When states are heavily dependent on foreign funding, legitimacy is often endangered as they be-

come accountable to the demands of external actors as opposed to their own constituencies. When models are imposed from outside and regimes are changed through military interventions, as historically they had been in Afghanistan throughout the occupations by the British, Soviets and Americans, legitimacy is not guaranteed from a human security point of view. As Luckham argues, “In the case of collapsed states, it makes a lot of difference whether the state fell apart from within or was brought down by external intervention. The latter almost inevitably makes foreign powers and even international agencies de facto parties in the conflict, making it much harder for them to act as legitimate honest brokers with a credible claim to be able to resolve it” (Luckham 2005: 34).

94.3 How to Deal with Failed States? Responses and Responsibilities

94.3.1 To Intervene or Not?

The realist conceptualization of failed states as dangerous for international, regional and national security requires a security-based response and immediate engagement by international powers, echoing their prerogative authorized by Chapter VII of the UN Charter. The shift of the debate away from the right of some states to intervene to the responsibility to protect by all states was first raised in the context of the right or duty to intervene for humanitarian reasons (Bettati/Kouchner 1987), and later crystallized through the Canadian sponsored *International Commission on Intervention and State Sovereignty* (ICISS) in 2001. The commission’s final report, *The Responsibility to Protect* contented that where a population “is suffering harm, as a result of internal war, insurgency, repression or state failure, and the state in question is unwilling or unable to halt or avert it, the principle of non-intervention yields to the international responsibility to protect” (ICISS 2001). The *Responsibility to Protect* (RTP) norm was endorsed at the 2005 World Summit of the UN, paragraph 139 in the Final Summit Outcome of the UN in 2005.

While the RTP faced criticism for its carte blanche to international military action and the erosion of sovereignty, from southern countries vocal through the G77 and the Non-Aligned Movement, the protest lost its moral force in situations where the states had already failed and sovereignty had been dissipated by a government’s failure to fulfill its core responsibilities, including provision of basic physical security and pro-

tection of citizens’ rights (Luckham 2005: 18). The supremacy of sovereignty had already been dented in 1993 when Francis M. Deng et al. (1996) articulated the idea of ‘sovereignty as responsibility’, and consequently adopted by Kofi Annan in his dual qualification of sovereignty, which not only protected a state from unwarranted outside interference but also obligated it to respect the basic rights and interests of its own citizens (Annan 1999). In the case where the state was unable or unwilling to exercise its sovereignty as responsibility, the ICISS proposed that this surrogate sovereignty would have to be replaced by “a more robust and genuinely equitable multilateralism, based on common norms and principles accepted by all the major international actors” (Luckham 2005: 18).

However, a number of factors came to debunk the moral supremacy of the RTP discourse and practice, even in failed states, where sovereignty had eroded with the collapse of the state:

First, the RTP Report was introduced in the coincidental aftermath (for the commission had been set up by Canada in September 2000) of the September 11 attacks which shifted the debate and actions away from military intervention on behalf of others to interventions in self-defense in a global campaign against a ‘War on Terrorism’. The US administration’s pre-emptive war, and use of force to confront perceived threats to its national security concerns in echo of the right, under the controversial Article 51 of the UN charter, prompted Chomsky to criticize it as an “imperial grand strategy” and “the right to commit aggression, plain and simple” in the name of humanitarian ideals (Chomsky 2006). This enshrining of national interest in the guise of morality reminded critics of the era of colonialism, where European governments insisted on their “white man’s burden,” “la mission civilisatrice,” and moral duty to bring peace, justice, and civilization while in fact pursuing territory, geo-strategic advantage, and natural resources.

Second, the focus of RTP was only on partial human security threats: Interventions by international and regional organizations were discussed in the context of promoting ‘freedom from fear’ and human rights. The ‘just cause’ criteria within the discourse set the bar for international intervention at ‘large-scale loss of life’ or ‘large-scale ethnic cleansing’. This limited international responsibility to reacting to violent punctual threats, and mostly as a punitive response to the actions of states that were willingly infringing harm on their population. Thus, the international community saw itself less responsible for interventions in cases of gross underdevelopment, poverty,

famine or environmental disasters, either man-made or natural.

Third, critics argued that interventions by themselves often led to more killings, both directly and indirectly, and increased human rights violations, which exacerbated, rather than reduced, the humanitarian crisis. While civilians suffer in all wars, the suffering of those in countries where the international community had intervened in the name of humanitarian ideals presented a moral dilemma. Furthermore, as the development community reiterated, wars did not only have direct human costs, but also indirect ones on the loss of livelihoods caused by the dislocation of economy and society resulting from conflict (Stewart/Fitzgerald 2000).

Criticism of humanitarian intervention came from proponents of the 'empire' school, who argued that success or green light in one case would lead "the hegemon to resort to interventions again and again, driven by the imperative of increasing its power and accumulated advantages within the international system." (Bello 2006). Since interventions could never be attempted against powerful states, international action in the name of humanitarian protection risked turning into a prerogative of the strong against the weak. They also came from the realist camp which argued that although military interventions were "easily feasible", "the benefits of humanitarian military interventions are smaller and the costs far greater than their advocates usually recognize over the long term" (Pham 2004). An ill-timed humanitarian military intervention could intensify the level of violence which would increase the domestic security threat and spread regional instability (Pham 2004). In addition, they could lead to what Johnson called 'blowbacks': anti-Western protests, including the emergence of armed networks such as Al-Qaeda, able to strike at targets in the West itself (Johnson 2004). Finally, criticism of RTP also came from the humanitarian organizations camp that were in principle for neutrality and against the blurring of lines between humanitarian and military action. MSF, which criticized the US military's airdropping of humanitarian food rations as a propaganda operation and pulled out its international staff from most of Afghanistan because of the danger caused by rising anti-Western feelings, categorically claimed that "independent and impartial humanitarian organizations cannot associate themselves with any of the parties, even if the intervention is carried out for human protection purposes... [otherwise] populations at risk will be the first to suffer" (Dumait-Harper 2002)

From a human security point of view, ultimately, the criteria set out by the RTP, failed to separate the humanitarian from the political rationale, and consequently to alleviate the fears of the motives, i.e., the 'ends' of interventions as well their means (Tadjbakhsh/Chenoy, 2006: 195). The human security framework would instead seek the end point against which the 'good' of an intervention had to be measured. In other words, actions are not considered right in themselves but are judged against their outcomes. The position is close to the 'simple truths' that Chomsky outlined: "The first is that actions are evaluated in terms of the range of likely consequences. A second is the principle of universality; we apply to ourselves the same standards we apply to others, if not more stringent ones" (Chomsky 2006). Additionally, the focus of a broader human security engagement would be on prevention rather than dealing with crises that are already underway. Thus, a key way in which human security engagement seeks to go beyond humanitarian intervention is to address a broader range of threats to individuals' security, and not just their freedom from fear but also their freedom from want, not only acts of direct violence but also acts of structural violence (Galtung 1969: 170), and indeed threats to security that lie beyond the control of human beings.

94.3.1.1 The Failure of the 'Intervention' in Afghanistan

The realist line of thought would argue that it was precisely the failure of the international community to stay the course and build a lasting peace in Afghanistan following the withdrawal of the Soviet forces in 1980 that had laid the groundwork for the rise of the Taliban, the establishment of terrorist training camps, and the tragedy of 9/11.

Walzer described the invasion of Afghanistan as "a triumph of just war theory" (Walzer 2004 cited in Chomsky 2006). But 'Operation Enduring Freedom' in October 2001, Bello argues, "took advantage of sympathy for the US generated by the events of 11 September 2001 and the image of the Taliban government sheltering Al Qaeda to eliminate negotiations with the Taliban as an option and throw international law out of the window by invading Afghanistan, with little protest from European countries" (Bello 2006). To critics of the empire school, the consequent diversion of the hunt for Bin Laden objective and the establishment of a strong US military presence in a region strategic to the control of oil-rich Middle East and energy-rich Central Asia provided evidence for

the logic of great power national interest embedded in humanitarian envelopes.

Second, critics argued that the campaign ended up creating a new political order that was worse than under the Taliban, for it failed to protect the basic physical security concerns of the population. If the Taliban had given Afghanistan its first secure political regime in over 30 years, in contrast, the externally imposed replacement regime was unable to provide for basic security. The government of Hamid Karzai did not exercise much authority outside Kabul, endangering its own authority, legitimacy and indeed sovereignty in the failure to secure the basic physical security needs of the population.

Third the campaign soon ended up doing what its promoters said they would eliminate: terrorizing the civilian population. The estimation of the number of civilian casualties of the war in Afghanistan since 2001 varies. According to Herold, between 3,000 – 3,400 civilian were killed alone between October 7, 2001 through March 2002 as a result of US bombing⁷, although the estimates were disputed by Muravchik of the American Enterprise Institute⁸ and Conetta of the Project on Defense Alternatives.⁹ In 2002, Steele argued in *The Guardian* that “as many as 20,000 Afghans may have lost their lives as an indirect consequence of the US intervention. They too belong in any tally of the dead.”¹⁰ According to the BBC, about 4,000 people were killed in Afghanistan in 2006, a quarter believed to have been civilians (at: http://news.bbc.co.uk/2/hi/south_asia/6614251.stm).

94.3.1.2 ‘War is Hell’ as Opposed to ‘War as Hell’: The Human Toll

The death of civilians as a result of collateral damage has led to three responses to justify this moral dilemma:

One is embedded within the ‘Just War’ theory, which holds the principle that civilians are not legitimate targets of war, and only those capable of harming others can be denied protection of their right to life (Walzer 1997: 22). Harming of civilians can be justified in ‘Just War’ theory in terms of the military advantage obtained from such attacks: the good must outweigh the unintended evil consequences of the act – the proportionality principle (Wheeler 2002). Yet, Wheeler argues, “if we apply the Just War principle, ... it is hard to justify U.S. attacks against facilities that sustain civilian life, and where such strikes resulted in hundreds of Afghans being killed” (Wheeler 2002). To critics like Herold, killing civilians even if unintentional is criminal as it is unacceptable to place civilians at risk in war (Herold 2004).

A *second* response is to blame the enemy for instigating the war in the first place. The US Secretary of Defense Rumsfeld for example said in 2001: “We did not start this war. So understand responsibility for every single casualty in this war, whether they are innocent Afghans or innocent Americans, rests at the feet of the al Qaeda and the Taliban.”¹¹ Walzer (1977) had dubbed blaming your enemy for the cruelty of war as the ‘War is hell’ doctrine (Walzer 1977: 146). That war can and must be fought with moral restraint distinguishes the doctrine of ‘war is hell’ from the ‘Just War’ tradition of moral theorizing (Wheeler 2002). The attraction of this moral conception of war is that it absolves political leaders of the death and suffering inflicted on innocent Afghans as a consequence of the U.S. bombing campaign.

The *third* response is what Wheeler calls accepting the necessity of fighting ‘Just Wars’ but insisting that ‘due care’ be taken in the protection of civilians (Wheeler 2002). Wheeler argues that there is sufficient evidence to suggest that the US had not shown ‘due care’ in its treatment of Afghan civilians, despite its repeated claims¹², by targeting elements of the infrastructure of the country and strikes where civilian deaths were foreseeable.

7 Marc W. Herold, “Dossier on Civilian Victims of United States’ Aerial Bombing: A Comprehensive Accounting”; at: <http://pubpages.unh.edu/~mwhero1/>, updated as of 2004.

8 Joshua Muravchik: “The Prof Who Can’t Count Straight and the Journalists Who Cite Him”, in: *The Weekly Standard*, 7,47 (2002); at: <http://www.weeklystandard.com/Content/Public/Articles/000/000/001/365otmps.asp?pg=1>.

9 Carl Conetta, 2002: “Operation Enduring Freedom: Why a Higher Rate of Civilian Bombing”, in: *Casualties Project on Defense Alternatives. Briefing Report No.11* (revised 24 January 2002); at: <http://www.comw.org/pda/0201oef.html>.

10 Jonathan Steele, in: *The Guardian*, 20 May 2002; at: <http://www.guardian.co.uk/afghani-stan/comment/story/0,11447,718647,00.html>

11 Press conference of Donald H. Rumsfeld, 5 December 2001; at: http://www.wavsource.com/SNDS_2007-04-27-99994518282138/news/20010911/rumsfeld_did_not_start_wav.

Human security advocates, like cosmopolitans, would argue that all lives are morally equal and should be treated accordingly, in contrast with 'Just War' theorists. Therefore, in times of war, there is a moral and legal duty to seek alternate strategies than military strikes to secure victory at a significantly reduced cost in terms of civilian casualties.

94.3.2 Stabilization and Securitization

If the realist driven policy response propagates quick and often short-term, pre-emptive or punitive action to deal with threats deemed too dangerous to leave to deterrence, sanctions or containment, it calls for immediate stability in post-conflict countries through strengthening domestic military and police forces, limiting opportunities for international terrorist activities, and suppressing trans-national crime. This approach tended to focus on 'stabilization' through security-led responses at different levels in Afghanistan:

At a first level, the traditional security response to Afghanistan concentrated on expanding international troops outside of Kabul and by expanding the mandate of the military to heart and mind operations, i.e., delivery of small scale relief and development projects through *Provincial Reconstruction Teams* (PRTs). NATO, in its first ground operation outside Europe, took over the command of the 20,000 strong US-led coalition troops and the 20,000 strong *International Security Assistance Forces* (ISAF) in July 2006, and by October, had decided to expand its presence into all of Afghanistan. From the traditional viewpoint, the answer was to seek increased armed forces from the international community and support the capacity of the newly established Afghan National Army for the Government.

At an auxiliary level, as the Afghan state was unable to hold the monopoly of military power over competing factions and non-state actors, and as NATO troops, with their expanded mandate of war-fighting, training and relief/development delivery, were not sufficient, international *private security forces* (PSFs) had begun operating in Afghanistan, as they had in most post-conflict situations. The 1990's had witnessed a rise in international private military and security industry, made up of former soldiers with clear

corporate structures. The delocalization of the result of this globalization of *Disarmament, Demobilization, and Reintegration* (DDR) of ex-international-combatants into the Afghan operation theatre meant that private security companies provided operational support in combat, military advice and training, arms procurement and maintenance to logistical support, including guaranteeing security country-wide for the Presidential elections in 2004.

From a human security perspective, the traditional response had a number of problems:

First, the expansion of NATO troops were deemed a short-term solution to violence that threatened the coalition troops, but not the answer to the security problems of Afghans who aspired for the ability to have a job, to participate in political processes, to have choices for the education of their children and to live a healthy life. Hence, insecurity was not to have been dealt only through short-term, 'residual' and sporadic military solutions, but a long-term comprehensive strategy that combined stabilization with development, conflict resolution, and promotion of human rights.

Second, the security-based response failed to eliminate the system of incentives for armed regional militia loyal to individuals instead of institutions, as well as criminal opportunists, especially narco-criminals. A human security response would have promoted public policy and state-building efforts that reduced local incentives that triggered insecurities in the first place. As the chapter will argue further down, competitive market forces were not the best way to tackle distorted incentives.

Third, the humanitarian and development projects of the military through *Provincial Reconstruction Teams* (PRTs) were deemed inadequate and dangerous from a human security viewpoint, similar to the position of humanitarian organizations operating in Afghanistan, as PRTs could blur the lines between soldiers and civilians, and transform aid workers into militant targets.

Fourth, in collapsed states and post-conflict societies, where the state does not have the capacity to provide security, as was the case in Afghanistan, the presence of *private security forces* (PSFs), becomes a symptom of state weakness and reinforces such deficit in four ways: first, the motivation of profit could lead PSFs to be more accountable to shareholders and not to the state or citizens; second, their services could be skewed towards the elite and powerful while the poor remained insecure; third, they could crowd out the establishment of legitimate and functioning state institu-

12 For example, Department of Defense spokesperson, Victoria Clarke, stated on 23 October that "U.S. forces are intentionally striking only military and terrorist targets. We take *great care* in our targeting process to avoid civilian casualties", cited in Wheeler (2002).

tions, which do not receive enough support from donors and finally, *private militaries corporations* (PMC) are not bound to respect or adhere to human rights and humanitarian law. The rules of engagement thus remain unclear and they are not integrated into the regulatory and accountability structures of the state security sector in which they are operating (Bourne 2004). Ultimately, the Afghan State should have had the prerogative of taking back the provision of security in its own hands.

It could therefore be argued that continuing to tackle insecurity through offensive operations was insufficient at best and counter-productive at worse, trapped in a desire for a “a quick, cheap war followed by a quick, cheap peace” (ICG 2006). Ultimately, the U.S.-led military engagement in Afghanistan helped produce a climate of fear, intimidation, terror and lawlessness (Tadjbakhsh/Saba/Zakhilwal 2004) and neglected the longer-term threat to security posed by inequality and injustice.

94.3.3 The Institutional Solution: Engagement through Aid

Much of the literature emanating from IFIs argues that donor assistance *may* have a stabilizing effect on failed and failing states, but this depends on whether the country has the absorptive capacity to direct aid towards poverty reduction and good governance. Collier and Dollar argued therefore for selectivity, factoring in the strength of potential recipients’ policy frameworks into donor’s decision-making (Collier/Dollar 2002). Critics argued however that selectivity applied to fragile states would lead to aid ‘darlings’ and ‘orphans’ (Dollar/Levin 2005). From a human security point of view, the rationale for aid would be to ensure that foreign assistance is given to the citizens that need it the most. The argument would then not only be against aid selectivity, but also against conditionalities based on specific economic and political models or increasingly so, on military imperatives. This new type of conditionality meant that development assistance was increasingly confused with the politics of bilateral support and foreign policy priorities based on a narrow security agenda, instead of being based on social justice and enlightened self-interest in shared prosperity and collective security.

In post-intervention situations, focus on immediate stabilization at the detriment of more long term needs of the population is especially problematic given the pronounced discrepancy between military and reconstruction spending. Between 2002 and

2006, the international community had spent US \$ 7.3 billion on development, as opposed to US \$ 82.5 billion on military spending (Senlis Council 2006: chapter 5). According to the data of the Congressional Research Service prepared for the U.S. Congress, the military budget authority for *Operation Enduring Freedom* in Afghanistan between 2001 and 2007 was at a rate of 90.3 billion dollars. This amount massively overshadowed the 8.6 billion US\$ authorized for humanitarian aid, reconstruction, counter narcotics, diplomatic operations and initial training of the Afghan Army (Belasco 2007: 8).

The ‘Marshall Plan’ for Afghanistan, which President Bush alluded to on numerous occasions in the aftermath of the fall of the Taliban, never materialized. Shortfalls in the delivery of funding pledged, combined with the slow, non-transparent processes of aid disbursements, the short-term duration of donor aid pledges, and the lack of labour-intensive investment in infrastructure, curbed the capacity of the government to deliver on its promises to the Afghan people (Sedra 2003; Tadjbakhsh/Saba/Zakhilwal 2004). At the same time, potential inflows of large aid pledged during highly politicized and political donor meetings meant, in the long term, that Afghanistan would become a rentier state funded through foreign countries, while in the short term, it made it difficult to resist the temptation of quick fix projects that raised expectations of rapid growth and recovery to an unrealistic level (Tadjbakhsh/Saba/Zakhilwal 2004). Additionally, competition for resources, responsibilities, and territory in Afghanistan led to a “projectization” of the reconstruction process and a fragmentation of the process along institutional and project lines (Sedra 2003: 4). The entire aid process had lacked continuity and coherence and was been plagued by problems of transparency and coordination. Ghani, Lockhart and Carnahan, with intimate knowledge and experience of Afghanistan where Ghani was Minister of Finance (2002–2004), have argued that the current aid system undermines states effectiveness in four specific areas: creation of parallel structures; the lack of harmonization; the non-state provision of traditional state services and its impact on state legitimacy; and the lack of predictability in aid flows (Ghani/Lockhart/Carnahan 2005: 10).

Additionally, the presence of foreign contractors in the reconstruction efforts of Afghanistan not only created distortions of the local economy and enhanced corruption, but additionally delivered poor quality goods. A 2006 CorpWatch report detailed the inadequacies of the US funded reconstruction effort,

where the US Agency for International Development (USAID) and other organizations granted contracts to corporations with minimal oversight and virtually no quality assurance, leaving the Afghan people with poorly constructed schools and medical facilities while corporations got millions of dollars in profits (Nawa 2006).

Ultimately, a government that is legitimate and accountable to its people needs to follow a national process, one that the international community can only support but not lead. The provision of aid can help this process only if it is transparent and consultative. From the human security point of view, it is questionable whether increased money for reconstruction by itself can bring peace. How the aid is spent may be a more important question, as is the institutional context of local capacity. Beyond aid, other responsibilities of the international community include stemming the flow of proliferation of weapons, promoting fair and equitable trade, and encouraging regional cooperation for a flow of investments and know-how. The debate on aid in fragile states should not be based on the interests of donor institutions on the selectivity or absorption capacities, but on methods of allowing for sustainable home-grown policies and individual agency to take over and make aid, in the long term, a need of the past.

94.3.4 State-building: The End State Vision and Its Responsibilities

94.3.4.1 Liberal Approach to State Responsibility and its Applicability in Post-Conflict Contexts

Duffield argues that the result of reconceptualizing development as conflict prevention led increasingly to the uncritical imposition of Western liberal values, political institutions, and capitalist markets on a subordinated but diverse and multi-cultural developing world (Duffield 2001). The Liberal Peace School came to argue for the supremacy of liberal economic instruments and democratic practices of ‘open societies’ and ‘open markets’ as a means of enforcing peace and reform in a post-conflict situation (Paris 2004). The problem however was that these reforms were often imposed from outside, often through conditionalities for aid, if not through advice provided by international institutions. Additionally, the legitimacy and effectiveness of the models themselves, based on a formula of a political model of liberal democracy, good governance, and an economic model of a liberal mar-

ket economy, for post-conflict situations are questionable.

In principle, argues Luckham, democracy poses an alternative to violence by encouraging the resolution of disputes through the political process. But in practice, democratic institutions have often failed to resolve conflicts and in some cases have even aggravated them (Luckham 2005: 36). Mansfield and Snyder have even argued that that the process of creating a democracy – democratization – is particularly prone to violence and war (Mansfield/Snyder 1995). To be legitimate, the timing and management of democratic processes, such as elections and constitutions, should be locally driven and locally owned rather than externally imposed (Bastian/Luckham 2003). Close attention is needed to make both the democratization process and democratic institutions as inclusive as possible at all levels. This would mean not paying lip service to institutions such as civil society and decentralization and focusing on a check list of Western recognized institutions, but fostering a true democratic political culture.

Luckham also argues that a developmental state needs to be created in a post-conflict situation, and “whether this is best done by expanding free markets and limiting the role of the state should be treated “as an empirical issue, to be decided on the basis of national circumstances, rather than as an overriding priority” (Luckham 2005: 35). Yet the standard neo-liberal economic model often imposed in post-conflict situations cannot be considered the most adequate mode of reaching the goals of a developmental state. First, the economies of post-conflict countries are generally extremely weak, if not collapsed altogether. Therefore, rapidly opening the economy and instituting a liberal market economy is not necessarily the best solution for stable economic development. Second, establishing a liberal market economy should be the choice of the national government and the local population and not that of the international community. Third, introducing a system based upon competitiveness may exacerbate sources of conflict and/or reinforce inequalities.

94.3.4.2 Failure to Establish Liberal Peace in Afghanistan

While the initial focus was on the removal of the remnants of the Taliban, it became soon apparent that Afghanistan needed a stable state that was at peace with itself and no danger to the world community. Given that the international community still adhered to a traditional state-centered understanding of security, and

with the desire to steer clear of the East Timor experience of the UN administration, a decision was made to recreate the Afghan state with a new regime. That a state was needed in Afghanistan was not contested. What type of state, and with what responsibilities, however, was open to different interpretations? Sedra for example argued that “while in the long run federal models of governance may be more suitable for [Iraq and Afghanistan]; a strong and representative central state apparatus is required to achieve stability and security in the short-term” (Sedra 2003: 4). Yet, a fundamental priority should not have been simply to reconstruct the state and its monopoly of legitimate violence, but to establish a legitimate public authority, “sufficiently independent of the occupiers to enjoy public respect, and sufficiently inclusive to draw wide support from the diverse ethnic and religious communities of [the] country” (Luckham 2005: 33).

The ‘state-building’ process in Afghanistan started with the December 2001 Bonn Agreement that put in place first an interim and subsequently a transitional government followed by a traditional consultative processes (known as *Loya Jirgas*) leading to a new Constitution in January 2004, national presidential election in October 2004 and parliamentary elections in September 2005. The checklist of what institutions a sovereign democratic state needed was designed at Bonn, with a precise timetable and sequencing guidelines. However, the design of this grand project seemed forced at best. The Bonn agreement was not an indigenous peace accord in the first place, as it left one of the warring parties, the Taliban, completely out of the possibility of negotiations. In the long term, their marginalization impeded the possibility of reconciliation on the one hand, and led to a false premise that war had been won or settled on the other. Furthermore, although participation in the presidential elections in 2004 far surpassed the expectations of the international community, and consultative traditional methods such as a *Loya Jirga* (assembly of elders) seemed to bring consensus around new political frameworks, it is a fact that the choices had already been made in the imposition of a Western-backed president to which these methods seemed to provide *ex post* legitimacy.¹³ Tired of two decades of

war, ordinary Afghans were unanimous in their desire for stability and progress. It was in this hope, and at the outset of a highly mediatized international intervention built on promises of this stability and funds for reconstruction, that Afghans were eager to embrace what was in fact presented as their only, and attractive choice: Western backed leaders (such as Karzai), western backed processes (such as a Constitution which was drafted with foreign experts’ support), and Western-backed institutions (such as a Parliament that was resuscitated after 30 years). That the parliamentary elections in September 2005 suffered from a very low turnout was an indication of the growing scepticism and disappointment that the Afghans felt in ‘their’ participatory democracy.¹⁴ The sustainability of this Western-backed liberal peace, however, could easily falter once the promises dissipated in the face of concrete realities.

Despite the imposition of democratic institutional models and the recreation of all the tenets of what a modern state should have, the post-Taliban state was unable to operate as an effective and legitimate state, neither from a traditional security, nor from a human security viewpoint. By 2007, the authority of President Hamid Karzai barely extended beyond Kabul, and achievements such as the establishment of a new currency, the Afghani, and the return of two million refugees, macro-economic recovery and the return of 2 million children to school had not created the sufficient legitimacy and satisfaction for the population to be able to divert attention from the precariousness of the new regime. Efforts to rebuild a national army and police force were slow and ineffective with heavy reliance on the good will of warlords, who, in turn, were driven more by personal ambition rather than goodwill (Sedra 2003: 1). By 2007, national reconciliation had still not taken place and the authority of warlords, some in the national parliament, couldn’t be curbed.

The economic blue-print for a post-conflict recovery in Afghanistan was also mired with inconsistencies

13 During the first *Loya Jirga*, for example, Karzai was gently ‘imposed’ by the then American Ambassador Zalmay Khalilzad and UNAMA, over the choice of a majority of delegates who thought they would be welcoming back the King from exile to head the new Transitional Government (personal interviews, Kabul 2004).

14 According to a United States Institute of Peace Report, “The disappointing turnout on election day reflects mounting disillusionment among the electorate about the benefits of democracy. Many Afghans who had voted in the 2004 presidential elections said they did not feel motivated to vote this time because nothing had improved as a result of the first election.” DeGrasse, Beth and Emily Hsu, 2005: “Afghanistan: Old Problems, New Parliament, New Expectations”, in: *USIPeace Briefing* (October); at: <http://www.usip.org/pubs/usipeace_briefings/2005/1025_afghanwomen.html>.

as it adhered to a standard model neo-liberal model based on the opening of markets and trade regimes in a post-conflict situation. In the 2006 *Interim Afghanistan National Development Strategy* (I-ANDS), for example, the government's economic vision was said to build a "liberal market economy" based on "an enabling environment for the private sector to generate legitimate profits and pay reasonable taxes, thereby enhancing public revenues that can then be invested in public services" (Government of Afghanistan 2006: 17). Laudable as this goal was, the challenge of reality was damning. The trend in GDP growth after 2002 was mainly based on foreign support and an illegal but important drug trade. The economy, while booming, was mainly informal and highly illicit. It was also highly concentrated on Kabul, where a combination of foreign assistance and narcotics profit had created the semblance of normality where business thrived, consumers flocked, and construction boomed. Participation in markets was not open to all and benefits were not spread equitably: gaps between the poor and the new rich had increased in the capital, and outside of Kabul, life had not changed much. Experience has shown that a fast track market economy would in fact be more conflictual in the short term as it does not address distributions, inequalities and urban-rural disparities, many of which may have contributed to conflict in the first place. For Afghanistan, where economic greeds and social grievances in the absence of a strong centralized state had for decades contributed to conflict (Tadjbakhsh/Saba/Zakhilwal 2004), a private sector with its potential pitfalls in terms of exclusive access and inequalities, was not the remedy. The ends and means of economic growth should have been based instead on principles of investing in human potential, regulated directly through public policy intervention, and not exclusively on creating an environment for the private sector as the engine of growth. The ultimate end of an economic vision should have been on the need to cater to people's long term needs: job creation, an adequate redistribution of wealth and assets, and poverty eradication. This would involve not only investing in economic development, and unleashing the forces of the market, but also on ensuring adequate measures of distribution and containment of rising inequalities of income and opportunities among different groups in different regions.

94.3.4.3 Coordinated/Integrated or Piecemeal Sector-specific Approach and Prioritization of Security over Development

If in previous decades of peacebuilding experiences, the military was traditionally involved in stabilization, humanitarian aid workers in providing for relief immediately after the conflict, development actors taking over for longer-term strategies, and the diplomatic community was engaged in political resolution of conflicts, new interventions such as in Iraq and Afghanistan set a trend where all these actors were operating in the same zone at the same time. The involvement of the military in delivering humanitarian aid and reconstructing local infrastructures, as seen by the PRTs in Afghanistan, for example, brought the military into relief and development mandates of others. Economic actors, such as *International Financial Institutions* (IFIs,) engaged in reconstruction and long-term rehabilitation, including the preparation of a medium term development strategy (*Poverty Reduction Strategy Papers* or PRSPs) even while the conflict was ongoing. The blurring of boundaries created multi-sectoral challenges requiring better coordination between economic, political, civilian and military actors in Afghanistan.

The piecemeal approach to sectors and the turf wars between institutions with different mandates was also mirrored at the state model in its planning and budgeting priorities.

The 2005 *Interim Afghanistan National Development Strategy* (I-ANDS) which was prepared for example in anticipation of a *Poverty Reduction Strategy Paper* (PRSP), and the *Afghanistan Compact*, the framework for co-operation for international community engagement beyond the completion of the Bonn Agreement, both identified what they called "three critical and interdependent areas or pillars of activity": 1) security, 2) governance, rule of law and human rights, and 3) economic and social development (Government of Afghanistan 2006).

Despite the claim on interdependence, however, the security pillar was seen as a foremost priority and as separate goal from that of governance and economic and social development. For its security vision, the government concentrated on the use of force to protect the rights of all Afghans, and sought additional assistance in combat assistance from the international community, including support for the capacity of national security forces to help create security forces that were professional, cost-effective and democratically accountable. (Government of Afghanistan

2006: 70). The separation, and subsequent prioritization of security over development approaches, reflected a realist solution to the state-building process, concentrating on law and order. This approach was also encouraged by analysts and policy makers who, taking the Weberian state as the model, concluded that building a functioning state required a basic level of security for human development to be able to take place, hence prioritization had to be on *security sector reforms* (SSR) (Ponzio 2005: 64).

From a human security point of view, however, the method of delivering 'security' through force, and the narrow definition of 'security' were exactly the problems that compounded the exacerbation of 'insecurity' in the first place, even from a traditional definition. Instead of hierarchizing and prioritizing among threats, it would have been more effective to explore on the linkages and interactions. Even where sectoral approaches may be easier to implement, they may lead to fragmentation and contradictions if they fail to take into account the inter-connection between various insecurities.

The human security school of thought would argue that the design of a strategy that isolated traditional security-related activities in Afghanistan was flawed to begin with. Security, in the broader sense, had to be achieved *through* social, economic and human rights interventions in order to achieve more sustainable results. And yet, in the *I-ANDS* and in the *Afghanistan Compact*, security and socio-economic development were seen as sectoral concerns with separate goals. Neither was the linkage between these sectors explored, nor was their human impact assessed. They were, in the traditional sense, institutional and sectoral strategies, to strengthen, at the end of the day, the 'security' of institutions of democracy and of the market.

Motivations and methods of eradicating opium plantations in Afghanistan present an accurate example where a traditional security focus were inadequate. If a ban imposed by the Taliban in July 2000 had led to a substantive drop in cultivations, five years later Afghanistan had become once again responsible for 90 per cent of the world's illicit opium production, and the US\$ 2.7 billion drugs trade accounted for about a third of Afghanistan's economy. Yet, the answer to the drug problem saw different solutions by different actors: The U.S. government had contemplated the eradication of drugs through aerial sprays, a position criticized as not only harmful to the indebted farmers, but also potentially backfiring as it would further hike up prices and enrich criminal car-

tels, including insurgents thought to be strongly linked with the lucrative activities of traffickers. The *UN Office on Drugs and Crime* (UNODC) had called for NATO to take military action to destroy heroin laboratories, disband public opium markets, attack opium convoys and bring major traders to justice¹⁵. President Karzai wanted to see additional international support for providing alternative livelihood to farmers, but existing programmes had faltered in their promises of cash for work providing jobs, irrigation canals and new roads. Each strategy was seen as inadequate by itself to be able to compensate people for losing their opium incomes, especially for the poorest farmers who were often deeply indebted to local drugs barons. The problem of narcotics in Afghanistan could not be dealt with in vacuum of the larger socio-economic implications and strategies of state-building and livelihoods.

94.4 Conclusions: An Ethical and Methodological Rupture

Human security is proposed in this chapter as an ethical and methodological rupture with the existing conceptualization of state-based and institutional based view of the problem of 'failed states' and their solutions.

First, human security poses a moral challenge to realism and liberal institutional views. The failure of states should not only be viewed through the lens of potential instability for international security or institutional stability, but from the point of view of their inability to provide for their populations. Human security offers the definition of an end point towards which all politics has to strive, i.e., the ethics of ultimate ends. In a world of nation states, national interests cannot of course be ignored, as neither can be the bureaucratic interests of international organizations. Yet, it is crucial to acknowledge the biases and the interests of states and institutions and open them up to an ethical scrutiny. The most important added value of applying a human security approach is to 'evaluate' donor objectives and interventions against the needs and sensitivities of the local population. This requires an understanding of the expectations of the populations concerned by the aid provided, and thus taking into account their needs, their aspirations

15 Judy Dempsey: "UN Urges NATO to Hit at Afghan Drugs", in: *International Herald Tribune*, 12 September 2006.

as well as the coping skills they developed during conflict. A human security approach propagates instead that civilians be at the centre-stage of a 'demand-driven' reconstruction and recovery processes that address the needs of the individuals and communities as defined by them. However, adequate consultation is often neglected when funding proposals have to be submitted in short time and where insecurity and lack of infrastructure prevents consultation with various regions. This creates a gap between the expectations of the recipients of the intervention and the perceptions of the external actors. When the international community takes the lead in determining the priorities of state-building based on their understandings of models and needs, the danger is not only that a state's weak structures will be overwhelmed and marginalized in the decision-making processes but it may also undermine the role of people as agents of change. Legitimacy of institutions in the long term comes not from the time-table of donors with their blue prints, but from the meaning that the populations give to them.

Second, human security claims a methodological rupture with realism and liberalism by proposing that the best way to achieve a broad definition security (both for the state and the international system) is to increase that of people. This rupture has implications for how security and development strategies should be designed, implemented and evaluated against outcomes of satisfaction of basic needs and empowerment. This methodological rupture also has implications for how ends and means are reversed. The survival, well-being and dignity of the individual become the ultimate goal, and constructs such as the state, the institutions of political democracy, and the marketplace are relegated to secondary status as means to achieve that goal. This too is a break from realism and liberalism.

Hence, the human security point of view dispels the belief that the surest way to provide security and build lasting peace in Afghanistan was through military action and reaction. Rather, the framework argues that there was a moral and ethical imperative to promote public policy reforms and state building efforts that enlarged people's choices and reduced local incentives that trigger conflict in the first place. State-building strategies needed to expand the notion of 'security' to cover not only territorial security, or the monopoly of the state to the use of force, but also its commitment to provide for basic human needs (education, health, food, shelter, incomes and livelihoods,

etc) as well as strategic needs (such as participation, dignity, empowerment, human rights etc).

The 'human security' agenda of the 1990's had shifted the focus away from state-centered security toward the security of people. The 'failed states' agenda, however, represents a return to more traditional, state-centric views of security threats and their solutions. The current policy directions in 'fragile states' such as in Afghanistan focus too narrowly on state function, primarily for taking back the prerogative of security provision, and secondary to ensure the stability of mainly economic institutions. The role of people as agents of change is often neglected. Yet, a strategy toward sustainable peace requires a transformed relationship between citizens and their state, and a changed relationship between the state and the international community. Together, these changes improve the chance for a state to meet its obligations to the human rights of its people (Simpson 2007). The failed state discourse by contrast puts the focus on diverted agendas, that of a military mentality around conflict or a preoccupation of whether or not 'we', as the international community, should act and be engaged in a failed state. Instead, the international community should focus on prevention of conflicts, reforming trade regimes, and responsible arms practices for a more practical, effective, and ethical way to approaching global (human) security.

95 Relevance of Human and Environmental Security Concepts for the Military Services: A Perspective of a Former Chief of Staff

Joseph C. Singh

95.1 Introduction

Environmental protection and nature conservation are fundamental to human security. The challenge facing nations today is no longer deciding whether conservation of biological diversity is a good idea, but rather how it can be implemented in the national interest and within the means available to each. (Brundtland Commission 1987: 66).

There is overwhelming evidence for a direct and integral relationship between the human condition and the environment. Historically, early civilizations derived their needs from being hunters and collectors, from their association with great rivers and watersheds and biodiversity, in terms of flora and fauna that supported their needs for food, fuel, and shelter. Such examples are the almost mystical and religious relationships that exist between the Nile, the Euphrates, the Ganges, the Amazon and their human populations.

It has been argued that the collapse of the great Aztec, Mayan, and Inca civilizations occurred when their exploitation of natural resources reached the point of unsustainability. The desertification of parts of Africa through deforestation and harvesting of firewood has manifested itself in the cycle of famine, disease, and civil wars.¹

At the national levels, the irresponsible exploitation of natural resources and the environment has led to degradation of watersheds, landslides from denuded mountain and hill slopes, polluted water and streams, spread of diseases such as malaria and typhoid, and the excessive urbanization resulting from the migration from rural and hinterland areas to the cities and towns in pursuit of the material culture. The relationships between the environment and the hu-

man condition are the subject of much debate at international fora. The Convention on Biodiversity (1992) and the Kyoto Protocol (1997) are two examples of the outcomes of policy debates that have been converted into political strategies.

The vulnerabilities of the planet to catastrophic events such as tsunamis, earthquakes, volcanoes, hurricanes, floods, and fires are very topical due to the massive loss of life, property damage, investments, and the scale of physical, emotional, and mental suffering. The newest manifestation of conflict after the damage to humankind and the environment from major wars, wars of attrition, chemical warfare, and civil wars, are terrorist attacks on the infrastructure to cause maximum trauma to humankind for political ends.

Undoubtedly a combination of demographic growth due to population growth and environmental stress from increasing demand for resources will be a catalyst for social unrest and make for increasing vulnerability to intra- and inter-state tensions and conflicts. Human security as now defined puts the individual at the centre of debate, analysis, and policy. "It is the individual who is paramount; government is an instrument of the people to protect human life and enhance human welfare"². Environmental security is the relative public safety from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement or design and originating within or across national borders. This relationship between human security and environmental security forms the basis of international and national strategies to cope with the negative manifestations of the lack or absence of such security. Such strategies should stress the importance of international interde-

1 World Summit on Sustainable Development: Future Dialogues: Human Security and Environment, 3 September 2002, Johannesburg, South Africa, at: <www.iucn.org>.

2 Hans van Ginkel, in: *News Release*, 13 June 2004, Issue 39: September - October 2005, United Nations University, UN Development Programme, at: <<http://update.unu.edu/>>.

pendence and, at the national level, the development of synergies among the decision-making and implementation agencies and institutions.

This chapter discusses the relevance of human and environmental security concepts for the military services. It will rely on a review of global debates on the reconceptualizing of security for the 21st century and on evolving concepts on human and environmental security. These concepts will be assessed for the Caribbean region to determine their relevance for the military services. The decisions these countries make will have implications for the military services if they are to be capable of responding to such threats, challenges, vulnerabilities, and risks in the future.

95.2 Evolving Concepts of Human Security

Scarcities brought about by environmental factors can interact with political, economic, social, and cultural factors and lead to instability, and in the poorer developing countries, where economic options are limited, there is greater pressure being placed on ecologically endangered areas, including urban slums. Such environmentally linked instability may increasingly result in large-scale population movements and, in the event of trans-boundary unregulated human flow, can easily precipitate crisis situations for state authorities and institutions such as the military services, as e.g. the tensions among the USA, Mexico, and Haiti have indicated.

95.2.1 Manifestations of Instability Linked to the Environment

Manifestations of environmental instability are linked to:

- land scarcity through allocations of large forestry, agricultural and mining concessions;
- deforestation resulting from large scale agriculture, chain saw logging, and ranching;
- siltification of rivers through alluvial and hydraulic mining, and the run-off from agriculture;
- water scarcity from conversion of land use through building of water conservancies, creation of reservoirs for hydropower projects, and reduction of wetlands;
- scarcity of fish stocks through heavy sedimentation, and suspended solids from mining activities and agricultural run-off.

95.2.2 The Poverty Challenge

The *Caribbean Regional Emergency Disaster Prevention Plan* (1997) stated that economic and social development are major determinants of vulnerability. The increasing poverty in urban areas with bad infrastructure has contributed substantially to risk. The *IUCN Wellbeing of Nations Report* (2001) confirmed that human and ecosystem well-being are intimately intertwined, and validates the need to plan and manage for ecosystem protection and human development simultaneously. According to this report, the key conditions for combining high human well-being and low ecosystem stress are freedom, good governance, and education. The IUCN report stressed that poverty is multi-dimensional, and insufficient income is only one indicator of human deprivation. Poverty is experienced as a lack of adequate food and water; vulnerability to environmental disasters and the ravages of disease; it is about the hardships of rural and urban existence, being exposed to hard working conditions, violence, crime, and violations of human rights. Men and women also experience poverty differently. Poverty is frequently rooted in lack of access to, and control of, assets upon which human livelihoods depend.

Speaking on Earth Day, US Secretary of State, Colin Powell (2004) said that the Bush administration had adopted an environmental policy linked to poverty reduction, good government, and sound economic and trade policies: “The new approach that we are taking is about creating conditions for growth that will help people lift themselves out of poverty and do it in a way that will sustain development, using the Earth’s resources, but not abusing the Earth’s resources.” However, Said W. Musa, the Prime Minister of Belize, speaking to the Opening Ceremony of the 23rd Regular Meeting of the CARICOM Conference of Heads of Government (2002) argued that:

The great integrationist endeavour we are engaged in has but one supreme objective: to enhance the quality of life of our peoples. Not simply to lift them out of poverty – although that must remain our first goal – but to empower them to take control of their lives and to attain the highest levels of excellence in their cultural, political, and economic existence. All this occurs within a global context that tends to make the poor more wretched and the rich more powerful.

95.2.3 The Democratic Challenge: Good Governance

The global debate has also shown that environmental problems are exacerbated in areas where there is con-

flict, chaos, and humanitarian challenge. Environmental degradation is demonstrably worse in countries where there is rampant corruption, lack of accountability to Parliament and citizens, and where there is lack of functional literacy, disease, and a sense of hopelessness. Said W. Musa (2002) pointed out that in the Caribbean,

...our political systems are by and large inherited from another era and were designed to divide the many for rule by the few. If we are serious about building national consensus about the critical issues affecting our societies, we have to change that and put in place new policies, structures, and institutions that will make possible people-centred development.

95.2.4 The Sustainable Development Challenge

In an environment where access to material resources has resulted in conditions of poverty, the human security condition is further aggravated by the lack of access to knowledge-technical, scientific and cultural, socio-political and economic knowledge. Only through increasing the consciousness and knowledge of people will they be better equipped to face the challenges of the globalized economy and marketplace and be able to seize the opportunities to break the vicious cycle of persistent poverty. Providing access to knowledge and education is a major challenge to be overcome if an environment conducive to sustainable development with a people-centred approach is to be constructed.

The Secretary-General of the United Nations, Kofi Annan (2005), in identifying a strategy for the pursuit of the *Millennium Development Goals* (MDG) highlighted three aspects of human security to be addressed by states in the attainment of these goals. He identified these as:

- *Freedom from want*: provision of adequate food, shelter, health, education, and sustainable livelihoods;
- *Freedom from fear*: ensuring that conditions of peace, stability, and the rule of law are enforced; that there is freedom to pursue legitimate interests; and, that contingency plans to safeguard human lives in times of natural disasters exist;
- *Freedom to live their lives in dignity*: adherence to the Constitution, a system of governance that allows for inclusive, participatory democracy; and, that within the state ethnic, religious, and cultural freedoms are guaranteed.

95.2.5 Strategic Responses to Threats to Human Security

Fox and Carr (1985) argued that realists must see: “the extent to which the daily lives of people are threatened by refugees, drugs, etc. and therefore security is no longer just military security. As time passes, it must be conceived more broadly.” In setting performance indicators to monitor the implementation of the strategy, the availability of resources to carry out the implementation process will be a vital component for achieving success. Many states have faced a severe decline in their human resources through emigration to the more developed countries, and the balance sheet of resources available for implementing strategies to address issues of human security will have shortfalls. It is important that states have a coordinated national effort that combines the work of all national agencies and institutions, including the armed forces, to produce a synergetic approach to strategy implementation.

95.3 Evolving Concepts on Environmental Security

95.3.1 Environmental Security and Scarcities

Environmental security is the relative public safety from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement or design, and originating within or across national borders. Former US Secretary of State Warren Christopher (1996) in a major policy speech at Stanford University said:

The environment has a profound impact on our national interests in two ways: first, environmental forces transcend borders and oceans to threaten directly the health, prosperity, and jobs of American citizens. Second, addressing natural resource issues is frequently critical to achieving political and economic stability, and to pursuing our strategic goals around the world.

Particularly in poorer developing countries, environmental scarcity can limit economic options and therefore force those already impoverished to seek their livelihood in ecologically endangered areas, including human slums. The US Government considers that:

...environmental scarcities are of significant importance in a typology of threats to international security. Environmentally linked instability is increasingly likely to spill over to other states in a key strategic region, or to result in a complex humanitarian emergency stemming from large-scale population movements³.

IUCN (2004a) has stated that the natural resources of our planet are being depleted, some irreversibly. For example, the IUCN's "Red List of Threatened Species"⁴ estimates that

some 11,046 species are now threatened with extinction. This includes 24% of all mammal species and 12% of all bird species. The scale of threat is similar, or possibly even worse for other vertebrates. Calculations indicate that some 25% of reptiles, 20% of amphibians and 30% of fishes (mainly freshwater) are threatened. Forests continue to be lost and degraded, a trend that threatens forest ecosystems as well as the 1.7 billion people who rely on forests for numerous goods and services. Water scarcity has grown in seriousness, with grim ecological and human implications - particularly in parts of Africa and West Asia. Some 27% of the world's coral reefs have also been effectively lost, up from 10% in 1992, taking a huge toll on marine biodiversity.

Concerns over climate change have also gained prominence, as our understanding has grown of the links between greenhouse gas emissions, rising temperatures and sea levels, and the growing frequency and intensity of extreme weather events.

IUCN also points out that

all the evidence suggests that current patterns of resource exploitation and consumption are unsustainable and are approaching natural limits in some areas. These problems underpin concerns that competition over dwindling natural resources may trigger future conflicts.

95.3.2 Environmental Threats Impacting on Human Security

The threat of living on a planet, whose resources could no longer be sufficient for humanity's needs, compels us to adopt a process that reflects a new ethic of conservation and stewardship for the environment. Thus, governments, industry, development agencies, local and indigenous communities, and the general public, have become increasingly concerned about the depletion of biological resources with the growing awareness that development depends on their maintenance. This accounts for the global, regional, and national commitments to, for example, the objectives of the Convention on Biodiversity (CBD), the Programmes of Work deriving from deliberations at the Conference of Parties (COP-7) of the

CBD and the Millennium Goals. Based on research and many international and national debates there are global concerns with the following threats to environmental security, nature conservation, and their impacts on human security:

- Habitat alteration as a consequence of natural resources exploitation, infrastructural works in or near to areas of high biodiversity significance;
- Chemical pollution and sediment loading from mining and agricultural run-off;
- Climate change and the melting of the polar ice caps;
- Natural disasters such as floods, hurricanes, volcanoes, and fires;
- Unregulated tourism especially where the volume of tourists and their impacts far exceed the carrying capacity of the destination sites;
- Wars, internal conflicts, terrorism, and the narcotics trade;
- Unregulated planning and land use policy;
- Introduced and invasive species;
- Persistent poverty;
- Poor governance, corruption, and money laundering;
- Lack of legislative, regulatory, monitoring and enforcement capacity and capability;
- Lack of harmonization of regulatory and enforcement mechanisms at transboundary and regional scales;
- Poor communication, public awareness, and education;
- Marginalization of local and indigenous communities, and land tenure issues.

95.3.3 Strategic Responses to Threats

In determining the nature of strategic responses to such threats, three factors will be of paramount importance:

- Opportunities to develop strategic collaborative responses through regional mechanisms and interdependence;
- Pro-active national integrated sectoral and societal responses through networking and synergies; and,
- Identification of resources, and building of capacities and capabilities to respond.

In assessing the feasibility of success through the strategic responses, states will have to conduct a reality check and many will find that there are a number of constraints that will influence the degree of success

3 Christopher (1996) on US Environmental Diplomacy, 10 April 1996, Stanford University, Palo Alto, CA.

4 IUCN: 2004 IUCN Red List of Threatened Species. *The Red List Consortium, International Union for Conservation of Nature and Natural Resources*, at: <www.iucnredlist.org>.

achieved in the implementation of their responses. These limiting factors will include:

- the lack of resources;
- the lack of political will and consensus;
- competing national priorities;
- breakdown in the rule of law;
- environmental insecurity and degradation; and,
- increasing dependence by civil authorities on the involvement and intervention of the armed forces.

95.4 The Military Services and Relevance of Concepts

95.4.1 The Military and Impact on Human Security

The traditional role and core competencies of the armed forces are generally the following: a) protection of national sovereignty; b) maritime regulatory and enforcement; c) aid to the civil authorities: internal security, counter narcotics operations, and homeland security; d) disaster relief operations and civil defence missions; e) humanitarian missions such as medical outreach in remote areas, poverty alleviation through engineering works related to housing, water, sanitation, drainage, and irrigation; f) search and rescue; and g) peace building and peace enforcement.

95.4.2 The Military and Impact on Environmental Security

From a traditional military perspective, in addition to conflict prevention due to environmental factors, environmental security has focused on: a) protecting the health of the soldier to carry out the mission; b) the use of force to protect the nation's interests that are challenged by environmental changes; c) protection of the environment from the damage that the military itself may cause; and, d) the role of the military in safeguarding natural resources.

95.4.2.1 Evolving Concepts in the USA

Sherri Goodman (1995), the former US Deputy Undersecretary of Defense for Environmental Security, stated at an Installation Commanders Conference, "environmental security is critical to the defense mission and should be fully supported".⁵ She gave the following four reasons:

- It is critical to protecting the quality of life of the armed forces.
- It is critical to military readiness. If steps are not taken to clean up and protect the environment now, it is going to cost more down the road. Through the armed forces' work with environmental regulators, the latter's concerns are integrated into defence operations so military training may proceed without any impediment. The conservation programme keeps the training exercises realistic and representative by rotating training areas, reseeded and replanting, thus assuring that future training will be as effective as current training.
- It is money well spent and ensures improved efficiency and performance of the environmental security in all areas from cleanup to compliance, conservation, pollution prevention, and technology development.
- It is the law.

She also indicated that the Armed Forces need to go beyond compliance to find new ways to direct more resources to pollution prevention, since the key to protecting and saving the environment is prevention. For example, there must be a responsive and reinvigorated technology programme and the armed forces must seek cooperative efforts with industry, state and local governments, and other federal agencies. The efforts must be global and negotiations must be entered into with foreign governments to establish protocols for the exchange of technologies.

These initiatives are evidence of the holistic and global dimensions of the concepts relating to human and environmental security, and of the role that the armed forces are called upon to play as a component of national synergy and of international interdependence.

95.4.2.2 Evolving Concepts in India

Eustace D'Souza (1995), a retired Major General of the Indian Army and a former Secretary General of the World Wide Fund For Nature, said:

In almost all parts of the world today, the military are a recognizable force politically, socially and to some extent, economically. It is not generally realized, however, that the military have a positive role to play in protecting and restoring our degraded environment. On the contrary, there are many who feel that they are only capable of wanton destruction of wildlife and nature. This

5 Sherri Goodman: "Beyond Compliance to Pollution Prevention-at the Installation Commanders Conference", Washington, 24 January 2005, in: *Defense Issues*, 10, 19.

is not so. Indeed, the military have a unique non-violent and productive role to play in protecting the environment, creating security and social patterns founded on cooperation and not on confrontation.

D'Souza argued that the military are well suited for the important and productive task of protecting the endangered environment and ensuring its regeneration where necessary. He said that the military have the leadership, motivation, training, and discipline to perform this role effectively; that the military have the infrastructure-mobility, intercommunications, medical and engineering skills necessary for such work; and, when armed forces personnel retire, this large number of trained and disciplined personnel forms a valuable pool of human resources for environmental duties.

95.4.2.3 Evolving Concepts in Brazil

The Brazilian Army is providing logistic support and guarantees the security of operations to monitor, control, and combat deforestation in the Amazon. The agreement between IBAMA (Brazilian Institute of the Environment and Renewable Natural Resources) and the Army Command of Land Operations, signed on 6 August 2004, is part of the Action Plan for the Prevention and Control of Deforestation in the Amazon that requires the participation of 13 ministries. The preservation of the Amazon is considered a matter of national security and the Minister of the Environment, Marina Silva, said that the partnership with the army represents a joint effort by a society that wants to see the Amazon protected and developed with sustainable growth and the preservation of its communities and its biodiversity.

The Brazilian military are also involved in military missions relating to human security. Crime in Brazil's urban centres is a grave problem, especially in Rio de Janeiro. Gambling, racketeering, gang violence, the trafficking of arms and drugs, and general disorder create a tremendous sense of public insecurity. Former President Cardoso (1995) while maintaining that it was not appropriate for the military to be involved in police duties due to their lack of proper training, yet, given the gravity of disorder in the slums of Rio, which he compared to an 'undeclared civil war', nevertheless ordered their deployment.

The Brazilian armed forces also have a tradition of civic action roles rooted in the notions of the military as an agent of development and a state- and nation-builder. Many Brazilian officers continue to think of their institution as "a force for national integration and the sole representative of the state in remote re-

gions of a vast and underdeveloped country" (State and Soldier in Latin America 2005).

Concrete examples of enlisting military troops in civic action include the construction of roads, bridges, dams, and other infrastructure projects, and the provision of education, food, and field health services in impoverished and remote areas. This social mission of the Brazilian Armed Forces is a model that has heavily influenced the multidimensional role of the military in developing states such as in Guyana and the Caribbean islands.

95.4.2.4 Discussion on General Implications for the Military Services

Since the removal of authoritarian regimes in Latin America and the Caribbean, and the blossoming of democracy through 'free and fair' elections, respect for human rights and building of institutions such as the judiciary, and the legislature, greater impetus is being given to seeking out of opportunities for military and police reform and in reorienting the latter towards a greater display of professionalism in its external role.

However, the resolution or diminution of disputes through diplomatic interventions or recourse to the international institutions such as the World Court and the Law of the Sea Convention and the rise of the narcotics industry and other 'grey area' or asymmetric threats to human and environmental security, combined with the pressure to reduce financial allocations to the military, obviate against the likelihood of the military focusing on purely professional military missions.

The dilemma faced by civilian governments in re-defining the role of the military is 'over inclusion' while another is 'excessive exclusion'. The promotion of dialogue between the military and civilian institutions can find creative solutions to the implications of reform as follows:

- promotion of downsizing and restructuring so that savings can be redirected from personnel and other basic operating costs to strengthen and re-tool conventional capabilities with existing resources;
- promoting legitimate ways of harnessing and redirecting the resources of the military into peace-keeping, peace-building and peace-enforcement missions under the umbrella of the United Nations or regional peacekeeping authorities;
- establishing and equipping police and non-security forces, such as community policing groups, in

order to rely on them to deal with police-type responsibilities, such as stopping criminal activities and maintaining social order;

- establishing the jurisdiction of the police and the military;
- ensuring that police reforms (overcoming corruption and enforcing compliance with human rights standards) lead to a restoration of confidence in the police, and that the military does not continue to be the 'default option' when the civilian administration needs to impose order.

95.5 Human and Environmental Security in the Caribbean

95.5.1 Current Threat Assessment

The scenarios that are familiar to the English-speaking Caribbean include: a) criminal activities spawned by unemployment, poverty, and the narco-industry; b) the annual hurricane season; c) flooding of low-lying coastal states; d) fires of domestic origin which then expand because of closely constructed built-up areas; e) forest fires (dry leaf litter) and in the savannahs (grass fires which go out of control); f) volcanic activity near to human settlements; g) wide-spread diseases such as malaria, typhoid in humans, and 'foot and mouth' in animals; h) polluted waterways from oil and chemical spills or from heavy metals contamination through leaching from shipping disasters, breaches of holding dams, and run-offs from agricultural and mining activities.

Given the limited resources, and the fact that many of these challenges give little advance warning, there will be a need for urgent response because of the likelihood of loss of life, trauma, damage to property, and negative impact on the environment. These scenarios justify the involvement of the military as a component of the national response mechanism, and logically there should be adequate contingency planning which not only allows for synergies through an integrated civil and military response mechanism, but which also acknowledges the limits of jurisdiction of both the civilian authority and the military command. Based on the scale and scope of the threat to the human condition and the environment, contingency plans will involve regional or trans-border collaboration or an integrated national response.

95.6 Implications for the Military in the Caribbean

95.6.1 Regional Threats and Importance of Networking

In the case of regional and trans-boundary contingencies, the implications for the armed forces will be the need to network among regional armed forces. Such networking would be emphasized through the following:

- *Diplomatic linkage.* Personal and cordial relationships are desirable among heads of services, their staffs and key senior operational commanders, particularly those responsible for border regions, air, naval or Coast Guard units and for intelligence collation and analysis.
- *Intelligence linkage.* An intelligence linkage should be established for swift passage of information and where possible, person to person contact should take place overtly and covertly.
- *Contingency planning.* Contingency plans must be developed with the full involvement of the headquarters of each of the armed forces that are parties to the agreed strategy. These contingencies should deal with the scenarios identified above.
- *Information and communication linkage.* Routine communication and information systems should be established which are, as far as possible, compatible, and which should facilitate the exchange of information in an efficient manner.
- *Joint training doctrine and exercises.* Where possible, such training should be realistic and involve the civilian population, especially if the latter are convinced that it is in their interest to be concerned about illegal migration, narco-trafficking, environmental degradation, and natural disasters.
- *Public information.* The use of the media can generate a climate of confidence and mutual respect, and thus motivate the civilian agencies and communities to be supportive of the overall strategy.
- *Rules of engagement* should be documented and disseminated on a need-to-know basis.
- *Documentation of incidents* through taping and filming as audio visual aids for training purposes, and to emphasize to more developed states, the need for assistance in order to cope with the challenges.
- *Language training* will be a significant factor in speed of transmission and accuracy of information.

- *Accountability* must be ensured so that, in the spirit of interdependence and collaboration, national interests are served.

95.6.2 Regional Threats and Importance of Synergy

In the case of national efforts to respond to endogenous threats, for example pervasive poverty, increase in crime and its associated violence, and natural disasters – the military, with its organization structure, resources, and access that it has to national institutions, should hold itself in readiness to initiate contingency plans perhaps through its Armed Forces Staff Colleges, since they incorporate national planning, organizational planning, threat analyses, doctrine, educational and training requirements, and systems development.

Much conceptual work needs to be done, including testing of ideas with civilian agencies and specialized institutions, refining them and then evaluating the effectiveness of these through operations and feedback. When workable results have been achieved, the documentation of the contingencies would have laid a foundation for a coordinated response to any of the scenarios relating to human and environmental security.

95.7 Conclusion

The environment is an important part of what former Secretary of Defence William Perry (1996) called 'preventive defence', i.e. "a strategic vision of preventing the causes of conflict and creating the conditions for peace."⁶ States, in analysing the role of their armed forces, must determine the ways in which military resources may be used to achieve political objectives. Ken Booth et al. (1987: 11) argued that: "Any satisfactory definition of strategy must take into account the peacetime applications of strategic thinking and must locate the use of military force in a more general context of foreign policy making." Henry Kissinger (1957: 15) stated that "at every stage of formulation of strategy, doctrine would be considered as a combination of political, economic and military factors." Political leaders also have concerns about the military's 'mission creep' and the extent of their involvement and

creeping jurisdiction in the internal functions of the state.

While this may be true of the more sophisticated military, the reality of developing countries is that of necessity their military roles must reflect national defence and development and have a more diversified role rather than being highly specialized and inflexible. There must be sufficient checks and balances built into the authority relationships and command and control to ensure that the civilian jurisdiction over the military in democratically run states is not compromised.

State governments and civilian organizations have supported military involvement in civic action and enlisted the energies of the military and their logistical capability in poverty reduction efforts. The armed forces themselves cannot turn a blind eye to poverty and underdevelopment which, when translated into the extent of human suffering and misery that they engender, can be catalysts for social disorder. On the other hand, some military leaders have serious misgivings about the extent of the military's involvement in civic action and the likelihood of compromising their abilities to carry out their primary missions for national defence.

Given that a framework should exist which allows for clearly defined roles in the internal and external security sector, the military services ought to be able to conceptualize and implement a multi-mission approach to capacity building and capabilities which, with civilian approval, permits its intervention in those threats which will have negative consequences on human security and on environmental security, and the responses to which cannot be based solely on the civilian agencies and institutions.

6 William Perry, 1996: "An American Security Strategy for the 21st Century: Global Issues of the Twenty-first Century: UN Challenges", at: <www.globalchallenges.org>.

96 Towards a Human Security-Based Early Warning and Response System

Albrecht Schnabel and Heinz Kruppenbacher

96.1 Introduction: Early Warning for Human Security Purposes

The recent attention given to the concept of human security – both in academic and political debates – is an encouraging development for those committed to improving the security and livelihood conditions of suffering populations. Not national security and defence, but the security and safety of the population are at the core of human security-focused domestic and international policy. While there are diverse interpretations of what is considered to be a human security threat, this chapter uses a definition that has been developed in a project on the operationalization of human security currently pursued by one of the authors: A human security threat constitutes an already or potentially life-threatening danger to a population in a specific geographic context. The specific source and nature of this threat depends on each situation and context – it could range from flooding to land slides to diseases or violent conflict.¹ Consequently, efforts to monitor, analyse and respond to such diverse threats vary greatly. In this chapter the authors argue that the contextualized, sometimes multi-layered nature of human security must therefore be

matched with an equally multifaceted monitoring, warning and response system.

Depending on the nature and source of the identified threats, their symptoms and causes, monitoring and early warning exercises must focus on very specific information and threat indicators. As the salience of data and events monitored will inevitably vary from threat to threat, the monitoring and warning approach used needs to differ accordingly. Contemporary political early warning systems lack the necessary flexibility to meet this requirement. They generally suffer from two major shortcomings: *First*, their focus lies exclusively on trends leading towards or away from violent conflict. Environmental, economic, and other threats do not feature on the radar screen unless they trigger social unrest or political upheaval. *Second*, in the past, early warning was targeted at ‘Third World countries’ only and the information gained was primarily used by Western states in order to enhance their country policies and development programmes. We believe that in a globalized world where developments in one corner of the globe sooner or later affect all societies, such ‘open source intelligence’ provided more or less exclusively for the donor community is not appropriate anymore – indeed has never been. Early warning information needs to be shared with all stakeholders and the response to human security threats has to be found in a participatory process with the response itself mainly being the responsibility of the local/national governments and non-state actors. Hence, no single-focus early warning system alone will satisfy the monitoring and warning capacity required for human security provision. Moreover, the up to now ‘extractive’ approach to early warning practiced by Western governments has to give way to one that is based on true partnership. The latter is a prerequisite for long-term, sustainable response strategies and mechanisms to alleviate potential and emerging threats to populations’ survival and state and regional stability.

1 The methodological approach towards human security analysis, monitoring, warning and response described in this chapter relies in large part on *swisspeace*’s ongoing work in human security research, particularly the four-year project “Operationalizing Human Security for Livelihood Protection: Analysis, Monitoring and Mitigation of Existential Threats by and for Local Communities,” jointly sponsored by *swisspeace* (HUSEC) and the National Center of Competence in Research (NCCR) North-South: Research Partnerships for Mitigating Syndromes of Global Change. The project is directed by Albrecht Schnabel, who acknowledges NCCR North-South for its support of his work. For further background see: Schnabel (2004: 109–131, 2004a, 2005a); Schnabel/MacFarlane (2005).

The chapter begins with an examination of existing first- and second-generation approaches to early warning and an illumination of the factors that explain their relatively limited utility for human security early warning (96.2). This part is followed by a discussion of the emerging concept of human security (96.3). We conclude by outlining how a third-generation early warning system would have to look like in order to successfully address the genuine human security needs of societies (96.4).

96.2 From Conflict- to Human Security - Early Warning Systems

Most if not all current political early warning systems are geared towards one specific threat, i.e. violent conflict, while they neglect other existential risks to human security linked to economic, political, social or environmental developments. The main reason for this negligence lies in the fact that political early warning generally builds on a traditional definition of security. According to this definition, which was coined during or even before World War Two, the security concept encompasses all forms of military threats and indirect warfare against a nation-state, while non-military threats to society are factored out. There are several reasons why decision-makers favour such a military-centered definition of security.²

The main argument was raised by Richard H. Ullman with regard to his home country: "Politicians have found it easier to focus the attention of an inattentive public on military dangers, real or imagined, than on non-military ones; political leaders have found it easier to build a consensus on military solutions to foreign policy problems than to get agreement on the use (and, therefore, the adequate funding) of other means of influence that the United States can bring to bear beyond its frontiers" (Ullman 1983: 129).

The resurgence of ethnic conflict after the end of the Cold War era has seemed to reconfirm the prevalence of military conflict as the main source of national, regional and global instability and human suffering, further confirming the tendency to return to traditional definitions of security and security provision in the creation of early warning analysis.

96.2.1 Genesis of Early Warning

Originally, early warning was a military concept. Over time it was adjusted for civilian purposes and various types of early warning systems emerged to assist national and international actors in the early anticipation of, and timely preparation for, natural disasters, the outbreak of famine, political destabilization, and forced migration.³ The rationale behind these political early warning frameworks, however, was still reactive rather than pro-active. Early warning and response measures were taken only after a humanitarian emergency had occurred and not beforehand. Crisis de-escalation was the key issue, not solid early preparedness.

Contrary to this first generation of political early warning schemes, present day early warning systems address - at least in theory - not only the symptoms but also the underlying causes of violent conflict. As the term 'early warning' indicates, monitoring and analysis of a potentially conflictive (or otherwise disastrous) situation should be initiated at the earliest possible stage in order to prevent rather than alleviate human suffering. The *Forum on Early Warning and Early Response* (FEWER), for example, defined (political) early warning as the "collection and analysis of information about potential and actual conflict situations, and the provision of policy options to influential actors at the national, regional and international levels that may promote sustainable peace." It further argued that "[e]arly warning is not only about assessing the possibility of conflict but also identifying the possible resurgence of conflict and the opportunities for peace" (Forum on Early Warning and Early Response 1999: 3).

On the one hand such definitions are helpful as they (a) link theoretical analysis of violent conflict to concrete action, (b) acknowledge the necessity to involve a broad range of state and non-state as well as local, regional, national, and international actors in addressing threats to sustainable peace, and (c) they point out the necessity to look not only for signs of escalating tensions but also of peace-building opportunities. The fact remains, however, that this and similar definitions used within the early warning community are still focusing on one single facet of the threat spectrum, which is violent conflict. Neither do they take other existential threats to society into account, nor

2 Krummenacher (1989) has discussed these motives with regard to the Swiss security policy.

3 An overview is given by: Krummenacher/Baechler/Schmeidl (1999: 77-99) and Schmeidl/Jenkins (1998: 56-69).

do they clearly delineate what type of information needs to be collected and analysed. Thus, such definitions invite decision-makers with a traditional military-centred understanding of security to continue looking at factors intimately linked to power structures and the adverse behaviour of opposition groups. The root causes of human insecurity, however, are easily neglected, since the focus is on inter- and intra-state violent conflict triggered by power struggles between opposing parties.

Most if not all political early warning activities fall into this trap.⁴ For instance, the FAST approach⁵ to early warning circumvents this definitional cliff by stressing the need to use a so-called 'analytical framework' in order to identify and categorize causes and issues of conflict for each of the observed countries.⁶ Nevertheless, in the FAST scheme, too, the dependent variable is violent conflict, and environmental or economic collapse, societal disintegration or state failure is beyond its explanatory power. In other words, while FAST is probably one of the more elaborate early warning systems that deals with violent conflict, it still does not capture the complex reality that contemporary societies face with regard to human security. If we are to create early warning systems that live up to this complex reality, we need to build a third generation type of early warning system. To this end, however, a number of challenges have to be overcome. Some of them pertain to models and approaches of early warning systems in general, while others are related to the fact that human security as a dependent variable is not as easily defined and operationalized than such narrowly defined threats as 'famine', 'forced migration', or 'violent conflict'.

4 These include early warning efforts by, among others, the *Uppsala Conflict Data Program* (UCDP), *Virtual Research Associates* (VRA), *Kansas Event Data System* (KEDS), UNDP's *Early Warning Systems in Southeastern Europe*, *ReliefWeb*, *Country Indicators for Foreign Policy* (cifp), *Global Information and Early Warning System* (GIEWS), or *International Crisis Group*, as well as *FAST International*, with whom the two authors are associated.

5 The FAST methodology distinguishes four vital components in early warning exercises: 1) systematic information collection on root, proximate, and intervening factors explaining the likelihood of armed conflict, 2) analysis of these factors and their interlinkages, 3) timely communication of early warning signals to all relevant stakeholders, and 4) linking early warning signals to concrete preventive activities (see: <<http://www.swisspeace.org/fast/>>).

6 See: <<http://www.swisspeace.org/fast/html>>.

96.2.2 Why a Human Security Focus?

96.2.2.1 Human Security as a Guide for Preventive Activity

Why should we focus on human security when considering preventive action? It is not easy to summon the necessary resources and goodwill to commit states, interstate and non-state organizations to preventive activities, when so much of their attention is already required to address the consequences of already ongoing crises. However, most of the very same actors who find it difficult to invest in preventive activities also realize and admit that prevention is the best insurance against the suffering and instability associated with structural and direct violence, and the costs of repairing the subsequent damage. Still, they remain stuck in a mainly reactive mode.⁷

How, then, can we assure that this obvious preference to react can be utilized in encouraging preventive action? The concept of human security offers a solution. If we assume that certain basic human security needs must be met to maintain a minimum standard of stability and order, then we can respond to cases where such needs are neglected. Once such neglect is addressed and needs are met, chances for suffering, disintegration and conflict are significantly reduced. Thus, reaction to observable slippage in the provision of basic security needs amounts to the prevention of eventual conflict, violence and, possibly, war. At the same time a foundation for long-term, positive peace is laid.

96.2.2.2 Human Security as a Pragmatic Notion

The provision of human security is not simply an idealist sentiment. It is a very pragmatic notion. Individuals want their needs fulfilled. In representative and participatory political systems politicians are interested in serving – at least nominally – the interests of their constituencies. If they want to secure their political office, they have little choice but to accommodate

7 For a series of case studies on efforts to mainstream conflict prevention within the UN and regional organizations around the globe, see Carment/Schnabel (2003, 2004) and Schnabel/Carment (2004). Case studies analysed in these books include the *European Union* (EU), the *Organization for Security and Cooperation in Europe* (OSCE), the *United Nations* (UN), the *International Monetary Fund* (IMF), the *Organization of American States* (OAS), the *North Atlantic Treaty Organization* (NATO), and the *Association of South-east Asian Nations* (ASEAN).

their voters' (reasonable) demands. Human security provision is thus the norm in well-functioning political systems where citizens have means and ways to keep those in power under control and where they ensure that the latter spend a substantial portion of their resources on securing the population's interests. If citizens enjoy good, accountable, and responsible governance, a culture of peace is more likely to develop than in an environment of oppression, insecurity and instability. This has positive effects on cross-border relations as well. Human security provision is thus a key ingredient in the creation and consolidation of 'security communities' (Adler/Barnett 1998).

Unfortunately, the majority of the world's population is ruled by governments that do not offer responsible, accountable, and good governance. Governments that are not interested in the welfare of their people will refuse to embrace a human security agenda. There have been suggestions to initiate human security audits or periodically publish a human security index or report. However, these efforts will not be successful as long as the provision of human security runs counter to the interests of many governments. What is needed are self-enlightened governments and leaders; the presence of domestic opposition groups who are capable of challenging irresponsible governments by non-violent means; and/or external pressure by states, sub-regional and regional organizations or the UN to encourage more responsible behaviour by governments.

96.2.2.3 Human Security Concepts in and for the UN System

While human security may be the key to good governance and peace, a fundamental shift of domestic, regional, and international norms towards the recognition of the general welfare of individuals and communities (i.e. the population as a whole) as the primary goal of governance is difficult to achieve. The work of the *International Commission on Intervention and State Sovereignty* (ICISS 2001) is a prominent example of an attempt to integrate human security in emerging global debates (and evolving norms) on the international community's responsibility to intervene in the affairs of sovereign states for 'human protection purposes'.⁸ In its final report, entitled *The Responsibility to Protect*, the ICISS defines "human security" as "the security of people - their physical safety, their economic and social well-being, respect for their dignity and worth as human beings, and the protection of their human rights and fundamental freedoms" (ICISS 2001: 15, para 2.21). It links the in-

ternational community's responsibility to prevent, to react and to rebuild directly to violations of human security. Other reports, studies, proclamations, or resolutions, many of which were the results of studies commissioned or undertaken by the United Nations, have produced a tremendously rich reservoir of recommendations for actions by nation states and their intergovernmental organizations to improve development, human rights and security provision, and thus to strengthen the chances for peace, stability and regional or global security for all.⁹

96.2.3 Human Security – From Debate to Policy?

Threats to the basic human needs of individuals and communities lead to human suffering, social and communal deterioration, and thus to violence in its various direct and structural manifestations. On the other hand, if individuals and communities feel secure and protected from actual and feared existential threats that emanate from social, political, and economic injustice, military violence, environmental disruptions or natural disasters – that is, if their basic human security is assured – human suffering on an individual level and conflict and violence on communal, regional and international levels can be significantly reduced.¹⁰ Therefore, investing in human security – particularly if approached in a pragmatic, systematic and focused way – will produce improved livelihood conditions for individuals and communities that currently live in vulnerable and life-threatening situations. Investing in human security improvements is thus a win-win situation. Moreover, if done in a contextualized (i.e. adjusted to specific needs and specific contexts) and focused manner (i.e. addressing the root causes of

8 The *International Commission on Intervention and State Sovereignty* (ICISS 2001) was established by the Canadian government, co-chaired by Gareth Evans and Mohamed Sahnoun, and modeled along the Brundtland Commission (1987). See at: <<http://www.dfait-maeci.gc.ca/iciss-ciise/menu-en.asp>>.

9 Among these are: UNDP's: *Human Development Report* (<<http://hdr.undp.org/>>), the *UN Millennium Development Goals* (<<http://www.un.org/millennium-goals/goals.html>>), several reports by the UN (2000e, 2001e, 2004, 2005f); the Human Security Commission's (2003) report, at: <<http://www.humansecurity-chs.org/finalreport/index.html>>; the *Human Security Report* (2005), at: <<http://www.humansecurityreport.info>>.

10 See also Lake/Rothchild (1996: 41–75).

threats), such investment is bound to produce positive results.

Many governments and international organizations have recognized the concept of human security as an important item on their national and international security and development agendas.¹¹ It is championed by those governments and non-governmental groups and organizations that oppose power politics – the tendency by powerful states and multilateral organizations to wield their might to advance their own interests and views of the world, which, incidentally, often do not coincide with the views of many of the less powerful. When it was initially introduced to broader policy and academic debates by the *Human Development Report* (UNDP 1994), where the concept was used as a comprehensive approach to encompass all human rights, security and development threats experienced by individuals and communities, the human security concept was meant to represent a key instrument in fighting poverty and improving human livelihoods. Human security has been promoted primarily by countries such as Sweden, Norway, Japan, Switzerland and Canada.¹² Some politicians and policy-makers have actively introduced the concept to the highest-level international debates – most prominently exemplified by former Canadian foreign minister Lloyd Axworthy's initiative to introduce the concept into UN Security Council debates (Oberleitner 2005: 185–203; Dedring 2008). Japan's initiative of a Human Security Commission added prominence and worldwide deliberations to the concept of human security (CHS 2003).

There has been an ongoing debate between those favouring a broad and those favouring a narrow definition of the human security concept. Some of the most forward-looking protagonists of human security, such as Canada, champion a narrow definition of the concept, one focused on *freedom from fear*. For reasons of political expediency as well as intellectual clarity, the focus is on personal security, immediate threats from violent conflict, and the provision of a *negative peace* (Galtung 1969). Such threats are miti-

gated primarily by operational preventive action once violent conflict is imminent or – in post-war situations – its resurgence must be prevented (Human Security Centre 2005). Others think quite differently: Much like the 1994 *Human Development Report*, the Human Security Commission's Report *Human Security Now* argues that a broader bandwidth of threats should be addressed, and existential threats of individuals should be addressed regardless of their source. The Commission equates human security with the protection of “the vital core of all human lives in ways that enhance human freedoms and human fulfilment” (CHS 2003: 4). The Commission further argues that, “[h]uman security means protecting fundamental freedoms – freedoms that are the essence of life. It means protecting people from critical (severe) and pervasive (widespread) threats and situations. It means using processes that build on people's strengths and aspirations. It means creating political, social, environmental, economic, military and cultural systems that together give people the building blocks of survival, livelihood and dignity” (CHS 2003: 4).

Thus, our understanding of human security analysis and provision – and our point of departure for a human security-based early warning system – focuses on the following five pillars (Schnabel 2004a):

First, human security focuses not only on armed conflict and its consequences for civilians, but also on many non-traditional security threats, including threats arising from diseases, or economic or environmental disasters. The costs of non-traditional security threats can be as – or more – devastating for human beings as those of traditional security threats. Moreover, they often have the potential to escalate into violence and war.

Second, the nature and level of human security and human insecurity depend highly on the context of one's analysis. For example, populations along border regions experience dramatically different threats than those living elsewhere in the country, or those living in a large capital. Thus, analysis of human security threats as well as the identification of mitigation measures is highly context-specific.

Third, a thorough threat (not ‘conflict’) analysis is key to identifying the most pertinent human security challenges.

Fourth, using a vulnerability scale as threshold criteria, one is able to differentiate between life-threatening and non-life-threatening dangers for the population. The former – actual or potential life-threatening danger – qualifies as a human security threat. Thus, a sanitation issue with deadly consequences for the

11 For an analysis of human security as a foreign policy tool, see: Debiel/Werthes (2006).

12 See the ‘human security’ website of the Canadian Government's Department of Foreign Affairs and International Trade (DFAIT); at: <<http://www.dfaitmaeci.gc.ca/foreignp/humansecurity/menu-e.asp>>. See also Lloyd Axworthy (1997: 183–196) and Behringer (2005: 305–342). For more information on the work of the Human Security Network, see: <<http://www.humansecuritynetwork.org/>> and chap. 75 by Fuentes/Brauch.

population of a refugee camp could be a major human security threat, while ethnic tensions within that same camp, yet with little potential of escalating into physical violence, are not human security threats. In order to assure the feasibility of response measures, 'human security clusters' are formed by a small number of such existential threats within a given context.

While this seems to be a very selective approach, focusing on issues with the most severe impact on the survival of the population, the *fifth* component of this approach focuses on root cause analysis and alleviation. The root causes of such visible, actual, life-threatening dangers inevitably overlap with those root causes of non-life-threatening vulnerability. Tackling the root causes of the former will inevitably also reduce suffering at the level of the latter. Root cause alleviation in the context of the most severe human security threats is thus seen as a comprehensive tool for the prevention of both life-threatening and non-life threatening dangers for suffering and endangered populations. Below we will discuss the possibilities for building an early warning system on such an approach to human insecurity identification and human security provision.

96.2.4 Challenges and Opportunities of Human Security-based Early Warning

Many challenges of a human security-focused early warning system reflect those of any early warning system. Some challenges are, however, unique to attempts at gearing an early warning system towards a cluster of threats that have emerged as key obstacles to the survival and safety of the population. They focus on a different approach to threat analysis, the necessity to undertake ongoing analysis, assessment and possibly reconsideration of key threats, and the necessity to move away from 'one-size-fits-all' approaches to the design and application of focus, method and implementation of early warning systems.

96.2.4.1 Focus of Early Warning

One of the key questions of any early warning effort is: What do we warn of? What are the core threats to human security that need to be addressed and that we wish to cover with our early warning system? In the context of human security monitoring it is obvious that a wide array of environmental, economic, social, cultural and political dimensions needs to be considered. However, the focus of monitoring and warning as well as the indicators used depend on the perceived

real threats (existing dangers) and potential threats (fears and concerns) identified in each covered geographic context. Once these threats are identified, the early warning system must develop indicators, methodologies and approaches to data collection and analysis that are suitable to the type of information required to measure such threats. For instance, event data may be particularly useful to track latent conflict developments but not the onset of environmental disasters. Thus, the nature of the threats monitored will also influence the methodology and type of data collection and assessment. One has to envision to run parallel systems based on a diversity of threats - or to generate one system with several thematic analysis units utilizing the same information collection, monitoring and analysis system. In the latter case the data collection and indicators used must be broad and versatile enough to accommodate the diversity of information required for tracking developments of several threat scenarios.

96.2.4.2 Method

Once the threats to, and vital requirements for, human security in a given country or region are identified, appropriate methodological approaches to monitoring and analysis have to be chosen. There are basically three methodological types of early warning systems: qualitative and quantitative approaches, and a combination of both. Examples for qualitative early warning systems are the publications of 'Human Rights Watch', 'Amnesty International', or the 'Crisis Group'.¹³ Analysts of such institutions are normally based in the countries monitored and produce risk assessments and recommendations based on context-specific background expertise. Quantitative early warning models boomed in the 1990's; partly because of a greater availability of data due to the fall of the Iron Curtain, and partly because of significant improvements of computer technology. The basic principle behind such models is the collection of structural or event data, which is then analysed in order to provide statistical trends of a country's stability or the

13 We consider them to be early warning systems even though they often lack typical early warning characteristics such as theoretical rigidity and periodicity. The country reports of the Crisis Group, for example, do not focus on the same conflict relevant factors but highlight varying specific dimensions or thematic issues of a conflict. In addition, reports are issued in irregular intervals and end-users of CG-reports never know when to expect the next issue.

level of conflictive and cooperative actions. Examples for quantitative oriented early warning systems are the Kansas Event Data System developed by Deborah Gerner and Philip Schrodt¹⁴, Barbara Harff's work in the field of genocide and politicide¹⁵, and the *Country Indicators for Foreign Policy* (CIFP) programme run by David Carment.¹⁶ Early warning systems that combine both approaches, such as FAST International¹⁷ and CEWARN (which draws on FAST methodology)¹⁸, benefit from the combination of extensive, standardized data collections, quantitative analysis, and qualitative expertise of country experts. We strongly believe in the necessity of combining quantitative and qualitative approaches to data collection and analysis.

96.2.4.3 Recipient of Analysis

It is not enough simply to generate information and hand it to those who might be in the situation to take necessary responses. If the recipients of early warning information are not placed, capable or willing to take action, early warning analysis would be nothing but an academic exercise without any effect on the improvement of volatile situations. Those who are engaged in early warning work, particularly if operating on a system that focuses on context-specific threats and their amelioration, must assure that the recipients of their analyses – the expected response actors – are closely involved in the early warning process and that they support the work done by the early warning system. Thus, those of us involved in early warning must ask a number of important questions: Whom do we want to warn? Who is the appropriate recipient of our analysis and warning? Are we aware of the political context within which recipients will receive our analysis and warning? Will they use the results of analysis and warning to serve the population's or their own particular interests? Is transparency of early warning analysis and recommendations assured? In short: How do we treat information, who should receive it and who not? Have the recipients of warning signals been adequately involved in developing the system so that it re-

sponds as closely as possible to their needs, capacities and requirements? Are the outputs/products of the early warning system presented and packaged in a way that is most appropriate for quick and thorough consumption by the recipients, and that responds to the recipients' needs and capabilities? Without satisfactory answers to these questions early warning activities stand on very weak ground.

96.2.4.4 Quality of Analysis

As a result of the 'cottage industry' that emerged from the prevention hype of the early to mid-1990's, many institutions claim to produce early warning analysis and policy description. However, only few have been able to produce useful products on a consistent, systematic basis, and others have overstepped their mandate of providing solid analysis to embark on the slippery path of advocacy. Despite the obvious need to pool resources and know-how, institutions show little willingness to cooperate, share information or develop and use common tools and methods. Funding continues to be rare and competition for funding is high. Donors are not without fault – they tend to show interest in supporting a diversity of small programmes with limited funds rather than a limited number of collaborating programmes with more significant funds. Donor coordination and cooperation would be able to improve much in this direction. Furthermore, as regards the methods used to collect and analyse data, too many institutions cover too many countries in unsystematic ways, with very little attention to detail and long-term analysis. The more countries would be covered by early warning efforts, the less 'selective', judgmental and thus politically sensitive it would appear if a country finds itself included on a certain organization's early warning roster. Unfortunately, governments' and regional or international organizations' willingness to fund early warning and preventive activities seems to have declined sharply in the past years, despite repeated calls in major international reports and policy statements for strengthening, not weakening, preventive capacities of state and intergovernmental actors. The former UN Secretary-General Kofi Annan's quest to make prevention part and parcel of international, global policy making, has not materialized and has lost further momentum with the end of his term.

96.2.4.5 Warning-Response Gap

The main challenge of early warning is the ability to bridge the gap between early warning and early ac-

14 See <<http://web.ku.edu/keds>>.

15 See at: <<http://www.cidcm.umd.edu/inscr/genocide/>>.

16 See at: <<http://www.carleton.ca/cifp/>>.

17 For more information on the FAST programme of swisspeace, see: <<http://www.swisspeace.org/fast/>>.

18 For more information on CEWARN, the *Conflict Early Warning and Response Mechanism of the Intergovernmental Authority on Development* (IGAD); at: <<http://www.cewarn.org/>>.

tion. Strong commitment by all stakeholders to act timely, appropriately and in a coordinated manner is imperative in ensuring effective early warning and crisis mitigation. With the help of thorough conflict and threat analyses, stakeholders (and key security providers, including foremost government authorities) can work with early warning systems on the root causes of potential violence and on the identification of early indications for evolving instability and crisis. Focusing on human security – on the survival needs of the populations – states would be able to show their commitment to serving society, not merely themselves. With their support, security providers would be able to adapt their work to the aim of long-term, sustainable and preventive action. Early action requires proper preparedness and the selection of the most appropriate and effective entry points for mitigation strategies. Both should be pursued in close cooperation with early warning systems. However, the issue of timing is not only crucial in the initial involvement in evolving crises situations, but also in choosing the most appropriate exit strategy: At that point, one's assistance should have created the basis for sustainable improvement, and relevant stakeholders should have been strengthened and equipped to the point where they can carry forward the work initiated by external actors, while progress should ideally be visible enough to allow external actors to sense that their input has been successful. Continuous monitoring of the impact of mitigation measures is thus a key issue in measuring what would otherwise be extremely difficult to assess: The impact of preventive activities. Such monitoring would quickly reveal if the gap between warning and response is not being closed. It would also inform those responsible for monitoring and analysis as to which recommendations and measures work, which do not, and which impact this may have on the approach, methodology and nature of monitoring, analysis and the generation and transfer of recommendations. If we talk about an 'early warning system' – in contrast to an early warning 'activity' – we are referring to a process that spans monitoring, analysis, recommendation for (policy) response, design and implementation of response actions, and subsequent monitoring and assessment of such mitigation measures. For early warning to be successful – in any context and in regard to any threat – we have to take such a system approach. Thus, partners in early warning and response need to work closely together.

96.2.4.6 Political Sensitivity

Resistance of those who fear intrusions in their own political backyards has been successful in spoiling efforts of strengthening early warning and preventive capacities by the UN and other well-intentioned international actors. Political sensitivities still surround 'early warning' as a political activity: They concern on the one hand the presence of foreign representatives who conduct 'intelligence' work for supposed benign reasons to improve and strengthen development assistance programmes, and on the other hand the debates at highest international levels about a much talked about 'responsibility to protect' populations whose human security needs are being violated at least partly at the hands of their own governments. For many governments these are worrisome issues. These developments go hand in hand with a certain degree of loss of faith in the UN as the neutral 'conscience of humankind' – because the organization is too heavily influenced by the North while proving extraordinarily resistant to efforts of further democratization, political opening and reform. Nevertheless, in order to be effective and be heard, early warning systems need to find ways of remaining objective and maintaining the ability to offer constructive criticism – even directed at governments, if needed – while at the same time they must retain the possibility to cooperate with government actors. Here again the advantage of a human security focus comes to the fore: Focusing on issues below the level of armed violence creates space for tackling root causes of human misery through engaging less sensitive issues, yet with a chance for real impact.

96.2.4.7 Measuring Success

The role and success of early warning depends on the degree to which it can be translated into early action. Thus, early warning can only be as useful as relevant organizations and individuals are committed to incorporating early warning analysis into their short-, mid-, and long-term activities and planning, particularly if this refers to efforts at root cause mitigation. In general it is difficult to prove the effectiveness of early warning systems in preventing crises, disasters and destabilization: Success of early warning depends on the counterfactual that due to specific actions negative events and developments did not occur. In addition, it is difficult to measure the extent to which early warning signals are incorporated into the work of relevant stakeholders, and to what degree and extent they do trigger early action. Should a deteriorating sit-

uation improve for the better, it is moreover difficult to link such developments to the implementation of recommendations generated by the early warning system. Often, credit for constructive mitigation efforts has to be situated with the implementing actor (for instance, government agencies), even if they were triggered by analysis and recommendations from the early warning system. Nevertheless, this challenge may be less problematic for a human security-based early warning system, where specific – and very concrete – threats are monitored, and specific response measures are designed and assessed for their implementation and effectiveness. Assessment of response measures requires a clear understanding of the targets, goals and indicators for success associated with each of them. We are thus not dealing with counterfactuals: We do not search for what has not happened (i.e. a crisis), but what has happened (i.e. the effect that counter-measures had on specific root causes). Human security-based early warning focuses on key problems that can be alleviated in order to prevent key threats. If such key problems persist, counter-measures were either misplaced, ineffective, or they were never implemented. Information on these issues will inform revised measures and undoubtedly will have an impact on the results of threat monitoring.

96.3 Contours of a Human Security-Based Early Warning System

Despite their often-lamented lack of measurable success, early warning systems are likely to proliferate. Catastrophes of various kinds will continue to happen, but authorities at state and international levels as well as private business and civil society actors are increasingly wary of the high costs of post-disaster rebuilding. While even functioning early warning systems will not always lead to early and effective responses, there is no alternative to the creation and strengthening of early warning systems. The often-mentioned claim that despite the ample and timely availability of information and warning, response measures fail due to inadequate political will is also an overstated and unhelpful argument. Any early warning effort outside a well-lubricated early warning system in which each part of the system feeds off and informs the other will have great difficulties in generating the desired results. Moreover, if – as is the case with most early warning systems – threats are pre-selected with little or no effort in consulting stakeholders or in adapting to changing security situations, such

early warning efforts simply miss the point of their very existence: To generate knowledge about effective response options to prevent major disasters from threatening populations' safety and survival. What we propose here can be summarized very simply in three points: a) early warning must be part of a monitoring-warning-response system, without which it cannot be effective; b) early warning systems must respond to the actual threat(s) to the security and survival of the population in a given context; and c) the key threats monitored and responded to by early warning systems must be identified as a result of collaborative, participatory multi-stakeholder processes. Particularly the latter point will also increase the likelihood that different components of early warning systems will not only speak to each other but also act with each other in successfully addressing those root causes that are responsible for the most severe threats to all stakeholders' survival and future well-being.

96.3.1 Human Security Threat Analysis

Human security-based early warning systems, if properly conceived, would help resolve a great number of problems that have so far plagued such systems. Due to the multi-stakeholder process in identifying (and over time verifying) key threats and respective response strategies to life-threatening dangers, chances are high that an early warning system would target the most relevant threat(s), including traditional (and non-traditional) security threats. Focusing on threats that, in the first instance, affect populations, will add legitimacy to early warning efforts at the level of society, state and international community. All three communities will have to contribute to response efforts and thus must be able to identify themselves with the legitimacy, approach and focus of any given early warning system.

Human security early warning systems will prioritize a small number of severe threats and outline feasible response measures to effectively alleviate root causes, thus increasing the likelihood that response actors (or human security providers) find it necessary to implement response options. Root cause alleviation will in all cases reduce the suffering among the population and therefore generate positive – and observable – results that speak to the necessity and success of implementing contextual human security warning and response systems. Focusing not only on armed conflict, genocide or failed statehood (issues that are at the centre of existing early warning programmes) will increase the likelihood that govern-

ment actors will listen and act in political contexts that tend to be hostile towards traditional early warning and prevention initiatives.

96.3.2 Structure and Procedure

In addition to these basic requirements, we can identify a few technical issues of structure and procedure, which would help overcome some of the challenges of successful early warning outlined above. These apply to attempts at generating new human security-based early warning systems, or at upgrading existing early warning systems so that they are able to meet the basic criteria of human security early warning.

When developing early warning systems or when integrating an early warning component into one's work, one should ideally develop comprehensive approaches that combine monitoring, analysis, early warning and early response: Thus, applied prevention should take the form of integrated, systematic and long-term commitments, in close cooperation between all those involved in the early warning cycle ranging from threat monitoring to response implementation. Existing efforts should be evaluated, revised and adjusted to reflect such comprehensive approaches.

The early warning system should offer systematic early warning services for in-house access, for partners within the early warning system, and for use by external audiences and users. While early warning systems can collect, monitor and analyse data (at local, country, regional or global levels) either locally or externally, linking both local and external monitoring, data collection and processing provides a solid balance between local and external expertise and biases.

Early warning systems can process their collected event and structural data either through qualitative or quantitative methods. While there are often clear preferences towards one or the other method (often related to misplaced mistrust toward the other 'school of thought'), both approaches to early warning analysis are highly complementary and should go hand in hand. Whenever possible, long-term, systematic and thorough analysis of positive and negative trends should be combined with short-term expert analysis of particular events, how those events affect certain more or less problematic situations, and how these may impact the level and nature of the threat under observation by the early warning system.

96.3.3 Taking an Early Warning 'System' Approach

Ideally, a number of very general steps should be standard practice for early warning systems: 1) Those who collect and code pertinent data should possess local expertise; 2) only state-of-the-art data processing and analysis tools should be utilized; 3) local and international experts should interpret the results of such analysis in a holistic manner, by taking into account political, economic, social and cultural factors in crisis and disaster situation assessments; 4) those experts relate the findings to entry points for local and external actors who have the capacity to slow down or alleviate negative - and strengthen positive - developments; 5) early warning analysts are informed about policy and programme design and implementation; and 6) performance of implementation measures is included in monitoring activities.

Early warning is a team effort: Few organizations have the capacity, competence and mandate to be responsible for all aspects of early warning and early response: from monitoring to analysis to decision support and policy design, to implementation and evaluation. Realistically, several actors, both at state and non-state levels, need to cooperate closely if an early warning system is to run smoothly and for the benefit of all stakeholders involved. Some organizations are better placed to conduct monitoring and analysis, others to develop policy options and assure implementation. Nevertheless, without close cooperation - starting with a common decision as to what to warn of (threat) and what to look for (root cause indicators) - no early warning system can function effectively. The ownership of early warning systems should as much as possible rest with local or national actors. This may help to counter and alleviate any possible misgivings about the practice of certain countries, mostly from the North, and certain intergovernmental organizations to interfere in the internal affairs of states.

If willingness to engage in such cooperation can be secured, then the first step will have been accomplished towards an effective warning and response tool. If the various actors involved in an early warning system are not willing to cooperate, the effectiveness and success of such a system is doomed. Therefore it pays to accept delays in launching early warning systems until the key stakeholders have reached the point where they will in fact be ready to create a truly cooperative early warning and response system. That point, we believe, will be reached quicker if an early warning

system is based on human security criteria, speaks directly to the stakeholders' needs and the context concerned, and builds on cooperative efforts between a range of governmental and non-governmental human security providers.

96.4 Conclusion

Physical survival is the very basic need of a human being. Other needs beyond the simple physical survival determine the quality or comfort of life. For the majority of the world's population, life is a constant struggle to secure a minimum of comfort and self-fulfilment. Human security, as defined earlier in the chapter and based on the human security research conducted by one of the authors, stands for the ability of people to secure this minimal right – the right of physical survival. If people cannot be sure if they will survive the next day or week or month, if they have to fight to secure the survival of themselves, their families and communities, society will neither be stable nor peaceful. It is therefore these existential threats that endanger the lives of people, which are at the heart of our understanding of human insecurity. Those threats vary from region to region, from country to country, from place to place.

Most of today's early warning efforts focus on violent conflict as the key threat in need of prevention. However, consider these figures: The number of battle-related deaths has declined sharply over the past 50 years – according to one estimate from around 700,000 during the time of the Korean War to roughly 20,000 in 2002;¹⁹ and according to another estimate from approximately 600,000 in 1998 to 170,000 in 2002.²⁰ The differences in estimates relate to the inclusion or exclusion of civilian war-related deaths. These figures are still tremendously high, particularly considering that non-violent solutions to communal, intra-state and interstate conflict should be embraced by any political authority with some sense of responsibility towards its and other nations' populations. More needs to be done to prevent these violent conflicts. Still, violent conflict is by far not the greatest threat to people's survival: Even if we continue to focus on violent deaths: In the year 2000, out of a global estimate of 1,659,000 violence-related

deaths, only 310,000 were war-related, while 520,000 were homicides and 815,000 suicides.²¹

Moreover, while around 40,000 to 230,000 people died in violent conflicts in 2001 according to estimates by the UN Fund for Population Activities, in the same year 22 million people worldwide died of preventable diseases. HIV/AIDS are killing approximately 3 million people annually; tuberculosis 1.7 million; and hepatitis B between one-half and 3 million people. Between 600,000 and 1.2 million people are estimated to die of measles every year; 2.5 million children under the age of 5 die of diarrhea; and 4 million of respiratory infections. In addition, cancer, for instance, kills 7 million people per year.²² Every year an estimated 529,000 women die during childbirth (a number much higher than battle-related deaths and equal the annual figure of homicides).²³

Similar comparisons could be made in relation to casualties of environmental catastrophes. These statistics show that threats to people's survival are manifold – and that the focus of today's early warning systems on violent conflict is greatly inadequate if we want to prevent the most significant threats to people's survival. Moreover, reducing the danger of such threats will create the conditions for social and political stability and avoid wars, which, in turn, will prevent further suffering caused by armed conflict.

Beyond the main claim of our research that early warning systems should also focus on threats beyond armed violence, we found that too many early warning efforts operate in virtual vacuums: They monitor, analyse, and generate more or less suitable recommendations for security providers that are more or less informed and convinced about the utility of such information. Most of today's early warning systems are not 'systems' as such – they are individual components of what should be full-fledged early warning (and response!) systems.

A number of questions remain unanswered – such as who should take the lead and coordinate early warning and response systems, how tasks can be distributed based on each partner's comparative advantage, and how different early warning systems, each of them focusing on very specific priority threats, can collaborate in order to avoid overlap and duplication

19 See at: <<http://www.humansecurityreport.info/figures/Figure1.6.pdf>>.

20 See at: <<http://www.humansecurityreport.info/figures/Figure1.7.pdf>>.

21 See at: <http://wmc.who.int/pdf/WHO_Euro_Health_Rep_ch1.pdf>, p. 10.

22 See at: <<http://www.ph.ucla.edu/epi/layne/Epidemiology%20220/diseases.pdf>>.

23 See at: <<http://www.unfpa.org/swp/2004/presskit/docs/message2.doc>>.

in the collection of data and events, and in the generation of response measures that would be relevant to a variety of early warning systems (and their priority threat focus). These and other questions need to be answered in the abstract and by trial-and-error - yet the fundamental mind-shift towards human security-focused early warning must first happen before further technical challenges can be resolved.

97 Methods and Techniques of Remote Sensing to Contribute to Security in Tropical Rain Forests

Dirk H. Hoekman

97.1 Introduction to Information Needs and Techniques¹

Primary and secondary tropical rain forests cover large parts of the Earth's land surface. The significance of these forests, and the need for information, can be seen from several perspectives. First, tropical rain forests play an important role in global hydrological, biochemical and energy cycles and, thus, in the Earth's climate. Second, tropical rain forests are among the Earth's most complex ecosystems and have large biodiversity. The functioning of this ecosystem and the significance of its genetic resources are still not well understood. Third, tropical rain forests are of large economic value as a major source of timber and other products, and as a source of land. Large areas are converted into forest plantations, arable land and pastures. The rate of deforestation in natural tropical forests has been fairly stable at a level of 14.2 million ha per year on average during the past decennium according to FAO (2001b).

Increased awareness and concern on the unprecedented high rate of deforestation resulted into an ongoing discussion among scientists and politicians, which may be characterized by strong conflicting interests and lack of data. Following the 1992 UNCED conference in Rio de Janeiro some progress has been made in the areas of sustainable forest management and climate, however, progress in the area of protection of biological diversity has been relatively poor. For sustainable forest management certain 'Criteria and Indicators' have been developed, among others, by the *International Tropical Timber Organization* (ITTO) and the *Forest Stewardship Council* (FSC), resulting in a system for timber certification. The Kyoto Protocol of the *United Nations Framework Conven-*

tion on Climate Change (UNFCCC) describes measures to mitigate the increase of greenhouse gases in the atmosphere. Article 3.3, in particular, concerns the role of deforestation and afforestation. A crediting system enables trading of CO₂ emission and sequestration volumes. In contrast to the development of 'timber certificates' and 'carbon credits' the *Convention on Biological Diversity* (CBD) which was ratified in 1994 did not yield mechanisms (yet) for protection of biodiversity. New initiatives, such as proposed at the 2002 COP-6 conference in The Hague, focus on an ecosystem approach in connection with issues related to sustainable management, climate and fire prevention.

Partly, the slow and cumbersome progress in these important fields is a consequence of the lack of insight in the functioning of ecosystems, lack of accurate data, and lack of good definitions. Remote sensing systems may play an important role in the development and implementation of such international treaties. The ongoing discussion on the carbon cycle is a clear example. Though there is a strong interest in data on the amount and distribution of biomass over the earth surface, most of the currently existing biomass maps may be of very poor quality. This is clearly illustrated by the paper of (Houghton/Lawrence/Hackler/Brown 2001). Seven biomass maps of the Brazilian Amazon produced by different authors and approaches are cross-compared. The results show clear disagreement, both for the spatial distribution of biomass (correlation between results obtained with the different methods vary from 0.05 to 0.35) and the absolute levels of biomass.

At present, the largest single source of uncertainty in the global carbon budget, amounting to 1.3 Giga-ton carbon per year, is due to terrestrial ecosystems (IPCC 2001). The study of the carbon cycle and its influence on processes related to climate change requires different sorts of earth surface observation (monitoring) in order to supply the necessary infor-

1 JAXA is acknowledged for providing JERS-1 SAR data in the framework of the K&C Initiative programme.

mation on carbon flow dynamics (Quegan/Le Toan 2001). Forest structure and biomass are important ecological descriptors needed as input for quantification of ecosystem productivity at different levels.

During the past decade research activities on the development of the application of *synthetic aperture radar* (SAR) for monitoring ecosystem processes has grown significantly. Its potential use can be categorized broadly as follows: (a) classification and detection of change in land cover; (b) estimation of woody biomass; (c) monitoring the extent and duration of inundation; and (d) monitoring other temporally-dynamic processes (Kasischke/Melack/Dobson 1997). To fulfil information needs, accurate mapping and monitoring is required at different scales. Severe cloud cover often prevents the acquisition of optical remote sensing data, thus making the (additional) use of satellite radar remote sensing for monitoring applications necessary. At the other hand, radar data may provide different or additional information, thus making (the additional use of) radar data (both spaceborne and airborne) an interesting choice, also for less timeliness-demanding applications such as inventory (Hoekman 2001). In recent years many research activities focused on the use of SAR to study tropical rain forest. At continental scale mosaics of all tropical rain forests have been created using JERS-1 SAR images (Siqueira/Hensley/Shaffer/Hess/McGarragh/Chapman/Freeman 2000; Rosenqvist/Shimada/Chapman/Freeman/De Grandi/Saatchi/Rauste 2000) and, for Africa, using ERS-1 SAR (De Grandi/Malingreau/Leysen 1999). At a larger scale researchers have focused their studies on the development of inversion algorithms, segmentation and classification techniques for polarimetric and interferometric SAR images and created a variety of types of tropical rain forest classifications, for example using texture (Oliver 2000), mapping tropical rain forest types and its biophysical characteristics (Hoekman/Quiñones 2002) or individual trees (Varekamp/Hoekman 2001).

In this chapter the suitability of radar techniques for acquiring relevant information on rain forests is illustrated with examples of studies conducted by the author in Indonesia.

97.2 Space Agencies and Ecosystem Monitoring

97.2.1 Ecosystems

Many of the world's ecosystems are critically endangered or lost. The Millennium Ecosystem Assessment (see at: <www.maweb.org>) clearly shows that the functions and capacities provided by the remaining ecosystems would not suffice to sustain mankind. Consequently, it is of utmost importance to protect remaining intact ecosystems, restore degraded ecosystems, and to develop approaches for continental scale ecological structures. However, until now, efforts seem to be too small and insufficiently uncoordinated.

97.2.2 Observations from Space

The Space Agencies are aware of their specific role in providing relevant information. Dedicated space missions and sensors have been designed to observe our environment systematically. However, until now, data have not been exploited sufficiently, notably for the terrestrial ecosystems. For example, only 3 per cent of the millions of space radar images collected in the previous decade have ever been used. Because of limited processing capabilities the focus has been on spatially fragmented observation of short duration, mainly for scientific purposes.

97.2.3 Recent Developments

Several recent developments may lead to a considerable better information supply. (i) The *Japanese Space Agency* (JAXA) adopted the policy to exploit data from new missions systematically to support international conventions such as the climate convention (UNFCCC), the biodiversity convention (CBD) and the wetlands convention (Ramsar). Since Japan lacks capability to do this on its own, tasks are delegated to internationally renowned organizations. These organizations receive large quantities of data free of charge, for a specific geographical region and purpose, and during the whole mission period, under the condition that all these data will be processed and that publicly accessible products are generated. (ii) BOS (an Indonesian nature conservation organization) and SarVision successfully introduced a rapid illegal logging response system in Indonesia based on radar data provided by the *European Space Agency* (ESA) (see at: <www.sarvision.nl>). As a result Space Agencies are

motivated to provide large quantities of radar data to develop large scale application in tropical rain forest areas. (iii) Recent developments in computing capabilities and Internet technologies allow automated processing of enormous quantities of data and fast distribution of resulting maps to remote users. For example, it has been demonstrated by SarVision and BOS that illegal logging operation could be ended within 5 days after a new observation of the ESA radar satellite.

97.2.4 New Opportunities

Capitalizing on these new developments, a number of problems, which currently limit progress in environmental security issues, can be addressed. (i) Information required by local managers can be generated systematically and spatially complete, and can be made available in a fast, frequent and continuous way, even at remote locations. (ii) Transparency is achieved. Financers of environmental services, politicians, or even the general public, can monitor ecosystem developments. (iii) Currently every organization is buying its own (very limited amount of) data; there is reluctance to share data, or to develop common methodologies. Better use of limited financial resources is made, and a major step towards integrated policies, when the proposed large scale applications emerge.

97.2.5 New Approaches

The approach should be highly proactive. Dedicated remote sensing organizations should serve as a bridge between user communities and the space agencies by participating in space mission planning, claiming capacity and data from the space agencies, processing data systematically in a fast and automated way in consultation with the users, and making products widely available. Data, in principle, should be collected within a targeted vast region for *all* areas environmentally important or sensitive, even though such data may not seem to serve a direct purpose. The reason is that as soon as adverse conditions develop (in many areas this inevitably will happen), data are already available and the developments which led to these adverse conditions can be assessed. To this aim the concept of a public library is proposed, where users can find up-to-date products as well as complete histories of land cover change. For Indonesia, for example, such a library is currently being filled by SarVision with data products of the Insular South-East Asian region. It encompasses medium resolution data

(with 150–1000 m detail) covering the entire region for the past decade, the most recent products showing the status less than 6 months ago. In addition, for areas of particular importance, and for applications like fast illegal logging response, it contains data at even higher resolution (25 m detail), the most recent products showing the status less than 35 days ago. Product types range from continental scale land cover, forest cover change and fire occurrence maps to detailed products showing hydrological and ecological characteristics (see at: <www.sarvision.nl>)

97.3 Peat Swamp Forests and the K&C Initiative

97.3.1 Present Condition of Peat Swamps

Thick deposits of peat underneath tropical peat swamp forests are among the world's largest reservoirs of carbon. Although occupying only about 0.3 per cent of the global land surface, they could contain as much as 20 per cent of the global soil carbon stock, representing 63–148 Giga ton of carbon (Rieley/Setiadi 1997; MacDicken 2002). The tropical peat swamp forests of Southeast Asia account for approximately 26.5 million ha of the total tropical resource of 38 million ha, with Indonesia alone contributing an estimated 17–27 million ha (Waldes/Page 2002).

The role of peat swamp forests in the conservation of biological diversity is noteworthy as they harbour a high percentage of globally threatened species. For example, of the 57 mammal and 237 bird species recorded in peat swamp forests to date, 51 per cent and 27 per cent, respectively, are listed as globally threatened species (Sebastian 2002). Furthermore, a number of formerly widespread species that are now rare can still be found in peat swamp forests, such as the Sumatran rhinoceros, the Sumatran tiger and the Orangutan in Borneo.

The areas are threatened by large scale deforestation, canal drainage and forest fire, causing enormous carbon emissions (Goldammer 1999; IUCN/WWF 2000). Emissions from the fires in Indonesia during the strong 1997–1998 *El Niño Southern Oscillation* (ENSO) event, for example, have been estimated at 0.8–2.5 Giga ton of carbon. This is equivalent to 13–40 per cent of the global annual emission from anthropogenic fossil fuel combustion (Page/Siegert/Rieley/Boehm/Jaya/Limin 2002).

Despite the relevance of this ecosystem, relatively little is known about its functioning and existing maps

are often of poor quality. L-band radar monitoring provides a means to observe seasonal dynamics of flooding, the impact of drainage by canals and the condition of the forest cover. A new methodology for mapping biophysical parameters, hydrological modelling and monitoring based on historical JERS-1 radar data has recently been introduced (Hoekman 2007). This methodology will be applied within the K&C Initiative.

97.3.2 K&C Initiative

In 2000, the *Earth Observation Research and Applications Centre* (EORC) of the *Japan Aerospace Exploration Agency* (JAXA) initiated the *Advanced Land Observing Satellite (ALOS) Kyoto & Carbon (K&C) Initiative* to support explicit and implicit data and information needs raised by international environmental *Conventions, Carbon Cycle Science and Conservation* of the environment (commonly referred to as CCC). The Initiative, which is led and coordinated by EORC JAXA, is also supported by an international Science Team from 13 countries and focuses primarily on defining and optimising provision of data products and validated thematic information derived from in-situ and satellite sensor data, focusing particularly on that acquired by the *ALOS Phased Array L-band Synthetic Aperture Radar (PALSAR)*.

The objective of the ALOS K&C Initiative is to define, develop and validate thematic products derived primarily from ALOS PALSAR data that can be used to meet the specific information requirements relating to the CCC. A key component has been the development of a systematic data acquisition strategy that fits within the constraints imposed by the orbital and technical capabilities of the spacecraft and also ensures that adequate data will be collected to allow the required thematic output products to be developed on a timely basis.

The K&C Initiative is based on the three coordinated themes relating to global biomes; forests, wetlands, deserts and semi-arid regions, and a fourth theme dealing with the generation of regional ALOS PALSAR mosaics. Each theme has identified key products that can be generated from the mosaics including land cover (forest mapping), forest change mapping and forest biomass and structure (forests), global wetlands inventory and change (wetlands), freshwater resources and desertification (deserts). Each of these products is generated using a combination of the PALSAR ScanSAR or fine resolution mosaics of backscatter or coherence datasets.

*The K&C Initiative builds on the experience from the Global Rain Forest Mapping (GFRM) and Global Boreal Forest Mapping (GBFM) projects, using data acquired by the JERS-1, the predecessor of the ALOS PALSAR. These projects confirm the utility of L-band SAR data for mapping and monitoring forest and wetland areas and the benefits of providing spatially and temporally consistent mosaics for regional-scale monitoring and surveillance.*²

97.3.3 Radar Observation Methods

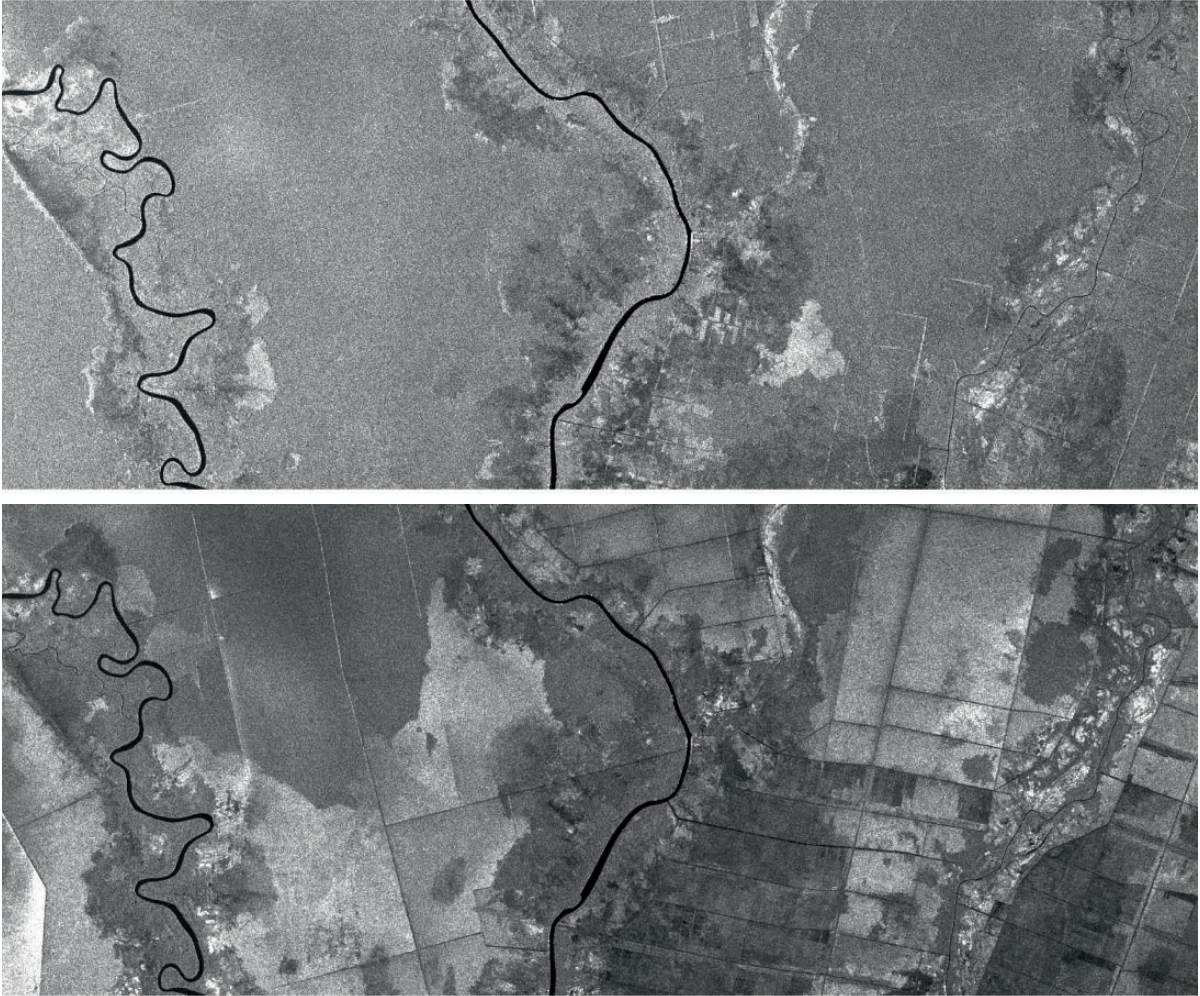
The usefulness of spaceborne radar data is mainly related to the ability of making observations frequently, thus enabling timely action to be taken, for example, in case areas of suspected illegal logging are detected, or in case of fire events. Statistics derived from the study of spatial and temporal distribution of cloud cover using geostationary meteorological satellites reveal that the probability of acquiring SPOT or Landsat-TM images with less than 30 per cent cloud cover are very low (Gastellu-Etchegorry 1988). For Kalimantan, the mean probability to acquire images with less than 70 per cent cloud cover is only 4 per cent per month.

The use of spaceborne radar to map and monitor peat swamp forests has certain unique advantages. In the first place, observation by radar systems is unimpeded by cloud cover, which is an advantage over optical data in the humid tropics. In the second place, radar can penetrate vegetation cover to a certain extent, depending on wavelength. The JERS-1 and ALOS imaging radar (or SAR) systems use a relatively long wavelength (23.5 cm, or 1.275 GHz), also referred to as L-band. It allows observation of flooding under a closed forest canopy. Hence, in principle, seasonal flooding dynamics can be revealed well.

A certain level of understanding of the physical interaction between the radar wave and the terrain is necessary to allow for an accurate interpretation of these L-band SAR images. Biomass and flooding are the two main terrain parameters and polarization is an important radar wave parameter. The effect of biomass is an increase of the radar echo (or backscatter)

2 See: Rosenqvist/Chapman/Cihlar/Costa/DeGrandi/Dobson/dos Santos/Finlayson/Hallikainen/Hess/Hoekman/Igarashi/Krug/LeToan/Lowry/Lucas/McDonald/Milne/Moreira/Olsen/Quegan/Running/Salas/Sawada/Schmullius/Shimada/Siqueira/Tadono/Tateishi/Taylor/Telmer/Townshend/Tschirley/Yamagata/Yasuoka/Zimmerman (2005).

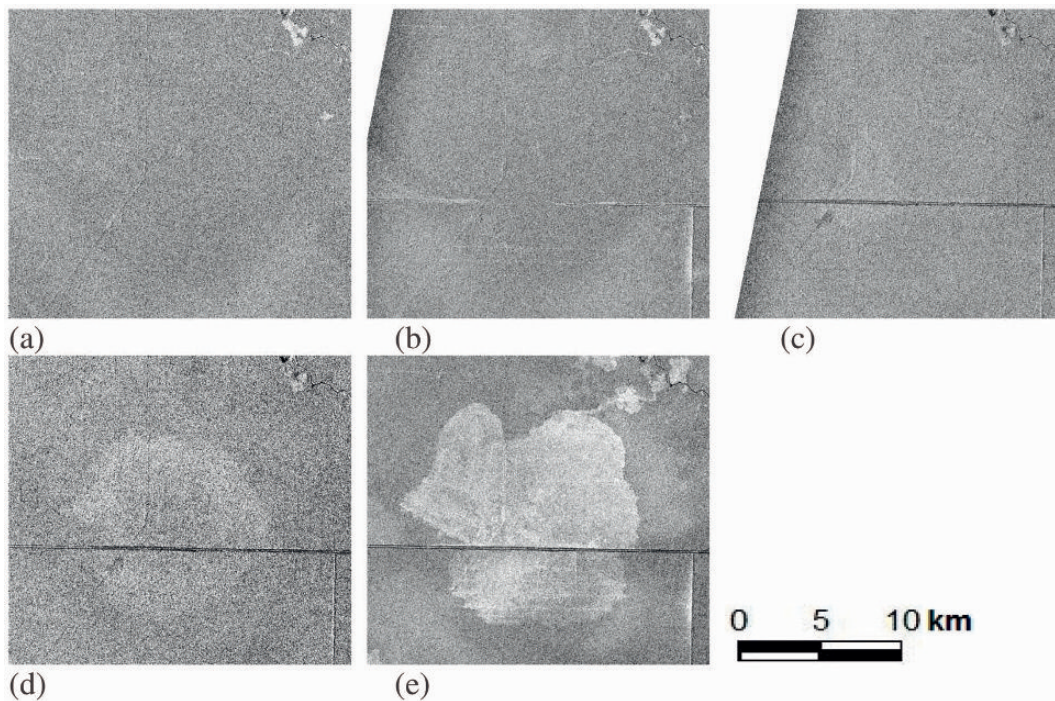
Figure 97.1: Satellite radar observations of JERS-1 at 24 September 1996 (top) and 21 January 1998 (bottom) of an area in Central Kalimantan near Palangkaraya (size: 70 km x 30 km). Large areas of swamp forest (with large orang-utan populations) vanished rapidly. Construction of canals locally resulted in drainage and collapse of forest on peat domes. The increased accessibility also resulted in an increase of illegal logging. Time series of radar observation clearly show vegetation changes related to these processes. **Source:** Courtesy: GRFM project. Permission to publish this radar image was granted by JAXA/GRFM project.



intensity with increasing biomass up to a level of around 100 ton/ha. Above this biomass level the radar image intensity saturates and the radar wave does not penetrate the vegetation well. Below this biomass level, or in open canopies, the effect of flooding is noticeable. In this case the interaction mechanism is somewhat different. The radar instrument is side-looking and the water surface acts as a mirror. Hence, smooth open water surfaces yield no radar return, i.e. these areas appear black in the image. However, when vegetation is present it causes a second reflection (mainly by tree trunks) in the direction of the radar. This effect is particularly strong for the so-called HH-polarization, which, in fact, is the only polarization

used by the JERS-1 SAR. In practice, for forested peat domes, the combined effect of flooding and biomass is a variation in the image intensity for which the *range of variation* is mainly determined by the biomass level (i.e. low biomass areas show large variations in time; high biomass areas small variations) and for which the *relative brightness* is mainly determined by the intensity of flooding (i.e. dry terrain shows a relatively low intensity; flooded terrain a relatively high intensity).

Figure 97.2: JERS-1 SAR time series of the collapse of the peat dome in Kahiyu: (a) 12 Jul 1995; (b) 19 Mar 1997; (c) 11 Sep 1997; (d) 25 Oct 1997; (e) 21 Jan 1998. Permission to publish this radar image was granted by JAXA/GRFM project.



97.3.4 Mega Rice Project (Central Kalimantan)

Time series of ERS and JERS-1 SAR observation have proven to be useful to monitor changes in land cover, (illegal) logging activities, fire damage or fire susceptibility in Kalimantan (Siegert/Rücker/Hinrichs/Hoffmann 2001; Hoekman/Vissers/Sugardiman/Vargas 2001).

Figure 97.1 gives an example of the rapid and large-scale changes that currently take place in the Indonesian rain forest areas. In this particular area, also known as the mega rice project area, 1 million ha of forest, mainly peat swamp forest, has been cleared with the purpose to convert the land into rice growing areas. At present the area is largely abandoned because the soil is unsuitable.

97.3.5 Mawas – Kahiyu Peat Swamp Forest (Central Kalimantan)

Time series of L-band radar data can provide useful information on hydrology in peat swamps. For many peat swamp areas in Borneo and Sumatra large series of JERS-1 images (i.e. 15–30) collected in the period 1992–1998 exist. Such data reveal biophysical characteristics, temporal dynamics in flooding, and ombrog-

enous domes. Since tropical rainfall can be very localized and surface run-off is fast, the availability of large time series strongly supports proper interpretation (Hoekman 2007). In one of the peat domes in this area all trees died of drought and sub-surface fires and fell down. The dome's collapse is shown in more detail in the time sequence of events in figure 97.2.

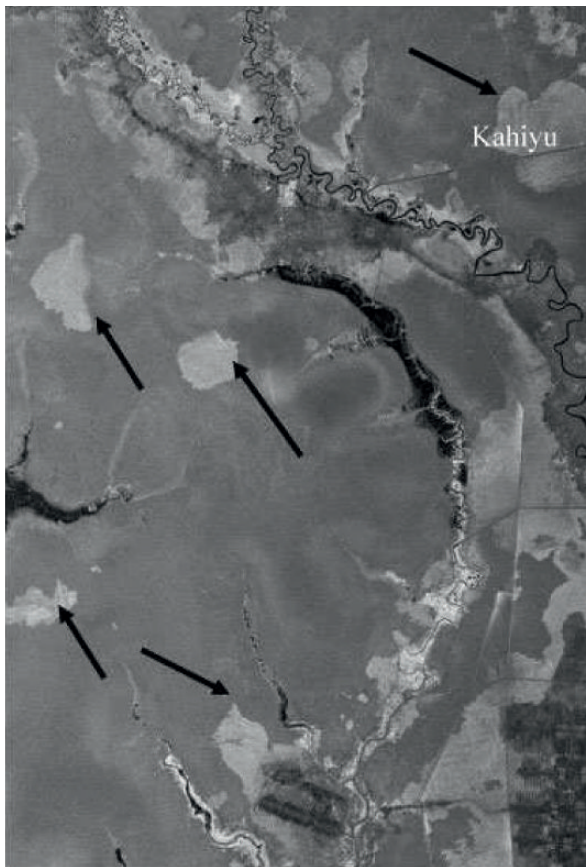
Until 1996 the dome was still hydrological intact. In 1997 the construction of a very wide canal (for the mega rice project) is visible. In figure 97.2(c) (September) the canal is filled with water (the canal becomes black) and a small somewhat brighter area appears. This area grows very fast and becomes even more bright as shown in figure 97.2(e) until the collapse is completed (January 1998). The physical interpretation of the radar brightness changes in the dome area can be associated with an initial period of excess drought under a dense canopy, i.e. the area becomes somewhat darker, like in Figure 97.2(b), followed by a period in which trees collapse and the brightness increases due to direct radar reflections from exposed trunks, like in figures 97.2(d-e). It is interesting to note that the spatial extent of the collapse halted at the relatively flat and wet fringe well visible in radar images of previous date. The obvious cause of the collapse is the huge drainage caused by the wide canal. The coin-

cluding strong ENSO period may have accelerated the process.

97.3.6 Sebangau Peat Swamp Forest (Central Kalimantan)

Many instances of forest collapse at peat dome tops occurred in parts of Borneo and Sumatra during the strong 1997–1998 ENSO event. As yet it is not entirely clear how much selective logging, and the associated construction of small canals for log transportation, have contributed to these collapses. The Sebangau National Park, located directly south-west of Palangkaraya comprises large peat dome complexes. Figure 97.3 clearly shows a large number of collapse events during the ENSO period.

Figure 97.3: In the Sebangau National park several areas of peat dome forest collapse, caused by the 1997 ENSO event, show up as bright areas indicated by the arrows (date: 17 July 1998). Permission to publish this radar image was granted by JAXA/GRFM project.



0 5 10 15 km

However, a recent collapse in Sebangau (detected by ENVISAT SAR in 2004), at the end of a canal extending to the top of a large dome, clearly shows collapses also occur in non-ENSO years. There is still little evidence that under conditions of extreme drought such massive collapses may occur naturally and thus form part of the dome formation process.

97.3.7 Berbak Peat Swamp Forest (Jambi, Sumatra)

After a collapse the remaining area is characterized by open vegetation and a large number of dead tree trunks and is very susceptible to fire. Lowered water tables cause peat oxidation. Peat fire and oxidation cause huge carbon emissions and soil subsidence. Soil subsidence causes stagnating water. Therefore, in time, the conditions for forest regeneration may diminish. At a certain point the damage is beyond recovery ultimately leading to complete combustion and oxidation of remaining peat dome layers. In order to prevent this irreversible process, restoration activities, such as canal blocking and replanting, are necessary. Van Eijk and Leenman (2004) conducted research in the Berbak National Park in Sumatra to study possibilities for regeneration. Time series of JERS-1 images proved to be very useful to determine and map certain degrees of damage. Depending on the nature of the damage certain restoration approaches are suggested. Radar images clearly show different patterns of damage, expressed by the number of fire events and flooding duration in subsided areas (Hoekman 2007).

97.4 Tree Mapping

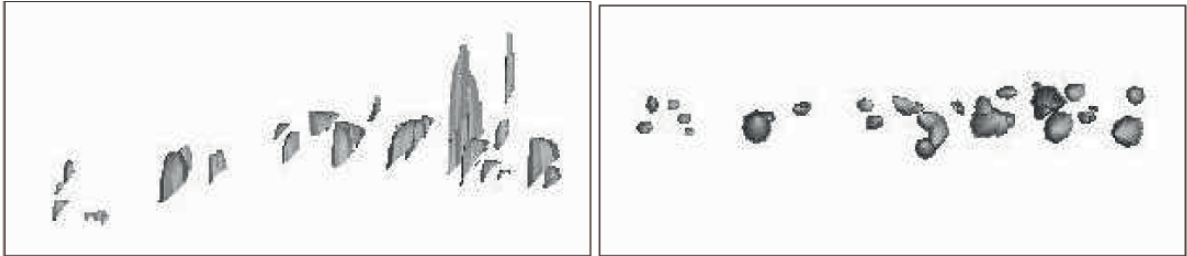
97.4.1 Information Needs

To enforce national legislation for sustainable forest management or to verify implementation of guidelines for sustainable forest management as proposed by the *International Tropical Timber Organization* (ITTO), information on terrain, forest and tree characteristics is needed. Among others, systems should be available to monitor logging activities and to detect illegal logging, allowing timely action to be taken.

97.4.2 Tree Mapping Algorithm

Parameters such as tree position, tree crown dimensions, canopy cover and terrain slope angle, and the

Figure 97.4: Analysis of high-resolution interferometric airborne radar data. A strip of approximately 180 m in length and 30 m wide is processed into a 3-dimensional reconstruction of the tree crowns present in the upper canopy layer. At the left a side-view is shown where the radar is looking from top-left. At the right a top-view is shown. The side-view shows that the transect is crossing a hilltop. Combining the side- and top-views it can be noticed that the two leftmost tree crowns are positioned on top of each other and that the large tree, number 7 from the left, has a sub-crown pointing to the right and upwards.



location of skid trails and logging roads, are of particular interest. In principle such information can be retrieved on a routine basis over large areas from aerial photographs. Repetitive observation would allow assessment of logging intensity, erosion and fire susceptibility, verification of reforestation obligations, etc. However, cloud cover too often prevents timely observation. Radar does not have this limitation. Moreover, images of short-wave high-resolution radar, in principle, may give sufficient information. Since other physical mechanisms underlie radar imaging, radar images can not be treated in the same way as aerial photographs. Notably effects of ‘radar shadow’ and ‘lay-over’ should be handled with care. To study the potential of radar the ESA *Indonesian Radar Experiment* (INDREX) campaign and the NASA *Pacific Rim 2* (PACRIM 2) were executed in the years 1996 and 2000, respectively, in East-Kalimantan.

Tree mapping technique basics are described in (Hoekman/Varekamp 2001) and (Varekamp /Hoekman 2001). The results of radar canopy reconstruction have been compared with stereo aerial photography, which was acquired near simultaneously, for tuning of the algorithms and validation. A result for a small area is shown in figure 97.4.

The agreement between fully automated radar canopy reconstruction and stereo aerial photography viewing appears to be very high. New studies focus on aggregation of radar tree data into maps, which are corrected for the relief, showing, among others, statistics such as the total crown volume per ha, the number of trees per ha, the mean crown height and the mean crown projected area. Such statistics may be correlated with forest degradation and regeneration stages and, as such, provides important information for the current forest rehabilitation programs in Indo-

nesia (Hoekman/Vissers/Völker/Nugroho/Siegert 2002).

97.4.3 TerraSAR-X and TanDEM-X Missions

With the advent of new generation high-resolution spaceborne radar missions tree mapping from space may soon become a reality. The TerraSAR-X satellite with X-band radar (wavelength 3 cm) is scheduled for launch in April 2007. An identical satellite named TanDEM-X will be launched two years later to form a pair. This pair of X-band radar systems forms an interferometric system capable of retrieving very high resolution 3-dimensional data.

High resolution interferometry allows assessment of 3D canopy architectural descriptors. These descriptors, such as crown size statistics, vertical distribution of the crown layer, gap occurrence intensity, etc., allow forest degradation/regeneration stage mapping or natural regeneration mosaic mapping. Also terrain slope information is very important in this respect. Another application would be the detection of selective logging in tropical forest. Usually mature (large canopy) trees are felled, which cause local damage in the form of gaps (neighbouring trees collapse) and skid trails (made to extract the trunks).

Information on the forest state is needed for land use planning, forest rehabilitation planning, forest protection, fire prevention and nature conservation. Forests in degraded state are more vulnerable to fire, which is causing major problems in countries like Indonesia and Brazil.

97.5 Summary and Evaluation

97.5.1 Information Needs

Scientists, policy makers and land managers have a large variety of information needs for which imaging radar may be well applicable. Partly this is related to the large quantity, high frequency and timeliness of data needed for development and proper implementation of mechanisms such as those related to carbon offset trading or timber certification. Obviously weather independent monitoring techniques will play a key role. On the other hand radar data may give new insights to scientists because of several of its unique characteristics and capabilities. Long wavelength (such as L- and P-band) polarimetric radar is capable of providing detailed information on forests' biophysical characteristics related to flooding, soil, vegetation structure and biomass.

97.5.2 Future Missions

In the near future some capabilities which are currently exclusive to airborne SAR may be available from spaceborne SAR. The ALOS PALSAR (launched January 2006) would give a boost to accurate monitoring of forest biophysical properties, including forest structure, flooding and biomass. The combination with advanced C-band systems such as RADARSAT-2 and ENVISAT ASAR would even increase this capability. For forest and timber certification mechanisms it would be ideal if individual large canopy trees could be mapped (in 3-dimensions) from space, as was experimentally achieved by aircraft. In principle this is possible with the new X-band satellite radar systems such as for the TerraSAR-X and TanDEM-X missions, which have a 2 m resolution. Finally, to complete the 'wish list', it would be worthwhile to have a P-band SAR system in space to further improve forest structure mapping and biomass monitoring, such as the proposed BIOMASS system (Le Toan/Quegan 2005).

97.5.3 Individual Tree Monitoring

High-resolution airborne InSAR is even capable of 3-dimensional mapping of individual canopy trees. This capability may be utilized to implement highly transparent new timber certification techniques in tropical forests. Aggregation of such detailed information reveals different forest structures in statistical sense, related to logging damage intensity or forest regeneration after logging, and may be useful for forest reha-

bilitation programmes as currently being executed in Indonesia.

Better knowledge of the forest state, and the possibility to monitor this state, or to monitor the natural succession stages, are of importance for climate studies related to global carbon cycle science and ecology (biodiversity).

Illegal selective logging is very hard to detect with current remote sensing methods. TanDEM-X is likely to provide useful data, and could be used operationally for law enforcement. The environmental and economic importance of this application is large. Slope information is important to detect illegal logging on steep slopes, causing erosion damage.

97.5.4 Peat Swamp Monitoring

Many of the tropical peat swamp forests in Borneo and Sumatra are seriously threatened by (illegal and legal) logging and conversion to plantations for the oil palm and pulp and paper industries. In all cases the hydrology is affected by excess drainage, leading to collapse of remaining forests, notably in dry years. Beyond a certain point the hydrological integrity of ombrogenous areas is lost, leading to an irreversible process of total collapse and the combustion and oxidation of the remaining thick peat layers. Unless rigorous measures are taken very soon, this most likely will lead to major negative effects on biodiversity and global climate.

More information is needed to support protection and restoration efforts. The availability of better vegetation and peat depth maps may be very useful. However, the most crucial factors may appear to be the knowledge on the hydrological functioning and the relationships between hydrological and ecological characteristics. These latter points are still poorly understood. Radar, unimpeded by cloud cover, can provide continuous observations which can be related to hydrological characteristics, may become a key instrument in future protection and restoration efforts.

Exploitation of PALSAR time series to be collected by the ALOS satellite may provide significant support for peat land management, protection and restoration, such as described in the Ramsar "*Guidelines for Global Action on Peatlands*" (GGAP)". Moreover, it may significantly support other international treaties, such as CBD and Kyoto Protocol, and carbon cycle science.

97.5.5 New Approaches to Implement Environmental Security Services

With the new developments in remote sensing technology, a number of problems, which currently limit progress in environmental security issues, can be addressed. Information required by local managers can be generated systematically and spatially complete, and can be made available in a fast, frequent and continuous way, even at remote locations. Financers of environmental services, politicians, or even the general public, can monitor ecosystem developments. Since transparency can be achieved donors will be more easily tempted to invest in environmental services because they can better assess the status of the terrain before starting a project, they can follow changes in the land cover, and can evaluate achievements in a fast and reliable way. In this way remote sensing systems can boost carbon offset trading and timber certification, or similar services, in remote areas, from which otherwise information is poorly available.

The approach should be highly proactive. Data, in principle, should ideally be collected within a targeted vast region for *all* areas environmentally important or sensitive, even though such data may not seem to serve a direct purpose. The reason is that as soon as adverse conditions develop (in many areas this inevitably will happen), data are already available and the developments which led to these adverse conditions can be assessed.

98 Linking Anthropocene, HUGE and HESP: Fourth Phase of Environmental Security Research

Úrsula Oswald Spring, Hans Günter Brauch and Simon Dalby

98.1 Introduction¹

After two decades of research “environmental security discussions can now move to a fourth stages of syn-

1 The authors are grateful to Patricia Kameri-Mbote (Kenya) and Czeslaw Mesjasz (Poland) for their very useful comments and stimulating suggestions that are reflected in this final text. With the Copenhagen school (Buzan/Wæver/de Wilde 1998) the authors understand ‘securitization’ as the use of extraordinary actions and means to cope with major security issues. Mesjasz (2008, 2008a, 2008b) has discussed applications of a ‘broadened’ security concept to the economic realm but he has repeatedly cautioned about the dangers if one were “to use extraordinary means to too numerous aspects of our life, which in some cases will be treated as ‘public goods’, [because] then the sense of security would be diluted.” With the ‘widening’ suggested in this chapter, new security dangers and concerns, such as environmental issues (climate change, water shortages, desertification) and their impacts (natural hazards) are addressed that require ‘extraordinary means’ from the state, society, the business and scientific community to develop the knowledge to ‘understand’ and ‘explain’ these new security dangers, as well as policies and measures to ‘cope’ with them to reduce the costs of ‘business as usual strategies’ (Stern 2007). These new security dangers do not only, or not primarily, affect the ‘state’ but affect both human individuals and ‘humankind’ in an unequal way thus posing new global equity problems. Narrow ‘national security’ responses, as have been addressed in many publications in the US since 2007 (Brauch 2008c) for coping with these new security issues, fail to recognize that the institutions, missions, policies and means of the traditional security approaches are bound to fail to cope with their ‘human security’ implications, and specifically with the impact of human-induced natural hazards on historically and culturally determined ‘gender’ relations (Oswald 2008b). Thus, the ‘extraordinary measures’ required to cope with these new security issues require a fundamental rethinking, re-contextualization and reconceptualization of security as suggested in this chapter (see also Dalby 2007), including the traditions and institution of ‘patriarchy’.

thesis and reconceptualization” (Dalby 2002a: 96). In this chapter the authors outline the topics, scope, areas and methods for a fourth research phase on human, environmental and gender security and peace research (Dalby 2002, 2007, 2007a, 2007b, 2008, 2008a; Brauch 2003, 2003b, 2005, 2007a; Oswald 2001, 2006; Boulding 2006). This phase, we argue, needs to build on the first three phases of environmental security research (see chap. 59 by Dalby/Brauch/Oswald) while explicitly incorporating advances in earth system science and disaster research into the analysis. It requires distancing security analysis from some of traditional assumptions in international relations thinking and focusing more explicitly on the specific contexts where people, especially socially vulnerable groups and their social networks, are insecure.

While the first three phases of environmental security research primarily focused on the ‘nation state’ as the key referent of environmental security concepts and policy (‘national security’), this chapter suggests that during the fourth phase the referent object of securitization should be both *widened* and *deepened* (Buzan/Wæver/de Wilde 1998; Brauch 2003, 2005, 2008, 2008a, 2008b; Oswald 2006). This implies that the environmental dimension of security should include both societal (Wæver 2008a), human (part IX) and gender (Oswald 2001) issues but also sectoral approaches such as water (part VII), food (part V), health (part VI), and livelihood security (chap. 36 by Bohle) and ecofeminist perspectives (chap. 90 by Oswald). Furthermore, the widening of the referents of securitization should include – besides the narrow focus on ‘national security’ – the global, regional, societal, community, family and human level. Thus, the state-focused approach to environmental security should be broadened to a ‘people-centred’ approach (Annan 2001, 2005; CHS 2003; Bogardi/Brauch 2005).

This chapter first introduces three conceptual components for the fourth phase: earth system research and the *Anthropocene* (98.2), *Human, Gender and Environmental Security* (HUGE, 98.3), *Human and Environmental Security and Peace* (HESP, 98.4). Second, it discusses the study of substantive issues that need attention in the fourth phase (98.5), such as extreme weather events, social systems and gender relations, environmental, social and urban vulnerability, migration, complex emergencies, crises and conflicts, political coping strategies with human insecurities. The final parts of the chapter are looking forward to implementing the fourth phase (98.6) and present conclusions (98.7).

98.2 Earth System Research and the 'Anthropocene'

One of the weaknesses in the environmental conflict literature in the 1990's was the failure to incorporate environmental science and ecological understandings directly into discussions of ecological change and environmental degradation.² Simple environmentalist assumptions of worsening conditions were frequently used as independent variables without enough careful analysis of the specifics of particular environments (Sullivan 2000). Taking the relevant science on environmental change seriously is unavoidable if the fourth phase analyses of insecurity are to link physical and human sciences in a useful way. The contemporary work in earth system science is trying to comprehend the interlinkages and connections in the biosphere (IGBP 2001). Crucially it involves understanding the environment as the shared context for human life that is now being substantially changed by both anthropogenic and natural processes. This links human actions at the largest planetary scale with practical ecological processes in specific places and shows that assumptions of nature separate from humanity are not accurate modes of considering either environment or security (Schellnhuber/Crutzen/Clark/Hunt 2005).

Understanding humanity as part of a dynamic biosphere that is being actively changed by human actions allows for an overarching conception of the human predicament, and one that directly connects the consequences of consumption in one part of the

planet with the hazards being faced by people in other parts. Making these connections explicit suggests a new global ethic where responsibilities to people in other parts of the world are related to the ecological interconnections of people in distant places (Pirages/DeGeest 2004). If global climate change is partly caused by excessive consumption in one part of the world, but increases the vulnerabilities elsewhere, then there is an obligation on the part of the consumers to take responsibility for the consequence of their actions at a distance.

In particular 'earth system research' (Schellnhuber/Wenzel 1998; Steffen/Sanderson/Tyson/Jäger/Matson/Moore III/Oldfield/Richardson/Schellnhuber/Turner II/Wasson 2004; Schellnhuber/Crutzen/Clark/Hunt 2005) offers a conceptual framework combining the various syndromes of environmental change. It insists on the importance of understanding the global economy as an ecological factor, one that has introduced novel 'forcing' agents into the biosphere, most notably such things as ozone depleting chemicals and greenhouse gases. The sheer scale of human activity becomes clear when looking at how the various facets of our collective activities act as ecological mechanisms (McNeill 2000; chap. 2). We can no longer operate with a set of categories that assume environment as an external factor to human affairs; the separation no longer makes sense when scientific knowledge is taken seriously and the scale of contemporary global changes is recognized (Dalby 2006).

Following a suggestion by Paul Crutzen and Eugene Stoermer (2000; Crutzen 2002), the *International Geosphere Biosphere Programme* (IGBP 2001) and other earth scientists suggest that we now live in a new era of natural history, the *Anthropocene*; one marked by the emergence of a new series of geological, biological and climatological forcing mechanisms in the biosphere. We have left the period of the *Holocene*, the relatively stable period of earth history between the end of the last ice age and the appearance of industrial society. Human activities have introduced new biophysical factors into the biosphere and begun to change the physical parameters that determine the functioning of the major earth system processes. The most high profile of these is climate change but other systems are being fundamentally altered too. The need for a new term comes not from a single historical innovation or ecological change but from the recognition that the total amount of human activity in all its diversity is now on such a scale that we are living in a qualitatively new era. In terms of the sciences of climate, geochemistry, geomorphology and

2 For surveys of this literature see i.a.: Gleditsch (1997, 1998, 2001, 2001a, 2001b, 2003); Kahl (2003, 2006); Brauch (2003, 2007, 2007a, 2007b, 2007c).

ecology it is no longer appropriate to think only in terms of 'natural' mechanisms to understand the processes that shape our habitat.

Climate change and carbon dioxide levels are only one facet of the changes that matter. The artificial 'fixing' of nitrogen, the rapid increase in human appropriations of 'natural' productivity, the extinction of avian and mammalian species not to mention the depletion of the oceanic fish stocks, all interact in fashions that we don't yet understand (UNDP 2007). What is clear is that many of these relationships work in non-linear often chaotic ways which will produce surprises in the future. Where the critical thresholds are we simply don't know, although we discovered one relating to ozone depletion in the 1980's quite by accident. There may well be negative feedback systems that counteract some of the perturbations, but there is no reason to believe that the cascading interconnected non-linearities will be benign to the current arrangements of human civilization (Schellnhuber/Crutzen/Clark/Hunt 2005).

During last half century many environmental concerns emerged that require a 'global' response. But in the *Anthropocene* no single environmental concern matters. It's the cumulative totalities that are beginning to interact in all sorts of unpredictable synergies that matters. In that sense the environment as a simple category of concern has also been transcended; the preservationist and romantic premises of its arguments have been undercut by both the scale of human activity and the growing sophistication of scientific understandings of ecology. Technical fixes can solve many pollution problems, but grasping the totality of material transformations is what is now the pressing priority; not least because the changes in climate and ecological processes render poor populations, in places apparently remote for industrial societies, especially vulnerable (Dalby 2003).

Ecology thus has a geopolitical dimension, and this is especially clear at the global scale where human actions are now accelerating ecological change mechanisms. One now has to recognize environments as actively constructed on various scales by their human inhabitants; simplistic assumptions about degradation as a cause of many things confuse science and environmentalism. This new geological era requires a different understanding of the environment and hence, crucially, of the changing social context of humanity. Naming our era the *Anthropocene* signals this epochal shift in human circumstances; it necessitates a rethinking of many other facets of human existence connected directly to the emerging understandings of

that changing global ecological context (Flannery 2006). Above all else it emphasizes the simple but crucial point that human activities are interconnected in numerous ways that cannot be ignored if human security is to be taken seriously. Environment is no longer the separate backdrop for human activities. It is increasingly the artificial context in which we all live and as such it is the shared context of our insecurities.

98.3 Human, Gender and Environmental Security (HUGE)

The deplorable conditions of physical, environmental, human, societal and gender security of a large part of humanity have inspired researchers (Oswald 2001, 2006, chap. 90 above; Møller 2001, 2003: 278–279) to ask security *for whom* (the nation state, society, human beings or humankind or the environment); *for what* (eternal or earthly peace, social justice, humane livelihood, sustainable development, gender equity); *from whom* (state and sub-state actors, terrorists, migrants, alien cultures, multilateral organizations, globalization, elites, nature, humankind, patriarchy, totalitarian institutions, religions, cultures and intolerance) and *for what* (sovereignty, territorial integrity, national unity and identity, survival and quality of life, sustainability, equity, identity, social representations and solidarity).

Oswald (2001, 2004, 2006) suggested a widened concept of *Human, Gender and Environmental Security* (HUGE)³ that combines an extended gender concept including children, elders, indigenous and other minorities with a human-centred focus on environmental security challenges, peace-building and gender equity. 'Gender security' is considering livelihood, food security, health care, public security, education and cultural diversity. This broad concept analyses the patriarchal, violent and exclusive structures within the family and society, questioning the existing process of social representation-building and traditional role assignment between genders. HUGE reorients 'human security' to include equity and develop-

3 The HUGE concept draws a, broadly defined, feminist analysis of society, power and identity. This shows that for several thousand of years the world has been organized through patriarchal relations where the male gender (strong sex) dominates over the female one (weak sex), including a symbolic distribution of public space for men and private for women and where power relations are also gendered: men public affairs; women delegated powers through household).

ment issues through social organization, specific governmental policies, private ethical investments and legal reinforcements. It aims at a socio-political participation of women, the young and elders. It focuses on gender discrimination and violence (Johnson 2002), by widening the narrow male-female relationship of some feminist approaches.

HUGE includes 'environmental security' concerns where a healthy environment and resilience-building of highly vulnerable groups (especially women) can reduce risk impacts (Oswald 2008a). For hazard prone areas, HUGE analyses the potential of technical, financial and human support for reducing this vulnerability, enabling women and other exposed groups to reinforce their own resilience through bottom-up organization combined (Oswald 2008b) with top-down policies and tools able to guarantee effective early warning, evacuation, disaster help and reconstruction. Immediate and efficient support for isolated regions affected by social and natural disasters could prevent long-term effects such as famine and violent conflicts. As non-violent conflict resolution is a central part of personal and social identity in a world where processes of unification and diversification are occurring faster than ever in the past, human beings have a basic necessity to simplify and to put order into complex realities through social comparison. The upcoming system of values, ideas and practices enhance conditions for living together, offering persons and groups the possibility to get familiarized with the social and material world. In synthesis, HUGE integrates social, environmental, human, cultural, political and identity concerns, aiming at solidarity, resilience, participatory democracy, peace-building and equity in a world that is facing many new security dangers and concerns due to the gradual transition from the Holocene to the Anthropocene.

98.4 Human and Environmental Security and Peace (HESP)

Thus, HUGE offers both an analytic framework for analysis and participatory action. A fourth phase of research on '*human and environmental security and peace* (HESP)' should combine the structural factors from the natural and human dimensions of *global environmental change* (GEC) based on the expertise from the natural and social sciences with outcomes and conflict constellations (Brauch 2003, 2003b, 2005, 2007a). Both HUGE and HESP are complementary, although there are differences in the goals

and focus. HESP aims at these ten conceptual and policy goals:

Scientific Orientation and Approach

1. *Orientation*: An equity-oriented Grotian perspective may support multilateral environmental efforts in international organizations and regimes to avoid conflictual outcomes of global environmental change, environmental scarcity, degradation and stress.
2. *Spatial Approach*. The analysis of environmental security issues on a regional level requires a spatial approach which may be called a *political geo-ecology*.⁴
3. *Human Security Focus*: The reference for research and policy should be human beings, individual victims and communities of distress migration, disasters, crises and conflicts.
4. *Sustainable Development and Sustainable Peace*: A human security perspective to the analysis of environmental security issues may aim at an enduring "sustainable peace"⁵.

Scientific Focus on Causes, Impacts and Extreme Outcomes of Global Environmental Change

5. *Causes*: The research should broaden the scope to include both environmental degradation and environmental scarcity and their impact on environmental stress and on nature and human-induced hazards. This requires close interaction between social and natural sciences and an interdisciplinary approach.
6. *Outcomes*: The research should include hazards, distress migration and environmental refugees as well as the complex interactions among these out-

4 Geoecology was introduced by Huggett (1995) as an interdisciplinary natural science. A *political geoecology* focuses from the perspective of international relations on the interactions between the geosystem and human activities, and especially on national and international political processes (Brauch 2003: 134, 2003b: 921–922). These three authors intend to develop this new approach of a *political geoecology* further in a third co-authored chapter to be published in vol. V of this book series from their respective scientific background in social anthropology, geography and political science.

5 See Kofi Annan's speech to the German Bundestag of 28 February 2002 on "Building Sustainable Peace", at: http://www.bundestag.de/aktuell/presse/2002/pz_0202283.html; in which he stressed: "that the aim must always be to create a sustainable peace, just as we aim to achieve sustainable development - and indeed sustainable development itself is one of the conditions for lasting peace" and Oswald (2008).

comes which may often lead to disasters, crises and conflicts.

7. *Policy Process*: Case studies should include the policy processes, e.g. how the state and the society have responded to the challenges and outcomes, they should emphasize the role the knowledge factor (learning, capacity building) has played in developing adaptive and mitigation strategies to reduce vulnerability and to strengthen resilience.
8. *Regional Orientation*: A regional perspective on the causes, the policy process and its outcomes is needed. This requires regional natural science models (climate, soil, water), and comparative social science case studies on the policy processes at the regional scale.

Policy Goals

9. *Policy Goals on the Societal and Individual Level*: Environmental security studies should contribute to strategies for reducing the *impact* of environmental stress, decreasing the *vulnerability* and strengthening the coping capacities and *resilience*.
10. *Policy Goals on the Communal, Sub-national, National and International Level*: Strategies for coping with outcomes of environmental stress should be developed by improving disaster preparedness and response and by integrating disaster reduction into development planning and resilience-building. The resolution, prevention and avoidance of resulting violence should become a major policy goal (Brauch 2005: 37-39).

HESP combines a *normative orientation* (the dual policy goals of *sustainable development* and *sustainable peace*) with a 'people-centred' *human security perspective* from the individual to the global level to develop strategies for adaptation and mitigation and to reduce the likelihood and impact of vulnerability to these outcomes by strengthening resilience. However; neither in the scientific community nor in politics, does an agreement exist- and will hardly ever exist in the future - on how to operationalize these dual goals as guidelines for analysis and action (Brauch 2008a). Both concepts and policy goals of *sustainable development* and *sustainable peace* are as highly contested as the security concept. Nevertheless, these dual goals require the scientific development of complex knowledge, a societal and political problem awareness, anticipatory learning and 'ingenuity' in the framework of a 'culture of prevention'.

From a scientific perspective that adheres to a rather narrow, strictly defined focus and rigorous primarily quantitative research methods, this wide and

embracing scientific concept and research goals are likely to be heavily criticized. This wide ranging understanding will most likely be rejected as impractical within a traditional quantitative scientific understanding. However, that traditional scientific approach has failed, and will continue to fail, to address the interconnectedness of highly complex human or societal and natural factors precisely because its mode of understanding deals with analysis of discrete entities rather than complex social systems.⁶

Undoubtedly the ten programmatic points for a fourth research phase on 'environmental security' that were submitted first by Brauch (2003, 2003b, 2005, 2008) are intended to provoke scientific objections, suggestions and critiques and in response more conceptual work and policy oriented scientific reflection will be needed. Most certainly, its emancipatory approach is bound to clash with purely scientific, primarily apolitical and frequently quantitative approaches that often are limited to explain the complex reality with highly sophisticated methods and narrow results that regularly resist any translation as guidelines for policy action and change that aims at an improvement of the prospects for the majority of humankind in their struggle for daily survival for their well-being and for a life in dignity.

The policy relevance of HESP as a research programme for a fourth phase of research is to *recognize* early-warning indicators, to *examine* both the environmental consequences of wars and the existing conflicts over scarce resources that may lead to environmental stress to *prevent* them escalating into violence and, last but not least, to develop longer-term priori-

6 Mesjasz in his comment on this draft chapter argued in September 2006 that "such a general programme, while very good at the universal level, may be criticized for the absence of something more specific. What makes the difference between HESP and, say, very broadly defined Galtungian peace research understood as a study of very broadly defined structural violence. In my opinion, only one factor - more attention paid to the environment and the gender violence. As far as I know gender sensitivity was also a part of discourse in structural violence (to eliminate) HESP should include some more specific features. In epistemological terms it would mean that some aspects of HESP should be defined in negative terms, as an opposition, for example, to economic short-sightedness of contemporary, market- and profit-oriented understood methods of running the economy at all levels. Here HESP is presented at a too high level of generality and postulativeness - a kind of theory of 'everything good', without exposing what is different between HESP and approaches already applied."

ties for developed and developing countries, and for international organizations to prevent and avoid violent and fatal societal consequences of extreme weather events and hazards from occurring, and to contribute to regional environmental good governance.

98.5 Substantive Issues for the Fourth Research Phase

The above discussion raises numerous questions about what we know and how best to formulate a research agenda that focuses on how to increase resilience and coping capacities, improve conflict resolution, reduce human and economic losses, and where possible identify those who are particularly vulnerable in advance of a disaster occurring. Given the lack of focus in traditional security studies on vulnerabilities and environmental matters (Buzan/Wæver/de Wilde 1998; Wæver 2008, 2008a), and the inappropriate focus on the state in many international relations texts, it is especially important that disciplines such as anthropology, sociology, social psychology, cultural studies, human geography and political science play a part in these investigations. Working these methodological matters into the research agenda is necessary and needs to be done with a focus on the most vulnerable people (Birkmann 2006) first rather than on states or economies or development. None of this is easy but at least three important considerations point the way forward to a substantial new research agenda.

One key point is that appropriate tools are needed in this research and security studies frequently do not supply the appropriate tool box. A broader approach is necessary linking the empirical and theoretical knowledge of peace research with development and environmental studies. The United Nations University combines under the goal of *human security* these five research areas: a) *peace* (international relations, †UN system, †human security and armed conflicts); b) *governance* (human rights/ethics, democracy/civil society, leadership, governance); c) *development* (globalization and development, growth and employment, poverty and basic needs, urbanization); d) *science, technology and society* (innovation, information and biotechnologies, software technology, food and nutrition); and e) *environment* (resource management, sustainable industry and cities, water, land, global climate and governance).

One notable shortcoming of the empirical case studies during the second phase of environmental se-

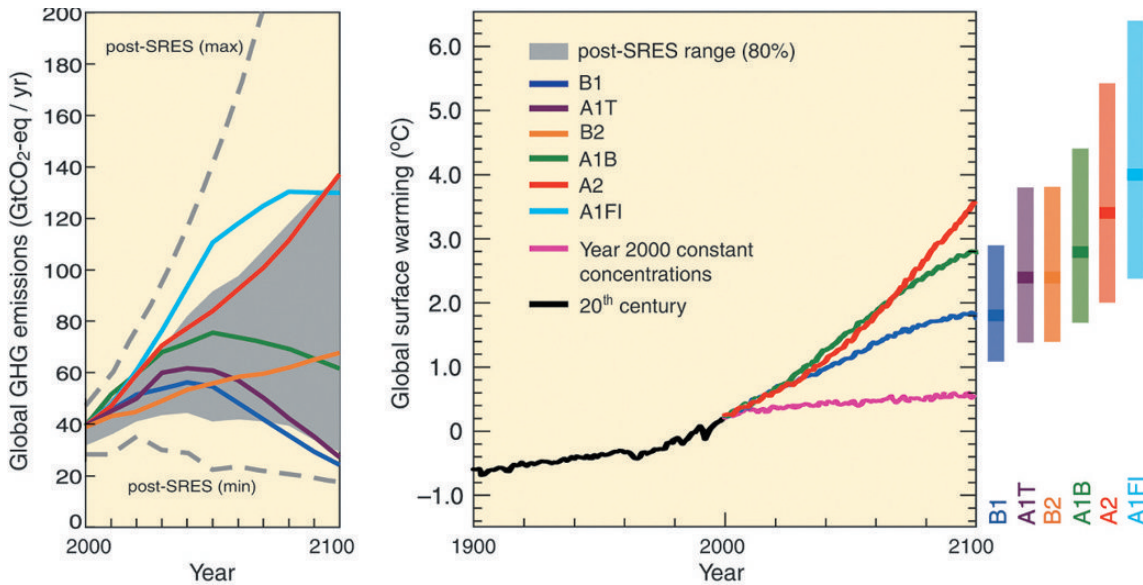
curity research (Homer-Dixon 1994, 1999; Homer-Dixon/Blitt 1998; Bächler/Böge/Klötzli/Libiszewski/Spillmann 1996; Bächler/Stillmann 1996a, 1996b) was that these analyses pursued different goals and used various methods thus preventing generalized conclusions relevant for theory formulation and policy-making. While there has been considerable discussion in the literature about the appropriate research methods on the links between environmental factors and violence (Levy 1995; Gleditsch 2001a, 2001b) the diverse contexts and the complexities of the relationships between natural factors and many dimensions of human existence illustrate there is no single methodology for the broad range of policy and academic questions. Kahl's (2006) work of comparison and synthesis has gone some way towards resolving the methodological difficulties but does not link the empirical discussion of violence and state failure to a wider consideration of human security. We suggest that the fourth phase of environmental security research should take three methodological matters seriously.

First, and in part building on Kahl's (2006) work, the methodological approach of 'structured focused comparison' that has been developed by Alex George (1979, 1988) in security studies offers substantial solutions to the shortcomings of research on different goals. If lessons from one place are to be applied elsewhere then the parameters of each case study need to allow 'structured focused comparisons' (Eckstein 1975; George 1979, 1993; Krepon/Caldwell 1991; Mitchell/Bernauer 1998; George/Bennet 2005), enabling careful comparisons from one case for other situations.

Second, there is a need for multi-, inter- and transdisciplinary research to clarify the parameters of the questions and to allow synergies among researchers. While social science methods and research designs are widely divergent the possibilities for complementarities are considerable if a common objective and careful teamwork is present from the start (Oswald 1988, 1992a, 1992b, 2005). In particular it is important to couple regional with topical specialists to integrate local expertise and the idiosyncracies of specific environments with generalizations across case studies. Likewise research into violence, social change and conflict resolution is also important besides the traditional focus on warfare.

Third, numerous substantive issues require further attention but this chapter concentrates on six salient themes that are of primary importance for the fourth phase of environmental security research: extreme (weather) events (99.5.1), social systems and gender

Figure 98.1: Scenarios for GHG emissions from 2000 to 2100 (in the absence of additional climate policies) and projections of surface temperatures. **Source:** Fourth IPCC Assessment Report, Synthesis Report, Summary for Policymakers, figure SPM 5, p. 7 of 22 for a full explanation; at: <http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf>. Reprinted with permission according to IPCC rules.



relations (99.5.2), environmental, social and urban vulnerability (99.5.3), migration (99.5.4), complex emergencies, crises and conflicts (99.5.5), as well as resilience-building and political coping strategies (99.5.6).

98.5.1 Extreme Weather Events

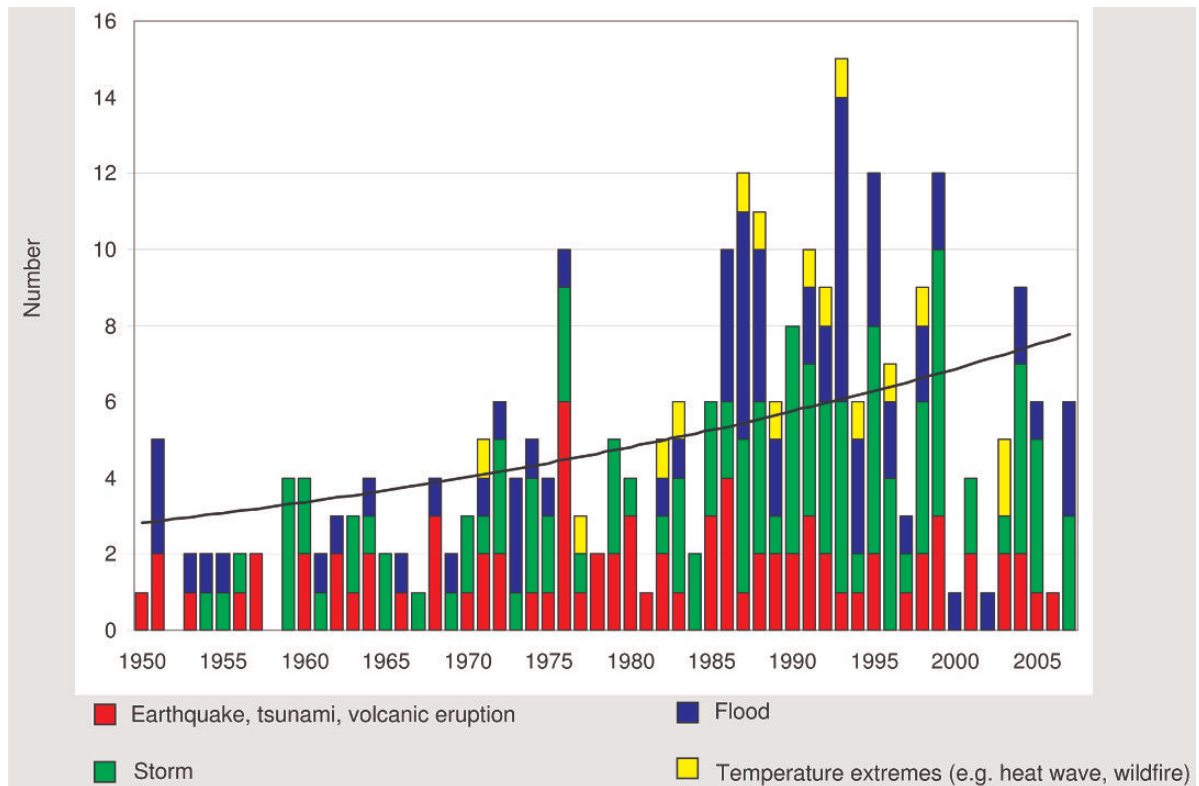
According to the IPCC (2001, 2001b, 2001f), the IFRC (2002a, 2005) and the reinsurance industry (MunichRe 2002, 2006; Swiss Re 2006) during the 20th century climate change has contributed to an increase in the number, intensity, scope and damage of hydro-meteorological events, such as storms, cyclones, floods, land-slides and drought. With the projected rise in temperature between 1.4°C and 5.8°C (IPCC 2001) or 1.2°C and 6.4°C (IPCC 2007) and a most likely corridor between 1.8°C and 4°C during the 21st century, an increase in these extreme weather events has been projected by the IPCC (2001: 3) as ‘likely’ or ‘very likely’. In addition, the projected sea-level rise between 9 and 88 cm will inundate densely populated coastal regions and small flat islands (see Kinnas in this volume), thus forcing the affected people to leave their homes, lose their livelihoods and their agricultural land.

Climate change will also have very severe negative affects on health (WHO/WMO/UNEP 1996) and ‘health security’ (part VI) caused by vector- (malaria, dengue, avian ‘flu pandemic), food- (streptococci) and

water-borne (diarrhoea, dysentery, cholera) infectious, diseases and extreme temperatures (heat waves; cold spills). Drought, soil properties, pests, pathogens and crop yields, are also widely affected by climate change, thus creating severe challenges for ‘food security’ (FAO 1996d, 2005f; Brauch 2002, Oswald 2007g, chapter xy in this volume). Climate change has contributed to a retreat of glaciers and is projected to lead to a progressive melting of the ice shields in the Arctic and Antarctic regions (chap. 73 by Hooigensen). This will have repercussions on the hydrological cycle, drought and floods, surface water, aquifers increasing in already water-stressed countries their ‘water insecurity’ (part VII).

During the first three phases of environmental security studies, threats, challenges, vulnerabilities and risks posed by global environmental change have not been systematically analysed⁷ and extreme weather events and their socio-political, economic and environmental outcomes have more or less been ignored. Traditional international relations research has also not focused on global change and on its winners and losers except on governmental mechanisms and international regime formation involved in the curbing of greenhouse gas emissions. While considerable attention has been paid to the cross boundary impacts of specific pollutants, and the international regimes established to deal with these matters, the larger questions of the consequences of any particular state as a

Figure 98.2: Development of major natural hazards between 1950 and 2007 (Number of events). **Source:** © 2008 Münchener Rückversicherungs-Gesellschaft GmbH, GEO Risk Research. NatCatSERVICE. Reprinted with permission.



result of the actions of others in changing the composition of the earth's atmosphere needs attention that focuses on how this affects the vulnerability of people in many places. While the discussion of winners and losers in climate change addresses some of these matters, if states remain the exclusive focus the vulnerabilities of people and their social systems then they are not adequately included.

Extreme weather events have remained outside the normal considerations of *International Relations* (IR) with its focus on wars, treaties, and high politics ignoring the vulnerabilities of people. But as the glo-

bal change research is now making very clear, human activities are causing changes in major bio-geo-chemical processes which will alter extreme events in addition to changing rainfall patterns and droughts.

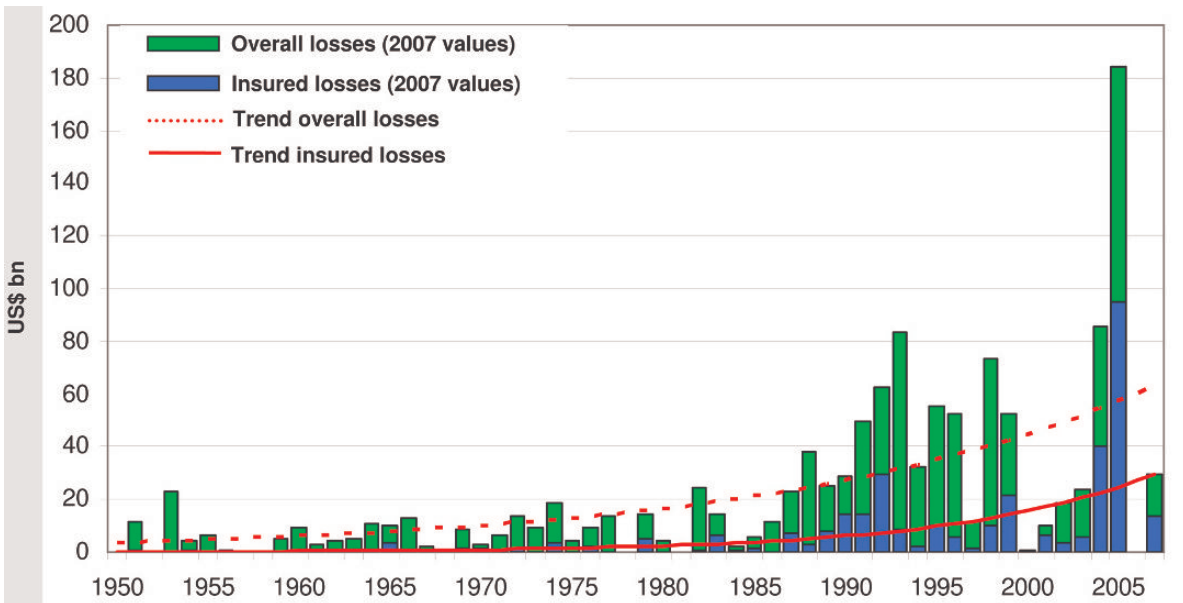
Research in IR needs to incorporate this discussion in the analysis of the global politics of vulnerability. Human activity and climate change must be understood as a cause of hazards, and more generally as an active part of the biosphere (Dalby 2006). This then also leads to an understanding of the ecological consequences of production and consumption on environmental damage and social conflict in parts of the world where materials and fuels originate (Le Billion 2005; Dalby 2007). Climate change in particular leads to new questions of causal responsibility and equity across boundaries.⁸

98.5.2 Social Systems and Gender Relations

Sociological and anthropological research on hazards and disasters has shown that economic, social and value systems have been severely affected by these 'environmental', 'natural' and 'human-induced' catastrophes but that the intensity of the impact depends on

7 In part this is probably because of the sheer difficulties of working with scenarios given the absence of definitive predictions as to how future climate will behave. An additional reason may well be that Thomas Homer-Dixon (1994) concluded that war was unlikely as a result of climate change, and hence the research agenda focused on resource scarcities which were identified as a possible cause of conflict and which were also a matter ostensibly amenable to rigorous empirical research. See the controversy between Homer-Dixon and his critics (Diehl/Gleditsch 2001; Peluso/Watts 2001); but see also Alcamo/Endejan (2002).

Figure 98.3: Development of major hydro-meteorological hazards from 1950 to 2007 (Trend of economic and insured damages). **Source:** © 2008 Münchener Rückversicherungs-Gesellschaft GmbH, GEO Risk Research. NatCatSERVICE. Reprinted with permission.



the complex interaction among environmental, social, urban, rural and other vulnerabilities of the affected human beings.

The impact of extreme weather events differs according to the specific social, economic and political system that influences the vulnerability of the affected people. This depends on the composition of the society, the relations between social classes, ethnic and religious groups, the level of development and education, available financial resources and knowledge, existing economic cleavages between the wealthy and the poor and the nature of the systems of rule as well as the effectiveness of government and societal institutions. All these factors reduce the 'protection' and 'empowerment' of people (CHS 2003).

The largest number of hydro-meteorological hazards as well as the highest number of killed and affected people has been documented in Asia, Africa and in Latin America while the highest economic damages have been recorded in OECD countries (CRED; IFRC-RCS; MunichRe). This reflects the fact that in wealthy industrial countries a significant part of the damage is insured and the affected will be financially compensated for parts of their losses and thus can recover relatively soon. But in developing countries only wealthy people are insured while poor people cannot afford such insurance and thus each time they are directly affected by such events they lose all of their belongings and are often forced to leave their homes. This situation often gets worse with weak and fragile governments and corrupt elites that not only fail in early warning, in disaster preparedness and response, but also in being unable to reduce the impact of these hazards. In some cases they have failed to assist the victims and have even captured part of the international relief for their own benefit (chap. 15 by Wisner).

Selected empirical case studies (Castro Garcia 2005; UNU-EHS 2006; chap. 93 by Ariyabandu/Fonseka) have documented the case that substantially more women have died in hydro-meteorological and geophysical hazards and are the primary victims of the resulting societal disasters. Women often are seen and perceive themselves as weak, incapable and depend-

8 It is possible to push this line of inquiry much further, but few security researchers are willing to entertain notions that, for instance, the car culture which is directly responsible for death on a large scale, and indirectly for the greenhouse gases that in turn generates numerous insecurities for many who don't drive, can be considered a threat to human security. Among populations in Northern states cars are the greatest hazard to young adults in particular, but such casualty rates are not considered a matter of human insecurity despite the carnage on the roads (Dauvergne 2005). If they were, the whole political economy of auto mobility would no doubt be challenged in innovative ways (Paterson 2007).

ing on men. Their role in daily life is *reproductive* (child-bearing, nurturing and maintenance of households), *productive* (livelihood support, food production), *social* (integrating family and community as a whole) and *psychological* as well as *cultural* (transmission of emotional stability and historic memory of the family, clan and village).

The world has been organized for thousands of years based on patriarchal relations where males dominate females. This social reality has created identity patterns, and in case of imminent danger, women usually try to save their children and family members risking their lives (see chapter Xy by Serrano and chapter xy by Oswald). Often they are inside their homes and unaware of the pending threat. They have not been trained in effective disaster response, and sometimes their clothes, long hair, and those carrying children have reduced their chance to survive. In spite of the existing evidence on the higher vulnerability of women in disasters, no systematic data collection (CRED; IFRC-RCS; MunichRe, Swiss Re) has distinguished the number of victims (dead and affected people) by sex and age, which reflects the prevailing gender insensitivity in hazard and disaster analyses.

Policy debates and scientific discourses on human security often focus on individuals rather than on collectivities and their social networks. In contrast gendered formulations bring with them the habit of the social compact and collective traditional indigenous responses as crucial to the survival of poor and marginal populations instead of the liberal market economic version of 'human'. It does so by understanding human ecology, the interconnectedness of human systems with their local environments rather than disconnected global consumer habits, rights and securities. A holistic consideration of causes of insecurity links to the impacts on those who are most vulnerable. It focuses attention on how to deal with the cycle of poverty or specifically the 'spiral of social vulnerability'. Poor people often live in hazard-prone habitats, lack a regular income and in many cases sufficient food what negatively affects their health security and survival. Both global climate change and extreme events make their situation worse by destroying their few belongings and their livelihoods.

98.5.3 Environmental, Social and Urban Vulnerability

The object of 'vulnerability' is both human beings and the environment (Bohle 2002). However, the 'environmental vulnerability' concept is used with various

different meanings in the global change literature (Steffen/Sanderson/Tyson/Jäger/Matson/Moore III/Oldfield/Richardson/Schellnhuber/Turner II/Watson 2004), climate change impacts analyses (IPCC 2001b) and in the hazard and disaster community (UN/ISDR 2004). For the hazard community, vulnerability is the combination of additional contributing factors causing a hazard due to natural variability or human inducement to become a disaster. The contributing factors are configured by the worldview, mindset, perception, the theories and models of the analyst. Thus, vulnerability is always socially constructed.

Of the 11 types of vulnerability identified by Wilches-Chaux (1989: 20–41), three features are discussed here: environmental, social and urban vulnerability. For Castro Garcia (2005) and Oliver-Smith (2004) vulnerability combines the interaction of nature and culture. Vulnerability results from "poverty, exclusion, marginalization and inequities in material consumption", and it is generated by "social, economic and political processes" (Barnett 2001: 132–133). For Cardona (2004: 49) "vulnerability signifies a lack or a deficiency of development" that often contributes to "disaster vulnerability". In his view population growth, rapid urbanization, environmental degradation, global warming, international financial pressures and war have all increased vulnerability originating in: physical fragility or exposure; socio-economic fragility; and lack of resilience. Heijmans (2004: 115–127) distinguished three causes: nature, financial resources, and social structure.

Frerks and Bender (2004: 194–205) argued that the societal focus on vulnerability has shifted from disasters as a natural event to focus instead on exposure and a complex socially constructed process. Wisner (2004: 183–193) criticized many studies on 'social vulnerability' arguing that they devalued local knowledge and coping capacities and he supported efforts to empower people. Cannon, Twigg and Rowell (2003: 4) argue that vulnerability analysis can "become an integral part of humanitarian work ..., by using vulnerability analysis in both the operation of emergency preparedness and reducing poverty."

As the HUGE framework discussed above suggests, livelihoods are influenced by *social and political networks* that may have varying levels of cohesion and resilience in the face of hazards. When disasters occur, relief and recovery is tied with the restoration of livelihoods, and the strengthening of self-protection. Vulnerability can be seen as a term that encompasses all levels of exposure to risk. There are two separate approaches to vulnerability and capacity. The

first conceives people who have a high degree of vulnerability and are low in capacity. The second perceives them as two distinct sets of factors. A capacity might include institutional membership, group cohesion or literacy. Some capacities are not the opposite of vulnerabilities, and some low-level vulnerability characteristics are not amenable to being considered capacities.

Pelling (2003a: 5) analysed 'urban vulnerability' to natural disasters and the role of social resilience. He defined vulnerability as "exposure to risks and an inability to avoid or absorb potential harm", *physical* vulnerability as that "in the built environment", *social* vulnerability as that "experienced by people and their social, economic and political systems", and *human* vulnerability as the combination of "physical and social vulnerability".

Disasters often strike mega-cities such as the earthquake in Mexico City of 1985, in Kobe in 1996, and near Istanbul (in Izmit in 1999). Questions of how to survive in cities, how migration and informal survival strategies may facilitate people caught in such circumstances are an additional part of the human security agenda, one that is now beginning to address urban agendas explicitly. Disasters are usually not singular events; they are closely linked to both environmental and social vulnerabilities. When multiple challenges come together (e.g. in Mexico in 1985, the experience of centuries of poverty, decades of authoritarian government, corruption and economic crises were compounded by a hazard event), survival and adaptation are especially pressing. Large families often have complex survival strategies facing environmental, social and urban vulnerability (Oswald 1991), spreading risks with some people migrating and others maintaining their traditional livelihoods. The diversity of survival and coping skills is especially important for women and their direct childcare and eldercare responsibilities as well as their traditional medical knowledge.

In Bangladesh, one of the most vulnerable multi-hazard countries that lost more than 1 million people due to hazards between 1950 and 2000, the combination of storm shelters, simple early warning systems, citizens' empowerment, disaster preparedness and training has significantly reduced the number of victims in more recent extreme weather events. However, Bangladesh has also experienced many cases of internal rural-urban environmental and hazard-induced displacement, and international migration to India and elsewhere (Suhrke 1993, 1996, 1997; Brauch 2002; chap. 19 by Ahmed).

98.5.4 Migration

Socio-economic pressures, high environmental, social, rural and urban vulnerability and lack of future expectations for the young have become major drivers for urbanization and migration. For many poor people, migration means abandonment of their livelihood, cultural heritage and of their existing social networks for immediate survival and a better long-term future. Besides these manifold *push* factors, extended external family and social networks (*pull* factors) have emerged as facilitators for the massive movement of affected or potentially threatened people. It is also worth noting that sometimes cities come to rural areas due to the rapid urbanization currently happening in many parts of the world; the results of the imposition of new buildings, highways and economies on traditional rural societies also seriously disrupt traditional social networks and modes of subsistence (Davis 2006). These are essential questions for the fourth phase of environmental security research.

Hazards obviously are closely linked to migration, not only as a result of repeated experience with many small and some major disasters but also of effective early warning and forced evacuation. The insecure economic situation, persistent poverty, lack of public security due to spreading organized crime, youth gangs (see chap. 81 by de Lombaerde/Norton; Rojas 2008) and criminality within the forces responsible for public order, and violent conflicts have all contributed to social vulnerability have thus become additional drivers of migration.

In his acceptance speech for the Peace Nobel Prize on 10 December 2007 in Oslo Rajendra Pachauri, Chairman of the IPCC, argued that:

Migration and movement of people is a particularly critical source of potential conflict. Migration, usually temporary and often from rural to urban areas, is a common response to calamities such as floods and famines. But as in the case of vulnerability to the impacts of climate change, where multiple stresses could be at work on account of a diversity of causes and conditions, so also in the case of migration, individuals may have multiple motivations and they could be displaced by multiple factors.

In a similar vein the new *Security Risk Climate Change* (WBGU 2007, 2008) that was addressed in its annual report by the German Advisory Committee on Global Change, warned that

without resolute counteraction, climate change will overstretch many societies' adaptive capacities within the coming decades. This could result in destabilization and violence, jeopardizing national and international

security to a new degree. However, climate change could also unite the international community, provided that it recognizes climate change as a threat to humankind and soon sets the course for the avoidance of dangerous anthropogenic climate change by adopting a dynamic and globally coordinated climate policy. If it fails to do so, climate change will draw ever-deeper lines of division and conflict in international relations, triggering numerous conflicts between and within countries over the distribution of resources, especially water and land, over the management of migration, or over compensation payments between the countries mainly responsible for climate change and those countries most affected by its destructive effects.⁹

These quotes directly address the new security issues posed by global climate change, one of several interconnected global challenges confronting humankind during the 21st century, and point to the importance of migration as part of the agenda. But quite who moves and in what ways in the face of long-term climate change and short-term disasters needs much further analysis. It is also important to note how politicians respond to a crisis; if the migrants are constructed as a threat to national security, rather than as disaster victims in need of assistance, then violence and further dangers may result for migrants (Smith 2007).

Research is needed on why people move in the face of disaster. Some move to get to safety once warnings are issued, but others may wish to stay and look after their livelihood and valuable cultural goods. The danger of losing their belongings in a disaster is considerable and failed reconstruction efforts, political corruption and wholesale looting during complex emergencies suggest that staying at home remains an important option for many even while risking their lives. Getting out of harm's way is the first and immediate response to impending disaster. Storm shelters and short-term emergency housing are inevitably a matter of moving, although sometimes only over a short distance and for a relatively short time until the immediate danger has passed. But in situations where housing and infrastructure are destroyed it is frequently necessary to move for longer distances and duration to re-establish family support systems or simply find a roof over one's head. But the difficulty of displacement is that the collective wisdom of villages

and their environments are destroyed when communities are broken up in the migration process. This makes survival more precarious for those who lose their support systems and rebuilding more difficult for those who are left behind or who only return much later.

98.5.5 Complex Emergencies, Crises and Conflicts

While the first three phases of environmental security research focused on the worst and often least likely outcomes of environmental stress – in most cases totally ignoring environmentally triggered hydro-meteorological hazards – violent domestic and international conflict and wars, the low-level violence with a few deaths, as well as societal crises were often not covered¹⁰ because IR and peace research have traditionally been focused on warfare rather than smaller scale violence and public insecurity.

Complex emergencies dealing with violent conflicts, post-conflict situations and hazards have increasingly confronted humanitarian agencies and NGOs with new challenges. Two research communities working on early warning of conflicts and hazards have ignored each other, as well as national governments and international organizations. For these reasons the fourth phase assumes that vulnerabilities cut across traditional academic and administrative divisions. This can contribute to a political and scientific agenda-setting by addressing the potential gain from synergies in research and action. e.g. mainstreaming both early warning activities and the focus on communities. But the key point for social scientists is to foster a constructive dialogue between different disciplines and paradigms. Given different definitions, foci of research and agendas the necessary cross disciplinary learning process will not be easy.

However, one key point provides a starting place for linking environmental security research with complex humanitarian disasters. Homer-Dixon (1999) argued that the frequency with which 'resource capture' by elites in crises aggravates the insecurity of vulnerable people and sometimes causes violence. Crises are used by elites, often under the pretext of maintaining order ('national security') to reassert control over resources and economic power during periods of rapid

9 See source at: <http://www.wbgu.de/wbgu_jg2007_engl.html> and an English summary for policy makers at: <http://www.wbgu.de/wbgu_jg2007_kurz_engl.html>. This report was discussed at a meeting organized by the German Foreign Ministry on 13–14 June 2007 in Berlin (Auswärtiges Amt 2008).

10 Strahm/Oswald (1990); Chomsky (1998); Stavenhagen (2003); Kaldor/Anheier/Glasius (2003); Shiva (2003); Calva (2003); Kaplan (2003); Stiglitz (2002); World Bank (1998b); Oswald (2004, 2005).

change. Here is a direct link with violence in humanitarian emergencies and to a larger political discussion of the global economic conditions that precipitate both violence and insecurity (Peluso/Watts 2001; Oswald/Brauch 2006).

All these considerations focus on measures and policy implications that flow from attempts to both prevent and respond to disasters. This suggests that states and corporations need to think about future investments in alternative renewable energy sources and technologies that reduce economic and environmental vulnerabilities caused by fossil fuels. These interconnection and technological innovations that reduce vulnerabilities might be understood in many ways.

98.5.6 Resilience-Building and Political Coping Strategies

Resilience, empowerment and coping capacity are crucial for survival and reconstruction in the aftermath of hydro-meteorological and geophysical hazards.¹¹ Resilience building and coping strategies should be complemented with preventive environmental management in terms of land planning, reforestation and ecosystem protection. Careful coastal planning (e.g. mangroves, coral reefs) is also important as the waterfront resorts worldwide (e.g. in Cozumel and Cancun in Mexico¹²), widespread deforestation in Haiti and the urban use of the everglades in New Orleans and Florida have shown. This suggests a need to widen the focus of environmental security by reducing social vulnerability with ecosystem protection and land use and urban planning; vulnerability

mapping for relocations from hazard-prone to safe areas, building shelters and evacuation facilities; early warning, institution building, disaster funds, and citizens' training and empowerment, especially of women and children.

In transboundary river basins suffering water stress (scarcity, pollution), cooperation through *international water resource management* (IWRM) aiming at basin-wide regimes and institutions may contribute to peaceful resolution of water disputes thus avoiding an escalation into violent conflict (Bogardi/Castelein 2002; UNESCO 2003d, 2006; chap. in part VII). Environmental and water scarcity has been both a cause of conflict and cooperation in hydro-diplomacy (Enrique 2004; Oswald 2005, 2007g) and environmental peace-building (Conca/ Dabelko 2002). On the contrary, abundance of natural resources has also led to conflicts (Collier 2000a; Collier/Elliott/Hegre/Hoeffler/Reynal-Querol/Sambanis 2003; LeBillon 2005).

A key question is how hazards become disasters. Hazards do not always kill people because similar events often have different outcomes. Why people sometimes die or don't is key to understanding human insecurities as part of a policy agenda for governments and non-government agencies. This emphasizes the importance of comparing experience with early warning and preparations to deal with consequences (IFRC 2005). Beyond appropriate precautionary policies further investigations of crisis responses are required. More particularly the intersection of traditional security studies and disaster responses highlights difficulties during crises.¹³

11 Comparisons between Cuba and Haiti are especially informative given their similar locations as islands in the Caribbean and rather different levels of casualties. With regard to the hurricanes during 2005 in the Gulf of Mexico, the resilience and coping strategies seem to have been better in Cuba and Mexico than in the U.S. and Haiti, which suggests that learning to deal with hurricanes is feasible, and can be achieved in poorer countries. The key to the success in Cuba is due to local experience, training and organization where citizens are playing a crucial active role (Sims and Vogelmann 2002).

12 Here developers destroyed the coral reef and mangroves to build a cruise ship port, which was destroyed during hurricane Wilma in 2005. In Cancun, 27,000 hotel rooms and facilities were built on a sand barrier dividing an interior lagoon from the sea. Wilma and previous hurricanes have repeatedly opened this natural connection between both and thus destroyed this tourist infrastructure that was rebuilt despite its high environmental vulnerability.

13 See the U.S. response to hurricane Katrina in New Orleans in August 2005 where the National Guard first tracked looters rather than rescuing people from floods. Imposing order was seen as their prime responsibility, actually helping people was secondary. This raises questions on the lack of appropriate preparation to deal with hurricanes, and particularly the flooding that resulted from the failure of the dikes around New Orleans. But it also highlights who has priority in a crisis. When imposing order gets priority over aiding victims, the state response may endanger numerous people precisely by declaring an emergency situation. It also raises the issue of social resilience and the possible contribution of civil society organizations to flood relief and the provision of shelter, food and water when state agencies are preoccupied with maintaining control. In contrast, the illegal Latino immigrants (230,000 estimated people) used their own networks and survived with few casualties.

Coping strategies such as the neighbourhood disaster response system in Havana suggest that planning and preparation for people's needs in advance, can prevent putting troops on the streets. A comparison of Havana and New Orleans during the hurricane season of 2005 is a starting point. Likewise an investigation of the role of the Zapatistas¹⁴ in the response to hurricane Stan in Mexico would point to the difficulties of states dealing with insurgencies while coping with disasters. The situation in Sri Lanka compared to that in Aceh (Indonesia) after the Tsunami in late 2004 suggests clearly that political change is possible in the aftermath of disasters but the complex politics of such events requires detailed fieldwork to examine the dynamics in individual cases (Le Billon/Waizenegger 2007). Clearly resilience is crucial to survival and in many cases in opposition to the imposition of an urban based commodity system. An investigation of these matters of rural and urban survival is part of the fourth phase research agenda.

In some cases business organizations are in a position to help organize and administer aid in the face of government incapacity or corruption. Many businesses are intrinsically adaptive mechanisms, shipping product to where there are demands at very short notice in a flexible mode of operation that is frequently anathema to centrally organized command systems. But a major danger is that privatization of relief functions and the reliance on corporations to provide assistance will only aggravate the vulnerability of the poor who will be unable to purchase aid in a crisis. Privatizing aid simultaneously reduces the capabilities of states to aid their poorest citizens when help is most needed (Klein 2007). Insurance also provides some non-government protection in disasters but only for those affluent enough to have property and cash to buy insurance. This shortcoming could be overcome by micro insurance schemes.

Unfortunately elite control of the supplies can also lead to its appropriation and their sale at inflated prices adding further to the burdens of the poor and the most vulnerable. Elite actions to capture and control relief supplies usually lead to further distrust and political violence. This feeds into policy issues in dis-

aster relief assistance where governments refuse access to aid workers where they might aid insurgencies: 'national security' is more important than 'human security'. Does the 2004 tsunami response teach us new lessons, and if so how can interventions be mounted that do not run into local bureaucratic and political opposition?

So a big question for human security research is how to work with civil organizations to build resilience in the face of disasters. Such responses are more complex after earthquakes, but nonetheless carefully crafted and effectively enforced building codes and evacuation training in schools and public buildings could reduce fatalities. For example the Pakistan earthquake (2005) suggests that local knowledge is important for survival because external aid to deal with disasters is frequently too late, except in the case of famines, which can be dealt with if there is reasonable response to early calls for food aid.

In all disasters gender also plays a crucial role. Normally food supply and provisional shelter are given to the heads of family (usually men). Widows and women living alone with children are not only confronted with gender-specific risks after a disaster (rape, theft of their belongings, discrimination), but are also excluded from emergency help. The few anthropological data available on gender-specific victims during different catastrophes (on the 2004 tsunami in Sri Lanka and on the 2005 earthquake in Kashmir, see chap. 93 by Ariyabandu/Fonseka; on Stan in Guatemala and Mexico see García/Marín/Méndez/Bitrán 2006) showed that at least 60 per cent of victims were women.

98.6 Looking Forward: Implementing the Fourth Phase

Reconceptualizing security in terms of ecology means thinking about causal chains from different perspectives by multidisciplinary teams. It requires enhanced adaptive strategies, and may involve security in terms of building codes understood as planning to minimize the damage by future disasters. Governance is a key but IR and its focus on state security is not an appropriate conceptual toolkit given the shift in referent object in 'human security' discussions from states to societies. There is a considerable irony that this is an IR issue because of transboundary causations but IR as a discipline has had relatively little to say about how to deal with the results.

14 Attempts to prevent development of indigenous survival strategies by central governments anxious to avoid a consolidation of insurgent organizations was the case in Mexico where 60,000 troops were present when the hurricane struck and the low intensity war against indigenous movements suggested the extension of neo-liberalism as opposed to facilitating indigenous self-organization.

This brings the discussion back to the anthropogenic causes of environmental vulnerability which means that the North has to assume responsibility for historical and present climate change. Thus, human security links to energy policy. It focuses on the context and implies that the North must not destroy Southern ecologies due to the export of biomass and 'virtual water' in crops to Northern markets. Hence 'human security' has a duty to consider the consequences of consumption and must incorporate a forward looking energy strategy to decrease fossil energy sources.¹⁵ If rain fed rice fields in the South are gone due to climate change indirectly contributing to starvation in the South then the North must respond.

Multi- and interdisciplinarity are needed to investigate the complex interconnections of many causes of social vulnerability. In particular outcomes of environmental stress triggered by extreme events may lead to conflicts. The interactions between stress, hazards and societal outcomes are also related to problems of the distribution of aid when conflict and violence complicate coping with disasters due to inadequate governance (see Sri Lanka after tsunami). Anthropology and social movement research is probably most important for analysing matters of strategies to cope with vulnerabilities of the poor and the most likely victims from disasters, because early warnings are useless without understanding and empowerment from below.

It is also worth noting that, globally, little disasters kill more people than big disasters and climate change seems to be increasing the numbers of those killed by hydro-meteorological events (United Nations International Strategy for Disaster Reduction, 2004, 2007). Understanding how this happens requires looking at the anthropological literature as well as media sources, anecdotal material, and increasingly, internet sources. Likewise there is a crucial need to disaggregate data on the basis of gender, age, handicapped, but also in terms of other demographic attributes so that the social dimensions of vulnerabilities can be unpacked from summary statistics. There remain all sorts of possibilities for online media monitoring of environmental difficulties and violent conflict similar to contemporary health monitoring early warning systems. But monitoring alone is not enough without an ability to respond to imminent destruction. The

fourth phase clearly has to look for practical innovations to increase resilience while reducing vulnerability in a rapidly changing biosphere.

Further work needs to be done on integrated early warning systems linking together conflict analyses with hazard mapping and conflict. How for instance do low level disputes work into hazards and vulnerabilities? What about herder and pastoralists conflict in Africa, related to early warning systems? How are land and water conflicts linked to environmental destructions and governance issues? Much of this research needs an explicit link to the ongoing work on complex emergencies, and work of such agencies as the *International Crisis Group* (ICG). Combining the academic literature on early warning of hazards and conflicts may be easier than pushing ministerial cooperation, but this too is an important part of the fourth phase of environmental security research.

The need to press ahead on all these themes in the fourth phase has recently been emphasized by the publication of the fourth assessment of the IPCC in 2007 (IPCC 2007). This work was highlighted by the Nobel peace prize the IPCC won in 2007 and this in turn has generated further reports and commentary (Campbell et al. 2007; Smith and Vivekananda 2007; UNDP 2007). While the IPCC's research on the impacts of climate change has looked extensively at hydro-meteorological hazards and the dangers of extreme events, much less work has been done on the socio-economic and political dimensions (Brauch 2002). In the earlier IPCC reports clarifications were lacking on the differences between hazard-induced migration in comparison with environmental stress-induced migration, a topic that was a matter of concern during the second phase of environmental security research.

These issues have now been addressed in part by Rajendra Pachauri, Chairman of the IPCC, in his acceptance speech upon receiving the Nobel Peace Prize:

One of the most significant aspects of the impacts of climate change ... relates to the equity implications of changes that are occurring and are likely to occur in the future. In general, the impacts of climate change on some of the poorest and the most vulnerable communities in the world could prove extremely unsettling. And, given the inadequacy of capacity, economic strength, and institutional capabilities characterizing some of these communities, they would remain extremely vulnerable to the impacts of climate change and may, therefore, actually see a decline in their economic condition, with a loss of livelihoods and opportunities to maintain even subsistence levels of existence.

15 A similar logic applies to replacing petroleum products in an energy strategy; there is no need to fight over supplies of oil in the Persian Gulf if one's economy is no longer dependent on those supplies.

The IPCC chairman noted that IPCC does not “provide assessments, which are policy prescriptive”, and thus restrained from any comments “on how conflicts inherent in the social implications of the impacts of climate change could be avoided or contained.” But he also stated that the IPCC reports have much information of high relevance “for individual researchers and think tanks dealing with security issues as well as governments that necessarily are concerned with some of these matters.” And he suggested that “it would be particularly relevant to conduct in-depth analysis of risks to security among the most vulnerable sectors and communities impacted by climate change across the globe.”

Pachauri identified peace with “the secure access to resources that are essential for living” and he added that “a disruption in such access could prove disruptive of peace.” He pointed out that climate change will directly affect the access of some populations to a) clean water, b) sufficient food, c) health conditions, d) ecosystem resources, e) the security of settlements. Thus climate change, he argued would directly affect water, food and health security. The effects he projected will probably be specifically severe for Africa, where by “2020, between 75 and 250 million people are projected to be exposed to increased water stress due to climate change.” With regard to food security he stated that “by 2020, in some African countries, yields from rain-fed agriculture could be reduced by up to 50%. Agricultural production, including access to food, in many African countries is projected to be severely compromised.” But also the health security

of millions of people is projected to be affected through, for example, increases in malnutrition; increased deaths, diseases, and injury due to extreme weather events; increased burden of diarrhoeal diseases; increased frequency of cardio-respiratory diseases due to higher concentrations of ground level ozone in urban areas related to climate change; and the altered spatial distribution of some infectious diseases.

Summarizing the projected effects based on the Fourth Assessment Report, Rajendra Pachauri pointed to the implications of specific likely regional climate changes:

- The Arctic, because of the impacts of high rates of projected warming on natural systems and human communities,
- Africa, because of low adaptive capacity and projected climate change impacts,

- Small islands, where there is high exposure of population and infrastructure to projected climate change impacts,
- Asian and African mega-deltas, due to large populations and high exposure to sea level rise, storm surges, and river flooding.

The IPCC Chairman (see foreword) also pointed to highly probable physical and social effects of climate change: an increase in the number and intensity of natural hazards, as well as in climate- and hazard induced distress migration. In a later speech to the World Economic Forum in Davos on 23 January 2008, Pachauri pointed to the economic costs of these trends and their likely impact for the Third World:

Some of the impacts of climate change are already translating into monetary flows and expenditure ... For instance, economic losses attributed to natural disasters have increased from US\$75.5 billion in the 1960s to US\$659.9 billion in the 1990s. Losses to insurers from natural disasters nearly doubled in 2007 to just below \$30 billion globally according to risk records. From 1980 through 2004, the global economic costs of weather-related events totalled \$1.4 trillion (inflation corrected), of which \$340 billion was insured.¹⁶

But these impacts are not likely to be felt equally; some people are more vulnerable than others and the consequences of climate change will vary regionally. In Davos Pachauri continued:

Far more important than the aggregate impacts of climate change on global economic activity are the consequences for some of the most vulnerable communities across the globe. In Africa, between 75 and 250 million people are projected to be exposed to increased water stress due to climate change by 2020. In the same year, in some countries yields from rainfed agriculture could be reduced by up to 50%. Agricultural production, including access to food, in many African countries would be severely compromised. This would further adversely affect food security and exacerbate malnutrition. Worldwide the health status of millions of people is projected to be affected through, for example, increases in malnutrition; increased deaths, diseases and injury due to extreme weather events; increased burden of diarrhoeal diseases; increased frequency of cardio-respiratory diseases; and other impacts.

Facing these new security threats, challenges vulnerabilities and risks requires a long-term, sophisticated policy strategy with many extraordinary policy, societal economic and scientific initiatives and measures to be able to *cope* with these new security dangers

16 See source at: <<http://www.ipcc.ch/graphics/speeches/pachauri-davos-january-2008.pdf>>.

and concerns. Rajendra Pachauri, in his Nobel Acceptance speech, stressed that:

climate change poses novel risks ..., such as impacts related to drought, heat waves, accelerated glacier retreat, and hurricane intensity. ... Adaptation measures essential to reduce such vulnerability, are seldom undertaken in response to climate change alone but can be integrated within, for example, water resource management, coastal defence, and risk-reduction strategies. The global community needs to coordinate a far more proactive effort towards implementing adaptation measures in the most vulnerable communities and systems in the world. Adaptation is essential. ... But, adaptation alone is not expected to cope with all the projected effects of climate change, and especially not in the long run as most impacts increase in magnitude.

Therefore, echoing the logic of the Stern Report (2007) on the economic dimensions of climate change, the IPCC chairman suggested that

... A rational approach to management of risk would require that human society evaluates the impacts of climate change inherent in a business-as-usual scenario and the quantifiable costs as well as unquantifiable damages associated with it, against the cost of action. With such an approach the overwhelming result would be in favour of major efforts at mitigation. The impacts of climate change even with current levels of concentration of greenhouse gases would be serious enough to justify stringent mitigation efforts.

With reference to the narrow mandate of the IPCC, Pachauri asserts that the question as to how “climate change will affect peace is for others to determine”, but the IPCC in its four Assessment Reports so far has “provided scientific assessment of what could become a basis for conflict.” Finally and with reference to Willy Brandt’s earlier speech as Nobel Laureate of 1971, he emphasized that “learning is in our world the true credible alternative to force.”

The learning that is now needed urgently on past, present and probable future security impacts of global environmental and climate change is just starting. Both the HESP research programme and the HUGE security concept - outlined above - are intended to contribute to the framing of the social science research on the manifold societal implications of environmental change at the global scale in the new circumstances of the Anthropocene.

98.7 Anthropocene Ethics and the Fourth Phase

From the past two decades of environmental security research, and in particular from its empirical investiga-

tions (chap, 60 by Dalby/Brauch/Oswald), emerged some consensus that the initial assumptions of scarcity or degradation causing violence were neither empirically accurate nor a useful set of precepts for policy-making. While environmental change, and more precisely resource access, are stressors on social systems, they are not the sole or even the dominant cause of political violence and social vulnerability (Kahl 2006). Scarcity alone is not what kills people or causes political violence; numerous other factors are important in the destruction of the social networks that ensure survival. Likewise the current dynamic changes in human affairs, encapsulated in the term globalization, are uprooting traditional societies and forcing people to move and change in numerous ways that render them vulnerable, while also requiring them to rapidly learn and adapt to new circumstances.

Despite official rhetoric there is no reason to believe that states are necessarily acting in ways that ensure the security of their populations. The critical development literature and discussions of political ecology emphasize that state actions in support of development may be a contributing factor to the vulnerability of social systems which are then incapable of ensuring survival when disaster strikes. Neither are states the innocent arbiters of disputes, nor necessarily benign agencies primarily interested in the welfare of their populations; they may be involved in the violent suppression of resistance to central rule or to the dislocations of economic globalization and the concomitant commoditization of items essential for survival. The broader approach, summarized in this chapter in terms of *HESP*, focuses on the complexity of political violence and the necessity of understanding this as much more than the traditional inter-state violence that pre-occupied security analysts through the twentieth century.

More recent research in the third phase has also suggested that linkages between North and South are important, both in terms of economic and ecological phenomena. While the assumption in the 1980’s, that environmental degradation was likely to cause social conflict, always implicitly assumed human agency in causing the damage to natural systems, until the 1990’s (Renner 1996) it was not focused upon directly nor was it linked to the larger patterns of development supported by numerous states. Frequently it was assumed that poor and marginal populations were the problem, now it is understood that the global economy and affluent consumption has the largest impact on natural systems and on social vulnerability.

It is now also clear that the rapid pace of globalization makes numerous people vulnerable in various places as a result of the disruption of social networks and support systems that are especially important to women who also frequently have the most important role in ensuring collective survival. As both HESP and HUGE have stressed, geological actions in one part of the planet have consequences for supposedly remote peoples elsewhere. An 'Anthropocene ethic' which focuses on these connections is now essential.

To accomplish this agenda requires research in many places and disciplines. This clearly needs comparative cases in carefully structured ways to sort out key factors of vulnerability by examining what endangers and what protects in complex circumstances. This also requires investigating connections between different places, looking at the distant consequences of trade and industrial activity as well as the international patterns of migration and innovation that facilitate resilience-building. This moves beyond the state centric approaches that have so frequently stymied innovation in the social sciences and explicitly links physical and human science research; there are many signs of such thinking emerging in the ongoing debate about human security and the United Nations; the fourth phase is thus timely (Dodds/Pippard 2005).

Ecological investigations have made it clear that these are all part of a larger set of syndromes of change belonging to a single biospheric system. Understanding humanity as a contributing factor to ecological processes at the global scale suggests that we can no longer operate on the assumption of the environment as a separate surrounding entity. Rather we are actively, albeit unintentionally, creating a habitat for humanity, one in which the risks due to environmental change are increasing for many and are unevenly distributed. These new circumstances for humanity, living in an increasingly 'artificial' biosphere, has given rise to a discussion of a new geological era, the *Anthropocene*.

The Anthropocene suggests that the interconnection of human and ecological matters needs to be understood in a way that transcends the divisions between the 'natural' and the 'human' that have structured thinking on security and especially identity since the emergence of modernity. We are not on earth, we are part of an ecosystem we are changing. Thus discussions of climate change are also about discussing the vulnerabilities created by urban consumption systems for those vulnerable both in the rural areas and the urban slums of the South. The fourth phase of environmental security research has to focus

on these interconnections recognizing that both economic and ecological linkages are involved in the global economy which now operates to varying degrees as part of all supposedly 'glocal' social systems (Sachs/Santarius 2007). Geological actions in one part of the planet may have consequences for supposedly remote peoples elsewhere making an '*Anthropocene ethic*' which focuses on these connections, and hence on social responsibilities, stressed by both HESP and HUGE. This emphasizes the importance of comparative research. This also implies a shift in our understanding of the context of our own lives so that we start from a concept of ourselves within an ecosystem which we are actively changing, rather than as urban 'civilized' dwellers manipulating an external environment which is in some ways 'threatening' to that mode of living (Dalby 2007a, 2007b).

In summary, the fourth phase of environmental security research needs to be more comprehensive than the earlier phases, and it needs to integrate physical and human sciences in ways that do neither focus simply on states on the one hand or environmental causes as a simple variable on the other. Dynamic change is crucial for understanding both human and ecological systems and how they are coupled in contemporary security thinking which is simultaneously sensitive to the specific contexts in which human insecurity occurs. Ecological thinking with its focus on adaptability, resilience and interconnection now understands security in contrast to earlier formulations assuming central control and violence as the essence of security.

The purposes of research thus focuses on analyzing risks and anticipating likely changes that may lead to violence and disruption so that preventative capacity building and policies of adaptation can be formulated in time to simultaneously mitigate the dangers and so reduce future vulnerabilities. This follows from discussions on human security as a 'culture of prevention', where anticipation rather than response to disaster is priority. The objects of analysis are not necessarily states or specific ecological parameters but starting from the social life of vulnerable people, a focus on the determinants of their economic, political and ecological vulnerabilities. Rather than the traditional security focus on conflict as the clash of separate entities, the focus is now on the interconnections between ecological and social change and the parameters that prevent or facilitate the adaptation of human systems to ensure survival.

99 Towards Sustainable Peace for the 21st Century

Hans Günter Brauch and Úrsula Oswald Spring

99.1 Introduction¹

Since the start of the Industrial Revolution humankind has been gradually moving towards a new era in earth history, the ‘Anthropocene’ (Crutzen/Stoermer 2000; Crutzen 2002) that is increasingly being influenced by the human-induced perturbations of *global environmental change* (GEC) and their societal outcomes.²

In a schematic framework (figure 99.1) the IPCC (2007c: 26) visualized the complex interaction between anthropogenic drivers, impacts, and policy responses to climate change and their linkages. Thus, humankind, international society, and business as well as the community of states and international organizations, will be faced with a new challenge to its well-being and survival that may be more severe than any security threat, challenge, vulnerability, and risk the world of states experienced during the past five centuries and especially since the two world wars and the pandemics during the 20th century.

Nicholas Stern (2006, 2007: iv) warned that “climate change will affect the basic elements of life for people around the world – access to water, food production, health, and the environment. Hundreds of millions of people could suffer hunger, water shortage, and coastal flooding as the world warms.” The Stern Review estimated based on formal economic models “the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more.” The Stern Review further argued that “all countries will be affected. The most vulnerable – the poorest countries

and populations – will suffer earliest and most, even though they have contributed least to the causes of climate change. The costs of extreme weather, including floods, droughts and storms, are already rising, including for rich countries.” The *Millennium Ecosystem Assessment* (MA 2005) argued that the proactive regionalized and globalized scenarios with regard to combating desertification are the most promising.

Peer reviewed research assessed by the IPCC (2007, 2007a, 2007b) leaves no doubt that during the 21st century humankind will face many new environmental security challenges that may pose fundamental new problems for the survival of individuals, states, and global policy actors. While in the 20th century and especially since 1945 the ‘security dilemma’ of states prevailed in the analysis of international relations, since the end of the Cold War this state-centred security perspective has changed due to a *widening* (from military and political to economic, societal, and environmental security), *deepening* (from national and international to human, gender, and global security) and *sectorialization* (energy, water, food, health, climate and livelihood security) of the security.

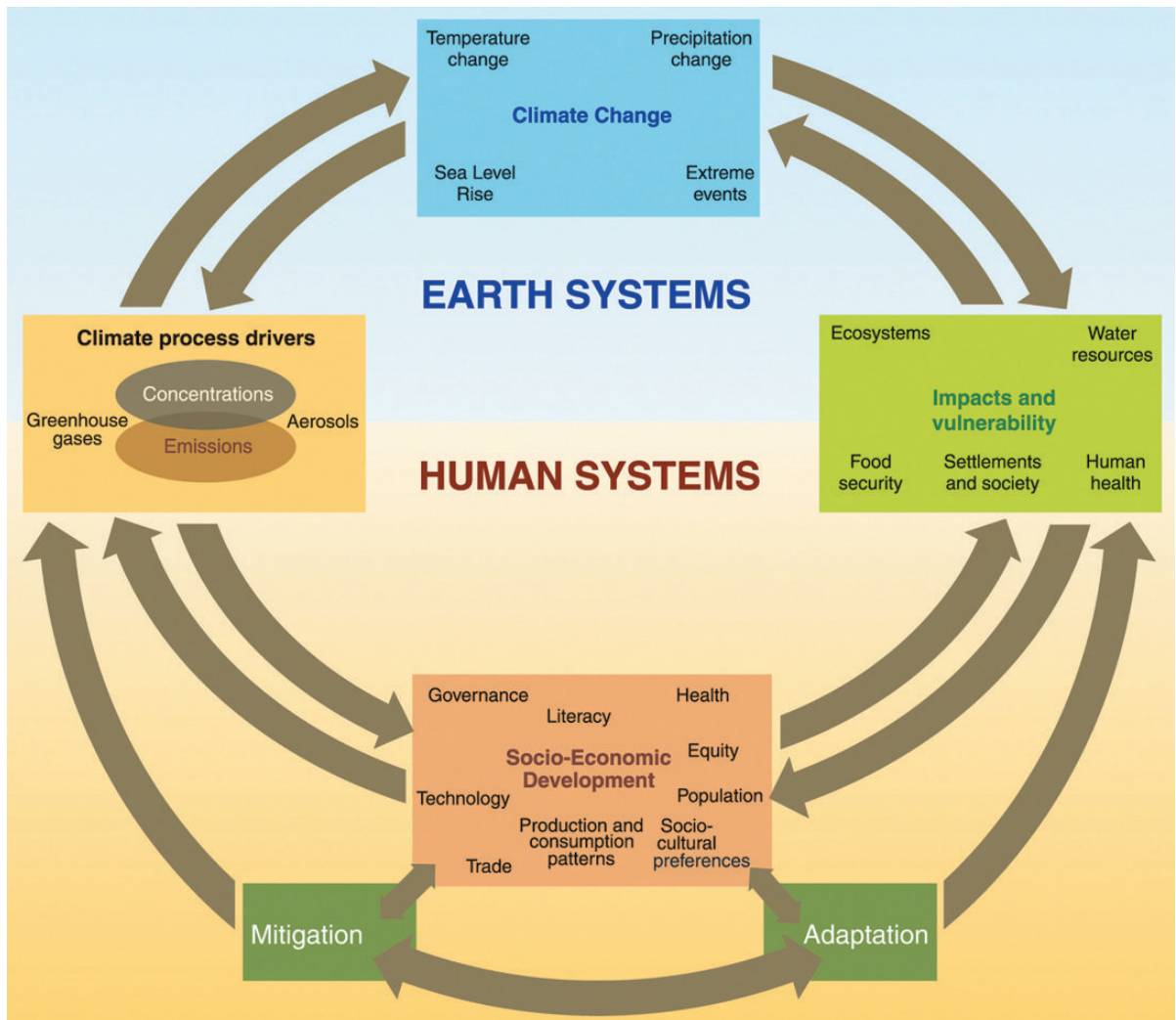
The state-centred ‘security dilemma’ (Herz 1950; Booth/Wheeler 2008) has been escaped by the evolving ‘security community’ (Deutsch 1957; Adler/Barnett 1998) in Europe with the expansion of the EU from 15 to 27 member states. But it has not globally been overcome with the end of the Cold War, rather the arms competitions have intensified in other parts of the world, e.g. between the new nuclear countries India and Pakistan, between China and Taiwan, between Iran and its Arab neighbours in the Gulf, as well as between Israel and its Arab neighbours. In addition, the dissolution of state authority in failing states as well as new networks of non-state actors (criminal gangs, drug and human trafficking, and terrorists) have posed intensive threats to national, regional, and international security.

A new human-centred ‘survival dilemma’ has emerged that has serious impacts on that part of

1 The authors are grateful to two reviewers for their useful comments that helped to significantly revise and condense this chapter.

2 This has been discussed in more detail in: chap. 1 and 4 by Brauch and in chap. 98 by Oswald/Brauch/Dalby.

Figure 99.1: Schematic framework of anthropogenic climate change drivers, impacts, and responses. **Source:** IPCC (2007c: 26). Reproduction permitted under IPCC rules.



humankind living in poverty in the South (Brauch 2000d, 2004, 2008c). Climate change will affect the countries and people in the South more seriously – as documented by the national communications to the UNFCCC – due to more severe and intensive hazards, a high degree of social vulnerability resulting from poverty and lacking resources for adaptation, and mitigation measures as well as an insufficient state capacity for implementation.

The monopoly of the state, its top leadership, and the power-based military establishment as the key ‘securitizing actor’ (Wæver 1995, 2008, 2009a) who defines the threats, challenges, vulnerabilities, and risks for national security has been challenged by a knowledge-based global epistemic community, the *Intergovernmental Panel on Climate Change* (IPCC 1990c, 1995, 1996, 1996a, 1996b, 2001, 2001a, 2001b, 2001c,

2001f, 2007, 2007a, 2007b, 2007c) that has addressed new global challenges facing humankind due to anthropogenic climate change.

The IPCC by its mandate has been limited to “assess on a comprehensive, objective, open and transparent basis the latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts and options for adaptation and mitigation.” It relies on peer-reviewed scientific knowledge and governmental reports. So far the IPCC did not address the societal consequences and related security issues, but its scientific messages have been perceived and communicated as most urgent environmental challenges by many media and put on the agenda of the UN, OAS, AU, of G-8, EU countries, and of many other regional

organizations. The heads of states and governments and their representatives have agreed in many policy declarations and statements that most urgent policy responses are needed. Thus, the year 2007 has been the turning point from a process of *politicization* (since 1992) towards a *securitizing* of global environmental and climate change (chap. 4 by Brauch).

These new environmental security challenges humankind faces in the 21st century cannot be solved by traditional and power-based security strategies, policies, and measures. They require a shift from a unilateral and national security concept – as pursued by the US administration (2001–2008) – to a cooperative and multilateral Grotian (Bull 1977; Wight 1991; Brauch 2008a) or Confucian (Lee 2008, Oswald 2008c) approach to security. The response to these new manifold challenges requires an extended security approach that involves besides the foreign and defence departments also ministries and agencies responsible for environment, development, science and technology, as well as economic policies and measures (chap. 77 by Werthes/Debiel) to adapt to these new challenges and to mitigate against their impacts.

The new global non-military security dangers and concerns in the Anthropocene, and the reconceptualized security concepts have already resulted in a new global, regional, international, and national ‘soft’ security agenda. The threefold contextual changes with a) the end of the *Cold War* (bipolarity, military, systemic, and ideological conflict), b) with *globalization* (emergence of new non-state actors, societal and economic processes, global communication and internet technologies), and c) with the emerging new security challenges in the Anthropocene requires a new international peace and security policy that differs fundamentally from the cooperative security and peace policies during the Cold War that aimed to overcome the global bipolar systemic and power conflict by a common security policy relying on arms control and disarmament policies, i.e. that was focusing at the military and its weapons. Such a new international peace and security policy for the Anthropocene should combine the two goals of a sustainable development pattern with the vision of a sustainable peace.

This concluding chapter tries to transform the conceptual and empirical results into a policy perspective that translates the scientific knowledge into political action. The chapter is structured into eight parts: the first two parts discuss the processes of knowledge creation (99.2), and of translating knowledge into policies and measures (99.3), while the following three parts refer to the role of society (99.4), of the business

community (99.5) in facing the new global challenges, as well as the role of the state and international organizations (99.6) in responding to these new global challenges. The final two parts address these new challenges for international peace and security (99.7) and suggest conceptual ideas for moving towards a sustainable peace policy for the 21st century (99.8).

99.2 Knowledge Creation: Scientific Research and Epistemic Communities

A key thesis is that the narrow conceptualization of political and military security policy during most of human history has been ‘power-based’ relying on diplomacy and the military in achieving the national interest. In the 21st century due to the increasing importance of issues of *global environmental change* (GEC) the new and widened concepts of *environmental security* and the deepened concepts of *human security* will increasingly be ‘knowledge-based’.

Since its establishment in 1988, the IPCC, as a science-based ‘epistemic community’ (Haas 1989, 1990, 1992, 1993) consisting of a few thousand authors and evaluators from different scientific disciplines from all parts of the world, has assessed the peer-reviewed knowledge primarily in the natural sciences on global climate change (GCC). With its first four assessment reports the IPCC has succeeded to create global awareness within the scientific community, in the media, and in the political realm, and has thus politicized climate change. With its *Fourth Assessment Report* (AR4), the IPCC (2007, 2007a, 2007b, 2007c) has succeeded to make climate change a global issue of utmost importance that requires extraordinary political, societal, and economic responses. The IPCC has thus become a new *securitizing* actor that indirectly securitized GCC issues without addressing security itself.

The other scientific and technological committees created in the framework of the *UN Convention on Biodiversity* (1992) and of the *UN Convention to Combat Desertification* (1994) as well as the *World Water Forum* (1997, 2000, 2003, 2006) have also become new policy focused epistemic communities. In the scientific realm the *Earth System Science Partnership* (ESSP) and its key scientific programmes were instrumental for scientific agenda setting:

- a.) *International Geosphere-Biosphere Programme* (IGBP), a research programme that studies global change by analysing interactive physical, chemical, and biological processes that define Earth System

dynamics changes occurring in these dynamics and the role of human activities on changes (Nobre/Noone 2009).

- b.) *DIVERSITAS* integrates biodiversity science for human well-being by linking biology, ecology, and the social sciences, producing socially relevant new knowledge to support sustainable use of biodiversity (Larigauderie/Loreau/Walther 2009).
- c.) *International Human Dimensions Programme* (IHDP), an international, interdisciplinary science organization that promotes and coordinates research, capacity building, and networking by developing a social science perspective on global change at the interface between science and practice (Young/Rechkemmer 2009); and the
- d.) *World Climate Research Programme* (WCRP) that draws on climate-related systems, facilities and intellectual capabilities of 185 countries to advance the understanding of processes that determine our climate, focusing on its predictability and on the effect of human activities (Church/Henderson-Sellers 2009).

These four scientific programmes and the many associated projects, such as *the Global Environmental Change and Human Security* (GECHS), have created global networks that encouraged the creation of 'new knowledge'. The advisory bodies of the global environmental conventions (such as the IPCC) have assessed and communicated this knowledge to the global community, to governments, and many international organizations. This new science-based knowledge that has been created during the past two decades has succeeded to create a wide global public awareness, and has been added to the policy agendas of most nation states and international organizations, e.g. of the United Nations and its organs: the General Assembly, the Security Council, and the Secretary-General as well as its specialized agencies (UNESCO, WMO, FAO, WHO), and its programmes (UNEP, UNDP).

The new knowledge on environmental challenges has been a result of both disciplinary research in the atmospheric sciences (meteorology, chemistry, physics) and of multidisciplinary studies, as well as of inter- and transdisciplinary research teams, where the linkages between different disciplines were instrumental for new scientific insights. Universities and major research institutes have become the creators of scientific knowledge that has been transmitted through teaching to students, thus creating within two decades a scientifically trained global environmental change community and sensitizing decision-makers in society, the

business community, and in the state, as well as in the international organizations for these new political and security issues. In transmitting this knowledge to the people, the IPCC has become a highly respected communicator and 'catalyst', whose assessments were widely reported and discussed in the mass media, by social movements, parliaments, cabinets, and international fora.

While most knowledge in the social and political sciences has been based on historical evidence and systematic analyses, the IPCC's scientific information is based on past climate analyses, observations, and measurements (meteorology, climate history) as well as on climate scenarios and modelling up to 2050 and 2100. As one key assumption has been the 'anthropogenic' or human-induced climate change, projections on future greenhouse gases require the integration of population projections, on the processes of urbanization and of agricultural and industrial production and services, as well as on transportation and on the projected energy consumption of fossil fuels (coal, oil, natural gas).

While these trends can be mathematically modelled, political constellations, decisions, and resulting events cannot be predicted, as the failure of the intelligence services and of many social science analyses to foresee the end of the Cold War (Gaddis 1992/1993) has shown. Thus, unpredictable events, such as future wars, diseases and pandemics, as well as turning points in global history due to learning and proactive policies cannot be foreseen. While policy-making as a result of manifold human choices, decisions, and responses to decisions is unpredictable, the trends posed by the many new global, regional, and local environmental challenges constrain the political leverage of decision-makers, and no action or late reactions may increase the costs for future decisions to adapt and to mitigate these challenges. Thus, anticipatory learning based on scientific knowledge and its communication via the media to society and policy-makers may lead to innovative policies that may revise the projected trends.

99.3 Translating Knowledge into Policies and Measures

Translating knowledge into action has become a major task of the 21st century. Anticipatory knowledge by creating public awareness has already become instrumental for launching manifold countermeasures in the framework of national climate change policies.

The concern with climate change, as well as rapid rises in the costs of fossil fuels, has triggered many innovations and initiatives for energy efficiency in production, households, and in transportation.

The Kyoto Protocol with its quantified emission reduction obligations for the industrialized countries (Annex-1 countries of UNFCCC; Annex-A countries of the Kyoto Protocol) and its three flexible mechanisms: emissions trading, joint implementation, and clean development mechanisms have brought about many economic incentives for the emergence of a rapidly growing new renewable energy sector.

The grim messages transmitted by the IPCC as well as the international climate change policies have contributed to societal learning based on the precautionary principle with the goal to shift from reactive to proactive policy-making. After Australia has ratified the Kyoto Protocol in 2007, only the remaining superpower is missing.

Recognizing and addressing the new security challenges has become an issue of utmost political importance that requires extraordinary policy measures. During the G-8 summits in 2007 and 2008, the presidents and heads of government of the eight leading industrialized countries have committed themselves to reduce their greenhouse gas emissions by 50 per cent by 2050, and medium-term reduction goals up to 2020 are presently being negotiated in the framework of the post (Kyoto) 2012 climate change regime that will set the policy framework for the policies and measures to be adopted at the COP 15 of the UNFCCC in Copenhagen in December 2009.

With regard to water scarcity and degradation, the *Millennium Development Goals* (MDGs) have adopted a set of short-term policy and measures to be achieved by 2015. They linked them to poverty alleviation and sustainable development policies in poor countries. On desertification, the COP 8 of UNCCD (1994) adopted “The 10-year strategic plan and framework to enhance the implementation of the Convention (2008–2018)” in September 2007 in Madrid.³

The *Millennium Development Goals* (MDG) aim at eradicating extreme poverty and hunger by 2015 by reducing “by half the proportion of people who suffer from hunger” (target 2). However, by 2005 the implementation has lagged behind in many developing countries with high poverty rates (World Bank 2005). According to the Director General of FAO, Jacques Diouf (2007: 17), “the proportion of people suffering

from hunger and malnutrition in developing countries, where hunger is concentrated [according to a World Bank study for the years 1990 to 2003], only a 3 per cent drop, from 20 to 17 per cent, was registered.” Therefore, “growth in the agricultural sector is thus a critical factor in hunger and poverty prevention, as was recently recognized by the World Bank in its 2008 *World Development Report: Agriculture for Development*.”

According to IFPRI’s *Global Hunger Index* (Welt-hungerhilfe/IFPRI/Concern 2007) “if current trends continue, there will still be around 580 million people going hungry in 2015.” During 2008, world food reserves (in cereals) have reached a minimum, while according to World Bank (2008) estimated prices of maize rose by more than 60 per cent from 2005 to 2007, and according to the *US Department of Agriculture* (USDA) this trend has “increased the food import bill of developing countries [in 2006] by 10 per cent over 2005 levels. For 2007, the food import bill for these countries increased at a much higher rate, an estimated 25 per cent.”⁴

This global food crisis is due to a growing middle class in poor countries, changes in the diet in China and India, drought and other natural hazards, bad harvests, speculative behaviour by transnational agribusiness, and a rapidly growing demand for biofuel that has been highly subsidized (US, EU).⁵ These developments have resulted in spring 2008 in food riots in Haiti and in several other developing countries. This tense food situation has threatened the well-being and survival of millions of extremely poor people primarily in developing countries in South Asia and in Sub-Saharan Africa.

The unequal trends in population change that have been projected until 2050 by the UN Populations Division (2007) for some industrialized countries (ageing and population decline, chap. 12 by Lutz) and developing countries (especially in Africa continued rapid population growth) and the direct and indirect

3 See the text at: <<http://www.unccd.int/cop/official-docs/cop8/pdf/16addIeng.pdf#page=8>>.

4 See: USDA: Amber Waves, February 2008; at: <<http://www.ers.usda.gov/AmberWaves/February08/Features/RisingFood.htm>>.

5 According to the World Bank’s WDR 2008 both the ethanol (USA: 46 per cent; Brazil: 42 per cent; EU: 4 per cent; others: 8 per cent) and biodiesel (EU: 75 per cent; USA: 13 per cent; others: 12 per cent) production was highly concentrated in mid 2007. Source at: <<http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EX-TRESEARCH/EXTWDRS/EXTWDR2008/0,contentMDK:21501336~pagePK:64167689~piPK:64167673~theSitePK:2795143,00.html>>.

impacts of climate change will most likely increase the environmentally-induced migration pressure from the most affected regions towards urban centres and abroad (WBGU 2008; IOM 2008). This poses new potential human security problems for the migrants as well as national security concerns for the countries of immigration. Whether the projected global environmental changes and the population changes and processes of uncontrolled distress migration and chaotic urbanization will result in extreme societal outcomes, such as crises and conflicts, depends on the policy constellations and on the decisions future policy decision-makers will take. But there is also the reaction of civil society and of the business world that are creating adaptation and mitigation strategies to better cope with the coming threats and risks.

Two combined strategies can offer guidelines and a conceptual framework for translating anticipatory knowledge and learning into proactive policies and measures: a *strategy of sustainable development* combined with the *vision of a sustainable peace*.

- *Sustainable development* is a broad scientific concept with many and often conflicting meanings. It tries to combine the economic growth of post-modern capitalism with sustainability and social equality. The outcomes are different in the North and the South, between men and women, and poor and rich. As a policy goal it tries to avoid further resource depletion and environmental destruction, without affecting the existing economic dynamics. As a policy strategy, through the Agenda 21, it creates instruments of policy measurements, able to mitigate the negative outcomes of the present consumerist society. Aware of these new threats, the Brundtland Commission (WCED 1987) defined sustainable development as a crucial element of the future of humankind and its livelihood, where the definition contains a prospective element: “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.” This simple definition still refers to continuous growth and life improvement for the highly privileged in consumerist nations, where the notion prevails that there are no inherent ‘limits to growth’ on a planet of finite natural resources and limited ecological resilience (Dalby 2006; Oswald 2008d).
- *Sustainable peace* has been used as a semantic construct in the UN context and by action-oriented researchers who combined peace with sustainable development. As a new concept it has

been used by several United Nations organizations and governments (Oswald 2008). Peck (1998: 45) has defined sustainable peace as “sustainable development (which) involves the institutionalization of participatory processes in order to provide civil and political rights to all peoples. The building blocks of sustainable peace and security are well-functioning local, state, regional and international systems of governance, which are responsive to basic human needs.” Sustainable peace has also been linked to ‘preventive diplomacy’ that tries to prevent the escalation of conflicts before they become violent. Despite this conceptual progress in linking development with environmental peace and culture, most official declarations are oriented towards short-term goals. Thus, a different paradigm and social behaviour is required to overcome the present security dangers in a coherent way.

The three actors for translating this knowledge into forward looking action are:

- *Society* from the family, to the local community, the town to the region, the national and international level. Many organized societal actors, social movements, clubs, non-governmental organizations (NGOs), etc. play a key role in promoting new policy goals for both sustainable development and peace, and to put them on the agenda of electoral processes and policy agendas.
- The three *economic sectors* of agriculture, industry and the services and the *business community* can play both an impeding as well as an innovative role towards achieving sustainable development. Whether the business sector is only guided by greed and the profit motive or whether it becomes a socially and ethically responsible innovative agent depends both on the society and the political framework established by the state.
- The *state* and *inter-state actors*, such as international organizations, regimes, and networks, will remain key actors for creating the policy guidelines, frameworks for innovative policies and measures aiming at and implementing the dual goal of sustainable development and sustainable peace.

99.4 Facing New Global Challenges: Role of Society

In the 21st century, pertaining to global environmental challenges the source of threat is ‘us’ and our eco-

conomic market-oriented and profit driven capitalist model, and the modern mode of production and consumption developed initially in the Western world that has been globalized. It is our collective and individual consumptive behaviour and our use of fossil energy that is contributing to global warming and to the accumulation of greenhouse gases in the atmosphere. Besides the natural climate variability, the anthropogenic climate change has been the result of the collective industrial and private consumption of cheap fossil fuels (coal, oil, and gas) since the technological revolution in the 18th century. Cheap fossil energy facilitated many technological innovations and breakthroughs, but it also made possible the developments of modern weaponry (tanks, aircraft, battleships, missiles, nuclear weapons) and their use in the two world wars and the nuclear arms race during the Cold War.

While during most of human history the source of threat to tribal, communal, city or national security was the 'other', the other tribe that competed for scarce water and food, for power and influence and the other state that challenged or impeded the realization of the national political, economic and military interests, in the emerging Anthropocene age of earth and human history, the source of the manifold new environmental threats, challenges, vulnerabilities, and risks has been humankind as a species, but especially the people in the industrialized countries that have during the past 250 years contributed most to the increase of greenhouse gases in the atmosphere. However, with the rapid industrialization of countries such as China, South Korea, and India, but also in Brazil, Mexico and South Africa, to mention only a few threshold states, the growth pattern in fossil energy consumption is gradually shifting from the industrialized to the newly and rapidly industrializing countries.

Thus, the debate between the developing and the industrialized countries that has dominated the climate negotiations since 1990 that it is 'they', the industrialized countries who should only take legally binding quantitative greenhouse gas reduction obligations (UNFCCC, KP), is insufficient. According to the principles of the UNFCCC, its parties "should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities."

It is also 'us' as individuals and not only 'they' (North, transnational corporations, consumerism) that pose the new threats due to the waste and inefficient use of fossil energy in the household and in transportation. However, in 2006, on average an

American still consumed 20 times or a European 10 times as much energy as a person living in India, and this relationship is even worse in relation to many African countries. As the private energy consumption between North and South but also between the wealthy elites in the South and their poor population has been unequal, also the impact of the climate-related hydro-meteorological hazards has been highly unequal. The major number of people killed, affected, and economically damaged have been living in the South, and it has been the highly socially vulnerable poor people in many of the poorest countries that have often repeatedly lost most of their belongings.

According to the IPCC (2007c: 53) there is a high probability that the hydro-meteorological hazards (tropical and other storms, floods, landslides as well as heat waves, drought and forest fires) will increase both in number and intensity. Furthermore, due to the projected sea level rise, the very existence of many small island states, of coastal regions, and of river deltas are seriously threatened. Thus, climate change will not only affect the survival of the highly socially vulnerable segments of society, but it will also challenge the territorial integrity of the affected nation states. In addition (figure 99.1) climate change will impact on precipitation levels that will affect the food security of many countries due to drought or floods. For these new threats, the military with its traditional defence strategies and weaponry offers no solution, but the military may be used for humanitarian missions to counter the hazard impacts.

In facing and coping with the security dangers posed by global environmental change, the societal actors play a key role in reducing social vulnerability and enhancing resilience building. Thus, public awareness for these new dangers and training for the people has become essential to enable them to save their lives and to better protect their few essential belongings. Thus, the increased resilience of the local societal actors in the physically most vulnerable regions can significantly reduce the impact of these disasters. But these bottom-up activities must be supplemented by disaster preparedness and funding from the state and international humanitarian actors.

The transmitters of traditional knowledge (e.g. elders, local leaders, women), as well as the representatives and communicators of modern technological knowledge (represented by the disaster preparedness agencies, schoolteachers), play a key role among the societal actors. Social movements, non-governmental organizations, religious groups, and the media can make a difference in creating public preparedness.

The key task of societal actors for coping with climate change impacts from the local, to the communal, city or regional and national level are: awareness creation, policy action with adaptation and mitigation, and resilience-building.

99.5 Facing New Global Challenges: Role of the Business Sectors and Community

The three economic sectors (agriculture, industry, and services) and the business community will play an essential role in the adaptation of production and consumption patterns to the new conditions required in the Anthropocene era of earth history. A key challenge for a reduction of global emissions from the energy sector by 50 per cent by 2050 is the gradual decarbonization of the energy sector by a dual strategy of increased energy efficiency and by a gradual replacement of fossil energy sources by renewables, such as hydropower, wind power, geothermal and solar energy, through both concentrated solar thermal and photovoltaic plants. Biomass can also make a contribution to the heating and transportation sector, as long as it does not conflict with food production and does not negatively affect biodiversity.

Thus, the success of the gradual decarbonization of the energy and other economic sectors requires the active involvement of the business community. The results of scientific and technological research, especially in the energy sector and in production, transportation, housing, but also in agriculture and in the services, must be implemented in new energy efficient processes of production and consumption.

With regard to the development, production, and commercialization of renewable energies, at least in many European countries, small and medium-sized companies have played a leading role as technology innovators and in the implementation of adaptation and mitigation policies. Later, often multinational corporations have bought the most promising companies to build up green production units within their conglomerates and to implement energy efficiency enhancement strategies in an effort to reduce their energy costs. While many of these initiatives have been driven by the profit motive and by efforts to enhance their 'green' image, some business leaders and companies have also stressed their social and ecological responsibility for the future generations.

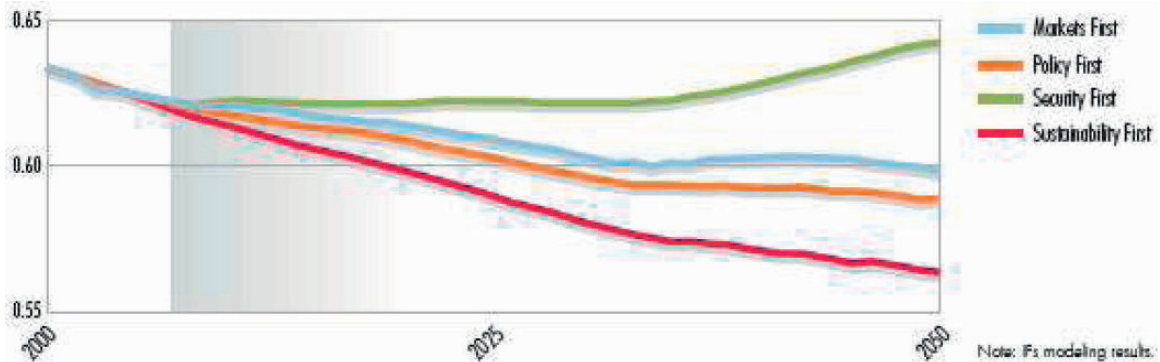
The companies that have joined for example the *World Business Council for Sustainable Development*

(WBCSD) and its regional and sectoral affiliates have stressed a responsibility for their activities and for their impacts on the environment. Ethical business goals are often linked with efforts to enhance resource and energy efficiency and to reduce the carbon component in their energy consumption. Many ecologically concerned business leaders understand the 'logic of change' in the free-market model, but also the responsibility of business to collaborate on the 'logic of value' to grant the poorest their basic human needs and to reduce the growing inequality (chap. 11 by Oswald/Brauch). They accept a responsibility of the free-market system for environmental damages, inequality, and discrimination, and link their investments to innovations that reinforce the well-being of humankind as a whole without ignoring long-term undesirable effects on the environment and for human beings.

UNEP's fourth *Global Environmental Outlook* (UNEP 2007: 400–401) distinguished in its perspectives towards 2015 and beyond four scenarios with different priorities:

- *Markets First*: the private sector, with active government support, pursues maximum economic growth as the best path to improve the environment and human well-being. ... Technological fixes to environmental challenges are emphasized at the expense of other policy interventions and some tried-and-tested solutions.
- *Policy First*: the government, with active private and civil sector support, initiates and implements strong policies to improve the environment and human well-being, while still emphasizing economic development. ... The emphasis is on more top-down approaches, due in part to desires to make rapid progress on key targets.
- *Security First*: the government and private sector compete for control in efforts to improve, or at least maintain, human well-being for mainly the rich and powerful in society. *Security First*, ... has as its focus a minority: rich, national, and regional. It emphasizes sustainable development only in the context of maximizing access to and use of the environment by the powerful. ... Responses under *Security First* reinforce the silos of management, and the UN role is viewed with suspicion, particularly by some rich and powerful segments of society.
- *Sustainability First*: the government, civil society, and the private sector work collaboratively to improve the environment and human well-being, with a strong emphasis on equity. Equal weight is

Figure 99.2: Global GINI index of income across states and households. (Lesser is more equal). **Source:** UNEP (2007: 413).



given to environmental and socio-economic policies, and accountability, transparency and legitimacy are stressed across all actors. ... Emphasis is placed on developing effective public-private sector partnerships not only in the context of projects but also that of governance, ensuring that stakeholders across the spectrum of the environment development discourse provide strategic input to policy-making and implementation. There is an acknowledgement that these processes take time, and that their impacts are likely to be more long-term than short-term.

These four scenarios projected the impacts on the income across states and households until 2050. “*Security First* exhibits growing inequality measured by both the GINI Index and the ratio of income between the wealthiest and the poorest 10 per cent of the global population. ... *Sustainability First* showed the most significant improvement in both cases” (UNEP 2007: 413–414).

While the *Security First* scenario further increases the income inequality, thus increasing poverty, social vulnerability and reducing the coping capacity, what may also result in higher human and environmental insecurity especially in the South, the *Sustainability First* scenario offers the best prospects for reducing global income gaps.

The UNEP (2007: 403–404) study assumed that the *Security First* (SecF) scenario focuses on the national level of decision-making, while *Sustainability First* (SustF) scenario combines all levels. While for the SecF scenario the level of international cooperation is low, for the SustF scenario it is high. For the SecF scenario the public participation in governance is the lowest while it is high for the SustF scenario. In the SecF scenario the governmental investment focuses on the military but in the SustF scenario it is the

highest especially for health and education. For the SecF scenario official development assistance and environmental mainstreaming is the lowest and for the SustF scenario it is the highest. The SecF scenario prefers closed borders, while the SustF scenario opts for open ones.

In the UNEP (2007) GEO-4 study, the *Security First* scenario comes closest to a power-focused, pessimist or neorealist worldview on security (in the tradition of Sun Tzu, Thucydides, Hobbes, Morgenthau, etc.) that focuses on a narrow national military security concept and to a neo-Malthusian pessimist standpoint on environmental issues (table 1.1). In contrast, the *Sustainability First* scenario reflects a liberal, pragmatist worldview on security issues that is based on a widened and deepened security concept including the environmental dimension of human security where cooperation matters and an equity-oriented environmental standpoint where cooperation will contribute to solve problems peacefully.

99.6 Responding to New Global Challenges: Role of the State and International Organizations

In democratic systems, the political process, the political parties, and the parliaments can be both a force of obstruction and innovation. The electoral behaviour of the people depends on the public awareness on the impact of climate change and on their political willingness to change their consumptive behaviour and pay the prize for a gradual transformation of their economy. Thus, in a democratic society the city, state, and national governments representing the state are to reflect the policy concerns of its people and not (only) the narrow economic interests of a small and often powerful elite that tries to influence the policy

agenda through its campaign contributions and lobbyists. The policies of the nation state are supposed to reflect the interests of the majority of its people as translated through the electoral process. The nation state by adopting climate change policies with specific and legally binding measures for adaptation and mitigation sets the legal and regulatory framework for the society and the economic sector. The state can support and temporarily subsidize technological innovations, energy efficiency measures, as well as the development and commercialization of renewable energy technologies and products.

Since the global turn in 1990, and especially since the *UN Conference on Environment and Development* (UNCED) in Rio de Janeiro (1992) and the *UN Summit on Sustainable Development* (UNSSD) in Johannesburg (2002), key problems of global environmental change: climate change, biodiversity, and desertification have been added on the international and national policy agendas. Since 1992 and 1994 three new international regimes, systems of rules and norms, have evolved globally, i.e. the climate change (UNFCCC, 1992), the biodiversity (CBD, 1992), and the desertification (UNCCD, 1994) conventions, of which only the climate change regime, its conference of parties (COPs), and the IPCC, its scientific epistemic community, have succeeded to both politicize and at least since 2007 to progressively securitize climate change by making it an issue of utmost importance that requires extraordinary measures in implementing the policy goals to be negotiated in the framework of the post 2012 climate change regime. But the referent object of these *securitization moves* differed for international, national, and human security (chap. 4 by Brauch).

While no similar global convention was adopted to deal with the challenges of water scarcity and degradation as well as with the hydro-meteorological impacts of climate change, nevertheless global scientific epistemic communities and policy-oriented networks have evolved on water and disaster issues. Several international river basin management regimes and treaties have evolved, such as the *Nile Basin Initiative* (chap. 48 by Adly/Ahmed; chap. 49 by Kameri-Mbote/Kindiki), the *Mekong River Commission* (chap. 43 by Affeltranger), and the Rio Grande/Bravo treaty regime (Oswald 2007), to address the multi- or bilateral problems of sharing and controlling the flow of water taking the different interests in environmental conservation, electricity generation, irrigation, etc. and early warning of floods and droughts into account to reduce negative economic impacts and to

solve water conflicts peacefully by negotiation instead of using political threats and military intervention.

With regard to international hazards, after the *International Decade for Natural Disaster Reduction* (IDNDR), the *International Strategy on Disaster Reduction* (UN/ISDR) was set up in 2001, and in 2005, ten years after the Kobe Earthquake the *Hyogo Plan for Action* was adopted (2005–2015). A key policy goal has been to improve the technical early warning systems and to initiate processes of disaster preparedness.

The four environmental and this hazard regime have initiated a global political process to increase public awareness through the media and to enhance the coping capacities of governments in implementing the globally adopted policy goals. The policy task of international organizations has become the development of an effective and legally binding policy framework. The task of the states has been both to advance the development of the action goals and to implement them locally.

The ‘securitization’ of *Global Environmental Challenges* (GEC) adds climate change, water, and desertification as issues of utmost importance on the top of the national and international policy agenda that require extraordinary measures. Thus, climate change has become a major policy issue that directly affects the livelihood and the survival of human beings as well as key interests of the nation state. Many business as usual strategies that have ignored the anthropogenic nature of climate change and policies that have opposed to accept any legally binding reduction obligations are increasing the costs of natural hazards and of the needed policy response. The *Millennium Ecosystem Assessment* (MA) has argued that both global and regional reactive scenarios will have negative impacts. To the contrary, in the framework of combating desertification, the MA has argued that proactive regional (*Adaptation Mosaic*), and global (*TechnologyGarden*) scenarios may be most effective in achieving the policy goals at least costs.

Thus, proactive environment policies that face and cope with these new global environmental dangers require strategies of “environmental peacemaking” (Conca/Dabelko 2002). This necessitates both a change in the worldviews of security specialists, and of the mindset of policy-makers on the national and international level. Climate change impacts cannot be solved with a *Security First* scenario where the military and the level of armaments are crucial. Rather, cooperative and multilateral strategies and diplomatic agreements (Oswald 2007) are needed that require

primarily other political tools, technological innovations, a sustainable development strategy, but also policies that aim at a sustainable peace.

99.7 New Challenges for International Peace and Security

The peaceful end of the Cold War in Europe (1989/1990) and between the two rival political, economic, social, and ideological systems (1990/1991) did neither lead to a new era of enduring global peace. The social and political sciences failed to project both the end of the Cold War (Gaddis 1992/1993) and the post-Cold War developments (Gleditsch 2008). In all these policy projections global environmental change, climate change, water, and desertification were not addressed as security dangers and concerns, and the widening and deepening of the security concept had not yet occurred. Most projections were framed in narrow political and military state-centred concepts of national, international, common or cooperative security among nation states.

Two decades after the global turn, the assessment is mixed: while there was some nuclear and conventional disarmament in the US, Russia and in Europe, and a closure of many military bases, there was no major conversion of military industry. Rather, military spending shifted from procurement to research and development, and since 1997/1998 world military spending has been rising again. In 2006, the sole superpower accounted for 46 per cent of world military expenditure (SIPRI 2007: 268–269).

The multilateral detente policy in the framework of the CSCE process (1975) relied on arms control policy and confidence building measures; economic and environmental cooperation; and human exchanges and human rights. The arms control policy aimed at enhancing strategic stability and preventing a breakdown of the deterrence system by building cooperation across the systems' boundaries. The contextual change since 1989 was instrumental for several major arms control and real disarmament agreements, but it also put new issues on the international agenda: to contain horizontal and vertical proliferation and new sources of political instability (Brauch/van der Graaf/Grin/Smit 1992; Brauch 2002b). The weapons innovation process continues unabated. Since 1990, the public focus has shifted to the 'horizontal proliferation' of ABC weapons and missiles, while arms exports remained uncontrolled and conventional weapons were illegally exported to developing countries, to

secessionist movements or to warlords in Africa and Asia. Simultaneous Latin America experienced a transition from military regimes to democratically elected governments.

With the end of the Cold War, the bipolar global international power, ideological and systemic conflict and the global deterrence system had become obsolete. Many proxy wars could be resolved, while new violent conflicts have emerged with the disintegration of multi-national, ethnic, and religious states, and with the collapse of regimes previously supported by both superpowers. New global terrorist networks have emerged where Islamic fundamentalism filled the ideological void with the end of communism and the dissolution of the USSR.

While intra-state wars have temporarily increased since the end of the Cold War (Gleditsch 2008) in failing or failed states, involving secessionist movements and warlords, interstate wars have declined in number and intensity. The *Human Security Report* claimed that "armed conflicts involving a government as one of the warring parties had declined by more than 40 per cent around the world from the end of the Cold War to 2003" (Human Security Centre 2005). The *Human Security Brief 2007* (Human Security Centre 2008: 6) stated that also for non-state conflicts there has been a decline in number, and in reported battle deaths between 2002 and 2006.

While since 1990 the number of wars and casualties has declined (Human Security Centre 2005, 2008; Gleditsch 2008), many small-scale violent disputes that were triggered also by environmental factors were not recorded in the war databases as they failed to meet the criteria of a 'war'. The empirical case studies in the environmental security debate did not systematically analyse these small-scale conflicts between herders and resident farmers or the food and hunger riots. Thus, there is a lack of empirical research on linkages between environmental factors, hazards, migration, crises and conflicts. As policy decisions cannot be predicted, it is impossible to foresee whether policy-makers will be able to resolve environmentally-triggered disputes or whether they will escalate into violence. Thus, the projection of new trends with extreme or fatal outcomes can neither be confirmed nor falsified.

Contrary to armed conflicts there has been a steady increase in the number and intensity of the people who died and were affected, as well as the economic damages caused by natural hazards, most of them being climate related (chap. 4 by Brauch).

As the perception of the enemy has been changing in some countries, and as the securitization of issues related to GEC and GCC is just evolving, the policy debate and the scientific research on a new security policy for the Anthropocene (Dalby 2009) and for a new global peace policy in the early 21st century is just emerging. Our conceptual ideas to be sketched below combine a strategy of sustainable development and a vision of a sustainable peace where scenarios of *security first* have the worst prospects for coping with these new security issues compared with the *sustainability first* scenario.

These opposite trends support a fundamental re-thinking of security and peace issues, and its reconceptualization where increasingly the impacts of GEC and GCC are being perceived and addressed as international, national, and human security dangers and concerns.

99.8 Sustainable Peace Policy in the Anthropocene

Neither the peace policy of the Cold War nor the new conflicts in the immediate post-Cold War era offer any orientation for the goals, requirements, policies, measures, and means for a new peace policy in the 21st century. Among most experts there is agreement

- that global population may stabilize in the second half of the 21st century around 9 billion people (chap. 12 by Lutz);
- that the anthropogenic climate change is for real, that the average global average temperature has increased globally by 0.6° C during the 20th century (figure 4.2), the sea level has risen by 10–20 cm, and that the number and intensity of hydro-meteorological hazards has increased since 1950 (figures 98.5, 98.6);
- that with a tripling of the global population and improved sanitation during the 20th century, water has become scarce and degraded due to pollution and salinization in many arid and semi-arid regions;
- that areas with soil degradation and desertification have grown globally, and that this process has forced many people to leave their homes;
- that the process of urbanization has been very rapid and often chaotic, and has resulted in many megacities with a low quality of life for slum dwellers;
- that despite the promises of the green revolution, the number of undernourished people has remained a reality in many parts of the world.

These many new challenges for international peace and security require a new conceptual and policy-oriented research programme to move from knowledge to action, from reactive to proactive policies, and to explore the opportunities of environmental cooperation for a new peace policy. Such a sustainable peace policy for the Anthropocene requires new strategies, policies, tools, and measures that fundamentally differ from the peace policy during the Cold War. Reflecting these changes, the Nobel Peace Committee by awarding the Nobel Peace Prize to the IPCC and Al Gore in 2007, justified its decision arguing that

indications of changes in the earth's future climate must be treated with the utmost seriousness, and with the precautionary principle uppermost in our minds. Extensive climate changes may alter and threaten the living conditions of much of mankind. They may induce large-scale migration and lead to greater competition for the earth's resources. Such changes will place particularly heavy burdens on the world's most vulnerable countries. There may be increased danger of violent conflicts and wars within and between states.

On 17 April 2007, the UN Security Council by discussing for the first time climate change as an international security issue acknowledged that *global climate change* (GCC) may trigger societal outcomes that could pose threats to international peace and security. This dual reference to global environmental and specifically climate change as a danger or threat for international peace and security requires an innovative conceptual thinking to develop the framework of a new peace policy for the Anthropocene age.

Besides climate change, water scarcity but also water pollution in international river basins can lead to political disputes as well as military conflicts. The processes of desertification due to an overuse of fragile soils by a rapidly growing population, and also due to a decline in precipitation resulting from climate change (figure 99.1), has already forced millions of people to leave their homes by moving to the urban centres and to neighbouring countries in the region or by emigrating overseas (Myers 1993, 1995; Biermann/Boas 2007; WBGU 2008; IOM 2008). One result has been an often chaotic urbanization process that has resulted in an ungovernability of megacities that has posed many new risks and problems of internal security. The complex linkages between these global environmental challenges and the possible societal outcomes have so far not systematically been analysed,

and have often too easily been disputed, downgraded or dramatized (Bulhaug/Gleditsch/Theisen 2008, 2008a).

The policy responses to these trends depend on the environmental and security perspective of the analysts, of which only three combined types (table 1.1) will be briefly discussed:

- the position of the Hobbesian and Neo-Malthusian pessimist;
- the position of the Kantian and Cornucopian optimist;
- the Grotian and equity-oriented pragmatist;

For the Neo-Malthusian environmental expert, the present trends will inevitably lead to a major crisis of humankind that in the perspective of the (neo)realists may only be solved by force. Thus the message of the adherence of this view is to maintain military strength and to adjust the missions of the armed forces to deal with these challenges. This is reflected in UNEP's *Security First* scenario, in the MEA's reactive regional scenario of *Order from Strength*, and in some securitization moves on climate change in terms of US national security.

From a Cornucopian perspective, human ingenuity, technological innovations, and responses to the new global challenges will be able to cope with these problems. From a legal perspective human rights, democratic rule, and new forms of global governance will be able to solve these challenges. From the vantage point of this combined perspective spreading democracy, the market economy, and introduced new technologies will solve all problems. This position is reflected in UNEP's two scenarios of *Politics First* and *Markets First*.

From a pragmatic perspective on security, multilateral cooperation is essential in addressing these new global environmental challenges. For the equity-oriented ecological distributionist a new global process is needed that leads to a more just distribution of resources and to an improved perspective for human well-being both on the national and international level.

The position of a Grotian equity-oriented pragmatist comes closest to the *Sustainability First* scenario of UNEP. It also takes the two proactive scenarios of the MA into account of a global *TechnoGarden* that focuses on green technologies and ecological economics, and of a regional *Adapting Mosaic* that includes integrated management, local adaptation, and learning. Within this third perspective a few conceptual ideas for a sustainable peace policy for the An-

thropocene in the early 21st century will be offered. Such a new peace policy will conceptually combine a 'sustainable development' strategy with the vision of a 'sustainable peace', as introduced above. Such a new peace policy should meet these requirements:

- Its major orientation must be *multilateral* instead of *national*. None of the above new challenges can either be solved nationally or with national military power. Rather, military power or military superiority is irrelevant for addressing, facing, and coping with the societal impacts of climate change. Unilateral military policies are bound to fail in solving these new global dangers.
- The major orientation must be *proactive* rather than *reactive*. This requires an early recognition of these challenges, an anticipatory multidisciplinary research process on the linkages between the natural and the social sciences, and an anticipatory learning by the society, the business community, and the representatives of the state. Both the Millennium Ecosystem Assessment and the Stern Report have pointed to the negative effects and high costs of acting late.

These dual goals and requirements must be translated into horizontally integrated new policies on the state level among different ministries, and on the international level between different international organizations, programmes, and agencies.

99.8.1 Strategy of Sustainable Development

Sustainable development has been the key policy guideline for the *Millennium Development Goals* (2000), for the *Millennium Ecosystem Assessment* (MA 2005; chap. 3 by Leemans), and for the *Sustainability First Scenario* of UNEP's *GEO-4* (2007). This guideline requires an inclusion of environmental sustainability goals into all sectoral policies. Within the European Union this has been adopted with the Cardiff process (European Council, Cardiff 1998) and with the European Union's Green diplomacy (European Council, Thessaloniki 2003). Such a policy requires many specific measures and tools.

With regard to climate change this implies a gradual decarbonization of production and consumption. Instead of focusing exclusively on the defence of the national access to hydrocarbons (oil and gas) with military means, the step-by-step introduction of energy efficient technologies and the commercialization of renewables must become obligatory, and its implementation must be enforced by the nation state. As

Table 99.1: Phases, levels, and instruments of peace-building.

Phases ▶ Levels ▼	Preventive	Peace-building	Consolidation of a Culture of Peace
Inter-national	Conventions, sanctions, UNSC resolution, treaties, emergency aid and development assistance, INGOs	UN Blue Helmets, financial support, international pressure for peace-building, boycotts of arms exports, control of transnational crime rings	Financing reconstruction, elimination of landmines, recovering and cleaning of environment after war damages, regime change support, UNHCR, ICC, WB
Regional	Agreements, regional surveillance, legal advice and treaties among neighbours, mutual support, control of arms trade	Regional peace forces, financing of peace-building, mediators, security mechanisms for peace processes, third country negotiation	Training of police, civil servants and cooperation for reconstruction, repatriation of refugees, food and emergency support, market structure
National	Democratization processes, reduction of social gaps and poverty, social improvements with equity and sustainability, social movements, NGOs	Negotiation of peace processes among all factions, public information, disarmament of combatants, peace processes training, job opportunities, constitution, rule of law and implementation, truth commissions	Building of institutions and infrastructure, public security, training of police and civil servants, democratic elections, constitution, school and health services, housing, rule of law and justice, support for independent mass media

many developing countries in the South cannot afford to pay for the learning curve towards new economies of scale, the access to these technologies must be shared and new forms of economic cooperation must be created that are in the medium- and longer-term beneficial both for the countries that share these technologies and for the recipient countries. A goal should be to produce these systems locally to the extent the local infrastructures and scientific sophistication permits. Important tools are technological innovations, economic inducements, and global distribution of these technologies in order to reduce in the medium term the resource competition for oil and gas. Sharing of scientific information and North-South scientific partnerships are important steps towards that end.

99.8.2 Sustainable Peace as Peace-building

Three phases of sustainable peace could be distinguished: a) a *preventive element*; b) a *peace-building process*, and c) the *consolidation of a culture of sustainable peace*. For the *first phase* national and international organizations and regimes have spread through diverse types of pressure a Western model of social, political, and economic organization to war-stricken and conflict-prone countries in the South. This process may increase local resistance and produce rejection and greater violence. But if it is combined with development aid, debt relief, and support for an internal reorganization and a fight against corruption, and if these efforts lead to a real improve-

ment of the quality of life for the majority of the population, this approach can induce a process of peace negotiation. There is also a possibility of an internal adjustment, where social equity and job opportunities strengthen a participatory democracy which may prevent and mitigate violent outcomes. Local social movements aiming at food sovereignty and an economy of solidarity, which is often in the hands of women, can also establish stable bases for policies of sustainable development.

To get to the *second phase*, to the cessation of violence and to the *peace-building process*, internally all groups involved in the conflict and in the building of a post-war society must be involved. This process is often supported by creative mass media and strong external mediators (Lederach 1997). The negotiation process itself requires a concealed agenda setting (De la Rúa 2007), secure places for the negotiators (guaranteed by UN peacekeeping forces, an African Peace Corps, or a safe place in a third country), independent financial support and step by step agreements. The negotiated agreements must be implemented and there is a need for a close monitoring and evaluation of the results and the progress achieved to avoid setbacks and a resumption of violence. Bridging processes such as a special attention for refugee camps, reconstruction of destroyed basic infrastructure (roads, bridges, markets, and governmental buildings), demilitarization of armed groups and their involvement and training in civil activities, truth commissions, a return of internally displaced persons with economic opportunities, etc. must be offered. Simultaneously, the ille-

gal arms trade, kidnapping, rape, and robbery must be stopped by the peacekeepers, and gang-related illegal activities must be dismantled. Legality at any cost, called 'zero tolerance', is important in this stage to strengthen the path to peace and to avoid violent outcomes (UNDP 2001a).

The *third phase* results from the former negotiation process where all parties to the conflict were involved and where during the negotiation process a win-win situation was found that satisfied the most important groups and gave them some benefits through a peace agreement. But some illegal groups remain that have lost in this peace process (such as arms and drug dealers, or human traffickers). They will try to destroy the peace process at any cost. These groups must be controlled internally (by the police, military or civil society) and externally (e.g. by Interpol). During this last phase, the consolidation of civil institutions, the return to normality, the elimination of war threats from landmines, small arms, and other war tools must be implemented. Simultaneously, a civil government, police forces, the involvement of the military and guerrillas in civil activities and under civil control, the establishment of legal private businesses with job creation, food, water and public health services and later the reestablishment of transport and communication infrastructure, ports, airports and train stations are crucial to stabilize the fragile process. The more parties in a conflict that have been involved in this process, the more stable and less corrupt the results may be during the reconstruction phase where political parties emerge and democratic elections must be held.

During these three phases different inputs occur from diverse geographical levels: the international, the regional, and the national levels, and from the local peace-building measures within these countries. The international and regional, but often also the national processes, are guided by international multilateral (UN) or regional organizations (AU, OAS, EU) which establish a framework for action in societies that are moving away from violence and conflict. The mechanisms used to achieve a sustainable peace are besides treaties among the conflict parties, disarmament measures, collection of small arms, control of the arms trade, and clearing of landmines and other war remnants. Table 99.1 synthesizes these three phases and the levels of action, taking the activities of international and public actors and civil society into account.

99.8.3 Beyond Environmental Peacemaking

Ken Conca (2002: 3) has pointed to a conundrum of the research and policy debate on ecological or environmental security:

Ecological security is emerging within OECD member nations as a powerful frame for international environmental protection, yet its terms of reference constitute an obstacle to international cooperation in the very places where the ecological insecurities of people and communities are most starkly displayed.

Conca (2002: 3–5, 9) argued that this literature did not “provide a clear strategy for peace” and he suggested that “environmental cooperation can create synergies for peace” by stressing “cooperative potential rather than violent inevitabilities.” He asked “whether environmental degradation can trigger broader forms of peace,” and “be an effective general catalyst for reducing tensions, broadening cooperation, fostering demilitarization, and promoting peace.” Such a strategy must work on two levels: “First, it must create minimum levels of trust, transparency, and cooperative gain among governments. ... Second, it must lay the foundation for transforming the national-security state itself.” Conca (2002: 13) suggests focusing “in particular on regional peace and cooperation, for both ecological and political reasons.” This thesis was discussed in six case studies on the Baltic (VanDeveer 2002), South Asia (Swain 2002), the Aral Sea Basin (Weinthal 2002b), the Caspian Sea (Blum 2002), Southern Africa (Swatuk 2002), and for water cooperation in the US-Mexico border region (Doughman 2002).

In conclusion, Conca and Dabelko (2002: 220–221, 230–232) discussed “problems and possibilities of environmental peacemaking,” cautioning that these six cases do not offer “formal tests of environmental peacemaking propositions.” They interpreted the case studies both with regard to interstate and trans-societal dynamics, and suggested that “certain forms of environmental cooperation could be extremely useful tools in the hands of peacemakers” that can combine “environmental, developmental, and peace-related concerns.” In a similar vein, Tänzler, Dabelko, and Carius (2002) reviewed “Environmental cooperation and conflict prevention” initiatives at the WSSD (2002) with a special focus on protecting transboundary resources in Africa on water cooperation, peace parks, and for integrating environmental protection into regional cooperation arrangements (NEPAD, AU). Six years later Dabelko (2008: 41–44) stated that a growing number of conflict-prevention and post-

conflict scholars and practitioners argue that natural resource management can be a key tool for helping prevent or end conflict and for building peace in a post conflict setting. The cooperation imperative spurred by environmental interdependence and the long-term need for iterated interaction can be used as the basis for confidence building rather than merely engendering conflict.

He illustrated the peace-building potential of environmental cooperation with examples of “rehabilitating the Jordan River Valley through cross-border community cooperation” (Williams/Parker 2008: 42) by the “good water makes good neighbours” project of the *Friends of the Earth Middle East* (FoEME) and with the Siachem Peace Park proposal in South Asia (Ali 2008), and with activities of UNEP’s *Post Conflict and Disaster Management Branch* (PCDMB) that have strengthened environment management institutions in conflict regions.

Within the EU, conflict prevention activities and the mainstreaming of environmental issues into all sectoral policies has been pursued in parallel, and so far no long-term strategy has evolved that addresses issues of what has been introduced as “environmental conflict avoidance” (Brauch 2000d, 2003: 86–89, 123–124).

99.8.4 Vision of a Sustainable Peace with Nature

However, the symbiosis of strategies for ‘sustainable development’ with a policy vision of a ‘sustainable peace’ as two goals of a new peace policy for the Anthropocene in the early 21st century requires a more fundamental rethinking of a comprehensive policy approach that includes many of the policy goals that have already been adopted in several international policy declarations (Agenda 21 of 1992; Millennium Development Goals of 2000; Policy Declaration and the Implementation Plan of the WSSD in 2002) and the normative scientific propositions on the precautionary principle, international peace with equity, on peace with nature or peace with the creation.

However, what has been lacking is a sufficient translation of this new knowledge into action and a transformation of these policy goals into policies and their effective implementation. The experiences with the guidelines adopted in the UNFCCC (1992), and with the quantitative emission reduction goals approved in the Kyoto Protocol (1997), have been disappointing.

It will be seen whether the recent *securitization moves* of issues of climate change, water, desertification, as well as the debate on environmentally induced forced migration will not only enhance the urgency of the security dangers and concerns posed by GEC and GCC, but also lead to long-term and proactive policies as suggested in the framework of the *Sustainability First* scenario of UNEP and the *TechnoGarden* and *Adaptation Mosaic* scenarios of the MA.

99.8.5 From ‘Facing’ to ‘Coping’ with Global Environmental and Climate Change

This requires moving a step further from understanding and *facing* these new security issues for the well-being, security, and survival of future generations to concrete political, economic, and societal strategies, specific policies and measures for *coping* with these new security dangers. This necessitates a fundamental change in our thinking on security and peace, where the past experience gained and the thinking of the past may offer little advice. Clark, Crutzen, and Schellnhuber (2004) proposed a new paradigm of a “science for global sustainability” as well as a “new contract for planetary stewardship”. They argued:

We are currently witnessing the emergence of a new scientific paradigm that is driven by unprecedented planetary-scale challenges, operationalized by transdisciplinary millennium-scale agendas, and delivered by multiple-scale co-production based on a new contract between science and society (Clark/Crutzen/Schellnhuber 2004: 24).

For coping with GEC and GCC “management systems for a sustainability transition need to be systems for adaptive management and social learning” that “require appropriate information, incentives, and institutions” (Clark/Crutzen/Schellnhuber 2004: 20).

This suggested scientific revolution must be translated into new international policies for the 21st century. International peace and security as the highest human and international policy goals of the UN charter require a policy strategy that combines sustainable development with sustainable peace.

100 Summary and Results: Facing Global Environmental Change and Sectorialization of Security

Hans Günter Brauch¹

The previous 99 chapters contain diverse theoretical and conceptual approaches and empirical results that are briefly summarized below following the ten parts of the book. Given the diversity of the theoretical and empirical approaches from many different disciplines, regions, and countries addressing global environmental change as one of three crucial factors contributing to a reconceptualization of security in the early 21st century, no effort will be made to reduce this complexity and to synthesize these chapters into a few key messages. Rather, this concluding chapter will provide an overview of major arguments made and topics addressed in these chapters. The three general messages of this book are:

- *Global environmental change* and especially global anthropogenic climate change, water scarcity, degradation and stress, as well as soil erosion and desertification have gradually been *securitized* since the year 2000 and become major security dangers and concerns for the environmental dimension of international, national, and human and gender security in the Anthropocene era of earth history (parts I–III).
- Besides the *widening* (environmental dimension, part VIII) and *deepening* (human and gender referent objects, part IX) of security concepts a *sectorialization* of security were conceptually mapped for energy, food, livelihood and health, as well as for water security (parts IV–VII).
- *Facing Global Environmental Change* requires multi-, inter-, and transdisciplinary research programmes (chap. 98) that address the linkages between earth and human systems (figure 99.1) but also new policies for coping with GEC that are based on the four goals of the conceptual quartet (peace, security, development, environ-

ment) and that should aim at strategies of sustainable peace with sustainable development (chap. 99).

The book started with a contextualization of *Global Environmental Change* (GEC) (100.1) that was followed by a securitization of GEC (100.2), and a securitization of extreme natural and societal outcomes (100.3). The next four parts introduced four sectoral security concepts focusing on energy security (100.4), food security (100.5), livelihood and health security (100.6), and water security (100.7). The last three parts reviewed the debates on environmental security (100.8), and human security (100.9), and the concluding section offered conceptual considerations for moving from knowledge to action (100.10).

100.1 Contextualization of Global Environmental Change

Part I provides a conceptual and political, a historical and systematic context for the analysis of GEC. In the introduction, *Hans Günter Brauch* distinguished three stages in the evolution of the GEC agenda: from *scientific agenda setting* (since 1970's), to a *politicization* (since 1992) and *securitization* (since 2000). He reviewed the global policy debate on environmental (UN, OSCE, NATO, ENVSEC, OECD, EU) and human security (UNDP, UNESCO, UNU) concepts and issues, before he mapped the global reconceptualization of security and environmental linkages and addressed several sectoral security concepts.

In looking backward to the 20th *John McNeill* argued that “our politics and institutions are ill-adapted to the complex demands of ecological prudence” and that “the international security anxiety of the 20th century selected for states and societies that emphasized military power and industrial strength over all else: survival of the dirtiest.” In many wars environmental

1 The author is grateful to three reviewers for their very useful and critical comments.

concerns were dropped and active ecological change was encouraged by the military (chap. 2).

From a systemic perspective, *Rik Leemans* in his review of the UN's *Millennium Ecosystem Assessment* (2001–2005) argued that the anthropogenic changes to ecosystems “have contributed to substantial net gains in human well-being (including many aspects of security) and economic development,” but they have also resulted in “growing costs in the form of degradation of ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty and security for some groups of people.” In his view, “the MA shows that these problems could grow much more serious in the coming decades. At the same time, the assessment shows that the future really is in our hands. People can reverse the degradation of many ecosystem services and improve human well-being further over the next 50 years, but the changes in policy and practice required are substantial and not currently under way” (chap. 3).

100.2 Securitization of Global Environmental Change

The eleven chapters in part II offer an overview on the environment – human interactions, reviewed climate history, climate change impacts for small island states, security aspects of desertification, discussed water as a security issue, assessed demographic trends as a security concern, and discussed linkages between urbanization and security.

Influenced by the Copenhagen school, *Hans Günter Brauch* reviewed the *securitization* of GEC (water, desertification, global climate change (GCC)). He outlined a new security policy for the Anthropocene, introduced the *securitization* approach and offered an overview of several models on nature and human interactions (OECD, UNCSD, EEA), discussed the approaches of the Toronto and Swiss schools on environmental security, outlined his own PEISOR model before he noted several vulnerability frameworks on natural hazards and disasters and a model for analysing causal linkages between climate change and conflicts. The empirical part provided an overview of the many *securitization moves* on international, national, and human security where the IPCC was perceived as an undeclared *securitizing actor* that put climate change on the top of several policy agendas (UNSC, UNGA, G-8, EU, World Bank, OECD et al.): He offered a brief assessment of the impact of GCC on the audience as reflected in public opinion polls. The

chapter concluded that three EU countries took the lead during their presidencies of the UNSC (UK), of G-8 and EU (Germany), and of the Human Security Network (Greece) while in the US the debate in the strategic community focused exclusively on the impacts on US national security.

Wolf Dieter Blümel (chap. 5) argued that “natural climatic fluctuations and variations were quite common during the past millennia. Humankind has definitely been influenced in its cultural development, regardless of the type of political regime.” This natural warming was further enhanced by human activities, especially during the past 150 years through the burning of fossil energy and changes in the earth's surface. He argued that climate history can help “understanding the natural system, for prognostic, modelling purposes, and even for the comprehension of social behaviour or reactions.” *Arie S. Issar* and *Mattanyah Zohar* (chap. 6) showed that these changes “were concurrent with major transformations in the history of the people” in the Near East during the past ten millennia. *Yannis Kinnas* (chap. 7) argued that climate change affects human security with a particular impact on the SIDS.

Rajeb Boulharouf and *Douglas Pattie* (chap. 8) claimed that “the relationship between environmental degradation and migration is important, complex, and yet little understood.” *Andreas Rechkemmer* (chap. 9) described the various aspects of the interaction between desertification and the people, and reviewed recent efforts at the multilateral level to identify effective mitigation measures. *Ali Ghazi* (chap. 10) argued that the Algerian government with its many technocratic programmes that often excluded the people has failed to reverse the trend towards soil degradation. He concluded that “a situation of continued degradation of the country's natural resources will only cause famine, which in turn will generate social conflicts, and consequently insecurity.”

Úrsula Oswald Spring and *Hans Günter Brauch* (chap. 11) reviewed the securitization of water since 2000 and the linkage between the sectoral water security concept and other new concepts. They reviewed the evolution of water security as a political concept and its use in scientific analyses, they discussed five dimensions of water security as an issue of environmental, social and societal as well as economic, political and military security, and four referent objects reflected in concepts of human, gender, national, and international security. Water security is also closely related to food and health security. In conclu-

sion they discussed both scientific and political tasks for achieving water security.

Wolfgang Lutz (chap. 12) assessed the “Changing Population Size and Distribution as a Security Concern” in terms of different security concepts, from the narrow national military security, to societal and environmental security. The key message is that “world population is likely to level off at around 9 billion during the second half of this century and then possibly start a declining tendency.” With population ageing and shrinking, the focus of the security attention is moving from total size to the distribution of the population, what is “largely a human security concern challenging the viability of established social security systems and creating fears about who will care for the rapidly increasing number of elderly in the societies concerned. There are also concerns that population ageing will result in lower economic growth.”

Ben Wisner and *Juha I. Uitto* (chap. 13) argued for Tokyo, Los Angeles, Manila and Mexico City that “urban social vulnerability remains a serious problem as yet insufficiently faced by municipal, metropolitan, or other higher levels of government.” They concluded that “the social basis for disaster-resilient cities is continued generalized capacity building across the whole of these heterogeneous populations. Revitalized democratic participation in the governance of cities, better education systems, employment generation, broader inclusion of women, minorities, and youth all contribute.”

Isabelle Milbert (chap. 14) concentrated her discussion of the policy dimensions of human security and vulnerability challenges “on Indian cities, which appear relatively ‘at peace’, and on the issues of urban dwellers’ security and vulnerability.” She concluded that “Indian cities and urban dwellers, even in a context of rapid economic growth, remain vulnerable to industrial, infrastructural, natural and social risks.” Due to the lack of local government activities the vulnerabilities for informal sector workers have accumulated. For several Indian cities “security in all its senses has become a key element in the fierce international competition for foreign investment and industries location.”

100.3 Securitization of Extreme Natural and Societal Outcomes

The eight chapters in part III discuss selected natural hazards and extreme societal outcomes. They focused on HIV/AIDS (chap. 16, 17), dealt with natural haz-

ards (chap. 18) and environment-induced migration (chap. 19), summarized the results of the Toronto and the Swiss schools on environmental security (chap. 20, 21), and dealt with environmental conflict resolution (chap. 22).

Ben Wisner (chap. 15) suggested a cooperation between the peace and conflict research and the hazard communities in addressing the “interactions between conflict and natural hazards.” He concluded that “war and violent conflict complicate the challenges of integrated disaster management.” Furthermore, “integrated disaster management can help to reduce the social and economic disparities ... that divides people in fragile societies and can lead to violent conflict.” He further argued that “disaster reduction work in the 21st century should not lose its ability to be inspired by such large visions, nor should practitioners lose the courage to speak truth to power in pursuit of the vision of a peaceful, just, and sustainable world.”

Nana K. Poku and *Bjorg Sandkjaer* (chap. 16) argued that “the full implications of the HIV/AIDS epidemic in Africa” are now being understood. This endemic often became “an add-on to other ‘more urgent’ demands.” They claimed that “until poverty is reduced there will be little progress with either reducing transmission of the virus or creating an enhanced capacity to cope with its socio-economic consequences.” This requires “the development of policies and programmes that address the interrelationships between poverty and development.” They stated that “the political energies required for overcoming the epidemic can be drawn from these other, longer-established social agendas. A symbiosis between longstanding demands such as education, food security or local democracy and HIV/AIDS will enable both aims to be met.”

Sophia Benz (chap. 17) illustrated “how HIV/AIDS as a health issue interacts with conflict or war experience. Recognizing the HIV/AIDS epidemic as a non-traditional threat to security highlights the importance of a widened and deepened definition of security.” She argued that “the results of the quantitative analysis indicate that countries’ prior conflict involvement significantly correlates with higher HIV-prevalence,” but also “that peace initiatives have a vital role in promoting health and indirectly contribute to stop the HIV virus from spreading.”

Janos J. Bogardi, *Jörn Birkmann*, *Niklas Gebert* and *Neysa Jacqueline Setiadi* (chap. 18) examined extreme hazard events as a major challenge and outlined new approaches how natural hazards and global environmental change can be analysed with concepts of

human security. A case study of Padang in Sumatra assessing community preparedness to tsunami showed that even communities which have not experienced any major tsunami event for decades are now getting prepared. This included knowledge and attitude (awareness), policy and guidelines, emergency planning, warning system and capacity mobilizing resources. The assessment approach also provided “insights for measuring preparedness even in regions which have not experienced a major hazard event for decades.”

Imtiaz Ahmed (chap. 19) showed for India and Bangladesh how environmental refugees “contribute to distress migration,” discussing the fate of environmental refugees as ‘stateless persons’ in Bangladesh and India, as well as India’s policy of fencing the borders to stop the flow of ‘illegal’ migrants from Bangladesh. He concluded that “for distress migration ‘security’ can no longer be defined in military terms, not even within the familiar ‘realist’ notion of national security.” He argued that ‘environmental’, ‘human’, ‘social’, and ‘gender security’ have influenced the “understanding of security not only within the national domain but also regionally and internationally.” He suggested a comprehensive security approach and “an innovation in policy-making in the age of environmental insecurity and post-nationality. Indeed, nothing short of creative and bold interventions would stop the reproduction of environmental refugees and the state of insecurity arising out of it.”

Thomas Homer-Dixon and *Tom Deligiannis* (chap. 20) provided a summary of the results of the Toronto group on environmental scarcities and civil violence. They argued how demand, supply, and distributional dimensions of human interaction with renewable resources can lead to scarcity and social effects from environmental scarcity, such as resource capture, and ecological marginalization, and highly contextual and interactive environmental scarcity-conflict linkages. Societies often overcome them through technological or social change, but many societies lack the capacity to alleviate its impacts, what can undermine a society’s ability to apply needed ingenuity. Many policy choices made today will have future consequences for the young generation. They are affected by ingenuity leading to ideas for new technologies and reformed institutions to overcome the impacts and effects of environmental scarcities. They concluded that there is no single solution, earlier interventions are better than late ones, policy responses do not have to be capital-intensive, and effective

policy interventions will not necessarily be unique or special.

Simon A. Mason, Tobias Hagmann, Christine Bichsel, Eva Ludi, and Yacob Arsano (chap. 21) analysed the linkages between sub-national and international water conflicts for The Eastern Nile Basin by both continuing and refocusing the research of the Swiss group on environment and conflicts since 1992. They introduced a “conceptual model with its *physical* water linkages between the sub-national, national, and inter-national systems of an international river basin, and its *political* conflict/cooperation linkages between the same levels.” They concluded with this hypothesis: “If water is taken out of a system (physical linkage) without compensation and without the participation of the people directly affected (economic and political linkage), conflict escalates or is transferred across the systems. Inversely, water conflicts are transformed or cooperation is transferred across systems, when water is brought into a system or is withdrawn and compensated, and this compensation happens with the participation of the people affected.”

Finally, *Saleem Ali* (chap. 22) identified the fault lines among communities that are grappling with extractive industry projects, and he discussed how an environmental analysis of the issues can inform discussions of local, national, and regional security. After a definition of ‘security’ in environmental narratives he discussed the relevance of international security for the analysis of extractive industries.

100.4 Energy Security for the 21st Century

Eleven chapters in part IV discuss conceptual aspects and concrete policy problems of energy security. *Klaus-Dietmar Jacoby* (chap. 23) reviewed the history and development of the IEA’s energy security programme since 1974 and subsequent modifications in the response mechanism enabling more flexible *coordinated emergency response measures*, the IEA’s coordinated actions during the oil supply disruptions of the 1991 Gulf War and in response to Hurricane Katrina (2005). Changes in energy markets have led to broadening the scope of the IEA’s energy security programme to the security of gas supplies and electricity.

Leo Schrattenholzer (chap. 24) combined two discussions on environmentally compatible energy supply in the framework of sustainable development in the scenario community with the security discourse in

the social sciences and the policy debate on energy security. He reviewed sustainable energy scenarios, explained specific indicators, discussed their significance and typical scenario results from the perspective of energy security, and assessed the implications of energy scenarios on international, regional, national security.

Jörg Schindler and Werner Zittel (chap. 25) argued that “world oil production is nearing its peak”, what “will have great implications on the availability of energy sources in the coming decades.” After a review of the imminent peak oil production, of future natural gas supply, and the future supply potential of coal, nuclear, and renewable energy technologies, *fuel supply scenarios* were offered for the most probable energy supply to sketch the major trends and challenges during the next decades. They concluded that the imminent peak of oil will cause an energy supply gap which cannot be filled by any other energy source. The oil peak will lead “to structural changes which will enforce changes in the lifestyle of industrialized countries.” Enhancing energy efficiency and promoting the rapid transition towards renewables is essential. Securing future energy supplies by military force will cause more problems than it solves.

Different answers to this challenge were offered in three chapters on renewable energy sources. André Faaj (chap. 26) explored “bio-energy market developments, resource potentials, and links between developing bioenergy markets, trade and socio-economic development, and how sustainable bio-energy production could be realized.” He discussed drivers, barriers, and future potentials for international bio-energy markets and identified socio-economic implications for possible exporting countries, and raised several key opportunities and issues for the developing international bio-energy markets and their possible impacts of relevance for policy-makers, market parties, international stakeholders, and other key stakeholders. He concluded that “biomass may be able to play a crucial role in enhancing diversity of energy supplies and energy security, as well as reducing greenhouse gas emissions and supporting rural development.” He also showed “that a gradual and sustainable development is necessary to develop the biomass resource base and infrastructure over time. Securing sustainability, e.g. by means of well established and credible certification schemes, is essential to avoid conflicts with food production and sustainable development.”

David Faiman (chap. 27) argued that “low-cost electricity from renewable energy could essentially decouple the security issue from that of energy.” He dis-

cussed the potential for *concentrator photovoltaic* (CPV) technology for the large-scale generation of solar electricity at low cost. He illustrated his thesis for seven of the world’s larger electricity producers (Mexico, Chile, Spain, South Africa, Saudi Arabia, India, Australia), and showed that it would be both technically and economically feasible to freeze their fossil fuel consumption at the 2012 level by a massive construction programme of CPV solar power plants. He argued that using solar to freeze the fossil requirements for electricity production and using low-cost solar electricity to generate transportation fuel would promote security. Low-loss transmission and efficient storage would enable other renewables, such as wind and wave power, to make their respective contributions to a world electricity grid, and hence to greater security by reducing the dependence on fossil fuels.

Franz Trieb, Wolfram Krewitt, and Nadine May (chap. 28) argued that “a strategy for energy and water security in the Southern European Union, the *Middle East, and North Africa* (MENA) can be based on a combination of rational use of energy, renewable energy sources, and international cooperation.” They concluded that “renewable energies can relieve Europe and the quickly growing economies of the ... MENA from increasing subsidies for their energy and water sector, and from overloading their environment and natural resources.” In the authors’ view “a strategy for energy sustainability must include three components: a) the rational use of energy, b) renewable energies, and c) a Trans-Mediterranean Partnership for Energy and Development.” They suggested that “the challenges of the 21st century must be tackled in a joint EU-MENA effort rather than lost through separatism and wishful thinking of national energy autonomy.” This requires a cooperative policy framework to implement this vision that will be beneficial for both regions.

A different perspective related to oil in the Middle East was offered by Mohammad El-Sayed Selim and Abdullah Sahar Mohammad (chap. 29) who reviewed the integration of energy security into the Arab conceptualization of security, the main substantive issues being debated, “the main energy-related threats to Arab security, the main strategies pursued by the Arab countries to achieve energy security, and the interlinkages between energy and conflicts in the Arab world.” They concluded that “the Arabs need to develop an ‘Arab energy security’ concept which should be integrated into the overall conceptualization of security. Such a concept would include elements of the use of the available energy and diversifying energy sources,

and partners, and building new strategic relations with oil customers.”

Gareth Winrow (chap. 30) analysed energy supply security within the economic and geopolitical dimension of security for the transportation of crude oil and natural gas from Central Asia through Russia and Turkey to outside markets. Due to its energy dependence on Russia, Turkey has diversified its oil and gas imports to Azerbaijan and Central Asian suppliers with new pipelines that avoid a sole reliance on the Russian system. From the Turkish perspective “major economic, political, and strategic issues are closely interlinked. Turkey has been a key player in the Great Game since the 1990’s and will remain so, given its sensitivities to developments in the neighbouring volatile Caucasus and the wider Caspian region.”

Nogoye Thiam (chap. 31) argued that *Sub-Saharan African* (SSA) countries experience an extreme lack of energy, a low level of energy consumption per inhabitant, and a dual structure which highly depends on oil imports and on biomass (60 per cent) which makes the energy system highly vulnerable. Most SSA countries lack a sustainable, affordable and environmentally sound modern energy supply, what is a key requirement for most *Millennium Development Goals* and *Poverty Reduction Strategies*. Thus, a transition towards sustainable energy sources is needed that relies on natural gas and renewables that has been constrained “by the high costs for importing equipment and the lack of information on the latest technologies used to generate electricity.” This requires a reduction of energy losses, higher energy efficiency, and new consumptive behaviour.

Rolf Linkohr (chap. 32) discussed two key questions whether a North-South energy partnership will contribute to energy security and whether we can avoid conflicts by exploiting exclusively renewable energy sources. His response to the first question is positive, “if we extend the partnership to all categories of life – environment, human rights, democracy, and good governance”, but he doubts that this can be achieved. In his view “the best approximation is probably a market-driven approach including all technologies and greenhouse gas abatement costs. The *European Neighbourhood Policy* (ENP) [may] ... develop into such a new relationship between North and South and deserves sympathy and political backing.”

100.5 Food Security for the 21st Century

This part provides three analyses on food security from Latin American, African, and Asian perspectives. *Úrsula Oswald Spring* (chap. 33) started with a critical analysis on: “Food as a new human and livelihood security challenge.” In her perspective, “food represents not only a security issue of intake of nutrients, but it forms part of a holistic understanding of life and a constituting element of any civilization.” She linked the concept of food security with food sovereignty. After an introduction of basic concepts such as food security, food sovereignty, survival strategies, self-sufficiency and livelihood, she scrutinized the contradiction that in a world with increasing production and a diverse offer of food, hunger is still a major cause of illness and death. She analysed three global models of food production: the productive paradigm of the ‘green revolution’; the new paradigm of the ‘life sciences’; and the paradigm of ‘organic agriculture’. In the concluding part she compared these three models and discussed their impacts for environmental, gender, and human security.

Mohamed Salih (chap. 34) argued that the conceptualization of security in the domain of globalized food production and food products, implies certain risks emanating from the intensification of food production through the use of new biotechnologies. By contrasting the governance of food security as food safety in developed countries with food scarcity and famine in developing countries, he argued that the former are “by necessity informed by the democratic dispensations which characterized the late 20th and early 21st century, whereby governance involves state and non-state actors as well as multilateral, corporate, private and global social movements, social justice networks, and NGOs.” In his assessment, “food governance regimes are more proactive in old democracies than new democracies and authoritarian regimes.” This implies that “reconceptualizing food security governance means giving ‘voice’ to those forces which could contribute effectively to an efficient and effective integrated governance regime duly conscious of the global-local nexus in the important sphere of human existence.”

Finally, *Selim Kapur*, *Burçak Kapur*, *Erhan Akça*, *Mustafa Aydın*, and *Hari Eswaran* (chap. 35) argued that “the security complex of energy, water, and food could be achieved, or at least enhanced, by improvement of integrated programmes for the sustainable management of land, water, and energy resources.” As an energy-scarce country with less than self-sufficiency

in food production, and an unequal distribution of water, Turkey launched the GAP project (South-eastern Anatolian Irrigation Development Project) with the aim: “to develop a strategy for a sustainable and secure production of energy and food.” They suggested a combined research programme via a *sustainable land and water management* (SLWM) strategy that called for a holistic and systems-based approach in a basin context without which the “long-term survival and short-to-mid-term development would be at risk. This eventuality would inevitably create security problems for regional as well as international levels. To deal with these, the starting point should be the development of a successful SLWM research strategy.”

100.6 Livelihood and Health Security for the 21st Century

Hans-Georg Bohle (chap. 36) reviewed the concept of sustainable livelihood security in geography and development studies against the background of the human security discourse by analysing “the academic and political context in which the livelihoods approach has emerged and became popular and asks how the concept was utilized by both researchers and practitioners and to what effect.” He focused “on the normative base and the discursive context of the concept,” and argued “that the new approach on sustainable livelihood security has emerged as an influential way of thinking on how the rural and urban poor can be identified and targeted, how pro-poor interventions can be planned, and how policy-relevant analysis on local levels can guide research on vulnerability, poverty and development.” This approach is “closely connected with the concept of human security, putting people at the centre and taking equity, human rights, capabilities and sustainability as its normative basis.”

Then, *Guénaël Rodier* and *Mary Kay Kindhauser* (chap. 37) reviewed: “Global Health Security: The WHO Response to Outbreaks Past and Future.” After a brief introduction of the evolution of the health security concept within the WHO, they discussed three health security issues for the outbreaks of anthrax, SARS, and H5N1 avian influenza, and how they have altered perceptions of the infectious disease threat. These changes were then placed in the context of concerns that had been mounting during the last decades of the previous century. Changes in concepts of national and international security were then discussed in terms of their increased ability to accommodate infectious disease threats and the operational

framework was explained that was put in place by WHO to defend global health security.

Jennifer Leaning (chap. 38) argued that future dramatic global threats will impact on human and health security that is advanced by more specific health system elements of what the medical and public health community consider as ‘health security’. She claimed that the term ‘health security’ in response to international threats of bioterrorism and pandemic disease is an enhancement of the ‘national security’ concept where the resources of the state are used to protect its citizens against external threats. But the near-term risks to human societies in the 21st century may be far more disruptive and widespread to our individual and collective well-being. In conclusion she assessed the relevance of the human security framework for these global threats, suggesting that this framework requires a most robust and creative application on a scale that could only be described as a truly comprehensive international security strategy to withstand what lies ahead and not to lose past collective achievements.

After this conceptual analysis a team of junior researchers offered four case studies on Africa and Asia. *Fred Eboko* and *Teresa Nemeckova* (chap. 39) argued that HIV/AIDS has increasingly been interpreted by international organizations as a challenge to world order, and as a threat to the national security for the most affected states in Africa, and also for Western states which perceive it as a threat to their security. They analysed its implication for the security of African states and the dynamics of the expansion of AIDS in Sub-Saharan Africa, and they showed how ‘the security’ theme was applied to this challenge. The case study on Botswana, a country with the highest HIV/AIDS prevalence, documented that AIDS is not only a threat for the poorest countries and that a sound national multi-sectoral approach to the national security threat is needed to combat the pandemic. The conclusions place the AIDS challenge into a broader global context of the security debate.

Isabel Fischer and *Mohammad Musfequs Salehin* (chap. 40) applied the concepts of human, livelihood, and health security to current debates in South and Southeast Asia, discussed the linkages of poverty, health, and human security, and presented empirical evidence based on two case studies on Vietnam and Bangladesh before they summarized the lessons learned and offered conclusions. Empirical results from Vietnam showed that the government’s efforts to reach the MDGs have improved the ‘human security’ of its people but that vulnerable groups still face poverty and health constraints. In Bangladesh the lack

of education reduces health and increases human insecurity. Spread of knowledge on basic health care and reproductive health among vulnerable groups is as important as the political will to change the cultural bias which avoids efficient prevention programmes.

100.7 Water Security for the 21st Century

This part with 18 chapters starts with a theoretical analysis, eight empirical chapters deal with water security issues in the international river basins of the Mekong, Euphrates and Tigris, Jordan and Nile, Senegal, Volta and Zambezi, four chapters examine water resource management and conflicts in Central Asia, while two review water security issues in India and Jordan, and one offers a theoretical analysis for the Middle East, one on Sub-Sahara Africa, and the last chapter offers a legal analysis of water security in armed conflicts.

J. A. [Tony] Allan (chap. 41) evaluated “the extent to which the well established international ‘virtual water’ trade will continue to mobilize the ‘soil water’ and freshwater in the global system to meet future local water needs.” He examined the contexts and driving forces (demography, water reuse, water efficiency in industry and services, poverty reduction) that have and will determine whether peoples and nations enjoy water security. He stressed “the need to conceptualize water security by accounting for all the types of water that meet the gross water requirements of societies, economies and environments.” He addressed two types of water security: “the water security of communities, economies and regions” that can be achieved by importing ‘virtual water’, and the water security at the global level. He pointed to “the importance of economic processes beyond the water sector in the achievement of a form of water security by the water scarce. This form of water security is heavily dependent of orderly international relations.”

Vandana Shiva (chap. 42) argued from an ecofeminist perspective that “water has already become blue oil - commodified, dwindling, yet overused and abused. ... The transformation of water into a commodity to be traded for profit is also leading to its overexploitation and its long distance transport. ... And as water is diverted, rerouted, mined and privatized, water conflicts and water wars are an inevitable result.” She developed her argument for river valley projects and large dams and a river linking project in India, discussed water disputes due to privatization

that “transfers water from where it flows to where there is money - cities and industrial areas.” She discussed two examples for the diversion of the Ganga waters to Delhi, and of the Banas River in Rajasthan to Ajmer and Jaipur that resulted in violent conflicts.

Bastien Affeltranger (chap. 43) analysed flood and drought hazards in the Mekong River Basin and details related to data needs for forecasting activities. He presented research results on the status of the Mekong Commission, reviewed the concept of the “value(s) of hydrological data” and discussed the recruitment of the *Chief Executive Officer* at the MRC, an environmental regime to establish a basin organization for the Lower Mekong that was created in 1995 by the Lao PDR, the kingdoms of Thailand, Cambodia, and the SR Vietnam under the auspices of the United Nations. He reviewed “the circulation and exchange patterns of environmental information as an analytical tool to understand and assess the day-to-day operation and effectiveness of an environmental regime such as the MRC.”

Mustafa Aydn and *Fulya Ereker* (chap. 44) analysed “the tension between the three riparian states: Turkey, Syria and Iraq.” They reviewed the “technical data about the available water resources, water use and demands of the riparian countries and the underlying reasons of the tension between them, as well as their conflicting arguments and initiatives for cooperation.” They argued that the dispute among the riparians “over water has a clear connection with the level of overall relationship between them.” They also showed “that ... for positive-sum results the actions of the downstream states serve a critical function, where uncompromising and unreasoned rhetoric against the upstream states leaves no room for further steps towards an agreement.” In their view “water is first of all a vital resource for human security, as well as for the socio-economic development of states. Thus, water scarcity makes it instantly a ‘national security’ issue, as in the case of Euphrates-Tigris Basin.” They concluded that “the improvement of the overall relationship and an effective cooperation between Turkey, Iraq and Syria to a level to conclude a comprehensive agreement would be the most appropriate expectation to solve the water-related disputes among the three countries.”

The section on water security issues in the Near East starts with a country study on Jordan by *Bassam Ossama Hayek* (chap. 45) that analysed its water and food situation, linked its water status to demographic change, presented water uses and future needs, summarized official plans for meeting the future water de-

mand based on comprehensive studies. He discussed the question “how Jordan will be able to adjust its economic practices to cope with this challenge, what the role of policy-makers will be, and which contributions will be needed from the international community.” Based on available data and scenarios he compared “present water uses with future water needs and the projected supply, taking current and future national plans, the role of institutions and the international community into consideration.”

Jan Selby (chap. 46), analysing the impacts of new security thinking on Israeli-Palestinian water politics, pointed to two sub-issues: “firstly, the impacts of post-Cold War reconceptualizations on the two main parties’ approaches to water issues during the course of their peace process; and secondly, the impacts of these reconceptualizations on external actors’ approaches to and involvement in these water issues.” He discussed “the impacts of new security thinking within Israeli-Palestinian relations at large,” as a necessary context “for analysing the specificities of their water relations.” He argued that “the practical influence of new security thinking on Israeli-Palestinian relations and their water politics has been at best negligible, at worst politically regressive.” He concluded that in the contested geopolitical contexts traditional security logics have predominated in Israel, Palestine, and in the USA.

Anders Jägerskog (chap. 47) argued that “in spite of fears of water-related violence and conflict, Israelis, Jordanians, and Palestinians have maintained a basic level of cooperation over their shared waters.” He analysed “prospects and potential avenues for increased coherence between different issues, in this case predominantly between conflict prevention and security issues and the sustainable use of natural resources.” He discussed “whether the actual water cooperation and coordination that takes place within the water sector ... could be further utilized as a conflict prevention and cooperation enhancement mechanism in other sectors.” He concluded “while the cooperation on water is rather strong and robust it has not been shown to promote cooperation in other political sectors.”

Two chapters deal with the Nile River Basin from the perspective of a downstream and upstream country. *Emad Adly* and *Tarek Abdallah Ahmed* (chap. 48) argued that “Egypt faces the pressing challenge of closing the gap between its limited water resources and the increasing water demand.” They reviewed Egypt’s views “on water and food security challenges from both governmental and non-governmental per-

spectives.” They analysed Egypt’s policies to reconcile traditionally opposed and diverging approaches. They argued that “collaboration and complementarity should shift from the traditional unilateral supply-driven centralized approach to a more effective participatory, demand-driven and consultative policies and action in the framework of a continued regional dialogue.” They suggested that “this complex and challenging relationship should be extended from the national to the regional level, allowing countries of the Nile Basin to share their concerns, responsibilities and visions.”

Patricia Kameri-Mbote and *Kithure Kindiki* (chap. 49) offered a legal view on “the perspectives of governments and NGOs of upstream countries regarding the consumptive utilization of the Nile River resources in the pursuit for water and food security within the basin states.” They reviewed the relationship between water scarcity and interstate armed conflict; and the status of bilateral treaties on the consumptive uses of the Nile between Egypt, Britain, and other powers before and during the colonial period. Water and food scarcity nurtured political tensions among basin states. They contended “that the current state of affairs whereby riparian states’ interests in the Nile Basin are diametrically opposed, coupled with the strong foundation in international law for the claims of upstream states, suggests that the traditional political methods of settling disputes like negotiation or conciliation are unlikely to yield results in the foreseeable future.” They concluded that “downstream states, notably Egypt, will continue to delay or complicate political dispute settlement mechanisms.” They recommended “a change in diplomacy by upstream states to one of convincing downstream states to submit the Nile question to some international judicial process.”

Two senior water specialists from South Africa, *Peter Ashton* and *Antony Turton* (chap. 50), offered a theory-guided analysis on: “Water Security in Sub-Saharan Africa: Emerging Concepts and their Implications for Effective Water Resource Management in the Southern African Region.” They argued that “in the post Cold War Sub-Saharan Africa, more and more countries are engaging with their neighbours to share their common water resources,” and that “this process is taking place through sets of negotiated water-sharing regimes that are most easily understood within the framework of a *Hydropolitical Complex*.” In their views it became “a prominent feature of the international relations of the *Southern African Development Community* (SADC) region.” They argued

that the answer to this dilemma “requires an understanding of two critical elements relating to the strategic access to water. ... The first element concerns security of supply (of water) ... the second element relates to the need for each state to choose an appropriate strategy ... that will achieve and sustain a high level of security of supply.” They explored “the relevance of the Southern African Hydropolitical Complex, both as an analytical concept and as a possible mechanism for building and sustaining inter-state cooperation, and thereby avoiding possible conflicts over water.” They concluded “that, in terms of water security in sub-Saharan Africa, the future trajectory of the various states in the Southern African Hydropolitical Complex will most likely be based on mutual cooperation, where the management of transboundary water resources will become a driver of regional integration in its own right.”

Martin Kipping (chap. 51) distinguished among three schools on ‘water security’, the Neo-Malthusian, the Cornucopian, and the political approach. He refined “the debate on water conflicts and water cooperation by investigating a case that constitutes a puzzle for the Neo-Malthusian discourse: the Senegal River in West Africa,” by identifying “causal mechanisms that will help generating better hypotheses for future comparative analyses and large-N studies.” He concluded that “growing water scarcity was a necessary condition for the intensification of international cooperation on the Senegal River,” but also “that the dam-induced increase in water availability was at least a reinforcing factor, if not surely a necessary condition” for conflict.

In a case study on the water regime formation in West Africa since 1990, *Maëlis Borghese* (chap. 52) addressed the question: “What realities, actors and mechanisms do encourage states to cooperate on international basins?” Based on regime theory she explored “the drivers for international cooperation... [and] the ongoing negotiation process in the Volta River Basin.” She argued that the “formation of local water institutions ... have convinced governments of the advantages of cooperation”, what supported “the *cognitivist* with *neo-liberal* views of cooperation theories.” While “the role of ideas and knowledge is essential to comprehend the realities of the formation of environmental cooperation in developing countries, ... their impact depends on their linkage with funding enabling them to effectively spread and shape states’ preferences.”

Stefan Lindemann (chap. 53) distinguished two approaches for resolving water-related conflicts in in-

ternational river basins through: general principles of international water law, and ‘horizontal’ initiatives for international river management between two or more riparian states. He developed the theoretical and methodological framework for a systematic and theoretically guided comparison and methodological considerations he applied to four case studies on the effectiveness of water regimes in South Eastern Africa where he identified the political determinants of water regime formation and effectiveness.

Four chapters deal with water problems in Central Asia. *Martin Kipping* (chap. 54) discussed the question: “Can ‘Integrated Water Resources Management’ Silence Malthusian Concerns? – The Case of Central Asia.” He explored how separate spheres of *International Relations* (IR) and problem-solving contributions in the natural sciences “can link up productively to ease solving international water problems.” He showed how most problems “could effectively be handled by adopting IWRM principles for water management, ... could largely reduce overall pressure on water resources; and decentralized management structures would mitigate local water conflicts.” He stated that “The Malthus-inspired, social science discourse on resource conflicts is able to adequately describe Central Asia’s main water conflicts: the international upstream-downstream conflict over relative water distribution, the international upstream-downstream conflicts over absolute water distribution as well as the diverse local scarcity conflicts.” He argued that “the prescriptive concept of IWRM is complementary to the social science analyses” suggesting “promising ways for managing the conflicts in question: Basin-wide integrated management and resulting intersectoral reallocation of water resources would create win-win solutions to the relative distribution conflict.”

Eva Patricia Rakel (chap. 55) identified the main environmental risks in Central Asia for potential or existing conflicts. She addressed social, political, and economic developments in *Central Eurasia* (CE) and national, regional, and transnational policy measures to counter these risks. She reviewed the prospects for joint environmental management in the CE countries, with a special focus on the Aral Sea and Caspian Sea as two main ecological systems at risk. She concluded that: “the CE region is confronted with many environmental problems with decisive implications for the region’s future. It is unlikely that environmental problems could lead directly to violent confrontations within and between the CE states. Environmentally-related conflicts in CE are related to other factors such as ethnicity, political instability, and declining and/or

diverging economic and living standards.” She claimed that “environmental issues in CE could act as major catalysts in intensifying already existing divisions, as well as having serious ecological, developmental, and health implications.”

Julia Wunderer (chap. 56) noted that while “the Central Asian states have signed numerous agreements concerning water issues at both the bilateral and regional levels” and established several water management institutions, their effectiveness remained limited. She discussed the question about “the conflict regulating effects of the regional water regime in Central Asia to resolve the environmental, economic and socio-political water-related problems,” and on the obstacles to regime implementation. She identified the “dimensions of conflicts over water in a politically instable environment and their correlations to the assumptions of the conflict-centred regime theory”, developed “a framework of conflict dimensions ... to analyse the multidimensional factors” relying on regime theory with which she analysed “the Central Asian water regime ... with a focus on transboundary river systems” and evaluated “the status of its implementation and success.” In the conclusions she confirmed “the assumption of the conflict proneness of the Central Asian societies ..., explaining the interdependencies between the environmental, economic, and political conflict dimensions.” In her assessment, “regime success is already limited by their failure to reach fundamental changes of behaviour, so that water-related security risks in Central Asia continue to exist.”

In an empirical study, *Christopher Martius, Jochen Froebrich* and *Ernst-August Nuppenau* (chap. 57) argued that “the Amu Darya River Basin in Central Asia is one of these crisis regions where management of water resources is unsustainable and uneconomic, bearing great potential for social conflicts.” Four factors drive the environmental and economic development in the irrigated lands of Central Asia: demography, climate change, increased water demand, and land degradation. They described the region and its specific problems, and then outlined a scenario of how to achieve IWRM in the specific situation of the ADL. They concluded that while “the declared Uzbek development policy of gradual change does not make this country a member of the so-called ‘fast-track countries’ among the CA states ..., security should centre on people – not on states, and ... for security and humanitarian reasons, the international community should not write off countries like Uzbekistan.” They suggested a pragmatic and stepwise “implemen-

tation of key activities and technologies ... to produce visible results that help to provide the ground for reaching acceptance for more advanced, institutional changes which must be considered as a prerequisite for implementing IWRM.”

Last but not least, *Mara Tignino* (chap. 58) pointed to water as a source of conflict and as a catalyst for cooperation. She focused “on the consequences of armed conflicts on water and water installations,” by dealing “with the legal framework provided by *ius in bello* or International Humanitarian Law (IHL) regarding water.” She argued that “the regime on water security built up by the IHL does not address water security as an autonomous issue. The IHL deals with water through its objectives, namely the protection of the victims of war and the regulation of the conduct of hostilities. Thus, water is dealt with as a basic need of people, as a weapon or as an objective of military activities.” She outlined some of the main rules provided by the IHL dealing with water and suggested the need for a comprehensive protection of water security in times of armed conflict.

100.8 Environmental Security Concepts and Debates

Fifteen chapters offer an overview of the environmental security discourse and on environmental security debates in North America, Russia, Belarus and Ukraine, in India and in the Far East, in the Arab World, on Israel and Palestine, on Uganda, Rwanda, Ethiopia and Burundi and in Sub-Sahara Africa, on Amazonia, the Caucasus region, on the Asia Pacific, as well as on the Arctic and Antarctic region.

Simon Dalby, Hans Günter Brauch, and Úrsula Oswald Spring (chap. 59) assessed the first three phases of research on environmental security, discussing their main achievements and the lessons learned and yet to be learned on the contexts of insecurity and the pillars of human security. They reviewed the major critiques of the environmental security debate and of the policy activities since 1990, translating research into action. In conclusion, they argued that “while the first phase of environmental security research focused on concepts and on their legitimization and critique, the second phase has been theory-oriented and empirically-based with a strong emphasis on case studies. In the third phase a plurality of methods have been applied: from qualitative case studies, to syndromes of global change and scientific approaches to mitigate them, to quantitative analyses

of state failures, and quantitative analyses of the causes of violent conflicts, to assessments of cooperative efforts in trans-boundary fresh water dispute resolution, to simulations of the interdependence between water availability and food crises.” In these three phases they noted “a lack of research on hazards and disasters, gender sensitivity, social vulnerability, bottom-up resilience as well as peace-building.”

Richard Matthew and *Bryan McDonald* (chap. 60) argued that the “sceptical, obstructionist mindset of the Reagan and Bush presidencies was swept away by the science-based environmentalism of Clinton and Gore.” The Clinton administration argued that “the environment ... could be saved without sacrificing human development, and the United States would lead this effort through the example of its own behaviour and through the authority attached to being the world’s only remaining superpower.” Within the “North American security community ... the process of rethinking security soon became intertwined with the process of environmental rescue.” While some believed “that in our degraded global environment, natural resource scarcity was rapidly becoming a significant contributor to violent conflict. Others looked at the sheer size of the world’s militaries, and their ugly Cold War footprints, and concluded it was time for these powerful entities to be greened and harnessed to an environmental agenda. Still others sought to integrate environmental issues into the larger project of complementing the concept of national security with the concept of human security.”

Alexander Sergunin (chap. 61) noted that “ecological security was nearly a taboo in the Soviet era.” He argued that “environmental issues reached the national agenda when Gorbachev (1987, 1988) introduced the idea of ecological security in his book on *perestroika*.” But on the practical level the debate mostly focused on “the implications of the Chernobyl catastrophe (1986).” He stated that “the broader debate on numerous environmental problems was at an embryonic phase, public attention was preoccupied with the political cataclysms of the early 1990’s. Only in the 1990’s the environmental security debate emerged.” He explored “how environmental problems have affected the CIS security discourse, including threat perceptions and national security doctrines and it examines how different national schools (Russian, Belorussian and Ukrainian) identify their approaches to the solution of the ecological problems.”

P.S. Ramakrishnan (chap. 62) started “with a discussion on our present state of understanding of ‘knowledge systems’, ... two case studies are used as il-

lustrative examples of the role of knowledge systems for linking ecological conservation with sustainable livelihood/development of traditional mountain societies – one from the north-eastern hill region of India ..., and another from the Garhwal and Kumaon region of the Central Himalayan mountain region.” In this review he concluded “with a brief discussion on such an approach to empower these marginalized sections of mountain societies by providing them with a better quality of life, as part of a short-term developmental strategy. This approach is critical for ‘environmental security’ linked with ‘human security’.”

Miranda Schreurs (chap. 63) focused on China, Japan, the Korean Peninsula, Mongolia, and the Russian Far East. She argued that due to the low status of environmental protection in this region until 1990, “‘environmental security’ as a concept is relatively new to both the scholarly and political debate. ... Rapid industrialization, however, has resulted in such serious pollution and natural resource degradation that governments are being forced to pay more attention.” She noted a “growing awareness among policy-makers that the region’s environmental degradation is causing human health problems, worsening the quality of life, threatening long-term economic growth potential, contributing to political instability, and in some cases contributing to regional frictions and even deadly conflict.” This shift has led “to changes in environmental laws and programmes” and to a “greater discussion of environmental degradation as a threat to national well-being.” She considered the specific “environmental challenges confronting Northeast Asia and the ways these have been linked to environmental security debates.” She briefly reviewed “the growing environmental awareness and its implications for the environmental security debates”, and discussed “the role of NGOs and environmental scientific communities and the implications for environmental security debates.” She addressed “the international dimensions of Northeast Asia’s environmental security problems as well as the regional cooperation for environmental security, linking environmental and human security concerns to official development assistance, assessing the regionalization of environmental protection and drawing general conclusions.”

Mohamad El-Sayed Selim (chap. 64) distinguished between two traditions of environmental security where the first referred to “that area where environmental concerns and security strategies interact,” and the second viewed “environmental security as ‘securing the environment’, which means taking a series of steps to ensure that the ecosystem will be preserved.”

In the Arab world environmental awareness began in the early 1980's, and since the early 1990's environmental issues have been linked with security. He reviewed Arab "approaches of environmental security by assessing the extent to which this concept has been integrated into Arab discourses on environment and security." He argued that environmental questions related to water "are highly politicized and closely linked to security issues," and that during the Middle Eastern multilateral negotiations a special working group dealt with the environment.

David Newman (chap. 65) focused on the "relationship between the military and environmental dimensions of the security discourse in Israel and Palestine" that lagged behind the environmental discourse in the industrialized world. He argued that "the reconceptualization of the security debate" has not impacted on Israel and Palestine. "For Israelis, security means safety from suicide bombers (for the individual) and from an existential threat to the State as a whole (for the collective), while for Palestinians, security is safety from Israeli soldiers and roadblocks (for the individual) and from the ongoing process of Occupation (for the collective). The fact that the environment in this region is undergoing a constant process of degradation is, at the most, of concern to aware citizens but is not defined in terms of security. For both Israelis and Palestinians, 'security' still belongs to another realm of discourse." He addressed "the notion of environmental security in Israel/Palestine from two, interlinked, perspectives," by dealing *firstly* with the "environmental and ecological threat faced by societies who do not undertake actions aimed at preserving and replenishing scarce resources within the context of a growing population and a semi-arid and arid environment," and *secondly* by examining "the way in which the existence of the political and military conflict impacts, both directly and indirectly, on environmental management." He concluded "with a brief discussion of the implications of conflict resolution and a peace agreement on the environment. While peace is obviously a positive development, the hasty implementation of development projects 'in the name of peace' without due recourse to the necessary environmental checks and balances, could result in substantial and irreversible damage to the environment."

Robin Twite (chap. 66) argued that "the long conflict between Israelis and Palestinians is fuelled by ... the memory of past violence, disputes over land, opposing historical narratives, religious dogmatism, demographic fears about the increasing number of the

'other' ... At the heart of the conflict is the struggle over land, which in its turn relates to security since each community wishes to ensure its safety by ensuring that it controls a viable geographic area and has access to natural assets such as water. On each side are those who believe that only by controlling as much land as possible can their future be secure." He stated that "extremists on both sides have made use of the environmental argument to persuade the wider public that they must avoid compromise and that their security ... is threatened by making concessions. Mutual suspicion is at the heart of these arguments and conflicting claims are purposely fuelled by statements in the media which serve to promote fear and hostility." He concluded that "environmental security is a necessity for Israel, Palestine, and the neighbouring countries," and that "obtaining environmental security implies trust. ... What is needed now is an equally clear concept as to what needs to be done in order to secure security and trust for the peoples of the region."

From a Palestinian perspective, *Mohammed S. Dajani Daoudi* (chap. 67) argued that environment and security issues were not yet seriously addressed. While the Palestine National Authority claimed that "environmental problems are primarily 'due to violent Israeli occupation practices on the ground, including the confiscation of land, illegal settlement activities, the uprooting of trees, the destruction of Palestinian agricultural land," in his view, "the PNA also bears a heavy responsibility for the poor environmental conditions in the Palestinian Territories." He concluded that "occupation, policies of closure and curfews, lack of awareness on the Palestinian side, and many other factors all have had significant negative environmental impacts. In the current phase of the conflict, the absence of even minimal cooperation is worsening the situation on a daily basis, with impacts not only on the environment but also on human health. Hence, both parties should pursue parallel attempts to address environmental protection along with reaching a peaceful resolution to the conflict."

Then, two authors from Africa reviewed international and national environmental security issues in Eastern Africa. *Mersie Ejigu* (chap. 68) analysing problems of environmental scarcity, insecurity, and conflict for Uganda, Rwanda, Ethiopia, and Burundi, pointed to the increase in intra-state conflicts in Africa since the end of the colonial period that are driven by "ideology, access to resources, deprivation, ethnicity, religion, greed, political power, etc" where "many of these conflicts are related to the use and

management of natural resources, in particular land.” He argued that “environmental insecurity arises not from the loss of extreme scarcity of environmental resources but more from the perceived and actual threat ... arising from that scarcity.” Among the many factors contributing to environmental insecurity and armed conflict: governance, socio-economic situation, culture, level of technology, and property rights, he considered governance as “the most vital factor because government policies and institutions heavily influence the behaviour of resource users and determines how, when, and why a natural resource is used.” He concluded based on several case studies that “environmental insecurity plays a significant role in causing, triggering, and aggravating armed conflicts”, and that “the probability of conflict increases, where environmental insecurity induces population mobility particularly towards heterogeneous communities (e.g. ethnic, culture, etc.); and where these migrants tend to dominate economic and political spheres, the recipient communities become aggravated and propensity to conflict mounts. Conflicts are almost certain where a weak state fails to deliver law and order, provide transparent and accountable administration, implement unbiased and fair policy, and institute effective mechanisms to address and resolve grievances and disputes.”

Sam Moyo (chap. 69) defined environmental security as related to “two central concepts: repairing damage to the environment for human life support and for the moral value of the environment itself; and preventing damage to the environment from attacks and other forms of human abuse.” He argued that “environmental insecurity generally occurs as a cumulative result of high population growth, decline in quantity and quality of renewable resources and the lack or unequal access to these resources.” He referred “to the capacity of individuals and groups to meet their basic needs from a sustainable environment,” involving “serious consequences for social, economic, political and physical security.” He suggested a widened security concept including “non-military threats, such as human rights abuses, outbreaks of diseases, resource scarcity and environmental degradation.” He also conceived “Environmental security [as] an integral part of human security.” He concluded that “without greater measures to insure environmental security, continued population and economic growth will diminish natural life support systems leading to migration and conflict. With half the world clustering into urban environments, natural disasters and global environmental change affect greater num-

bers of people who are dependent on civil systems for water, power, transportation, food, and other manufactured systems.” In his view, “the environment is now considered in terms of human security and viewed much more urgent and important a future challenge than conventional and nuclear war.”

Turning from Africa to Latin America, *Alexander Lopez* (chap. 70) analysed “the dynamic link between environmental factors and security and social conflicts as a result of continuous interactions between systemic (Amazon) and supra-systemic factor”, that “explain why environmental matters have been politicized and to a certain extent militarized.” He tried to explain “why social conflicts are mainly a product of two systemic constraints of a misallocation of resources and of skewed land distribution.” He stressed that in “most cases environmental change is no direct source of social conflicts, but an important aggravating factor through its side-effect,” arguing that “in the Brazilian Amazon in most situations environmental scarcity is no key factor for social conflicts, rather in the northern state of Roraima abundance is crucial.” He concluded that “the contribution of environmental change to social conflicts in the Brazilian Amazon may be understood as indirect and/or interactive This means that social conflicts are understood partially as the outcome of the social and environmental side effects of environmental change.” This implies “that deforestation, pollution from mining activities, and flooding in connection with other sources will produce social conflicts and/or contribute to social conflicts by introducing more entropy to a system that is already in turbulence. ... As a trigger environmental change basically releases accumulated non-environmental social pressures, and as an aggravating factor environmental change adds to other factors producing conflicts.”

Vicken Cheterian (chap. 71) argued that “the past two decades of environmental politics was part of a nationalizing project in the Caucasus.” He reviewed “the conditions for the emergence of environmentalist movements in the Soviet Union, and why they lost the leadership of independent politics to nationalist forces.” He argued “that environmental politics continues to remain expressions of national projects, and as such unsuitable neither for addressing regional environmental concerns, nor for solving complex security problems.” He looked “at newly emerging environmental movements that carry the potential of separating environmental politics from nationalizing projects, and create the necessary conditions for environmental cooperation on the regional level.” He

concluded that “the rise and fall of environmentalist movements in the Caucasus and other post-Soviet republics should make international organizations highly cautious about rapid transplantation of value-charged projects.”

Jon Barnett (chap. 72) offered a brief background to the Asia-Pacific region he reviewed several major regional environmental security issues and discussed two key case studies of environmental insecurity for Kiribati, the Marshall Islands, Tokelau and Tuvalu, and China. He argued that these cases “provide a useful contrast and reveal much about the diverse nature of environmental insecurity in the region,” and he claimed “that environmental insecurity in the region is caused by economic rather than demographic changes.” He stated that due to the different socio-ecological contexts, the environmental security issues differ widely throughout the region. He claimed that “environmental insecurity in the region is caused by economic rather than demographic changes; ... that lead to ... greenhouse gas emissions, overuse and pollution of water, deforestation, and air pollution.” This calls for “constraining the externalities of economic development, through ... improved land use planning at national and local levels, reducing the rate of greenhouse gas emissions through the use of sustainable energy technologies, adoption of cleaner production technologies, adoption of sustainable harvest targets, and reducing consumption in developed countries. Failure to address environmental problems through these and other methods may, and in some cases is already causing widespread and significant impacts on people’s livelihoods.”

Gunhild Hoegensen (chap. 73) discussed “the nature of environmental security, and its relevance in two regions that are relatively peaceful and pristine – the Arctic and Antarctic.” She argued “that the concept is relevant but context dependent”, and that “the security of the Arctic and Antarctic are deeply connected to the environment, both with regard to the impacts of humans on the environment, but also the subsequent impacts of the environment upon humans.” She stressed that “the environmental linkages between the polar climates and the rest of the planet are extremely complex and non-linear, and the Arctic and Antarctic influence climate over a large part of the globe.” In both regions the ‘categories’ to identify security are “very fluid, and closely linked to each other. Economic security cannot be completely isolated, for example, from environmental security or political security.” She focussed on “the impacts of climate change and how this phenomenon has and

continues to impact the many security dynamics of the Arctic and Antarctic.”

100.9 Human and Gender Security Concepts and Debate

With 23 chapters this part offers an overview of the debates on human security in the social sciences and in international organizations (chap. 74–77), it reviews human security discourses in the Arab world, in Southeast Asia, in Sub-Saharan Africa, in Central and South America (chap. 78–82) and analyses human security as ‘freedom from fear’, ‘freedom from want’ and as ‘freedom to live in dignity’ and as ‘freedom from hazard impacts’ (chap. 83–88). This is followed by a controversial discussion on human and gender security approaches (chap. 89–93) and it concludes with three case studies on Afghanistan, Guyana, and on a human security based early warning and response system (chap. 94–96).

Introducing into the scientific and political debate on human security, in chapter 74, *Hans Günter Brauch* surveyed the evolution of the human security concept in the social sciences and in international organizations. This is followed by a brief analysis by *Claudia Fuentes Julio* and *Hans Günter Brauch* (chap. 75) on the *Human Security Network* (HSN) where they analysed the objectives of the HSN and explored the reasons why its member countries have advocated these objectives at the international level. They examined the specific agenda items of the HSN and its mechanisms for coordination. They concluded that its “effectiveness is the result of three key advantages: *First*, it has developed a recognized capacity in *international agenda-setting*. ... *Second*, it has emphasized the *broad and multidimensional* nature of both the concept of human security as well as of the Network itself. ... *Third*, it has become a platform on which countries can lobby collectively for issues of common concern, thereby contributing to the *international policy-making process*.”

The next two chapters offered conceptual discussions from a South Asian and European perspective. *A.K.M. Abdus Sabur* (chap. 76) claimed that in the realist tradition national security “was achieved at the expense of the security of the individual or people in terms of their political, social, and economic rights and choices. Thus ... the state ... has served as a threat to their security.” He argued that “the end of the Cold War and the accompanying structural changes of monumental proportion introduced a revolutionary

change in security thinking,” what “has dramatically decreased the traditional security threats to the states that came out victorious in the Cold War. On the other hand, the world was confronted with a series of intra-state violent conflicts of various origins, large-scale atrocities, and even genocide.” He developed a general framework for a theoretical perspective on human security he applied to South Asia.

Sascha Werthes and *Tobias Debiel* (chap. 77) shifted the reference object from the state to the individual, and integrated elements of foreign and development policy. They argued that “the perforation of state sovereignty – resulting from the multifaceted globalization processes and the incapability of states to respond to growing non-military security threats – produced a pressure for practical solutions and strategic responses.” They briefly sketched “the horizontal and vertical extension of the security agenda”, which furthered the emergence of the human security concept. They showed “that human security not only is of political attractiveness but also has practical advantages and can be substantiated for academic purposes.” They concluded that “as a political and normative leitmotif ‘human security’ helps to clarify how to conduct, justify and sometimes legitimize policy decisions. It may also inspire decisions on policies and policy instruments. It helps to focus the (international) political agenda on the most vulnerable or most threatened individuals, too often forgotten in other security approaches. Finally it can also be substantiated for academic purposes.”

This is followed by five chapters that review the human security debate in the South. *Béchir Chourou* (chap. 78) argued that “the concept of ‘human security’ is not a common subject of research or discussion in the Middle East or in North Africa. ... In the Maghreb the topic remains largely unknown, ignored or avoided,” because the literature on human security includes components that are not open to free public discussion. By referring to the main threats to human security in the Maghreb and identifying the most serious challenges, he attempted “to show that two forms of direct violence (practices of autocratic regimes and inter-state conflicts) and a number of indirect violence (demographic growth, food insecurity, lack of education particularly among women, exposure to environmental hazards) represent major threats to human security in the Maghreb.”

Zarina Othman (chap. 79) reviewed “the dynamics, patterns, approaches and debates on the various human security concepts” and analysed “how members of the *Association of Southeast Asian Nations*

(ASEAN) have responded to this approach.” She argued that “its members believe that human security is associated more with economic development as a precondition for political stability; while human rights issues have been considered as domestic problems that are best left to the individual states to deal with, and thus should not be discussed at the regional level.” She discussed first “the Southeast Asian concept of ‘comprehensive security’, a traditional approach that has been adopted by ASEAN states for designing their respective national security policies”; then she explored “the human security approach, how it has evolved and some specific issues and policies”; and finally she suggested “what needs to be done to promote and strengthen this concept in Southeast Asia.” She concluded that “the main challenge to human security in the region remains the perceived threat to national ‘sovereignty’ and to the regime in power.” But this state security “does not necessarily guarantee the peoples’ survival.” Due to increasing interdependence Southeast Asian states adopted a comprehensive concept of security which acknowledges non-military issues as threats to national security.

Nana Poku and *Bjorg Sandkjaer* (chap. 80) pursued a twofold aim: “to explore security from a human perspective and to illustrate this perspective [with] material from sub-Saharan Africa,” based “on the premise that for many ordinary Africans the chief security concern is often their own government, either through its pervasive power and oppressive policies, or as a result of its incapacity to sustain the infrastructure of life.” They argued that “the resulting social decay presents a dramatic picture of insecurity of ordinary people in circumstances where states ... are either unable to provide protection or are themselves the principal sources of violence.” Their key focus was “how to adequately understand and address the security concerns of a people in these circumstances.” In the first two parts they explored “what is meant by human security,” by charting its origins and outlining its significance for the study of contemporary African societies and analysing “the African state and the complexities it poses for the provision of security on the continent.” In the third and fourth part they surveyed “the extent of Africa’s human security challenges by examining the continent’s economic performance as well as development prospects.” They then examined “Africa’s progress towards the *Millennium Development Goals* (MDGs)” arguing that “the goals might not be achieved by 2015.” They suggested that “the human security framework should be conceived as emancipatory; encompassing and empower-

ing the hopes and aspirations of a group of people – individuals, civil society, development practitioners, NGOs, CBOs, donor organizations – for a better continent.” In their view “the concept is intended to evoke discussions as explicit as possible, organized as emotively as possible, while making empirical observations as compelling and practical as possible.”

Philippe De Lombaerde and *Matthew Norton* (chap. 81) assessed *human security* (HS) threats and challenges in *Central America* (CA). They evaluated “clusters of HS challenges in three major HS pillars and connect[ed] them to the emerging regional human security discourse.” The first included “social and political issues, and particularly the challenges posed by high levels of social violence, and faltering democratic consolidation processes.” The second was “related to issues of economic development and the integration of CA in the regional and global economy”, and the third dealt “with regional impacts of natural hazards and disasters.” They placed these three human security threats and challenges “in the light of regional strategies to enhance and achieve the human security agenda.” They concluded that the HS concept is well suited for the analysis of these security challenges “although its use in Central American academia and politics is only slowly gaining importance.” They argued that “from a broader and person-centred definition of HS, ... serious threats to HS, both from internal and external origins, exist and require policy responses. They are related to organized crime, poverty, low educational levels, distorting migratory flows, environmental risks, and the adjustment costs of economic liberalization.” They showed “that traditional and non-traditional HS threats are highly interlocked in CA and that due to the structural characteristics of the region (small scales, high degrees of openness, dependence vis-à-vis US, etc.), effective policy responses require (deeper) regional cooperation and integration driven by institutional and political processes with (higher) degrees of democratic participation.”

Francisco Rojas Aravena (chap. 82) argued that several structural and international factors have contributed to a reconceptualization of security: “1. end of bipolar conflict; 2. new power relationships; 3. impact of globalization ... and interdependence; 4. changes in the dimensions of time and space; 5. loss of state capabilities; 6. increase in intra-national conflicts; 7. new international actors; 8. new threats to security; and 9. development gaps.” He argued that “Latin American governments have gradually assimilated the new human security concept.” In South

America, “Chile made this concept part of its foreign policy strategy” and “Ecuador included it in its defence policy definition.” He examined “the relationship between human security and development ... and human security and its links with state security and international security.” He concluded that “South American nations face the challenge of improving policies and actions in the double triad of human security. Achieving human development is crucial. Without resolving inequity and poverty issues, the main goal in human security will be impossible to obtain. ... In addition, for South American countries conceptual development is a key tool for the consolidation of democratic regimes and to overcome the unjust situation for its people.”

David Black and *Larry Swatuk* (chap. 83) mapped “the intellectual and practical terrain of human security in North America” by comparing Canadian and US perspectives. They argued that “the Canadian turn toward ‘human security’ constitutes a logical extension of Canada’s post-World War II ‘middle power’ status and self-proclaimed ‘helpful fixer’ role in global politics. In contrast to American unilateralism, the ‘helpful fixer’ approach is based on multilateralism and consensus seeking.” They briefly examined “current debates about human security in the North American and European settings in an indicative rather than exhaustive manner,” they described “official Canadian human security policy and practice”, and they highlighted “debates among Canadian academics surrounding this approach.” They “would like to see the North American debates regarding human security engage more directly with the critiques made by critical scholars on the left. This would mean, in part, reinvigorating discussions regarding the ways in which ‘fear’ and ‘want’ are interrelated, including exploring possible causal pathways.”

Human security as ‘freedom from want’ on the human development agenda was covered by *Hideaki Shinoda* (chap. 84) who examined “the use of the concept ‘human security’ by the government of Japan and its implications”, arguing “that this concept has been favourably accepted by the Japanese government as a policy theme and it interprets how the government refers to it. While there are historical and political contexts in which Japan is naturally attracted by concepts like human security, it would be premature to assert that Japanese foreign policy as a whole is guided by this human security concept.” He claimed that “most Japanese scholars on international relations initially found the concept of human security too ambiguous. Experts on ‘traditional security’ sel-

dom speak of human security.” He analysed “where human security concerns are reflected in Japanese foreign policy, and where Japan is advancing human security as a rationale for its development policy and humanitarian aid.” He concluded that “Japan is trying to adapt itself to a world under new security conditions, while keeping its traditional ‘soft’ image”, arguing that the human security approach “does not harm the traditional orientations of Japanese foreign policy. ... Human security is expected to contribute to an advancement of the goals of Japanese foreign policy.”

Max Schott (chap. 85) presented a case study on what the people and members of the Human Security Cell in the *Ministry of Foreign Affairs and International Cooperation* in Mali consider as their key human security concerns. In the first part, he analysed “both discourses on human security ... by looking at some common rhetorical categories used to defend or criticize the human security concept.” He then discussed “the implications of the human security agenda at the policy level in Mali as Chair of the HSN and investigated its autonomy in formulating policy priorities.” Finally, he evaluated “the perceptions of human security on the ground through consultations carried out with the local populations at the rural, pre-urban and urban levels in Mali.” He proposed to link the “discourses and discussions on human security with a ‘bottom-up’ view of a local reality, with concrete inputs from its referent object, the individual.” He stressed that it might be possible ... to identify common characteristics and challenges to human security through comparative analysis of local/regional human security definitions. This would, in time, allow the development of a global human security concept, and eventually better and more efficient policy implementation.”

The third pillar of human security as ‘freedom to live in dignity’ through different human rights treaties was introduced by Dieter Senghaas (chap. 86) who discussed the “emergence of the concept of human rights and human security,” and the role of “human rights as the result of a cultural revolution.” He concluded that in the “worldwide cultural conflict scenario, of which the human rights discourse is currently a core element, ... its real setting is individual societies with their specific cultural cleavages.” He argued that due to the ‘clash within civilizations’ “the international dialogue is becoming easier, because the encounter is no longer between internally harmonious, rather monolithic or homogenous cultures, but between cultures that have come into conflict with themselves.” But it is uncertain “whether the idea of

human rights ... will be translated into political orders congenial to human rights.” In his view “the decisive factor will be the political power-constellations within development processes, which will either succeed or fail.” As human rights issues and the concern for human security overlap and will not counteract each other, he assumed “that with respect to both intellectual and political activities there will be a kind of mutually reinforcing feedback.”

The fourth pillar of human security as ‘freedom from hazard impacts’ is conceptually introduced by Fabien Nathan (chap. 87). He analysed the linkage between vulnerability and human security and offered a typology of the concepts of natural risks and disasters, of the sources of vulnerabilities and affected areas, and discussed the inclusion of hazard threats into human security. He concluded that “natural disasters constitute a very important threat for millions of people, usually poorly taken into account in security studies, even though their acuteness is constantly growing”, and that “traditional security thinking is unable to comply with the ‘requisites of an integral conception of security’ that recognizes the threats and analyses all their dimensions.” He suggested that the human security concept “could be used as a strategic means to elaborate an integral conception of security.”

Surichai Wun’Gaeo (chap. 88) addressed the question: “How do environmental resources become a key factor of human security for social groups?” He developed two hypotheses: “first, the state is both a determining and an intervening factor; and second, the affected communities are not passive actors, but are rather active partners in sustainable livelihood recovery.” For the Indian Ocean tsunami he examined “environmental resources as an element of human security by placing the ASEAN region and Thailand into a geographical context.” He outlined “a framework for human security from an environmental perspective focusing specifically on how natural disasters can threaten security and create situations of extreme vulnerability.” Based on a field study he discussed “the coping strategies in facing such extreme circumstances of vulnerability and human insecurity.” He discussed “hazard impacts and social vulnerability interpreting the event by focusing on hazards posing threats to human security in Thailand.” He concluded that “human security remains problematic in South-east Asia today. Poverty and environmental threats continue to stand as obstacles to human development. The increasing frequency of environmental threats confronting the region only serves to under-

score the notion that environmental security is a crucial element for the attainment of human security.” But this would require “the utilization of resources in a sustainable way that will maximize the potential to preserve natural resources for the protection of human security.”

The next five chapters by women from Mexico, Vietnam/Netherlands, the Philippines and Sri Lanka offer different approaches to human and gender security. *Serena Eréndira Serrano Oswald* (chap. 89) scrutinized the possibility of ‘securitizing gender’ in security studies. She suggested a paradigmatic shift for approaching security by discussing the process of identity formation. She argued “that the problem is not to ‘securitize’ gender” and she proposed “to extrapolate the lessons learnt from the developments in the feminist agenda ... in order to ‘engender’ the concept of security itself so as to make it viable for an equitable and more secure world.” This approach is framed in a discussion on social identity, the formation of representations, and societal change. She linked the concept of ‘security’ to the systemic critique of the exclusionary – dualistic western tradition. In her view “the process of engendering democracy and security, means developing gender sensitive representations in both men and women. Regarding the possibility of ‘securitizing gender’, it may be more urgent and desirable to commence ‘engendering security’ vis-à-vis the impossibility of securitizing gender.”

Úrsula Oswald Spring (chap. 90) focused “on the development and limits of the gender security concept that are imposed on gender epistemology by the prevailing patriarchal mindset in science.” She reviewed four main schools of thought: “epistemological feminism, feminist empiricism, postmodernism, and standpoint feminism.” She explored the process of identity and social representations, discussed post-modern feminism and linked it to the gift economy, ecofeminism and social movements. She combined human, environmental, and gender security for a peaceful and nonviolent livelihood with threats posed by environmental degradation and social marginalization. She argued that more cooperation reduces violence and that this could overcome hard security approaches, and that the military and police could be reassigned to civil protection and disaster management. Furthermore, she discussed gender links with human and environmental security to foster an economy of solidarity and a democratic, ‘glocal’ and participative model of governance that guarantees equity, peace with quality of life, and prospects for a future for the most vulnerable people.

ThanhDam Truong (chap. 91) argued that the regimes of international migration based on welfare and humanitarian concerns were replaced by “multilateral initiatives in migration management guided by the logic of trade and finance, foreign policy and national security,” that “opened the scope for market-based smuggling of refugees and migrants.” While “the legal view treats differing social worlds of transnational migration as mutually exclusive categories”, she addressed their reciprocal implications based on Foucault’s theory of governmentality and emphasized “the significance of thoughts underlying political discourses, practices of discipline and control over mobility.” She highlighted “the nature of intersectional domination of gender, class and race as being contingent on a one-dimensional vision of liberty in neo-liberalism as a political rationality.” She argued that a human security concept that addresses the daily security of the most vulnerable can no longer be locked in a positivist interpretation. She claimed that “exploring the notion of ‘security’ in respect to ‘freedom’ and questioning the context of, and capacity for, social transformation would bring new lights to the exercise of power in this domain.” In her view “feminist theory can contribute to an understanding that does not treat different categories of security as distinctive and self-contained, but as elements in a web of mutually implicating relationships and, also, as matters of social justice systemic to global capitalism as a whole.” She discussed the neo-liberal governmentality with regard to gender and culture and suggested human security as a political rationality for countering neo-liberalism. She concluded that “neo-liberalism has created a new style of governance”, and she suggested “as the key political question for codes of human security to include the protection of people on the move is how to address the now obsolete but still affective demarcation between the ‘domestic’ (self) and the ‘foreign’ (distant others).”

Then, *Mary Soledad L. Perpiñan, María Eugenia Villarreal* and *Úrsula Oswald Spring* (chap. 92) addressed the question how women analyse and survive in very violent situations in South East Asia and in Central America. They discussed “how threats affecting women and children are resolved collectively by women and marginalized groups, relying on their own capacities.” They reviewed two case studies on gender insecurity in South East Asia based on participative research and the trafficking in children for sexual exploitation in Central America. In their view, “both regions represented strategic zones during the Cold War where both superpowers fought proxy wars. In both

examples the fight against communism brought about environmental disaster due to chemical warfare, guerilla war, and a large number of displaced persons.” They argued that “once a peace agreement was achieved, the destruction of the social networks ... was triggered by global environmental change and increasing natural hazards, which often led to social and political disasters.”

Madhavi Malalgoda Ariyabandu and *Dilrukshi Fonseka* (chap. 93) discussed the gender dimension of natural hazards for the tsunami in India and Sri Lanka (2004), and the Kashmir earthquake in Pakistan (2005). They argued that “exposure and vulnerability to natural disasters pose a major threat to human security, by ... exposing individuals to the threats of physical, economical, social, health, personal, cultural and psychological insecurities.” While disasters kill and displace people and make them socially and economically insecure, “post-disaster contexts further threaten human security, as political and institutional structures ... are unable to deliver relief and recovery.” South Asia is one of the most hazard prone regions and “home to a very large number of resource poor people.” In addition, “poor governance, institutional and policy frameworks, weak infrastructure, lack of social protection and security all lead to high levels of disaster related insecurity.” They argued “that the degree and extent of an individual’s human security risk vis-à-vis natural disasters is ... related to the multiple ... identities ... as well as to the physical, structural and attitudinal violence that is inflicted on these identities by his/her community.” They analysed “how different groups of people in India, Sri Lanka, and Pakistan have been affected by the December 2004 Asian tsunami and the October 2005 Kashmir earthquake; unfolding vulnerabilities, the degrees of disaster risk and threat to human security from the immediate, natural hazard impact, and through disaster responses.” Both mega disasters demonstrated deep rooted problems; exposing the failure to understand and address causes and effects of vulnerability, and a recovery process devoid of risk and vulnerability reduction.

The last three chapters offer case studies on specific issues. *Shahrbanou Tadjbaksh* (chap. 94) combined the debate on human security with that of failed states and suggested “a constructivist view of the political and normative usage of these terms to see whether these two ultimately political concepts are compatible.” She reviewed “the differences between a traditional (security or institutional based) approach and a human security approach to ‘conceptualizing’ fragile states.” She scrutinized “differences

in terms of evaluations of failure, strength and weaknesses, as well as motivations for engagement from the three different points of views,” arguing “that the human security framework poses an ethical challenge to realism and institutional liberalism by introducing the element of human dignity.” Distancing herself from “traditional approaches to responses and responsibilities of the international community,” she scrutinized “questions of interventions, stabilization, aid, and a liberal approach to state-building ... from the realist, liberal and human security viewpoints ... as applied in Afghanistan,” and proposed “an alternate framework of engagement,” arguing that “the human security framework proposes different solutions to the problems of efficiency and legitimacy of states and their institutions, specifically in the cases of ‘failed states’.”

Joseph Singh (chap. 95) discussed “the relevance of human and environmental security concepts for the military services,” focusing on concepts of human and environmental security. These concepts were assessed “for the Caribbean region to determine their relevance for the military services,” arguing that “the decisions these countries make will have implications for the military services if they are to be capable of responding to such threats, challenges, vulnerabilities, and risks in the future.”

Albrecht Schnabel and *Heinz Krummenacher* (chap. 96) argued that “a human security threat constitutes an already or potentially life-threatening danger to a population in a specific geographic context. The specific source and nature of this threat depends on each situation and context – it could range from flooding to landslides to diseases or violent conflict.” They argued “that the contextualized ... nature of human security must ... be matched with an equally multifaceted monitoring, warning and response system,” and that “the monitoring and warning approach needs to differ accordingly.” In their view, “contemporary political early warning systems lack the necessary flexibility to meet this requirement. They ... suffer from two major shortcomings: *First*, their focus lies exclusively on trends leading towards or away from violent conflict. ... *Second*, early warning was targeted at ‘Third World countries’ only and the information gained was primarily used by Western states in order to enhance their country policies and development programmes.” They proposed to share early warning information with all stakeholders and that “the response to human security threats has to be found in a participatory process ... of the local/national governments and non-state actors,” based on true partner-

ship “as a prerequisite for long-term, sustainable response strategies and mechanisms to alleviate potential and emerging threats to populations’ survival and state and regional stability.” They examined “existing first- and second-generation approaches to early warning and an illumination of the factors that explain their relatively limited utility for human security early warning.” Then they discussed “the emerging concept of human security,” and concluded “by outlining how a third-generation early warning system would have to look in order to successfully address the genuine human security needs of societies.”

100.10 From Knowledge to Action and Policy Outlooks

The last part refers to the increasing role of remote sensing for environmental security analysis. *Dirk H. Hoekman* (chap. 97) argued that “remote sensing systems may play an important role in the development and implementation of such international treaties.” Therefore, “accurate mapping and monitoring is required at different scales. Severe cloud cover often prevents the acquisition of optical remote sensing data, thus making the use of satellite radar remote sensing for monitoring applications necessary.” He illustrated the “suitability of radar techniques for acquiring relevant information on rain forests ... with examples of studies conducted by the author in Indonesia.”

This is followed by a research manifesto by *Úrsula Oswald Spring*, *Hans Günter Brauch*, and *Simon Dalby* (chap. 98) in which they outlined the topics, scope, areas and methods for a fourth research phase on human, environmental and gender security, and peace research that should build on the first three phases of environmental security research while explicitly incorporating advances in earth system science and disaster research into the analysis. They distanced security analysis from traditional assumptions in international relations thinking and focusing more explicitly on the specific contexts where people, especially socially vulnerable groups and their social networks, are insecure. While the first three phases of environmental security research primarily focused on the ‘nation state’ as the key referent of environmental security concepts and policy, they suggested that during the fourth phase the referent object of securitization should be both *widened* and *deepened*. This implies that the environmental dimension of security should include both societal, human, and gender issues but

also sectoral approaches such as water, food, health, and livelihood security and ecofeminist perspectives. Furthermore, the widening of the referents of securitization should include the global, regional, societal, community, family, and human level. Thus, the state-focused approach to environmental security should be broadened to a ‘people-centred’ approach.

They introduced three conceptual components for the fourth phase: earth system research and the Anthropocene, the combined *Human, Gender and Environmental Security* (HUGE) concept, and the *Human and Environmental Security and Peace* (HESP) programme. They also addressed the study of substantive issues that need attention in the fourth phase, such as extreme weather events, social systems and gender relations, environmental, social and urban vulnerability, migration, complex emergencies, crises and conflicts, political coping strategies with human insecurities.

Finally, in chapter 99, *Hans Günter Brauch* and *Úrsula Oswald Spring* developed their conceptual perspective for a sustainable peace for the 21st century translating the conceptual and empirical results into a policy perspective that moves from scientific knowledge to political action for society, the business community in facing the new global challenges, as well as the role of the state and international organizations in responding to these new global challenges. They addressed these new challenges for international peace and security, and suggested conceptual ideas for moving towards a sustainable peace policy for the 21st century.

Abbreviations

AA	Auswärtiges Amt [Federal Ministry for Foreign Affairs, Germany]	AP II	Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts
AC	alternate current		
AC	Arctic Council		
ACF	Australian Conservation Foundation	APA	ASEAN People's Assembly
ACHAP	African Comprehensive HIV/AIDS Programme	APEC	Asia-Pacific Economic Cooperation
ACIA	Arctic Climate Impact Assessment	APFA	Accès à la Propriété Foncière Agricole [Access to Agricultural Land]
ACP	Africa – Caribbean – Pacific	API	American Petroleum Institute
ACS	Association of Caribbean States	APN	Asia Pacific Network for Global Change Research
ACTS	African Centre for Technology Studies		
AD	anno domini [after Christ]	APPRA	Asian-Pacific Peace Research Association
ADB	Asian Development Bank	APR	Asia-Pacific Roundtable
ADHR	Arctic Human Development Report	APROFEM	Association pour la Promotion de la Femme et de l'Enfant au Mali [Association for the Promotion of Women and Children in Mali]
ADL	Amu Darya Lowlands		
ADM	Archer Daniels Midland		
AEW	aerial early warning	APWLD	Asia Pacific Forum on Women, Law and Development
AFD	Agence Française de Développement		
AfDB	African Development Bank	AR4	Fourth Assessment Report (of IPCC in 2007)
AFES-PRESS	Peace Research and European Security Studies (international scientific NGO)	ARF	ASEAN Regional Forum
AFREGS	Armed Forces Regression Study	ARIJ	Applied Research Institute of Jerusalem
AGOA	Africa Growth and Opportunity Act	ARW	Advanced Research Workshops
AI	Amnesty International	ASALA	Armenian Secret Army for the Liberation of Armenia
AIAS	African Institute for Agrarian Studies	ASEAN	Association of Southeast Asian Nations
AIDS	Acquired Immuno Deficiency Syndrome	ASI	Advanced Study Institutes (of NATO)
AIOC	Azerbaijan International Operating Company	ASPO	Association for the Study of Peak Oil
ALBA	Alternativa Bolivariana para los Pueblos de Nuestra América (Bolivarian Alternative for the Americas)	ASS	Africa Sub-Saharan
		ATTAC	Association for the Taxation of Financial Transactions to Aid Citizens
ALIDES	Alianza para un Desarrollo Sostenible [Alliance for Sustainable Development]	AU	African Union
ALOS	Advanced Land Observing Satellite (of JAXA)	AWEO	Alternative World Energy Outlook
AltSEAN	Alternative ASEAN Network	AWW	African Water Week
AMAP	Arctic Monitoring Assessment Programme	AZ	Arizona (USA)
AMCEN	African Ministerial Conference on the Environment	B	billion
ANAT	Agence Nationale d'Aménagement du Territoire [National Agency for Territorial Management]	B.C.	Before Christ
		b/d	barrels/day
ANN	Agence Nationale pour la Conservation de la Nature [National Agency for Nature Conservation]	BAR	basins at risk
		BASA	Amazon Bank (in Brazil)
ANWR	Arctic National Wildlife Refuge	BAU	business as usual
AOA	Agreement on Agriculture	BBC	British Broadcasting Company
AOSIS	Association of Small Island States	BBC	(conceptual work on vulnerability by Bogardi/Birkmann (2004) and Cardona (1999/2001))
AOYE	Arab Office for Youth and Environment	bbf	barrel (1 barrel = 159 litres)
AP I	Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts	BC	before Christ
		BCE	before Christian era
		bcm	billion cubic metres
		BCPR	Bureau for Crisis Prevention and Recovery (UNDP)

Bd	billion dollars	CAMRE	Council of Arab Ministers Responsible for the Environment
BEAC	Barents-Euro-Arctic Council	CAPCO	Central African Power Corporation
BEAR	Barents-Euro-Arctic Region	CAR	Central African Republic
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe [German Federal Agency for Geosciences and Raw Material]	CARE	CARE International
BIG/CC	Biomass Integrated Gasification/Combined Cycle	cat	category
BISS	Bangladesh Institute of International and Strategic Studies	CBCP	Catholic Bishops' Conference of the Philippines
BIOMASS	proposed P-band radar mission (of ESA)	CBD	United Nations Convention on Biological Diversity
BMBF	Bundesministerium für Bildung und Forschung [German Ministry for Education and Research]	CBI	Caribbean Basin Initiative
BMU	Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit [German Federal Ministry on the Environment, Nature Conservation and Nuclear Safety]	CBO	community based organization
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit [German Federal Ministry for Development Cooperation]	CBR	crude birth rate
bn	billion (in US and increasingly in the UK) or a thousand million: 10^9	CBSS	Council of the Baltic Sea States
BOD	Biochemical Oxygen Demand	CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources
boe	barrel oil equivalent	CCC	conventions, carbon cycle science and conservation of the environment
BOO	built, own, operate	CCGA	Chicago Council on Global Affairs
BOS	Borneo Orang-Utan Survival Foundation	CCMS	NATO Committee on the Challenges of Modern Society
BOTA	Boru Hatlar ile Petrol Tama Anonim irketi (Petroleum Pipeline Corporation), Turkey	CD	UN Conference on Disarmament (in Geneva)
BP	British Petroleum company	CDA	Canada
BP	before present	CDC	US Centers for Disease Control and Prevention
yBP	years before present	CDM	Clean Development Mechanism
BPOA	Barbados Plan of Action	CDR	crude death rate
BPS	Bureau of Statistics (in Indonesia)	CE	Christian era
BSC	Black Sea Commission	CE	Central Eurasia
BSE	Bovine Spongiform Encephalopathy	CEDARE	Centre for Environment & Development for the Arab Region and Europe
BSEC	Black Sea Economic Co-operation	CEEAC	Communauté Economique des Etats de l'Afrique Centrale [Economic Community of Central African States]
Bt	bacillus Thuringensis	CEF	Country Environment Profile
BTC	Baku-Tbilisi-Ceyhan pipeline	CEG	Contact Expert Group
BTU	British thermal unit	CEN	Comite Européen de Normalisation
BUIS	Basin Irrigation Systems Management Authority (in Uzbekistan)	CENAPRED	Centro Nacional de Prevencion de Desastres [National Centre for Disaster Prevention in Mexico]
BVO	Basseynoe Vodnoe Ob'edinenie [River Basin Authority of Syr Darya and of Amu Darya]	CENTCOM	U.S. Central Command
BWO	Basin Water Organization (in Central Asia)	CEO	Chief Executive Officer
C	degree Celsius	CEP	Caspian Environment Programme
CA	Central America	CEPAL	Comisión Económica para América Latina y el Caribe [Economic Commission for Latin America and the Caribbean]
CA	Central Asia	CERES	Centre for European Energy Strategy (Brussels)
CACILM	Central Asian Countries Initiative for Land Management	CERI	Centre d'Etudes et de Recherches Internationales (Paris)
CACM	Central American Common Market	CERM	Co-ordinated Emergency Response Measures (of the IEA)
CAEC	Central Asian Economic Community	CERT	Citizen Emergency Response Training
CAFTA	Central American Free Trade Agreement	CESR	Centre for Economic and Social Rights
CAIS	Central American Integration System	CEWARN	Conflict Early Warning and Response Mechanism
cal BP	calendar years before present (calibrated dating)	CF	Conceptual Framework

CFA	Communauté Financière Africaine [African Financial Community]	CP	Conflict Prevention (office of UNDP)
CFB	Circulating Fluidized Bed	CPCC	Canadian Peacebuilding Coordinating Committee
CFR	Council on Foreign Relations (New York)	CPDC	Network on Conflict, Peace and Development Co-operation
CFSP	Common Foreign and Security Policy (of the EU)	CPIA	Country Policy and Institutional Assessment
CGI	Clinton Global Initiative	CPR	Chantier Populaire de Reboisement [Peoples' Reforestation Sites]
CHGA	Commission on HIV/AIDS and Governance in Africa	CPV	concentrator photovoltaic
CHP	Combined Heat and Power generation	CR	Caspian Region
CHS	Commission on Human Security	CRED	Centre de Recherche en Epidémiologie des Désastres (Centre for Research on the Epidemiology of Disasters), Université Catholique de Louvain, Brussels, Belgium
CIA	Central Intelligence Agency	CRHC	Comprehensive Reproductive Health in Crises
CICAD	Comisión Interamericana para el Control del Abuso de Drogas [Inter-American Drug Abuse Control Commission]	CRIC	Committee for the Review of the Implementation (of UNCCD)
CIDA	Canadian International Development Agency	CRIM	Center for Multidisciplinary Studies (of UNAM, in Mexico)
CIE	Comité Inter-Etats [Inter-State Committee of the riparian states of the Senegal River]	CRSE	Commission de Régulation du Secteur de l'Electricité [Electricity Sector Regulation Commission]
CIFP	Country Indicators for Foreign Policy	CRU/UEA	Climate Research Unit; University of East Anglia (in UK)
CIFTA	Convención Interamericana contra la Fabricación y el Tráfico Ilícitos de Armas de Fuego, Municiones, Explosivos y Otros Materiales Relacionados [Inter-American Convention against the Illicit Manufacturing of and Trafficking in Firearms, Ammunition, Explosives, and other Related Materials]	CSCAP	Council for Security Cooperation in Asia-Pacific
CILSS	Comité Permanent Inter Etats de Lutte Contre la Sécheresse au Sahel [Permanent Interstate Committee on Drought Control in the Sahel]	CSD	(United Nations) Commission on Sustainable Development
CIMI	Indian Missionary Council	CSEC	commercial sexual exploitation of children
CIR	Indian Council of Roraima	CSIR	Council for Scientific and Industrial Research
CIS	Commonwealth of Independent States	CSIS	Center for Strategic and International Studies (Washington, D.C., USA)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora	CSLP	Cadre Stratégique de Lutte Contre la Pauvreté
CLOC	Consejo Latinoamericano de Organizaciones Campesinas [Latin American Peasants Organizations]	CSN	National Security Council (Brasil)
cm	centimetre	CSP	Country Strategy Paper
CMP	Catchments Management Plan	CSP	Concentrating Solar Thermal Power Stations
CNA	US Center of Naval Analysis	CSS	Center for Security Studies (ETH Zürich)
CNAS	Centre for a New American Security	CSSDCA	conference on security, stability, development and cooperation (in Kampala, Uganda in 1991)
CNN	Cable News Network	DAC	Development Assistance Committee (of OECD)
CNTS	Centre National des Techniques Spatiales [National Centre for Spatial Techniques]	DANIDA	Danish International Development Agency
CO	carbon monoxide	DC	direct current
CO ₂	carbon dioxide	DCI	Director of Central Intelligence
COE	costs of electricity	DDR	disarmament, demobilization and reintegration
COERR	Catholic Office for Emergency Relief and Refugees	DDT	dichloro-diphenyl-trichloroethane
COMELEC	Comité Maghrébin d'Electricité [Maghreb Electricity Committee]	DENIX	Defense Environmental Network & Information eXchange
COP	Conference of Parties (of an international environmental regime, e.g. of UNFCCC)	DEPI	Disaster Management Branch (of UNEP)
COP 13	Conference of Parties (of UNFCCC in December 2007 in Bali)	DESA	United Nations Department of Economic and Social Affairs

DESTIN	Development Studies Institute (at LSE in London)	ECONILE	Environment and Cooperation in the Nile Basin (research project, University of Zürich, Switzerland)
DEWA	Division of Early Warning and Assessment (of UNEP)	ECOWAS	Economic Community of West African States
DFAIT	Department of Foreign Affairs and International Trade (Canada)	ECPAT	End Child Prostitution, Child Pornography and Trafficking of Children for Sexual Purposes
DFID	Department for International Development (UK)	ECSP	Environmental Change and Security Program (Woodrow Wilson Center, Washington, D.C., USA)
DIVERSITAS	international research programme on biodiversity science	ECU	European Currency Unit
DIWO	Diverse Women for Diversity	EDC	endocrine disrupting chemicals
Dk	Denmark	EDM	Electricité Du Mali [National Electricity Company of Mali]
DLDD	desertification, land degradation and droughts	EEA	European Environment Agency (in Copenhagen, Denmark)
DME	dimethylester	EECCA	Eastern Europe, Caucasus and Central Asia
DoE	Department of Energy	EFA	Education for All
DPRI	Disaster Prevention Research Institute, Kyoto University	EgNDF	Egyptian National Discourse Forum
DRC	Democratic Republic of Congo	EGS	Environmental Goods and Services
DR-CAFTA	Dominican Republic - Central American Free Trade Area	EIA	Energy Information Administration (US)
DRMU/	Disaster Relief and Monitoring Unit -	EIA	Environmental Impact Assessment
HRCSL	Human Rights Commission of Sri Lanka	EIB	European Investment Bank
DRR	disaster risk reduction	EJ	exa louses
DRS	Défense et Restauration des Sols [Soil Protection and Restoration]	ELECTRO-	Northern Brazil Electricity Board
DS	Devlet Su leri [General Directorate of State Hydraulic Works, Turkey]	NORTE	
DSR	Driving Force-State-Response (model)	EM-DAT	Emergency Events Database
DTI	Department of Trade and Industry (UK)	EMM	Emergency Management Manual (of the IEA)
DTIE	Ozone Action Program (of UNEP)	EMP	Euro-Mediterranean Partnership
DVPW	Deutsche Vereinigung für Politikwissenschaft	ENCOP	Environment and Conflicts Project (Zürich University - Swisspeace, Bern, Switzerland)
DWAF	Department of Water Affairs	ENLA	Emergency Network Los Angeles
DZD	Algerian currency	ENMOD	Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques
e.g.	for instance	ENP	European Neighbourhood Policy
E3 scenarios	energy-economy-environment scenarios	ENSO	El Niño-Southern Oscillation
EAC	East Asian Community	ENVISAT	ESA satellite with C-band radar
EADB	East African Development Bank	ENVSEC	Environment and Security Initiative (of OSCE, UNDP, UNEP, NATO)
EADI	European Association of Development Institutes	EOLSS	Encyclopaedia for Life Support Systems (UNESCO)
EAPP	East African Power Pool	EORC	Earth Observation Research and Applications Centre (of JAXA)
EBRD	European Bank for Reconstruction and Development	EPA	US Environmental Protection Agency
EC	European Council	EPS	Environmental Protection Service (Israel)
ECAFE	U.N. Economic Commission for Asia and the Far-East	EPS	Ejército Popular Sandinista (Nicaragua)
ECE	Economic Commission for Europe	ERCRTC	Emergency Response Caspian Region Thematic Centre
ECHO	European Commission's Humanitarian Aid Office	ERP	Ejército Popular Revolucionario (Popular Revolutionary Army in Mexico)
ECLAC	Economic Commission for Latin America and the Caribbean	ERS/USDA	Economic Research Service, United States Department of Agriculture
ECOMAN	Environmental Change, Consensus Building and Resource Management in the Horn of Africa (research project, University of Zürich, Switzerland)	ERS-1	ESA satellite with C-band radar
ECOMOG	Military Observer Groups (of ECOWAS, in West Africa)	ES	environmental security
		ESA	European Space Agency

ESCAP	UN Economic and Social Commission for Asia and the Pacific	FLN	Frente de Liberación Nacional (El Salvador)
ESDP	European Security and Defence Policy	FMLN	Frente Farabundo Martí para la Liberación Nacional (National Liberation Party of El Salvador)
ESS	European Security Strategy (of EU of 12 December 2003)	FMMS	Flood Management and Mitigation Strategy
ESSP	Earth System Science Partnership	FOEME	Friends of the Earth Middle East
etc.	etcetera	FOI	Swedish Defence Research Agency
ETIC	Euphrates Tigris Initiative for Cooperation	FONDECYT	Fondo Nacional de Desarrollo Científico y Tecnológico
ETS	Emissions Trading Scheme	FPL	Frente Popular de Liberación (Popular Liberation Front)
EU	European Union	FPT	feminist political theory
EU-GSP	European Union - Generalized System of Preferences	FSC	Forest Stewardship Council
EUMENA	Europe, Middle East and North Africa	FSLN	Frente Sandinista de Liberación Nacional (Sandinist Front of National Liberation, Nicaragua)
EUSC	EU Satellite Centre	FSS	Forum for Social Studies (Ethiopia)
EUWI	EU Water Initiative	FSU	Former Soviet Union
EVI	Environment Vulnerability Index	FT	Fischer-Tropsch (synthetic hydrocarbons)
EWEA	European Wind Energy Association	FTA	Free Trade Agreements
EWP	Egyptian Water Partnership	FTAA	Free Trade Area of the Americas
EXACT	Executive Action Team	FüAk	German Command and Staff College
EZLN	Ejército Zapatista de Liberación Nacional [Zapata's National Liberation Army]	FUNAI	National Indian Foundation (Brazil)
		FYROM	Former Yugoslav Republic of Macedonia
FAL	Frente Armado de Liberación (Armed Liberation Front, Guatemala)	G&A	General and Administrative
FAO	Food and Agriculture Organization of the United Nations (in Rome)	G-7	Group of seven major industrialized countries (Canada, France, Germany, Italy, Japan, UK, US)
FAOSTAT	FAO Statistics	G-77	Group of 77
FAR	Forces Armées Rwandaises (Armed Forces of Rwanda)	G-8	Group of eight major industrialized countries (Canada, France, Germany, Italy, Japan, Russia, UK, US)
FARC	Frente Armado Revolucionario de Colombia (Armed Revolutionary Front in Colombia)	GA	United Nations General Assembly
FARN	Fuerzas Armadas Revolucionarias Nicaragüenses (Nicaraguan Revolutionary Armed Forces)	GAD	gender and development
FAST	Frühanalyse von Spannungen und Tatsachenermittlung (Early Analysis of Tensions and Fact Finding)	GAIN	World Food Centre, Commission for Genetic Resources for Food and Agriculture
FBI	US Federal Bureau of Investigations	GaN	gallium nitride
FCFA	Franc de la Communauté financière africaine (Franc of the Financial Community of Africa)	GAP	Güneydou Anadolu Projesi (Turkish acronym for the Southeastern Anatolian Irrigation Development Project)
FCO	Foreign and Commonwealth Office (UK)	GATS	General Agreement on Trade in Services (of WTO)
FCV	fuel cell vehicles	GATT	General Agreement on Tariffs and Trade
FDA	US Food and Drug Administration	Gb	gigabarrel (10 ⁹ barrel)
FDI	foreign direct investment	GBFM	Global Boreal Forest Mapping project
FESS	Foundation for Environmental Security & Sustainability	GBV	gender-based violence
FEWER	Forum on Early Warning and Early Response	GCC	Gulf Cooperation Council
FFCT	Flood Forecasting Core Team	GCC	global climate change
FFS	Forum on Food Security,	GDI	German Development Institute
FHS	Friends of Human Security	GDN	Gender and Disaster Network
FINAM	Investment Fund for Amazônia (Brazil)	GDN	Green Development Network
FLACSO	Facultad Latinoamericana de Ciencias Sociales [Latin American Faculty of Social Sciences]	GDP	gross domestic product
		GEC	global environmental change
FLEGT	EU Action Plan for Forest Law Enforcement, Governance and Trade	GECHS	Global Environmental Change and Human Security (project of IHDP)
		GEF	Global Environmental Facility
		GEM	Gender Empowerment Measure

GEO4	Global Environmental Outlook, No. 4 (2007 by UNEP)	HESP	Human and Environmental Security and Peace (book series)
GFRM	Global Rain Forest Mapping project	HH	household
GGAP	Guidelines for Global Action on Peatlands	HIIK	Heidelberg Institute for International Conflict Research (Heidelberg University, Germany)
GGP	Gross Geographic Product	HIPC	Highly Indebted Poor Country
Gha	gigahectare; 1000 million hectare.	HIV	Human Immunodeficiency Virus
GHG	greenhouse gas	HIV/AIDS	Human Immunodeficiency Virus - Acquired Immunodeficiency Syndrome
GID	Global Interactive Dialogue (of UNCCD)	HMD	hydro-meteorological data
GINI	measure of inequality of income or wealth distribution	HPCR	Humanitarian Policy and Conflict Research (Harvard University)
GIS	Geographic Information System	HPI	Human Poverty Index
GITEWS	German Indonesian Tsunami Early Warning System	HPTR	Helsinki Process Track Report
GLASS	Global Assessment of Environment and Security (project at Kassel University)	HRC	Human Rights Commission
GLP	Good Laboratory Practice	HRF	higher rainfall area
GM	gene modification	HRH	His Royal Highness
GMES	Global Monitoring for Environment and Security	HRTW	human right to water
GMF	German Marshall Fund	HRW	Human Rights Watch
GMO	genetically modified organism	HS	human security
GNI	gross national income	HSN	Human Security Network
GNP	gross national product	HSR	Human Security Report
GOARN	Global Outbreak Alert and Response Network	HSU	Human Security Unit (of UNOCHA)
GoM	Gulf of Mexico	HSU/OCHA	Human Security Unit, United Nations Office for the Coordination of Humanitarian Affairs
GoSL	Government of Sri Lanka		
GoZ	Government of Zimbabwe	HSZs	high security zones
GPA	Global Programme on AIDS	HUGE	human, gender and environmental security
GPHIN	Global Public Health Intelligence Network	HUMSEC	Research Project funded by the 6 th Framework Programme on Research (EU Commission)
GRAIN	Genome Resources Action International		
GS	gender security	HVDC	high voltage direct current transmission lines
GSEII	Global Sustainable Energy Islands Initiative	HYV	high yielding variety
GSIS	Graduate School of International Politics (at Denver University)	IAEA	International Atomic Energy Agency
GtC	giga ton of carbon	I-ANDS	Interim Afghanistan National Development Strategy
Gtoe	giga tons of oil equivalent (=10 ⁹ tons)	IBAMA	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute of Environment and Renewable Natural Resources)
GTZ	Gesellschaft für Technische Zusammenarbeit [German Agency for Technical Cooperation]	IBDF	Forestry Institute (Brazil)
GW	gigawatt (10 ⁶ of kilowatt hour)	IBRD	International Bank for Reconstruction and Development (World Bank)
GWh	gigawatt hours	IBSFC	International Baltic Sea Fishery Commission
GWP	Global Water Partnership	ICAB	Interstate Council for the Aral Sea Basin
GWp	gigawatt peak	ICAD	Inter Agency Coalition on AIDS and Development
GWP-Med	Global Water Partnership, Mediterranean	ICAS	Interstate Council for Addressing the Aral Sea Crisis
GWSP	Global Water System Partnership	ICC	International Criminal Court
h	hour	ICC	International Chamber of Commerce
H5N1	H5N1 avian influenza virus strain	ICG	International Coordinating Group (on vaccine provision for epidemic meningitis control)
Ha	hectares	ICG	International Crisis Group
HC	Hunger Commission		
HDI	Human Development Index		
HDR	Human Development Report		
HelCom	Helsinki Commission		
HEP	Hydroelectric Power Production		
HEPR	Hunger Eradication and Poverty Reduction Programme		

ICISS	International Commission on Intervention and State Sovereignty	IIASA	International Institute for Applied Systems Analysis (in Laxenburg, Austria)
ICJ	International Court of Justice	IIED	International Institute for Environment and Development (London, UK)
ICKKU	Interstate Council for Kazakhstan, Kyrgyzstan and Uzbekistan	IIRR	International Institute of Rural Reconstruction, Philippines
ICPD	International Conference on Population and Development, held in Cairo in 1994	IISD	International Institute for Sustainable Development (New York, NY, USA)
ICRC	International Committee of the Red Cross	IISS	International Institute for Strategic Studies (London, UK)
ICSU	International Council of Scientific Unions	IITM	Indian Institute of Technology Madras (Madras, India)
ICT	information and communication technology	IKMAS	Institute of Malaysia and International Studies
ICTY	International Criminal Tribunal for the former Yugoslavia	ILA	International Law Association
ICWC	Interstate Commission for Water Coordination (Central Asia)	ILC	International Law Commission
IDB	Inter-American Development Bank	ILO	International Labour Organization
IDF	Israel Defence Forces	IMF	International Monetary Fund
IDNDR	International Decade for Natural Disaster Reduction	INC	International Negotiating Committee on Climate Change
IDP	Internally Displaced Persons	INCD	Intergovernmental Negotiating Committee
IDRC	International Development Research Centre (Canada)	INDREX	Indonesian Radar Experiment (of ESA)
IDS	Institute of Development Studies (Brighton, United Kingdom)	INEF	Institute for Development and Peace (Duisburg-Essen, Germany)
IDSA	Institute for Defence Studies and Analyses (New Delhi, India)	INEGI	Instituto Nacional de Estadística, Geografía e Informática [National Institute for Statistics, Geography and Information] (Mexico)
IEA	International Energy Agency	INERIS	L'Institut National de l'environnement industriel et des risques [Institute for Industrial Environment and Risks] (Paris, France)
IEA/NEA	International Energy Agency, Nuclear Energy Agency	INESG	Institut National des Etudes de Stratégies Globales [National Institute for Global Strategies Studies] (Algeria)
IELRC	International Environmental Law Research Centre	INFOTERRA	International Network of Information Referral Systems
IEP	International Energy Programme	INGOs	international nongovernmental organizations
IFAD	International Fund for Agricultural Development	INN	Instituto Nacional de la Nutrición Salvador Zuribán [National Institute for Nutrition] (Mexico)
IFAP	International Food and Agriculture Programme	INNSZ	National Institute of Nutrition Salvador Zuribán (Mexico)
IFAS	International Fund for the Aral Sea	INTERREG	EU's programme on inter-regional co-operation
IFI	international financial institution	INWRDAM	Islamic Network on Water Resources Development and Management
IFPRI	International Food Policy Research Institute (Washington, D.C.)	IOM	International Organization for Migration
IFRC	International Federation of the Red Cross	IPCC	Intergovernmental Panel on Climate Change
IFRC-RCS	International Federation of Red Cross and Red Crescent Societies	IPCRI	Israel Palestine Center for Research and Information
IGAD	Intergovernmental Authority on Development	IPR	Intellectual Property Rights
IGBP	International Geosphere-Biosphere Programme	IPY	International Polar Year
IGCC	integrated gasification combined-cycle	IR	International Relations
IGO	international governmental organization	IRA	Irish Republican Army
IHDP	International Human Dimensions of Global Environmental Change Programme	IRBM	International River Basin Management
IHE	Institute for Water Education (UNESCO in Delft, The Netherlands)	IRD	integrated rural development
IHI	Index of Human Insecurity		
IHL	international humanitarian law		
IHP	International Hydrological Programme of UNESCO		
IHS	IHS-Energy (company name)		

IRD-INSERM	Université de la Méditerranée, Observatoire Régional de la Santé	LA	Latin America
ISAF	International Security Assistance Forces	LA	Los Angeles
ISARM	International Shared Aquifer Resource Management	LA21	Local Agenda 21
ISDR	International Strategy on Disaster Reduction (of UN)	LAS	League of Arab States
ISIS	Institute of Strategic and International Studies (Kuala Lumpur, Malaysia)	LBST	Ludwig-Bölkow Systemtechnik GmbH (company name)
ISO	International Organization for Standardization	LDC	least developed country
ISRIC	World Soil Information	LDCs	less developed countries
ISS	Institute of Social Studies, The Hague	LEAPs	Local Environment Agency Plans
ISS	Institute for Security Studies, Pretoria (South Africa)	LEDs	light-emitting diodes
ISSJ	International Social Science Journal (UNESCO)	LGM	Last Glacial Maximum
ITC	Indian Tobacco Company (previously Imperial Tobacco Company)	LHWP	Lesotho Highlands Water Project
ITDG	Intermediate Technology Development Group	LINV	lower irrigation investment
ITOPF	The International Tanker Owners Pollution Federation Unlimited	LIPI	Indonesian Science Institute
ITTO	International Tropical Timber Organisation	LNG	liquefied natural gas
ITU	International Telecommunications Union	LNMC	Lao National Mekong Committee
IUCN	The International Union for the Conservation of Nature (World Conservation Union)	LPG	liquefied petroleum gas
IUED	Graduate Institute of Development Studies, Geneva, Switzerland	LPI	Living Planet Index
IWBM	Integrated Water Basin Management	LSE	London School of Economics and Political Science (London, UK)
IWMI	International Water Management Institute	LTTE	Liberation Tigers of Tamil Eelam
IWMI/SIC	International Water Management Institute/Scientific Information Centre	M	million
IWRM	Integrated Water Resource Management	m ²	square meter
IYDD	International Year of Deserts and Desertification	MA	Millennium Ecosystem Assessment
JAXA	Japan Aerospace Exploration Agency	MA	Mine Action
JEEC	Joint Environmental Experts Committee	MAD	mutual assured destruction
JERS-1	JAXA satellite with L-band radar on ALOS satellite	mb	million barrels
JI	Joint Implementation	mb/d	million barrels/day
JICA	Japan International Cooperation Agency	mbd	million barrels per day
JNNURM	Jawaharlal Nehru National Urban Renewal Mission	MCCA	Mercado Común Centroamericano (Central American Common Market)
JRC/GVMU	Joint Research Centre, Global Vegetation Monitoring Unit	MCM	million cubic metres
JSSR	Justice and Security Sector Reform (UNDP)	MCM/Y	million cubic meters/year
JTC	Joint Technical Committee	MDC	more developed country
Jubilée 2000	Jubilee Debt Campaign	MDG	UN Millennium Development Goals (adopted in 2000 by the UNGA)
K&C	Kyoto & Carbon Initiative (of JAXA)	MEDA	Mediterranean Development Assistance
km ²	square kilometre	MED-CSP	Mediterranean Concentrating Solar Power
KOGAMI	Komunitas Siaga Tsunami (NGO working on Tsunami in Indonesia)	MENA	Middle East and North Africa
KP	Kyoto Protocol	MEnA	Palestinian Ministry of Environmental Affairs
KW	kilowatts: a thousand (10 ³) watts	MENR	Ministry of Energy and Natural Resources, Turkey
kWh	kilowatt hour	MERCOSUR	Mercado Común del Cono Sur (Common Market in the South of Latin America)
		MFA	Ministry of Foreign Affairs, Turkey
		MILF	Moro Islamic Liberation Front
		MMA	Ministry of the Environment, Water Resources and Legal Amazon (Brazil)
		MMBTU	Million British thermal units
		MNC	multinational corporation
		MNE	multinational enterprise
		MNEPR	Multilateral Nuclear Environmental Program in the Russian Federation
		MNLF	Moro National Liberation Force
		MoD	British Ministry of Defence
		MoFA	Ministry of Foreign Affairs (Japan)

MOFAIC	Ministry of Foreign Affairs and International Cooperation of the Republic of Mali	NEPAD	New Partnership for Africa's Development
MOLISA	Vietnamese Ministry of Labour, Invalids and Social Affairs	NEPED	Nagaland Environmental Protection and Economic Development
MOP	Meeting of the Parties (e.g. of the Kyoto Protocol of UNFCCC)	NESCO	EU Network of Energy Correspondents
MOPIC	Palestinian Ministry of Planning and International Cooperation	NESDB	National Economic and Social Development Board
MoU	Memorandum of Understanding	NGO	nongovernmental organization
MoW	(Iraqi) Ministry of Water	NHDR	National Human Development Reports
MRC	Mekong River Commission	NIB	Nordic Investment Bank
MRCs	Mekong River Commission Secretariat	NIC	National Intelligence Council
MRF	Munich Re Foundation	NIS	New Independent States
MRTPC	Monopolies and Restrictive Trade Practices Commission	NISAT	Norwegian Initiative on Small Arms Transfers
Mscf	thousand cubic feet ($\sim 27 \text{ m}^3$)	NLD	National League for Democracy
MSS	multispectral scanner	NOAA	US National Oceanic and Atmospheric Administration
MST	Movimento sem Terra [Movement of Landless Peasants in Brazil]	NOP	National Organic Program (in the USA)
mt	million tonnes	NO _x	nitrous oxides
Mtoe	million tons of oil equivalents	NPA	New People's Army
MTP	medium term plan	NPD	National Petroleum Directorate (Norway)
MunichRe	Munich Reinsurance company	NPP	net primary production
MW	megawatt	NPP	nuclear power plant
MWRI	Ministry of Water Resources and Irrigation in Egypt	NPT	Nuclear Non-Proliferation Treaty
NAC	National AIDS Committee	NRVA	National Rural Vulnerability Assessment
NACA	National AIDS Coordinating Agency	NSA	Nuclear Safety Account
NAFTA	North American Free Trade Agreement (of USA, Canada, Mexico)	NTFP	Non-Timber Forest Product
NAP	National Action Programme	NWFP	North Western Frontier Province
NAP	National Anti-AIDS Programmes	NZAID	New Zealand Aid
NAS	(US) National Academy of Science	O&M	Operation and Maintenance
NATO	North Atlantic Treaty Organization	OAPEC	Organization for Arab Petroleum Exporting Countries
NATO-CCMS	former NATO Committee on the Challenges of Modern Society	OAS	Organization of American States
NBD	Nile Basin Discourse	OCAS	Organization of Central American States
NBI	Nile Basin Initiative	OCHA	Office for the Coordination of Humanitarian Affairs
NC	Nordic Council	ODA	Overseas development assistance
NCCR	National Centre for Competence in Research (in Switzerland)	ODI	Overseas Development Institute
NCCR/NS	National Centre for Competence in Research, North-South (in Switzerland)	OECD	Organization for Economic Co-operation and Development
NCM	Nordic Council of Ministers	OECD/DAC	Development Assistance Committee (of OECD)
NCP	National Contingency Plan	OEF	Operation Enduring Freedom (in Afghanistan)
NCRFW	National Commission on the Role of Filipino Women	OERS	Organisation des Etats Riverains du Fleuve Sénégal (Organization of the Riparian States of the Senegal River)
Nd	no data	OFDA	Office of U.S. Foreign Disaster Assistance
NDEP	Northern Dimension Environmental Partnership	OFDA/CRED	Office of Foreign Disaster Assistance (USAID), Centre for Research on the Epidemiology of Disasters
NDI	Northern Dimension Initiative	OKACOM	Permanent Water Commission on the Okavango River Basin
NEB	National Energy Board (Canada)	OMVS	Organisation pour la Mise en Valeur du Fleuve Sénégal (Organization for the Development of the Senegal River)
NEF/IIED	New Economics Foundation/International Institute for Environment and Development	OPEC	Organization of Petroleum Exporting Countries (Algeria, Indonesia, Iran, Iraq,
NEFCO	Nordic Environmental Finance Corporation		
NEMA	National Environment Management Authority (Uganda)		

	Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, Venezuela)	PMACI	Project for the Protection of the Environment and the Indigenous Communities
OPT	Occupied Palestinian Territories	PMC	private military corporations
OSAA	UN Office of the Special Adviser on Africa	PMC	Post-Ministerial Conference
OSCE	Organization for Security and Co-operation in Europe	PNA	Palestine National Authority
OSU	Oregon State University	PNIC	Palestine National Information Center
PA	Palestinian Authority	PNUE-PAM	Programme des Nations Unies pour l'Environnement - Programme Alimentaire Mondial [United Nations Environment Programme - World Food Programme]
PACD	Plan of Action to Combat Desertification		
PACRIM 2	Pacific Rim 2 campaign and (of NASA)	PNVEP	Programme National de Valorisation Energétique de la Plante Pourghère [A National Programme for the Valorization of Pourghère]
PAES	Partnership for African Environmental Sustainability	POPs	Persistent Organic Pollutants
Pagasa	Philippines Atmospheric, Geophysical, and Astronomical Services Administration	POS	Plan d'Occupation des Sols [Soil Occupancy Plan]
PALSAR	L-band radar on ALOS satellite	ppd	person per day
PAS	Partido Alternativa Socialdemócrata (Alternative Socialdemocratic Party)	ppmv	parts per million by volume
PASSIA	Palestinian Academic Society for the Study of International Affairs	PPP	purchasing power parity
PBC	Peacebuilding Commission	PRB	Population Reference Bureau (Washington, D.C., USA)
PCBS	Palestinian Central Bureau of Statistics	PRIO	International Peace Research Institute (in Oslo, Norway)
PCCP	Potential Conflict to Cooperation Potential (UNESCO)	PRSP	Poverty Reduction Strategy Paper
PCDMB	UNEP's Post Conflict and Disaster Management Branch	PRTC	Partido Revolucionario de los Trabajadores Centroamericanos (Revolutionary Worker's Party of El Salvador)
PCIJ	Permanent International Court of Justice		
PCR	Polymerase Chain Reaction (laboratory diagnostic test)	PRTs	Provincial Reconstruction Teams
PDAU	Plan d'Aménagement Urbain [Urban Management Plan]	PSA	Ejército Popular Sandinista (Popular Sandinist Army)
PDD	NATO's Public Diplomacy Division	PSFs	private security forces
PDR	People's Democratic Republic (of Laos)	PSI	Population Services International
PDVSA	Petróleos de Venezuela SA (oil company in Venezuela)	PSR	pressure-state-response (model of OECD)
PEAC	Pool d'Electricité de l'Afrique Centrale [Central African Power Pool]	PTA	Phuket Tourist Association
PECDAR	Palestinian Economic Council for Development & Reconstruction	PTSD	post traumatic stress disorder
PEISOR	pressure - effects - impacts - societal outcomes - response (model)	PV	photovoltaic
PENA	Palestinian Environmental National Authority	PWA	Palestinian Water Authority
PENGON	Palestinian Environmental NGOs Network	QR	quantitative restrictions on imports
PEPS	Petroleum exploration and production statistics	R&D	Research and development
PES	Palestinian Environmental Strategy	R/P	reserve to production ratio
PGC	Great Carajás Programme	R ²	statistical measure (or a scale 0-1) of goodness of fitting data
PHG	Palestinian Hydrology Group	RADA	Reconstruction and Development Agency
PISPAL	Programa de Investigaciones Sociales sobre Población en América Latina [Programme for Social Research on the People in Latin America]	RAED	Arab Network of Environment and Development
PITF	Political Instability Task Force	RAI	Rural Advancement International
PKK	Partiya Karkaren Kurdistan [Kurdistan Workers' Party]	RAMILCOR	Regional Alliance Against Mining and Large-Scale Commercial Logging
PKO	Peace-Keeping Operations	RAP	Action Programmes at the regional level [of UNCCD]
PLO	Palestine Liberation Organization	RDPI	Rural Development Policy Institute
		REC	Regional Environment Center for Central and Eastern Europe
		RFE	Radio Free Europe

RFSTE	Research Foundation for Science, Technology and Ecology (New Delhi, India)	SHI	State Hydrological Institute in Russia
RIL	Reliance Industry Limited	Sib-TREES	Siberian Taiga Resources and Environmental Monitoring by Satellites
RME	rapeseedmethylester (Biodiesel from rape seed)	SICA	Sistema de Integración Centroamericana [Central American Integration System]
RPTES	Regional Programme for the Traditional Energy Sector	SIDA	Swedish International Development Agency
RSA	Republic of South Africa	SIDS	Small Island Developing States
RTP	Responsibility to Protect	SIE	Systèmes d'Informations Énergétiques du Sénégal
RUSI	Royal United Services Institute (London, UK)	SIPAM	Protection System for Amazonia (Brazil)
RWGHR	Regional Working Group on Human Rights	SIPRI	Stockholm International Peace Research Institute
S & T	Science and Technology	SITCEN	EU Joint Situation Centre
SADC	Southern African Development Community	SIVAM	Sistema de Vigilância da Amazonia [Surveillance System for the Amazon] (Brazil)
SADEM	Secretariat for National Defence (Brazil)	SIWI	Stockholm International Water Institute
SADR	Sahrawi Arab Democratic Republic	SL	sustainable livelihood
SAE	Secretaria de Assuntos Estratégicos - Secretariat for Strategic Affairs (Brazil)	SLF	Sustainable Livelihoods Framework
SAED	Société nationale d'Aménagement et d'Exploitation des terres du Delta du fleuve Sénégal et des vallées du fleuve Sénégal et de la Falémé (National Agency for the Agricultural Development of the Senegal River Delta and of the Senegal and Falémé River Valleys, Senegal)	SLM	sustainable land management
SALW	small arms and light weapons	SLWM	sustainable land and water management
SAN	Save Andaman Network	SNSF	Swiss National Science Foundation
SAP	Salmon Action Plan	SNV	Netherlands Development Organization
SAP	Structural Adjustment Programme (of IMF)	SO ₂	sulphur dioxide
SAPP	South African Power Pool	SOC	soil organic carbon
SAR	Search and Rescue	SONADER	Société nationale pour le développement rural (National Agency for Rural Development, Mauritania)
SAR	Synthetic aperture radar	SOT	solar thermal power plants
SARDC	Southern African Research and Documentation Centre	SPDC	State Peace and Development Council
SARS	Severe Acute Respiratory Syndrome	SPR	Strategic Petroleum Reserve
SAT	Science and technology	SPREP	South Pacific Regional Environment Programme
SAU	Surface Agricole Utile [Usable Agricultural Surface]	SPVEA	Superintendence for the Economic Valorisation of the Amazon (Brazil)
SCAR	Scientific Committee on Antarctic Research	SRAP	Sub-Regional Action Programme
SDC	Swiss Agency for Development and Cooperation	SREP	South Pacific Regional Environmental Programme
SDF	Self Defence Forces (Japan)	SRES	Special Report on Emission Scenarios
SDNP	Sustainable Development Networking Programme	SSA	Sub-Saharan Africa
SDWW	Women in Development Service, FAO Women and Population Division	SSARR	Streamflow Synthesis and Reservoir Regulation
SE Asia	Southeast Asia	SSF	NATO's Science Security Forum
SEACSN	Southeast Asian Conflict Studies Network	STD	sexually transmitted disease
SecF	SecurityFirst (scenario of GEO-4 by UNEP, 2007)	STI	sexually transmitted infection
SEI	Stockholm Environment Institute	SUDAM	Superintendência de Desenvolvimento da Amazônia [Superintendent of Development of the Amazon] (Brazil)
SEMA	Environment Secretariat (Brazil)	SUHAKAM	Malaysia Human Rights Commission
SEMS	Standard Emergency Management System	SUKALA	Complexe Sucrier du Kala Supérieur
SENELEC	Société Sénégalaise d'Électricité [Senegal Electricity Company]	SustF	SustainabilityFirst (scenario of GEO-4 by UNEP, 2007)
SEPA	State Environmental Protection Administration	t	ton
SEQ	Standing Group on Emergency Questions	TA	technology assessment
		TACIS	Technical Assistance for the Commonwealth of Independent States
		TAMA	There are many alternatives
		TanDEM-X	German satellite mission with X-band radar

TB	tuberculosis	UNAM	National University of Mexico (Mexico)
Tcf	tera cubic feet (= 10 ¹² cubic feet)	UNCCD	United Nations Convention to Combat Desertification
TEEN	Tripartite Environmental Education Network	UNCED	United Nations Conference on Environment and Development
TEA	Türkiye Elektrik İletim Anonim İrketi (Electricity Transmission Company of Turkey)	UNCHS	United Nations Commission on Human Security
TEK	traditional ecological knowledge	UNCOD	United Nations Conference on Desertification
TEMM	Tripartite Environmental Ministers Meeting	UNCRD	United Nations Centre for Regional Development
TENs	Trans European Networks	UNCSD	United Nations Commission on Sustainable Development
TERI	The Energy and Resources Institute (New Delhi, India)	UNCT	United Nations Country Team
TerraSAR-X	German satellite mission with X-band radar	UNCTAD	United Nations Conference on Trade and Development
TFDD	Transboundary Freshwater Dispute Database	UNDAF	United Nations Development Assistance Framework
TINA	Margaret Thatcher: there is no alternative	UNDDA	United Nations Department on Disarmament Affairs
TNE	Transnational enterprise	UNDP	United Nations Development Programme
TNK	Tyumen Oil Company	UNECA	United Nations Economic Commission for Africa
TNOCs	transnational oil corporations	UNECE	United Nations Economic Commission for Europe
toe	ton oil equivalent (1 toe = 7.1 boe)	UNECOSOC	United Nations Economic and Social Council
TPAO	Türkiye Petrolleri Anonim Ortaklı (Turkish Petroleum Corporation)	UNEMG	United Nations Environmental Management Group
TREC	Trans-Mediterranean Renewable Energy Cooperation	UNEP	United Nations Environment Programme
TRIPs	Trade-Related Aspects of Intellectual Property Rights (WTO)	UNEP FI	United Nations Environment Programme Finance Initiative
TÜPRA	Türkiye Petrol Rafinerileri Anonim İrketi [Turkish Petroleum Refineries Corporation]	UNEP/GRID	GRID Arendal collaborative centre, United Nations Environment Programme (in Arendal, Norway)
TW	terawatt or: a million million (10 ¹²) watts	UNESCO	United Nations Educational, Scientific and Cultural Organization
TWh	terrawatt hour (10 ⁹ of kilowatt hour)	UNESCO-IHE	Institute for Water Education of UNESCO (in Delft, The Netherlands)
TW:MAE-W	Third World Movement Against the Exploitation of Women	UNESCO-WWAP	United Nations Educational Scientific and Cultural Organization – World Water Assessment Programme
UAVs	unmanned aerial vehicles	UN-FAO	United Nations Food and Agricultural Organization
UBC	University of British Columbia	UNFCCC	United Nations Framework Convention on Climate Change
UCC	Union Carbide Corporation	UNFPA	United Nations Population Fund
UCDP	Uppsala Conflict Data Program	UNGA	United Nations General Assembly
UCI	University of California at Irvine	UN-Habitat	United Nations Human Settlements Programme
UCIL	Union Carbide India Limited	UNHCR	United Nations High Commissioner for Refugees
UDSSR	Union of Socialist Soviet Republics	UNICEF	United Nations International Children's Emergency Fund
UEMOA	Union Economique et Monétaire Ouest Africaine [West African Economic and Monetary Union: WAEMU]	UNIDIR	United Nations Institute for Disarmament Research
UIS	Irrigation Sub-System Management Authority (in Uzbekistan)	UNIDO	United Nations Industrial Development Organization
UK	United Kingdom	UNIFEM	United Nations Fund for Women
UKM	Universiti Kebangsaan Malaysia [National University of Malaysia]		
UMA	Union du Maghreb Arabe [Union of the Arab Maghreb]		
UN	United Nations		
UN DESA	United Nations Department of Economic and Social Affairs		
UN/ISDR	United Nations International Strategy for Disaster Reduction		
UN/OCHA	United Nations Office for the Coordination of Humanitarian Affairs		
UNAIDS	United Nations Joint Programme on HIV/AIDS		

UNISDR	United Nations International Strategy for Disaster Reduction	W	watts
UNMAS	United Nations Mine Action Service	WAEMU	West African Economic and Monetary Union
UNMIK	United Nations Mission in Kosovo	WAGP	West African Gas Pipeline
UNO	United Nations Organisation	WAPCo	West Africa Gas Pipeline Company
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs	WAPP	West Africa Power Pool
UNODC	UN Office on Drugs and Crime	WB	World Bank
UNOWA	United Nations Office for West Africa	WBCSD	World Business Council for Sustainable Development
UNPD	United Nations Population Division	WBGU	Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen [German Advisory Council on Global Change]
UNRG	Unidad Revolucionaria Nacional Guatemalteca (Guatemalan National Revolutionary Unity)		
UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East	WCD	World Commission on Dams
UNSC	United Nations Security Council	WCDR	World Conference on Disaster Reduction
UNSCR	UN Security Council Resolution	WCED	World Commission on Environment and Development (Brundtland Commission)
UNSG	UN Secretary-General	WCRP	World Climate Research Programme
UNSSD	UN Summit on Sustainable Development (in Johannesburg, South Africa, 2002)	WCS	The World Conservation Strategy
UNSTAT	UN Statistics Division	WDI	World Development Indicators
UNTFHS	United Nations Trust Fund for Human Security	WDM	weapons of mass destruction
UNU	United Nations University	WEO	World Energy Outlook
UNU-CRIS	United Nations University - Comparative Regional Integration Studies (in Bruges, Belgium)	WFP	World Food Programme
UNU-EHS	United Nations University - Environment and Human Security Institute (Bonn, Germany)	WG I	Working Group I of IPCC on the Physical Science Basis
UNWFP	United Nations World Food Programme	WG II	Working Group II of IPCC on the Impacts, Adaptation and Vulnerability
UNWTO	United Nations World Tourism Organization	WG III	Working Group III of IPCC on Mitigation of Climate Change
UPE	universal primary education	WHO	World Health Organisation
US	United States	WID	Women in Development
US HW	US hard wheat	WIID	World Income Inequality Database
US RSW	US red soft wheat	WMO	World Meteorological Organization
US	United States (of America)	WP/ENV	DAC Working Party on Development Cooperation and Environment
US\$	United States dollars	WPGSP	Working Party on Global and Structural Policies
USA	United States of America	WRI	World Resources Institute (Washington, DC)
USAID	United States Agency for International Development	WSF	World Social Forum
USCR	United States Committee for Refugees and Immigrants	WSSD	World Summit on Sustainable Development (in Johannesburg, South Africa, 2002)
USD	United States Dollar	WTO	World Trade Organization
USDA	United States Department of Agriculture	WUAs	Water User Associations
US-DoD	United States Department of Defense	WW I	First World War (1914-1918)
USIP	United States Institute for Peace	WW II	Second World War (1939-1945)
USSR	Union of Socialist Soviet Republics (until 1991)	WWAP	World Water Assessment Programme
		WWC	World Water Council
		WWF	World Water Forum
		WWF	World Wildlife Fund (in the US only)
		WWF	World Wide Fund for Nature
		WWV	World Water Vision
VCJD	Variant Creutzfeldt-Jakob Disease	X	solar magnification factor
VDBs	Village Development Boards		
VDI/VDE-IT	VDI/VDE Innovation + Technik GmbH (German technology company)	y	year
VFA	Visiting Forces Agreement	Y2K	year 2000
VID	Vienna Institute of Demography	YOHO	Youth Health Organization
VLS-PV	very large scale photovoltaic	Yr	year
VMS	vessel monitoring systems		

ZACPLAN	Action Plan for the Environmentally Sound Management of the Common Zambezi River System	ZEF	Center for Development Research (Bonn, Germany)
ZEE	Macro-Zoneamento Ecológico-Económico da Amazonia [Ecological - Economic Zoning in Amazonia]	ZOPFAN	Zone of Peace, Freedom and Neutrality (ASEAN concept)
		ZRA	Zambezi River Authority

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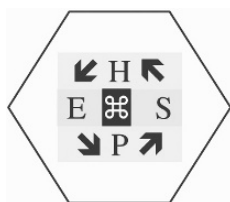
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