Huong Ha · R. Lalitha S. Fernando
Amir Mahmood *Editors*

Strategic Disaster Risk Management in Asia

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Editors
Huong Ha
UON Singapore, Singapore

University of Newcastle, Australia

Amir Mahmood
UON Singapore, Singapore

University of Newcastle, Australia

R. Lalitha S. Fernando
Department of Public Administration
Faculty of Management
Studies and Commerce
University of Sri Jayewardenepura
Nugegoda, Sri Lanka

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Foreword

Governments and their bureaucracies are notoriously slow, methodical and lumbering. Natural and human-induced disasters often occur suddenly and unpredictably, with rapid devastation. Hence, there is a serious mismatch between governments' abilities and their responsibilities to prevent and mitigate disasters. Moreover, this gap between ability and responsibility will continue to grow unless governments greatly improve disaster management. This is because the number of disasters is growing, partly to patterns of contemporary human civilisation, and the probability of their occurrence and reoccurrence is increasing. By one calculation as chapter 9 notes, some 3,870 disasters took place worldwide from 2000 to 2009 – more than one per day on average. Ironically, although we have better technology, such as remote sensing, satellites, equipment, transportation and emergency medical care to deal with disasters, technology itself is a contributor to weather-related devastation, the human and environmental tolls of violent conflicts, the spread of epidemics and even earthquakes as in the case of hydraulic fracturing ('fracking') used in the extraction of natural gas and oil. To many observers, long-term strategies to reduce disasters appear utopian, involving changes in our human nature and economic and social organisation and preventing further climate change and perhaps almost total global reorganisation. In the shorter term, as *Strategic Disaster Management in Asia* demonstrates with great clarity, acumen and common sense, much more can be done through improved planning and implementation of disaster prevention and relief efforts.

As the title indicates, strategic planning for disaster management is essential to any effort to reduce the gap between governmental ability and responsibility to deal efficiently and effectively with the challenges posed by the wide variety of potential disasters. Amongst the possibilities are multiyear disaster management plans; assessing the potential for shortages of energy and other necessities of contemporary life; taking into account the differential impact of disasters on population groups, including men, women, children, the elderly and disabled persons; developing collaborative relationships with nongovernmental organisations; arranging for international cooperation; delineating the role, if any, of the armed forces; improving public awareness, education and training with respect to risk reduction, safety and

recovery; as well as establishing relief centres in disaster-prone areas. Sadly, Chap. 13 (Disaster Management and Corruption) points to the necessity of making certain that infrastructure projects emphasise safety and avoid creating environmental and other hazards and those relief efforts fully reach victims and reconstruction projects. Finally, *Strategic Disaster Management in Asia* reminds us that natural disasters, and I would add human-spawned disasters as well, are an inescapable part of the human life cycle. They will occur, but with wise strategic thinking and management, we can reduce their devastating tolls and the human suffering they cause. This book is an excellent contributor to national and international efforts to make the world a safer, more habitable and hospitable place for humanity.

American University
Washington, DC, USA

Prof. David H. Rosenbloom

Prologue

Development is a matter of trade-off between the economy and environment. Many of the natural disasters take place when this trade-off becomes disbalanced. The world population now stands at about seven billion and is expected to reach nine billion by the year 2030. With the expanding population, there is obviously a need for space and resources. The choice then is between mere economic development and sustainable development. Education forms the basic pillar for transition in any society. Environmental education is not just about planting trees or being kind or tolerant towards other living beings; it also implies the need to understand the importance of protecting our rivers and water bodies, recycling of garbage and solid waste, understanding biodiversity and allowing it to flourish and ensuring food security without causing damages.

Disasters do not respect borders and education for sustainable development should include:

(a) Education for all;
(b) Vocational skilling as part of High School education; and
(c) Address issues from a holistic perspective.

It is only when education covers the above three factors that it brings along with it a sense of responsibility towards protecting the environment, strong civic sense and commitment towards a safer world.

The effect of deteriorating environment is more acute on the poorer societies as poverty is one of the biggest polluters. Hence, to ensure that awareness on disasters, prevention and reduction is adequately placed, a two-pronged approach is unavoidable. It is with this in mind that the need to skill and train students at the same time has been mooted. It is necessary for each one to abandon apathy and be moved into action.

A disaster does not respect boundaries. Nor does it show any consideration towards the haves. The best way is to be well prepared and adopt practices that make us more resilient towards disasters.

Addl. Chief Secretary
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Government of Kerala
India

Dr. Nivedita P. Haran, IAS

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Dr. Stanley Bruce Thomson (MacEwan University and University of Alberta in Edmonton, Alberta, Canada)

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Contributors

Dr. **Nasim Banu** is a professor of public administration in the Department of Politics and Public Administration at Islamic University, Kushtia, Bangladesh. She has earlier held the position of chairperson of the department. She received B.S.S. honours and master's in public administration from the University of Dhaka and additional master's in urban and regional planning from the Bangladesh University of Engineering and Technology (BUET). She earned her Ph.D. in monitoring and evaluation of the public sector development project. She has over 24 years' experience in teaching. Her teaching responsibilities are comparative public administration, development studies, development administration and project management. She has served as a member of Journal Committee, member of Development Studies Programme and founder administrator of Female Hall of Islamic University. Presently she is an academic council and faculty member of Islamic University. Her research interest includes monitoring and evaluation of public sector development project, public policy, labour management and disaster management. She has published over 25 articles in the reputed journals of home and abroad and participated in several international seminars as paper presenter. She is an active member of Bangladesh Institute of Planners, Bangladesh Political Science Association, Bangladesh Public Administration Association and Dhaka University Alumni Association. Currently she is designing a research framework on disaster financing issues in Bangladesh for climate change adaptation.

Dr. **Sanjeev Kumar Mahajan**, Ph.D., is professor and chairman, Department of Public Administration, Himachal Pradesh University, Shimla (Himachal Pradesh), India, and has had a brilliant academic career. He was awarded the University Medal for standing first in master's of arts by Punjab University, Chandigarh (India). He also visited Hungary under Indo-Hungary Exchange Programme in 2010. His areas of specialisation include public enterprises, road transport management and disaster-related issues. He has contributed articles in national and international journals.

The contributors' names are arranged according to the order of the chapters.

He has authored and coedited books on public undertakings, *Public Administration in New Millennium: Challenges and Prospects* (2003, Anamika Publishers, New Delhi), *Challenges in Good Governance* and *Financial Administration in India* (2014, PHI Learning, New Delhi).

Dr. **Anupama Puri Mahajan**, Ph.D. is a researcher and a freelance writer who served as a postdoctoral research fellow in the Department of Public Administration, Himachal Pradesh University, Shimla (Himachal Pradesh), India. She regularly contributes articles to reputed journals of public administration, newspapers and books. She has authored books on women empowerment and financial administration in India.

Dr. **Vanmala Hiranandani**, Ph.D., is Assistant Professor at Global Nutrition and Health Program, Metropolitan University College, Denmark, and has been involved in community-based research, policy advocacy and teaching in master's and bachelor's degree programs in Canada, India and USA. Her interests include disability and development, humanitarian emergencies, health equity, food security, and poverty in the context of neoliberalism.

Mr. **Ramanand N. Garge** is a research scholar in the field of security studies comprising of policies on terrorism worldwide, nuclear energy studies [power generation], European Union and SAARC, maritime security and other related subjects in international studies. He has proficiently studied the maritime security, energy security and antiterrorism policies, focusing the antiterrorism financing policies in India as well as in international domain. He is an alumnus of University of Pune, Department of Defence and Strategic Studies. He is also pursuing his doctoral research in the field of security studies. He has presented papers at national and international levels during various seminars and conferences and also has published research papers in the field of security studies encompassing a wide spectrum of issues such as energy security, maritime security, the effect of climate change, etc. He has served as a faculty of International Relations at Kingston University, London, and had an opportunity to research in the institutions affiliated to London School of Economics. He has shared his expertise as faculty-in-charge for subjects such as international relations, policy and economics, at MIT School of Government, Pune, India, and UNESCO chair for peace and human rights. He is the president of a think tank named RISE – Research in Integrated Security and Environment – in India.

Dr. **Susie Khoo** has spent more than two decades in the education industry, both public and private education, and holds a broad view of education, which comes not only from teaching at the undergraduate and graduate levels but also from a background in managing several private higher education institutions as the chief academic and operating leader. Dr. Khoo is currently the dean and chief executive officer of Ngee Ann Adelaide Education Centre (NAA) with responsibility for developing and expanding the institution's interest academically and financially, as well as building the University of Adelaide's contribution to Singapore and in the Asian education market.

She holds a degree of doctor of business administration from the University of Newcastle, a master's degree of social sciences (applied economics) and a bachelor's of arts (economics and English language) from the National University of Singapore and a master's degree of business administration from the University of Western Sydney. She gained her Graduate Diploma in Education from the National Institute of Education, Singapore.

Ms. **Mahesha Abeykoon** served as a lecturer in the Department of Public Administration at the University of Sri Jayewardenepura from March 2012 to June 2014. She currently serves as an assistant director of education in the Sri Lanka Education Administrative Service. Ms. Abeykoon obtained a B.Sc. public management (special) degree from the Faculty of Management Studies and Commerce at University of Sri Jayewardenepura, Sri Lanka, and was awarded a gold medal for the subject public finance at the Annual General Convocation of the University of Sri Jayewardenepura, Sri Lanka, in 2012.

Ms. **K.M. Prematilaka** has been serving as a lecturer for 2.5 years in the Department of Public Administration at the Faculty of Management Studies and Commerce in the University of Sri Jayewardenepura in Sri Lanka. Presently, she serves as a staff officer at the National Savings Bank, Head Office, attached to the Risk Management Division in Sri Lanka. She has worked as an accounts trainee at KPMG Sri Lanka for 1.5 year. She has completed B.Sc. public management degree with a second class upper division in the same university. She is a professionally qualified member of certified business accountant (CBA), Faculty of the Institute of Charted Accountants of Sri Lanka. Her research interests are in the field of development administration, entrepreneurship, disaster management and e-governance.

Ms. **Aruna Muthulingam** presently serves as a lecturer in the Department of Public Administration of University of Sri Jayewardenepura and conducts lectures on public administration, political science, managing rural development and managing local government. Previously she worked as assistant director of administration and human resources in the Land Use Policy Planning Department of the Ministry of Land and Land Development. Ms. Aruna obtained a bachelor of science in public management (special) degree in 2010 offered by University of Sri Jayewardenepura in Sri Lanka. Further, she obtained two gold medals for obtaining the highest marks for the degree with a first class. She possesses Higher Diploma in International Relations. Her research interests are public sector organisational studies, public service delivery systems, disaster management and ethics in management.

Prof. Dr. **Vinay Sharma** has around 20 years of experience in the areas of marketing, rural marketing, international marketing, business opportunity development, market development, brand development, IT-enabled services and spiritual orientation for market prosperity development. He has been teaching these subjects for the past 12 years and is currently working as an associate professor with the Department of Management Studies at Indian Institute of Technology, Roorkee. Vinay Sharma teaches marketing and the allied subjects at various institutions

including Indian Institute of Management Lucknow. His association with several international bodies gives him a regular exposure to the international business scenario and emergence of the world as an integrated market. His areas of interests also include poverty alleviation and rural market development through business development, market development and technology wherein he has designed and proposed a specialised model recognised by the name *Affordability for the Poor and Profitability for the Provider* which has been acknowledged at various platforms and published as a book by VDM Publishing House, Germany. Further, he has contributed an appendix on rural marketing in the 13th edition of *Philip Kotler's Principles of Marketing*. He is an associate and a member of the founding group of the Network of Asia Pacific Schools and Institutes of Public Administration and Governance constituted by Asian Development Bank in December 2004 and a member of the Editorial Board of the Journal of NAPSIPAG called Journal of Administration and Governance. He has been a founding HOD of the Department of Management Studies of an Institution at Lucknow and also has been the associate dean of College of Management and Economic Studies of the University of Petroleum and Energy Studies at Dehradun where he was also a member of the prestigious Academic Council of the University. He has worked with the Institute of Management Technology Ghaziabad as associate professor and as dean academics with IILM, Lucknow. He has published and presented around 110 papers and chaired sessions at national and international platforms especially in his areas of interest, which includes a paper presentation at a conference organised by United Nations University-WIDER, Helsinki, Finland. He has developed and published 16 case studies based on primary research and has conducted more than 100 workshops, seminars, FDPs and MDPs. He has edited an internationally circulated journal and is a member of the Editorial Board of Gurukul Business Review and Chinese Public Administration Review and is also a member of academic and advisory councils and Board of Governors of prestigious institutions. Presently, his engagements include his contribution as executive committee member of the Intellectual Property Rights Chair at IIT Roorkee and working group member of the Ganga River Basin Management Plan, a pan IIT project.

Kapil Kumar Joshi is a postgraduate in mechanical engineering from IIT Roorkee, India. After serving few years in engineering organisations of India, he got selected as an Indian Forest Service officer in the year 1992. Since 1992 till 2013, he has worked in various capacities as divisional forest officer, deputy conservator of forest (World Bank Forestry Projects), regional manager (Forest Corporation), deputy director/director of Corbett Tiger Reserve and conservator of forests in the state of Uttarakhand, India.

During the last 20 years, he has been actively associated with management of forest and wildlife in the state of Uttarakhand, India. During this period he himself implemented various participatory programmes like Joint Forest Management, Eco Development and Forest Development Agency activities in the various divisions of Uttarakhand Forest Department. In the year 2003–2004, 2004–2005 and 2005–2006, he was awarded with various state level forestry awards for his outstanding

services in the state. He has been actively involved in water conservation, pine needle briquetting, social entrepreneurship and leadership aspects in conservation of natural resources during the course of his service in the Forest Department.

In 2002, he was been awarded with diploma in 'Training of Trainer' course from the Institute of Management and Development, University of Manchester, UK. He has visited various countries like China, Finland, UK, USSR and Thailand in order to get a deep insight of various commercial and conservation aspects of forestry.

Since January 2013, he is pursuing research work in climate change financing and forest bio residue resource utilisation from the Department of Management Studies, Indian Institute of Technology, Roorkee, India. During the course of his research work, he has actively participated in four international conferences and so far his six works have been published in various journals and international documents like SAARC Forestry journal, Indian Forester, EM International, IMA and IJRSMS. He is also involved in innovation strategies for young engineers and management students. One of his resent designs of a multi-option biomass briquetting machine has been cleared by the institute's board for development and testing.

Dr. **Rajat Agrawal** did his graduation in mechanical engineering from Dayalbagh Educational Institute, Agra, in 1995 and master's in business management in 1999 and doctorate in 2002.

Dr. Agrawal is working as assistant professor in the Department of Management Studies, IIT Roorkee, since 2008. His involvement in area of innovation and business incubation is an important reason for handling duties of CEO at the newly started TIEDA (Technology Incubation and Entrepreneurship Development Activity) Centre at IIT Roorkee. He is a member of a working committee of Intellectual Property Rights Cell of IIT Roorkee. He is also a member of the Board of Studies of IIT Roorkee. He has teaching experience of UG and PG of more than 13 years, besides 2 years of industry experience. He has participated in various national and international conferences and published papers in journals. He has published more than 28 papers in different proceedings and journals. His current area of research and writing is social entrepreneurship, sustainable supply chain management, green marketing and case studies on MSME sector. He has contributed chapters in three different books published by IGNOU, Delhi (*Technology and Change Management*), and NIOS, Delhi (*Science in Ancient India*). He has given more than 15 talks on various subjects of rural development and technical management education from All India Radio. He has presented papers and chaired technical sessions in more than 50 national/international conferences. He was an active member in a large project (Rs 49.5 million) on knowledge economy sponsored by the Govt. of India at IIT Roorkee particularly related to skill development for better employability. He is also handling a project on cycle rickshaw to develop it as a tool for social entrepreneurship. He is also a part of project to develop Ganga River Basin Environmental Management Plan. The Govt. of India has awarded this project to consortium of seven IITs. He is looking after the sociocultural aspects in the river basin. He is also involved in some of the international programmes such as ACARA challenge. He is in advisory boards of

various management institutes. He was on the panel of experts at APES 2009 and 2010, Sydney, Australia. He travelled to Germany, Switzerland, France, Pakistan and Turkey to participate in various academic programmes. He is a reviewer of various national/international journals. He is a member of the Academy of Management, USA, All India Management Association, New Delhi, and Integrating Spirituality and Organisational Leadership (ISOL), New Delhi.

Dr. **Rabindranath Bhattacharyya** is currently a professor of political science, University of Burdwan, West Bengal, India. He obtained M.A. [Calcutta University, 1983] and M. Phil. [Calcutta University, 1986] degrees in political science and completed Ph.D. [Calcutta University, 2001] on *Nation Building in India – Gandhi and Nehru: A Comparative Study*. Currently his area of research focuses on democratic governance across countries with special focus on poverty alleviation programmes and the role of government as well as different groups in that regard. He has been appointed as Australia Awards Ambassador by the Australian High Commissioner to India on 28 March 2014. He has been awarded Australian Government Endeavour Post-Doctoral Research Award, 2009, and AIC Australian Studies (Senior) Visiting Fellowship 2007–2008 in Australia. He has co-edited two books: *Governance and Poverty Reduction – Beyond the Cage of Best Practices*, 2009 [Singh, Amita, Kapoor, Kapil and Bhattacharyya, Rabindranath (eds.), New Delhi, Prentice Hall India. ISBN 978-81-203-3698-8] and *Essays on International Terrorism*, 2006 [Bhattacharya, Mohit, Ghosh, Sekhar and Bhattacharyya, Rabindranath (eds.), Kolkata, Levant Books, 2006. ISBN 81-87169-71-0]. He has a number of papers and book chapters published in both national and international journals and books. He has presented papers and chaired sessions in various national and international conferences/seminars spreading over seven countries other than India. He has successfully supervised four Ph.D. theses (two were under joint supervision) and has been currently supervising five Ph.D. scholars. He is a life member of various professional bodies in various capacities such as NAPSIPAG (member, Asia Pacific Research Committee), WBPSA (member, Executive Committee) and IIPA (member, Executive Committee, Burdwan Local Branch).

Dr. **Neena Joseph** is a professor at the Institute of Management in Government, Regional Centre, Kochi, Kerala, India, with masters in management and doctorate in economics. Her academic interests are in the areas of management, governance and gender. She is the author of a book ***Gender Related Problems of Women***, ***Women and Empowerment, Panchayati Raj*** (Himalaya Publishing House, 2001). She has presented papers at international seminars and has written articles on governance, gender and management. Currently she is on the research team of Human Rights Law Network, Kochi, to research on the issues and problems of children rehabilitated in care homes . She is in the Govt. of India project of Customer Satisfaction Survey of Social Justice Department of Kerala. She had drafted NGO government partnership policy with special reference to institutions of the Social Justice Department. She is also a member of the state level working group for the preparation of Gender Planning, Gender Budgeting and Gender Auditing Manual

for Govt. of Kerala. She is a member of the State Resource Group of Panchayat Raj Institutions- Community-based organisations convergence project.

She has conceptualised and directed many training programmes in the areas of her interest and engaged classes on creativity, time management, gender, women and violence, domestic violence, etc.

She is the facilitator of State Training Policy Programmes of Social Justice Department and Collegiate Education Department, Govt. of Kerala. She is the core committee convener of the Welfare Departments at the Institute. She is in the National level Executive Body of Women Power Connect, Delhi. She is the trustee of Sakhi, Women Resource Centre, Trivandrum and a member of Governing Body of Cultural Academy for Peace. She is also a member of the Governing Body of Federal Institute of Science and Technology.

Dr. **Charlita Andales-Escano** is a doctor of philosophy in development administration from the University of Southeastern Philippines. Following her baccalaureate degree in civil engineering, she completed her master's in business administration and academic units in public administration from Cor Jesu College in Digos City, Philippines. She has also undertaken short courses on infrastructure finance, environmental management, project management, knowledge management, human resource management, policy analysis and advocacy from international universities and local service providers commissioned by international donor agencies. She gained experiences from her early employment as a civil engineer at the Department of Public Works and Highways and Department of Science and Technology in early 1990s. She later joined the academe as a part-time professor. Currently, she holds the position of Director III in Mindanao Development Authority (formerly Mindanao Economic Development Council), a primary subnational agency in the Philippines mandated to promote peace and accelerate development in Mindanao, where she has served for 19 years now. As a peace and development advocate, she has been involved in planning, investment programming, resource mobilisation and implementing various programmes and projects including policy advocacy with funding from international donor agencies.

She has conducted various researches and studies in infrastructure, transportation, budget and social sciences subject matters. She also taught subjects in engineering, mathematics, geology and sewerage, amongst others, as a civil engineer. She provides advisory and consultancy services to key decision-makers and policymakers in Mindanao. Her expertise includes infrastructure, development planning, project/programme implementation, monitoring and evaluation, policy advocacy and networking, human resource management and development, financial management and statistical analysis.

Prof. **Janki Andharia** teaches at the Tata Institute of Social Sciences (TISS), Mumbai, India. She obtained her Ph.D. from School of Environment Sciences, University of East Anglia, UK, in the area of gender, development and environment and was awarded the Association of Commonwealth Universities Scholarship for the same. She has participated in projects related to over 20 national disasters and led the TISS disaster response work in several instances. This has helped her understand

the significance of logistics. She was head of the department of urban and rural community development before moving on as the chairperson of the newly created Centre for Disaster Management at TISS in 2006. She was responsible for initiating a full-time multi-disciplinary master's programme in disaster management in 2007, the first of its kind in Asia. Within the programme she introduced a specialisation on disaster logistics amongst other things. Professor Andharia has over 30 years of experience in the field of community organisation and social development. Her areas of work focus on gender issues, environmental concerns, social planning and participatory development, addressing diverse forms of marginalisation and vulnerability. She has been involved in policy work and has had a long association with grass-roots organisations.

More recently she was invited to be a member of the international Bellagio Group which developed 'Post-2015 Millennium Goals, Targets and Indicators'. She was involved in a series of consultations in various parts of the globe which culminated in a report that was shared with the UN High-Level Panel on the subject. Professor Andharia provides policy advice to governments and has also successfully led several international missions in order to forge collaborations between TISS and other universities and offered special lectures. She has several research projects to her credit, has published extensively and is also involved in a number of international research collaborations. Professor Andharia serves on the board of several organisations.

Dr. **Vikas Saharan** is a social science researcher. He has obtained his Ph.D from Jawaharlal Nehru University, New Delhi. His research focuses on contemporary issues of disaster management, development studies, urbanisation, climate change, sustainable development, cultural studies, health, education, discrimination and exclusion, social and regional geography and issues related to tribals, dalits, minorities and gender in India. His expertise is in empirical study with special focus on village-level research. He has participated in numerous seminars, conferences and workshops and has published numerous articles and chapters in different journals and edited books on these issues.

Dr. **Vinita** has a total work experience of over 15 years in diverse consultancy organisations and in domains ranging from institutional analysis, urban planning, financial planning, governance, inclusive development, infrastructure development and capacity building. She has completed her master's in planning (with specialisation in urban planning) from School of Planning and Architecture (SPA), New Delhi, and MBA (financial management) from Indira Gandhi National Open University (IGNOU), New Delhi. Later, she obtained Ph.D. from Jawaharlal Nehru University, New Delhi. She started her career as a programme manager in SEEDS India in Delhi where she worked in the area of disaster. During her stint as a consultant with J.P.S Associates (P) Ltd., she has managed varied projects as project coordinator in the field of urban and rural development including preparation of Kanpur City Development Plan. She has also worked as a manager, consultancy and resource mobilisation in an international non-government organisation, i.e. Praxis- Institute for Participatory Practices, where her responsibilities included project management

and business development. Since December 2009, she is working as an associate professor in the Department of Regional Planning at School of Planning and Architecture, New Delhi; teaching theory subjects such as poverty and development, institutional analysis and governance; and handling studio assignments in the areas of village, block, district and metropolitan region planning. In 2014, her book entitled '*Metropolitan Governance: Cases of Ahmedabad and Hyderabad*' has been published.

Mr. **Hemant Sharma** pursued his master's in planning (with specialisation in regional planning) from the School of Planning and Architecture, New Delhi. His dissertation is entitled 'Identification of Future Smart Cities in a Region: A Case Study of State of Karnataka'. He completed his bachelor's in physical planning from School of Planning and Architecture, Vijayawada, in 2013 with the qualifying research on 'Mainstreaming Hawking to Stabilise Market: Case Study of Laxmi Nagar market of East Delhi'. He was one of the finalists selected countrywide in 'Transform Urban India' in 2012 organised by Indian Institute of Human Settlements, Bangalore, and the winner of 'Current Practices' competition in National Organisation of Students of Planning (NOSPLAN) Credence, 2012, organised in SPA, New Delhi.

About the Editors

Dr. **Huong Ha** is a senior lecturer at UON Singapore and University of Newcastle, Australia. Her previous positions include Dean, Director of Research and Development, Deputy Course Director, Chief Editor, Executive Director, Business Development Manager, etc. She holds a Ph.D. from Monash University (Australia) and a Master's degree from Lee Kuan Yew School of Public Policy, National University of Singapore. She was a recipient of a Ph.D. scholarship (Monash University), Temasek scholarship (National University of Singapore), and a scholarship awarded by the United Nations University/International Leadership Academy, and many other scholarships, professional and academic awards, and research-related grants. She was a subject of biography in the *Who's Who of the World, 1999–2000*; *Who's Who in Asia Pacific, 1999–2000*; and *Who's Who in Vietnam, 1998–1999* by Barons Who's Who, USA; and she was invited to be included in *Who's Who of Asia Pacific, Vol. IV, 2002*, by Rifacimento International, India. She has authored or coedited three books: (1) Ha, Huong (2014). *Change Management for Sustainability*. USA: Business Expert Press; (2) Ha, Huong (2014). *Land and Disaster Management Strategies in Asia*. H. Ha (Ed.), Springer; and (3) Ha, Huong & Dhakal, T. N. (2013). *Governance Approaches to Mitigation of and Adaptation to Climate Change in Asia*. H. Ha, & T. N. Dhakal (Eds.), Basingstoke: Palgrave Macmillan. She has also published about 75 journal articles, book chapters, conference papers, and articles in encyclopedias. She has been an invited member of (1) international editorial boards of many international journals/book projects in Romania, the Philippines, Singapore, the USA, and the UK; (2) scientific and/or technical committees of several international conferences in Albania, Australia, Europe, and the USA; and (3) international advisory boards of many associations. She has also been a reviewer of many international journals and international conferences, such as *International Journal of Contemporary Hospitality Management (A category)*, *Thunderbird International Business Review, Journal of Management and Organisation,* Academy of Management (conferences)*, International Journal of Environment and Sustainable Development,* Australian and New Zealand Academy of Management conferences, and *International Journal of Consumer Studies (A category)*, among others.

Dr. **R. Lalitha S. Fernando** serves as a Professor in Public Administration, Faculty of Management Studies and Commerce of the University of Sri Jayewardenepura in Sri Lanka. She was awarded the prestigious Commonwealth Academic (internal) Scholarship to pursue Postgraduate Diploma in Development Studies, leading to Master's in Development Administration and Management at the University of Manchester, UK, for the period 1990–1992. She obtained a full-time scholarship to pursue her Ph.D. from the Graduate School of Public Administration, National Institute of Development Administration (NIDA), Bangkok, Thailand, for the period 1999–2003. She has published a number of papers related to public management and governance in both national and international journals.

Prof. Dr. **Amir Mahmood** is the Pro-Vice-Chancellor of the University of Newcastle, Australia. He holds an M.A. and a Ph.D. in Economics from the University of Manitoba, Canada. Since joining the University of Newcastle in 1992, he has significantly contributed to the areas of research, teaching, internationalization, and academic leadership. During this period, Prof. Mahmood was the Oceania Representative and a member of the leadership team (2011–2012) of the Pacific Asian Consortium for International Business Education and Research (PACIBER), a US-based consortium comprising of 27 leading Asia Pacific universities. He has also played an active and productive role in the Australian Business Dean Council (ABDC) International Network. A recipient of the Australian Government's Endeavour Malaysia Research Fellowship, Prof. Mahmood has a strong research track record in the fields of economics, business, and management. In 2012, he was appointed by the university to lead negotiations to develop a joint Ph.D. program with five research-intensive universities in Malaysia.

Abbreviations

Chapter 1

DRR	Disaster risk reduction
FYP	Five-year plan
NAPSIPAG	Network of Asia Pacific Schools and Institutes of Public Administration and Governance
R&R	Reconstruction and rehabilitation

Chapter 2

ADP	Annual development programme
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
CCA	Climate change adaptation
CDMP	Comprehensive Disaster Management Programme
CPP	Cyclone Preparedness Programme
CPPIB	Cyclone Preparedness Programme Implementation Board
CRA	Community risk assessment
DMA	Disaster Management Act
DMB	Disaster Management Bureau
DMRD	Disaster Management and Relief Division
DPP	Development project proposal
DRR	Disaster risk reduction
ECNEC	Executive Committee of the National Economic Council
EPAC	Earthquake Preparedness and Awareness Committee
ERM	Emergency response management
EWS	Emergency Warning System
FFWC	Flood Forecasting and Warning Centre
FGD	Focus group discussion

FY	Fiscal year
FYP	Five-year plan
GFDDR	Global facility for disaster risk reduction
GoB	Government of Bangladesh
IMDMCC	Inter-Ministerial Disaster Management Coordination Committee
KII	Key informant interview
MD	Meteorological Department
NDPDR	National Platform for Disaster Risk Reduction
NDRCG	National Disaster Response Coordination Group
NPDM	National Plan for Disaster Management
PC	Planning Commission
RQS	Rapid qualitative survey
RRAP	Risk reduction action plans
SOD	Standing orders on disaster

Chapter 3

HIMURJA	Pradesh Energy Development Agency

Chapter 4

DPOs	Disabled People's Organisations
IFRC	International Federation of Red Cross
NDMA	National Disaster Management Authority
RPD	Rights of persons with disabilities
UNCRPD	United Nations Convention on the Rights of Persons with Disabilities

Chapter 5

CSOs	Civil society organisations
DMA	Disaster Management Authority
DMD	Disaster Management Department
GOI	Government of India
MHA	Ministry of Home Affairs
NCB	Nuclear, chemical and biological
NDMA	National Disaster Management Authority
NDRF	National Disaster Response Force
NGOs	Nongovernment organisations
SDMA	State Disaster Management Authority

SDRF	State Disaster Response Force
SOPs	Standard operating procedures
TA	Territorial Army

Chapter 6

CBDRM	Community-based disaster risk management
CRPRA	Community-based risk assessment, participatory rural assessment tools
DDMCs	District disaster management coordinators
DDMCU	District Disaster Management Coordinating Unit
DMC	Disaster Management Centre
GIS	Geographic information system
ICS	Incident Command System
NCDM	National Council for Disaster Management
NIE	National Institute of Education
SLAS	Sri Lanka Administrative Services
SLPS	Sri Lanka Planning Services Officers
UNDP	United Nations Development Programme

Chapter 7

HFA	Hyogo Framework for Action 2005–2015

Chapter 8

GHG	Greenhouse gas
GLOF	Glacial lake outburst flood
IMD	Indian Meteorological Department
IPCC	Intergovernmental Panel on Climate Change
MLA	Member of Legislative Assembly
WIHG	Wadia Institute of Himalayan Geology

Chapter 9

AITMC	All India Trinamool Congress
CERD	Centre for Research on the Epidemiology of Disasters

HDRCC	Human Development Research and Coordination Centre (HDRCC)
TOI	Times of India

Chapter 10

ADB	Asian Development Bank
CHC	Community Health Centre
FGD	Focus group discussion
HED	Harbour Engineering Department
IREL	Indian Rare Earths Ltd
KMML	Kerala Minerals and Metals Ltd
KSEB	Kerala State Electricity Board
PWD	Public Works Department
R&R	Reconstruction and rehabilitation
TEAP	Tsunami Emergency Assistance Project
TRP	Tsunami Rehabilitation Programme

Chapter 11

ARMM	Autonomous Region in Muslim Mindanao
BFAR	Bureau of Fisheries and Aquatic Resources
CAB	Comprehensive Agreement on the Bangsamoro
CERED	Center for Empowerment and Resource Development, Inc.
CHES	Conference on Human Ecological Security
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DENR	Department of Environment and Natural Resources
DILG	Department of the Interior and Local Government
DND	Department of National Defense
DOST	Department of Science and Technology
DPWH	Department of Public Works and Highways
DRRM	Disaster risk reduction and management
DSWD	Department of Social Welfare and Development
EO	Executive order
IMPEDE	Interfaith Movement for Peace Empowerment and Development Inc.
ITCZ	Intertropical Convergence Zone
IUCN	International Union for Conservation of Nature
KIN	Kitanglad Integrated NGOs, Inc.
LGUS	Local government units
MB	Murcielagos Bay

MEDCo	Mindanao Economic Development Council
MinDA	Mindanao Development Authority
MMC	McKeough Marine Centre
NCDA	National Civil Defense Administration
NCDC	National Disaster Coordinating Council
NDRRMC	National Disaster Risk Reduction and Management Council
NEDA	National Economic and Development Authority
NGOs	Nongovernment organisations
NGP	National Greening Program
OCD	Office of the Civil Defense
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PCSD	Philippine Council for Sustainable Development
PSSD	Philippine Strategy for Sustainable Development
R2R	Ridge to Reef
SRA	Social Reform Agenda
UNCED	United Nations Conference on Environment and Development

Chapter 12

GIS	Geographic information system
HFA	Hyogo Framework for Action
HRDs	Humanitarian Response Depots
IT	Information technology
LCAs	Logistics Capacity Assessments
LETs	Logistics emergency teams
LRTs	Logistics response teams
SCM	Supply chain managements
WFP	World Food Programme

Chapter 13

FEMA	Foreign Exchange Management Act 1999

Chapter 14

FGDs	Focus group discussions
LoC	Line of control

MMI Modified Mercalli Intensity
NRI Non-resident Indians
UDPFI Urban and Regional Development Plans Formulation and Implementation

Chapter 15

IDNR International Decade for Natural Disaster Reduction

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Chapter 1
Strategic Disaster Risk Management in Asia: An Introduction

Huong Ha, R. Lalitha S. Fernando, and Amir Mahmood

1.1 Introduction

The motivation for the editors to embark on this new project is twofold. Firstly, many countries in the Asian region have become increasingly vulnerable to natural disasters due to unsustainable land use patterns, catchment, migration patterns and over-exploitation of resources. The number of natural disaster has steadily increased over time, i.e. about ten disasters reported in 1990 to about 400 disasters in 2011. Further, a total of 8,835 disasters were reported from 1970 to 2012 (Imgur Inc. 2014a; World Meteorological Organisation 2014). Some of the recent incidents in Asia are (1) the blizzards and avalanches in Western Nepal (October 2014), (2) landslides triggered by Typhoon Kalmaegi in Vietnam (September 2014), (3) floods and landslides in Kashmir (September 2014) affecting both Pakistan and India, (4) landslides in Hiroshima, Japan (August 2014), and many other incidents (Khanal 2014). The economic and human loss due to such disasters has rapidly multiplied, i.e. less than US$0.05 billion in 1975 to more than US$0.35 billion in 2011 (Imgur Inc. 2014b). The World Meteorological Organisation (2014) reported 1.94 million deaths and US$ 2.4 trillion of economic loss from 1970 to 2012. These incidents were not new forms of natural disasters, but the ways in which they were tackled

H. Ha (✉) • A. Mahmood
UON Singapore, Singapore & University of Newcastle, Australia
e-mail: Huong.Ha@newcastle.edu.au

R.L.S. Fernando
Department of Public Administration, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura, Nugegoda, Sri Lanka
e-mail: lalithafernaando@gmail.com

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produced different outcomes. The pressing question, therefore, is whether such incidents could be better handled in order to reduce the magnitude of both human and economic losses. Secondly, Asian governments, especially in Southeast Asia and South Asia, have been continuously reviewing current approaches and searching for new approaches to improve disaster risk management. Governance, in this context, has been considered as one of the mechanisms for governments and relevant stakeholders to manage disasters and reduce risks (Ishiwatari 2013). However, the expected outcomes have not been uniformly and satisfactorily achieved (Ha 2014). Also, the intensive discussion and debates on who should be responsible for disaster risk management, and how different groups of stakeholders can jointly address challenges associated with disaster risk reduction and disaster management, have been continuous. Although Islam and Chick (2011) explained that the public and private sectors, as well as the third sector (civil society), should be involved in the design and planning process and governance of disaster management, to date there has been insufficient evidence on this collaboration (Kickbusch and Gleicher 2012). Therefore, it is important to explore and investigate the mechanisms and approaches employed to manage disaster risks before, during and after a disaster. Equally important is to investigate how such groups of stakeholders in different sectors have assumed and discharged their responsibilities to prepare for disasters, cope with risks during disasters and manage post-disaster recovery and reconstruction, as well as address other challenges associated with disaster governance.

In this setting, this volume has endeavoured to cover the following main themes: (1) strategies to address risk reduction and disaster management; (2) strategies to mitigate the impact of disasters, including public education regarding disaster management and addressing issues associated with the disabled; and (3) strategies to manage post-disaster recovery and reconstruction and other associated issues.

The chapters in this book are the products of academics, practitioners and researchers from different Asian countries with diverse disciplinary backgrounds. This book is significant for the following reasons. Firstly, it is interdisciplinary in nature, encompassing research on governance, environment, disaster management and disability issues. It has a wider scope and covers disaster management issues such as preparedness for disasters, post-disaster reconstruction, peace, development and corruption. The views of different groups of stakeholders are incorporated in the discussion to produce comprehensive findings and analysis of the governance process and best practices in pre- and post-disaster management. This book also includes chapters focusing on issues that are usually not a priority in the context of disaster management, such as the need to invest in public education to improve public awareness of issues associated with disaster management and approaches to support the disabled, the vulnerable and the elderly in the context of disaster governance. Finally, the proposed book presents research on disaster management in different countries in Asian region. The next section summarises the key arguments and findings of each chapter in this volume.

1.2 An Overview of the Chapters

This volume starts with an interesting chapter titled 'Disaster Management in the Five-Year Plans of Bangladesh: An Assessment'. The author, Prof. Banu, explains that natural disasters and human-induced hazards are frequent visitors of Bangladesh (Ali et al. 2012; Akter 2009; Ha and Ahmad 2014). People's lives and national socioeconomic development have been seriously affected by these disasters and hazards. Therefore, the Government of Bangladesh has implemented several *Five-Year Plans* (*FYPs*) to respond to such disasters and address the issues associated with post-disaster recovery. FYPs have provided directions for stakeholders to mitigate, prepare and respond to disaster risks in Bangladesh. This chapter revisited the master plans, initiatives and strategies discussed in the FYPs regarding disaster risk reduction and management. The findings suggest that the Government of Bangladesh has implemented a number of strategies for disaster risk adaptation via (1) assessment of climate change induced risk in order to adopt appropriate mechanisms to address such risk, (2) introduction of community-based programmes to increase the public awareness of disaster management, (3) improvement of early warning systems via upgrading communication facilities and (4) strengthening emergency response systems (Haque and Haque 2009). According to Prof. Banu, there has been a strategic shift from 'traditional relief and rehabilitation' focus to a 'disaster risk reduction (DRR)' approach. This shift aims to achieve cost-effectiveness in DRR and establish an institutional framework for DRR (Government of Bangladesh 2010, 2012). Nevertheless, many of these plans and policies have not been fully implemented and reaped the desirable results as affirmed by Prof. Banu.

Expert Group on Energy Efficiency (2007) explained that energy is the main catalyst for the development of various industries and national economic growth. There has been a significant increase in the demand for energy in many countries all over the world, especially in the rural areas in India (Ahuja and Tatsutani 2009). Given limited energy resources, hydropower is a workable solution to provide electricity to the villagers in such remote areas. Thus, the authors of Chap. 3, Prof. Mahajan and Dr. Mahajan, discuss the politico-administrative response to the disastrous impact of hydropower on nature and people, using Himachal Pradesh as a case study. This chapter identifies alternative sources of energy and explains how energy can be used as a development tool in the Himalayan region of India, particularly in Himachal Pradesh. Prof. Mahajan and Dr. Mahajan explain that the development of new energy resources can produce both positive and negative effects on the local community in these areas. Although hydropower has a significant role to play in economic development of Himachal Pradesh, the development of hydropower does negatively impact the natural environment and the local people. The findings suggest that relevant groups of stakeholders should assess the politico-administrative response to such impacts and evaluate all possible negative effects in order to formulate suitable policies and strategies in a timely manner to address such issues effectively and efficiently.

About 15 % of the world total population and 10 % of the young people in South Asian countries have one or more forms of disability (UNICEF 2003; WHO 2011). Although these people together with the minorities, women, children and the elderly have been the most adversely affected by natural disasters, they are usually neglected during the planning stage, the evacuation plans and post-disaster reconstruction stage (Hemingway and Priestley 2006; Islam 2014). In other words, they have been marginalised from both immediate interventions and longer-term post-disaster recovery or rehabilitation programmes (Todd and Todd 2011). According to Article 11 in the United Nations Convention on the Rights of Persons with disabilities, people with disabilities should receive equal attention in all political and socioeconomic activities in the governance of disaster risk (Ikeda (2009); Islam 2014). However, there has been under-reported disability issues and research on such issues regarding the discourse, research, practice and policies in disaster management (Ha 2014). Chapter 4 in this volume reviews the existing academic and nonacademic literature and research studies with regard to the manners with which disability challenges and issues have been addressed in India. The findings propose that there has been insufficient systematic research on disability with regard to disaster risk management in India. The author, Dr. Hiranandani, successfully identifies the common problems associated with disability in India, including wide-ranging neglect, inaccessible evacuation, a lack of relief and response systems and a lack of respect of rights to and dignity of persons with disabilities. Also, India's *Disaster Management Act 2005* does not include clauses covering disability issues. Dr. Hiranandani highlights that the impairments/disabilities are not barriers to rights, dignity and lives, but the real challenges are social, institutional and environmental exclusions that these individuals face. Therefore, it is imperative for relevant groups of stakeholders to address the issues associated with socioeconomic exclusions and structural and social inequalities, as well as promote the rights of people with disabilities in all contexts as advocated by Hiranandani (2014). Huppert and Sparks (2006) and Hiranandani (2014) explained that disasters are not only natural consequences of environmental hazards but also the outcomes of human actions, and thus disability studies should be incorporated in the studies of disaster risk management in order to ensure equality and safety for all recipients, including people with disabilities, the disadvantaged people, the minorities, women, children and the elderly. Finally, it is essential to involve people with disabilities in all phases of the process of disaster management in India. The participation of people with disabilities in all phases is beneficial to other recipients, given their expertise, skills and daily experiences in negotiating uncertain and difficult terrain.

The authors of Chap. 5, Mr. Garge, Dr. Ha and Dr. Khoo, study the important role of the Armed Forces in disaster management in India. It is noted that the public and relevant government agencies in many countries, including India, have not been well prepared or do not have sufficient capacity to deal with disasters (US Senate Committee on Homeland Security and Governmental Affairs 2006). This situation has led to more human and economic losses. Yet, it is a common practice that when a natural or man-made disaster takes place in India, the Armed Forces under the Ministry of Defence is deployed to participate in the relief activities as part of their

charter of providing aid to civil authorities when they are required (National Disaster Management Authority 2009). A separate section of the Armed Forces has been dedicated to provide aid to rescue civilians during and after disasters (Shivananda and Gautam 2012). Mr. Garge, Dr. Ha and Dr. Khoo explain that although support from the Armed Forces is necessary given the available manpower and expertise of the forces, this should not be an excuse for civil authorities to over-rely on the Armed Forces. In other words, the state should clearly stipulate the role of various government agencies and the Armed Forces in disaster risk management. The state can utilise the services and manpower of the Armed Forces for capacity building of civil authorities and the local communities in disaster relief and rehabilitation activities (Singh n.d.). Mr. Garge, Dr. Ha and Dr. Khoo suggest that if the Armed Forces are indispensable in disaster risk management, the state can establish one or more Territorial Army battalions who can be deployed at pre-identified sensitive locations as first responders to disasters. These personnel should be equipped with adequate knowledge and equipment to discharge their duty competently.

Prof. Fernando, Ms. Abeykoon and Ms. Premathilaka, the authors of Chap. 6, examine the effectiveness of the implementation of educational and training programmes to improve public awareness of how risk can be reduced in the context of Sri Lanka. Obviously, natural disasters cannot be avoided or removed, but potential risk can be curtailed if effective risk reduction strategies are in place. One of the proposed strategies is to focus on a community-based approach via conducting educational and public awareness programmes at educational institutes, i.e. schools, colleges and universities (Dobos and Jenei 2013; Nielsen and Lidstone 1988). These programmes can help building community's capacity to deal with disasters. In 2005, the Government of Sri Lanka introduced a seven-strategy *Disaster Risk Management Framework* which is known as 'Towards a Safer Sri Lanka: Road Map for Disaster Risk Management'. Enhancement of public awareness, which is the seventh strategy in the framework, has been considered one of the most effective and efficient ways to reduce disaster risk. Prof. Fernando, Ms. Abeykoon and Ms. Premathilaka find that not all sub-strategies under the seven strategies in the *Disaster Risk Management Framework* have been implemented. Some programmes, such as the awareness programmes introduced via curricula of public schools and universities, have only been partially implemented, whereas the suggested National Training Center has not been established. There has been no clear indicator or measure to assess the success or failure of the disaster-related frameworks. Also, there have been unclear descriptions of the number of participants and the role and responsibilities of partners and stakeholders in the implementation of the framework. There has been repetition of the expected outcomes of some activities. In addition, there have been no clear guidelines on financial aspects. Further, Prof. Fernando, Ms. Abeykoon and Ms. Premathilaka identify many of the difficulties during the implementation stage which need to be urgently addressed in order to improve the efficacy of educational and training programmes relating to disaster risk management. Therefore, a lot of work needs to be done before the objectives of the framework for disaster risk management in Sri Lanka can be fully achieved.

In Chap. 7, Prof. Fernando and Ms. Muthulingam discuss the effectiveness of administrative preparedness for coping with flood and mitigating its impacts in Sri Lanka. It also identifies appropriate measures to improve the current mechanisms dealing with floods. Similarly to other South Asian countries, Sri Lanka is susceptible to frequent floods during monsoonal rainy seasons (National Council for Disaster Management 2013; Ranasinghe 2002). There is no strong correlation between the patterns of floods and the degree of vulnerability to disasters. For example, the provinces in the south and east of the country are affected by frequent floods, but the central area has a high degree of vulnerability in recent years. Stakeholders do understand the needs of systematic arrangements for and responses to disaster management, in general, and for floods, in particular, in Sri Lanka, especially after the tsunami in 2004. The Government of Sri Lanka has enacted a number of legislation and plans, such as the *Disaster Management Act No. 13* (*2005*) and the *Hyogo Framework for Action 2005–2015*, to establish an institutional framework and provide directions to other sectors regarding disaster risk management (National Council for Disaster Management 2013). Prof. Fernando and Ms. Muthulingam identify some critical success factors of the effectiveness of administrative preparedness. These include (1) the experience and knowledge of such acts and plans of disaster risk management of the administrative teams; (2) the level of public engagement and participation during the planning, setting directions, implementation and evaluation processes via decentralisation of responsibilities to the communities; and (3) adaptive measures to upgrade preparedness mechanisms and systems to mitigate the impact of flood. Collaboration among various groups of stakeholders is required to establish proper hazard monitoring and early warning systems and provide opportunities for administrative personnel to acquire skills and knowledge in order to operationalise the preparedness plans effectively (FEMA 2011; Ha 2014; Ha and Ahmad 2014; Ha and Dhakal 2014; Ha and Jamil 2014). Prof. Fernando and Ms. Muthulingam also proposed a participatory approach at the village level, including team members who are villagers. These team members will be assigned different roles, based on their capabilities and availability. They should receive adequate training so that they can adopt simple hazard monitoring methods, for example, recording data and reviewing rainfall patterns, and maintain regular communication with other divisional subcommittees (Disaster Management Unit of the Ambagamuwa Divisional Secretariat 2013). It is highlighted that relevant authorities should design and maintain a well-established early warning system with a high level of public participation and proper channels of communication in order to disseminate information about disasters to the recipients promptly and accurately. It is important that public officials employed at the village and local levels should receive adequate training so that they can effectively respond to floods as well as foster links with disaster management teams in different villages. Prof. Fernando and Ms. Muthulingam also emphasise the technical aspects to mitigate impacts of floods in the long term, such as (2) widening the river banks, (2) reconstruction and establishment of frequent maintenance of cannels and drainage systems and (3) review of building regulations.

Similar to Chap. 7, the authors of Chap. 8, Dr. Sharma, Mr. Joshi and Dr. Agrawal, argue for the importance of community involvement in mitigating disasters. This chapter critically revisited the notion that human beings' persistent disobedience of the nature's prescriptions has led to unavoidable disasters (Zhernosenko and Ha 2014). The research focused on the Ganges valley of Uttarakhand in India, which experienced one of the biggest calamities in the modern world, i.e. the tragedy in Kedarnath in June 2013. Thousands of lives are lost in a single day. Various causes of such disasters have been analysed, namely, (1) rapid global climate change phenomenon, (2) administrative neutrality, (3) unscrupulous practices, (4) technical weaknesses and (5) lack of stakeholders' participation. Dr. Sharma, Mr. Joshi and Dr. Agrawal conclude that living in harmonisation with the nature, a high degree of people participation in environmental governance and community involvement and fair execution practices are required to mitigate disaster risk.

In Chap. 9, Prof. Bhattacharyya examines the administrative planning and political response to a post-disaster reconstruction with regard to the *Aila* cyclone in West Bengal, India. Prof. Bhattacharyya explains that planning for both short-term crisis management and long-term disaster risk management is required to restore and develop socioeconomic infrastructure and provide relief to the victims during post-disaster reconstruction (Agrawal and Chhatre 2007; Blakie and Muldavin 2004). The findings suggest that relevant stakeholders have prioritised short-term crisis management over long-term disaster risk management during the post-disaster reconstruction in West Bengal. Apparently, there have been mixed political responses due to different interests, different levels of power and different agendas by different groups of stakeholders. This has led to 'legitimising bias of the local authorities in the name of people's participation in the decentralised structure' as explained by Prof. Bhattacharyya. In addition, in order to gain consensus and manage conflicts that occurred during the post-disaster recovery process, as argued by Bhandar (2008), it is important to design proper measures to identify the root causes of conflicts in the context of post-disaster management and address them timely and comprehensively.

The author of Chap. 10, Prof. Joseph, studies the post-tsunami reconstruction and rehabilitation of Alappad Panchayat, Kerala, India. The reconstruction and rehabilitation (R&R) programmes were introduced in Alappad Panchayat to ease the shocks to the community and to facilitate the adaptability of the community to the new environment (Jayasuriya and McCawley 2008). This chapter examines how the Government of Kerala and different groups of stakeholders took part in the decision-making process regarding R&R programmes designed for the tsunami-affected region of Alappad Panchayat. The author clearly identifies (1) the issues and problems associated with the post-disaster reconstruction and rehabilitation process and (2) factors affecting the livelihood security of the victims after the R&R tsunami programmes. This study finds that a high level of public participation and the public sector's commitment with regard to conceiving, formulating and implementing the R&R programmes lead to a higher possibility of successful implementation of the programmes (Lyons 2010; Mulligan and Nadarajah 2012).

R&R programmes were initiated and administered by state (the public sector) via bureaucratic hierarchical administrative systems. Therefore, the community's voice and selection of R&R activities were not included in the programmes. In other words, there was a missing link between state and the community in all R&R activities in Alappad Panchayat. Thus, the Government of India should adopt a sound governance system which promotes public participation in all R&R activities. This chapter provides the foundation for further research in participatory decision-making, specifically in a conflict ridden arena in which multiple interests of various groups of stakeholders affect the implementation and the outcome of post-disaster R&R programmes.

It is impossible not to mention development and peace when discussing how risk disasters can be minimised and contained. Therefore, Dr. Andales-Escano, in Chap. 11, explores this research area by introducing the 'ridge to reef approach' to achieve peace and developmental goals, using Mindanao (the Philippines) as a case study (Global Environment Facility n.d.). Mindanao, located in the southern part of the Philippines, has been considered as one of the important food suppliers of the country due to its abundant agri-fishery production (Gonzales 2000). Nevertheless, several areas in this location have been exposed to many natural disasters which claimed many lives and damaged the infrastructure and means of livelihood of the local communities. Hence, there is an urgent need for stakeholders to search for comprehensive and integrated approach to preserve, utilise, restore, rehabilitate and sustain the natural environment and the sources of livelihood of the local communities (Ha 2014). Dr. Andales-Escano proposes the 'ridge to reef approach' as an innovative governance mechanism to achieve peace and development. In this approach, all groups of stakeholders have clearly identified roles to play before, during and after disasters. This approach requires significant involvement of all sectors, including the public sector (e.g. government agencies, local government units), the private sector (e.g. business community), civil society (e.g. nongovernment organisations, professional and industry associations), academia and host communities to manage disaster risk and achieve the developmental goals. To achieve a dynamic, inclusive, resilient and green Mindanao economy, Dr. Andales-Escano suggests that the following strategies should be applied: (1) setting strategies to ensure sustainable use and management of limited natural resources, (2) investing in agricultural and fishery sectors as key catalysts for economic growth, (3) developing adequate and reliable infrastructure, (4) making policies in a way which can mobilise resources from different sectors and (5) promoting public-private partnerships to support Mindanao's development.

The author of Chap. 12, Prof. Andharia, looks at the humanitarian logistics in Asia in the context of post-disaster management. Obviously, humanitarian logistics plays a very critical support role in the supply chain of post-disaster relief and response management since it heavily affects the degree and quality of the outreach during post-disaster reconstruction and relief (Kovacs and Spens 2011). The supply chain of humanitarian logistics consists of procurement, transportation, receiving and distribution of supplies to disaster victims. The speed of these activities is very important for humanitarian logistics since it will affect the outcome of programmes

regarding disaster response and post-disaster relief (Day et al. 2012). Although many studies have focused on logistics and supply chain in commercial settings, very few studies have paid attention to logistics and supply chain in the humanitarian sector, especially in Asian countries. This chapter, therefore, attempts to close this gap by examining challenges of humanitarian logistics and recommending solutions to overcome such challenges. Some suggestions are as follows: (1) strengthening partnerships with various industries (transport, services, retail, agriculture, etc.) and well-established international organisations and humanitarian agencies, (2) developing effective logistics and supply chains in the pre-disaster period and (3) improving the relevance of logistics practices to respond to the needs of the local communities at both the municipal and village levels, especially in developing countries (Bharosa et al. 2009; Sheppard et al. 2013). Prof. Andharia provides convincing arguments for the inclusion of a more focused supply chain management system within disaster management. According to the authors, logistics and supply chain management in the context of humanitarian considerations are the essential functions applied during and after disasters. Thus the operational implementation of such programmes can only be successful if there are clear defined individual responsibilities, appropriate processes and collaborating and coordinating efforts of relevant groups of stakeholders (Malena 2004).

Chapter 13, contributed by Dr. Saharan, discusses the thought-provoking topic of corruption and disaster management. There are several challenges and issues associated with relief efforts in terms of financial management. Usually, after a disaster, there are large flows of financial resources provided by humanitarian aid organisations, international nongovernment organisations and governments, to the government of the affected countries, or directly to the local communities (Ryfman 2007). This creates conditions for corruption and profiteering in various forms, ranging from diversion of relief supplies to inequitable distribution of international and national aid, as well as substandard reconstruction of physical infrastructure. Dr. Saharan explained that 'corruption in emergency procurement not only reduces amount and the quality of resources for life-saving operations but it also influences public support for humanitarian relief by increasing transaction cost' (Chap. 13). Thus, addressing issues of corruption and preventing corruption in humanitarian aid are imperative to warrant effective and equitable humanitarian assistance to the victims and their families who are really in need of resources and assistance so that they can rebuild their lives without enduring additional hardship due to the misuse of resources and aid. The findings suggest that robust control mechanisms and administrative arrangements are required to combat corruption at the early stage of the post-disaster reconstruction. Relevant authorities and humanitarian aid organisations should design effective systems through the following: (1) fostering internal and external monitoring measures, (2) eliminating monopolies in handling humanitarian aid, (3) improving transparency and accountability in contractual arrangements, (4) responding to the recipients' needs and (5) promoting public and civil society engagement and participation (Department for International Development London 2006). Also, direct supervision and monitoring of relief and reconstruction efforts should be an on-going task of relevant authorities.

It is extremely difficult to manage disaster risk in peaceful locations. It is more problematic to deal with issues associated with disaster management in border-sensitive areas where disputes between the two countries may frequently occur (Lai 2012). The authors of Chap. 14, Prof. Yadav and Mr. Sharma, explore how natural and man-made disasters increased the vulnerability of communities residing in such border-sensitive areas, using Amritsar District, Punjab, India, as a case study. Prof. Yadav and Mr. Sharma comment that the illegal storage and hazardous commercial activities in strategic locations were some of the main causes which put thousands of lives at risk. The risk escalates when the daily number of tourists from both countries (Pakistan and India) visiting the Golden Temple increases. Also, non-implementation of fire safety standards is stipulated by laws, and 'illegal and loose electric connections further added to the vulnerability for fire hazards in the region' as explained by Prof. Yadav and Mr. Sharma in Chap. 14 (National Capital Region Planning Board 2010). Both natural disasters, such as the floods in the river Ravi, and man-made disasters (e.g. fires) have seriously affected the local people's lives. Lack of law enforcement and difficulty in law enforcement due to different jurisdictions also contributed to worsen the situation. Thus, Prof. Yadav and Mr. Sharma recommend the following strategies to address these issues: (1) fire standards should be frequently reviewed, taking into account the increase in population density in the area; (2) a joint disaster mitigation plan should be put forward, discussed and agreed by both the countries, i.e. India and Pakistan; and (3) peace agreements should be signed and observed by both countries in order to mitigate the loss of human lives and tangible resources.

Finally, it will be a grave mistake if we do not acknowledge the importance of NAPSIPAG (the Network of Asia Pacific Schools and Institutes of Public Administration and Governance) in this edited volume. NAPSIPAG secretariat and members are the key stimuli and inspiration for the editors and the authors to embark on this project. Without NAPSIPAG, certainly, this edited volume would not have materialised.

1.3 Conclusion

Disaster risk governance is a multifaceted and perplexing task, involving many groups of stakeholders. There is no single governance approach to address disaster risks due to the multidimensional challenges of disaster risk reduction and management. Although international, regional and national authorities and stakeholders have exerted their power and influence on the governance process, several issues associated with disability, corruption, humanitarian logistics, legal enforcement and policy implementation in border-sensitive areas and risk deduction have been observed. Therefore, the quest for innovative and new approaches for disaster risk reduction and post-disaster reconstruction should be a continuous endeavour. In short, readers are encouraged to explore the various chapters to gain a deeper understanding of the complexity of disaster management.

References

Agrawal A, Chhatre A (2007) State involvement and forest co governance: evidence from the Indian Himalayas. Stud Comp Int Dev 42:67–86

Ahuja D, Tatsutani M (2009) Sustainable energy for developing countries. Surv Perspect Integr Environ Soc 2(1):1–16

Akter T (2009) Climate change and flow of environmental displacement in Bangladesh. Centre for Research and Action on Development, Dhaka

Ali SS, Rahman M, Chowdhury NR (2012) Bangladesh: a sustainable and disaster resilient future. Islamic Relief Worldwide-Bangladesh, Dhaka

Bhandari RK (2008) Disaster management in India – a new awakening. Chairman, centre for disaster mitigation. Vellore Institute of Technology, Vellore

Bharosa N, Van Zanten B, Zuurmond A, Appelman J (2009) Identifying and confirming information and system quality requirements for multi-agency disaster management. In: Landgren J, Nulden U, van de Walle B (eds) Proceedings of the 6th international conference on Information Systems for Crisis Response and Management (ISCRAM), 10–13 May 2009, Gothenburg, Sweden

Blakie P, Muldavin J (2004) Upstream, downstream, China, India: the politics of environment in the Himalayan region. Ann Assoc Am Geogr 94:520–548

Day JM, Melnyk SA, Larson PD, Davis EW, Whybark DC (2012) Humanitarian and disaster relief supply chains: a matter of life and death. J Supply Chain Manag 48(2):21–36

Department for International Development (2006) Reducing the risk of disasters-helping to achieve sustainable poverty reduction in a vulnerable world. Department for International Development, London, UK

Disaster Management Unit of the Amabagamuwa Divisional Secretariat (2013) Requirements statement on financial assistant for disaster relief. Disaster Management Unit of the Amabagamuwa Divisional Secretariat, Nuwara Eliya District, Sri Lanka

Dobos A, Jenei A (2013) Citizen engagement as a learning experience. Procedia Soc Behav Sci 93:1085–1089

Expert Group on Energy Efficiency (2007) Realizing the potential of energy efficiency: targets, policies, and measures for G8 countries. United Nations Foundation, Washington, DC

FEMA (2011) National disaster recovery framework strengthening disaster recovery for the nation. US Department of Homeland Security, Washington, DC

Global Environment Facility (n.d.) From ridge to reef: water, environment, and community security GEF action on transboundary water resources. Global Environment Facility, Washington, DC

Gonzales LA (2000) Philippine agriculture in the next millennium: strategic issues and directions. Paper presented to the crop protection Association of The Philippines, February 2000

Government of Bangladesh (2010) Comprehensive disaster management program (phase-II). Disaster Management and Relief Division Ministry of Food and Disaster Management, Dhaka

Government of Bangladesh (2012) Public expenditure for climate change: Bangladesh climate public expenditure and institutional review. General Economics Division, Planning Commission, Ministry of Planning

Ha H (2014) Land use and disaster governance in Asia: an introduction. In: Ha H (ed) Land and disaster management strategies in Asia. Springer, New Delhi, pp 1–14

Ha H, Ahmad A (2014) Bangladesh: natural disaster risk management. In: Ha H (ed) Land and disaster management strategies in Asia. Springer, New Delhi, pp 83–98

Ha H, Dhakal TN (2014) Land use and disaster governance: implications and policy recommendations. In: Ha H (ed) Land and disaster management strategies in Asia. Springer, New Delhi, pp 259–264

Ha H, Jamil S (2014) Disaster risk management and public education in Singapore. In: Ha H (ed) Land and disaster management strategies in Asia. Springer, New Delhi, pp 171–188

Haque MSS, Haque N (2009) Enhancing national and community resilience: integrating disaster risks reduction and climate change adaptation measures into development planning and processes in Bangladesh. Ministry of Food and Disaster Management, Dhaka
Hemingway L, Priestley M (2006) Natural hazards, human vulnerability and disabling societies: a disaster for disabled people? Rev Disabil Stud Int J 2(3):57–67
Hiranandani V (2014) Disability and humanitarian emergencies in INDIA: toward an inclusive approach. In: Michael G, Schlund-Vials CJ (eds) Disability, human rights and the limits of humanitarianism. Ashgate, Surrey, pp 101–118
Huppert HE, Sparks RSJ (2006) Extreme natural hazards: population growth, globalisation and environmental change. Phil Trans R Soc A 364(1845):1875–1888
Ikeda K (2009) How women's concerns are shaped in community-based disaster risk management in Bangladesh. Contemp South Asia 17(1):65–68
Imgur Inc. (2014a) Number of disasters reported 1900–2011. Available at http://www.Emdat.Be/Natural-Disasters-Trends. Accessed 2 Nov 2014
Imgur Inc. (2014b) Emdat natural disaster trends 2012. Available at http://www.emdat.be/natural-disasters-trends. Accessed 2 Nov 2014
Ishiwatari M (2003) Disaster risk management at the national level. Asian Development Bank Institute, Tokyo
Islam SM (2014) Deficiency of disability issue in disaster risk reduction strategy: implications on human security and social cohesion. In: Ha H (ed) Land and disaster management strategies in Asia. Springer, New Delhi, pp 111–120
Islam SMT, Chik Z (2011) Disaster in Bangladesh and management with advanced information system. Disaster Prev Manage 20(5):521–530
Jayasuriya S, McCawley P (2008) Reconstruction after major disaster: lessons from the post tsunami experience in Indonesia, Sri Lanka, and Thailand. ADB Institute Working Paper No.125. ADB Institute, Tokyo
Khanal A (2014) Disaster report. Available from http://www.disaster-report.com/p/contact_15.html. Accessed 28 Oct 2014
Kickbusch I, Gleicher D (2012) Governance for health in the 21st century. World Health Organisation, WHO Regional Office for Europe, Copenhagen
Kovacs G, Spens KM (2011) Trends and developments in humanitarian logistics – a gap analysis. Int J Phys Distrib Logist Manag 41(1):32–45
Lai AY-H (2012) Towards a collaborative cross-border disaster management: a comparative analysis of voluntary organisations in Taiwan and Singapore. J Comp Policy Anal Res Pract 14(3):217–233
Lyons M (2010) Can large scale participation be people cantered? Evaluation reconstruction as development. In: Lyons M, Schilderman T, Boano C (eds) Building back better: delivering people cantered housing reconstruction at scale. Practical Action, London
Malena C (2004) Strategic partnership: challenges and best practices in the management and governance of multi-stakeholder partnerships involving UN and Civil Society Actors. Background paper prepared by Carmen Malena for the Multi-Stakeholder Workshop on Partnerships and UN-Civil Society Relations Pocantico, New York, February 2004
Mulligan M, Nadarajah Y (2012) Rebuilding community in the wake of disaster: lessons from the recovery from 2004 tsunami in Sri Lanka and India. Commun Dev J 47(3):353–368
National Capital Region Planning Board (2010) Disaster management in the national capital region. National Capital Region Planning Board, New Delhi. Available at http://ncrpb.nic.in/disaster.php (Accessed 18 November 2014)
National Council for Disaster Management (2013) National policy on disaster management, Sri Lanka. National Council for Disaster Management, Colombo
National Disaster Management Authority (2009) National policy on disaster management 2009, Approved by the Union Cabinet on 22nd Oct 2009. Government of India, Ministry of Home Affairs, India
Nielsen S, Lidstone J (1988) Public education and disaster management: is there any guiding theory. Aust J Emerg Manag 1998:14–19

Ranasinghe M (2002) Risk and uncertainty analysis of natural environmental assets threatened by hydropower projects: case study from Sri Lanka. Energy Sustain Dev VI(1):56–62

Ryfman P (2007) Non-governmental organisations: an indispensable player of humanitarian aid. Int Rev Red Cross 89(865):21–45

Sheppard A, Tatham P, Fisher R, Gapp R (2013) Humanitarian logistics: enhancing the engagement of local populations. J Humanit Logist Supply Chain Manag 3(1):22–36

Shivananda H, Gautam PK (2012) Reassessing India's disaster management preparedness and the role of the Indian armed forces. J Def Stud 6(1):102–113

Singh KM (n.d.) Revamping of civil defence in the country national policy approach paper. National Disaster Management Authority Government of India, New Delhi, India

Todd D, Todd H (2011) Natural disaster response lessons from evaluations of the World Bank and others. The World Bank, Washington, DC

U.S. Senate Committee on Homeland Security and Governmental Affairs (2006) Hurricane Katrina: a nation still unprepared. Report of the senate committee on homeland security and governmental affairs. U.S. Senate Committee on Homeland Security and Governmental Affairs, Washington, DC

UNICEF (2003) Examples of inclusive education. The United Nations Children's Fund (UNICE), Kathmandu

WHO (2011) World report on disability. World Health Organisation, Geneva

World Meteorological Organisation (2014) Atlas of mortality and economic losses from weather, climate and water extremes (1970–2012). World Meteorological Organisation, Geneva

Zhernosenko I, Ha H (2014) Ecology and culture: innovative approaches to the educational system of indigenous people of Altai. In: Ha H (ed) Land and disaster management strategies in Asia. Springer, New Delhi, pp 209–214

Chapter 2
Disaster Management in the Five-Year Plans of Bangladesh: An Assessment

Nasim Banu

2.1 Introduction

Bangladesh is frequently visited by natural disaster and human-induced hazards which affect the normal human life, environment and retard socioeconomic development. The disasters that happened in the past had caused serious human casualties, economic and social losses, disruption of livelihoods and degradation to environment. In an average, every year ten million Bangladeshi people are being affected by the recurring disasters. The country has incurred annual loss of USD 189 million, i.e. 1.8 % of annual GDP during 1980–2008 (GoB 2010a). Bangladesh is recognised as the most vulnerable to natural disasters. Floods, cyclones, storm surges, arsenic contamination and salinity intrusion are likely to be more intensified and frequent in Bangladesh due to climate change. Climate change is altering disaster risk. Thus disaster risk reduction and climate change mitigation and adaptation share common concern, i.e. reducing the vulnerability of communities and achieving sustainable livelihood development. Therefore, disaster management has been treated as important concern for all the plans of Bangladesh to both adaptation and reduction of the risk of people from the effects of disaster to a manageable and acceptable humanitarian level and to have in place an efficient emergency response system, capable of handling large-scale disasters. The planning process of the country involves macro policy planning including formulation of perspective plan, five-year plan (FYP) and poverty reduction strategy (PRSP), sectoral planning and programme and project planning, preparation of annual development programme (ADP) and processing of individual projects.

Since its independence, Bangladesh have implemented a good number of five-year plans (GoB 1973, 1980, 1985, 1990, 1997a). The government had undertaken

N. Banu (✉)
Department of Politics and Public Administration, Islamic University, Kushtia, Bangladesh
e-mail: nasimbanu411@yahoo.com

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various steps in those FYPs including planning for responding disaster which refers to the management of risk and consequence of disaster. Under FYPs, government took plans and programmes for disaster reduction which include the incorporation of mitigation measures into the development plans, activities and preparedness plan in disaster-prone areas and organise appropriate emergency responses to disasters when they occur and post-disaster reconstruction. In light of the FYPs, the government has given utmost priority to improve the early warning issuing capacity on probable disasters and building up institutional arrangement from national level to the local levels for effective and systematic disaster management.

2.2 Objectives of the Study

The paper concentrates on the situation of disaster management and governmental plan, programme of FYP and organisational efficiency in the context of mitigation, preparedness, emergency response and recovery of disaster risk in Bangladesh with operational aspects and appreciation of resources. However, the broad objectives of this paper are to:

(a) Measure the appropriateness and effectiveness of governmental plan, programme and action in case of disaster management practices in Bangladesh.
(b) Highlight the resilient investment areas to manage disaster risk in Bangladesh.
(c) Evaluate the impact of a project implemented for restoration and recovery from the damage due to devastating cyclones Sidr and Aila.

2.3 Methodology of the Study

The paper is positivist in nature, its approach is deductive, and the data collected to achieve the objectives are predominantly quantitative. However, qualitative tools and secondary information have been used for preparing this paper. Rapid qualitative survey (RQS), focus group discussion (FGD) and key informant interview (KII) have been conducted in order to obtain necessary data and information related to the objectives of the paper in great detail. FGD consisted of different actors that deal with disaster management in Bangladesh both in policy formulation and implementation level and people's representatives and government administrator in the local level, particularly in vulnerable areas.

Government's reports and publications, relevant books and journals, government budgetary documents and the FYPs of Bangladesh have been considered the sources of secondary information. The overall progress, implementation performance and impact analysis of a disaster management related to 'Emergency Cyclone Recovery and Restoration Project' have been reviewed. However, both qualitative and quantitative mode of analysis has been considered for the paper and is finalised after careful examination of collected data and information.

2.4 The Plan and Planning Aspects for Disaster Management

Disaster management has become an integral part of the planning/plan for Bangladesh. Managing natural disasters, in the last few years, has given emphasis on creating a foundation to achieve a paradigm shift from traditional 'relief and rehabilitation culture' to 'risk reduction culture'. The country has already established a planning framework with seven strategic goals (GoB 2010a) which are the following: professionalising the disaster management system, mainstreaming disaster risk reduction and climate change, strengthening institutional mechanisms, empowering at-risk communities, expanding risk reduction programming across all hazards and all sectors, strengthening emergency response systems and developing and strengthening regional and global network. The fifth FYP accorded priority to disaster preparedness, warning system, response and rehabilitation; accordingly appropriate resource allocation was made for measures to mitigate impact of disasters and prevent environmental degradation. Disaster risk reduction (DRR) and climate change adaptation (CCA) are the ultimate objectives of Bangladesh disaster management (GoB 2010a) through:

(a) Integrating DRR and CCA approaches in all national on-going and future development plans, programmes and policies
(b) Enhancing professionalism of the key personnel at disaster management
(c) Strengthening mechanisms for building disaster reduction capacities
(d) Programming for disaster and climate change risk reduction
(e) Strengthening capacities for disaster and climate change risk assessment
(f) Strengthening national capacity for response management and coordination mechanism
(g) Establishing/improving early warning, community alerting and information management system
(h) Creating legal and institutional framework for effective response management

Thus, the sixth FYP has stressed to carry forward the National Disaster Management Plan and to focus more on reducing disaster risks and the relief and recovery needs, fixing strategies like disaster management of both risk and consequences which include prevention, emergency response and post-disaster recovery; community involvement for preparedness programmes to protect lives and properties; and nonstructural mitigation measures such as community disaster preparedness training, advocacy and public awareness.

Bangladesh disaster mission is to bring a paradigm shift in disaster management from traditional response and relief activity to more comprehensive risk reduction culture. In order to achieve a paradigm shift in disaster management, a regulatory framework has been established. The regulatory framework provides the relevant legislation and policy under which DRR and emergency response management (ERM) activities in Bangladesh are managed and implemented. The framework is composed of the following.

2.4.1 Disaster Management Act (DMA) 2012

The DMA forms the legal basis to protect life and property, manage long-term risks from the effects of natural- and human-induced hazards and respond and recover from a disaster. *Disaster Management Act* creates the legislative framework under which disaster risk reduction and emergency response management are undertaken in Bangladesh.

2.4.2 National Plan for Disaster Management (NPDM)

The NPDM was introduced on 7 April 2010 for disaster management (2010–2015). It defines the systemic and institutional mechanisms under which disaster risk reduction and emergency response management are undertaken in Bangladesh. The plan outlines disaster management vision, strategic goals and conceptual frameworks. It establishes disaster management regulatory and planning framework and identifies priority areas for DDR and ERM. The NPDM outlines a simple model to DDR and ERM and the model has three elements. Defining and redefining risk environments is the first model which includes establishing the context, i.e. understanding the social, political and community environment, and identifying, analysing and evaluating hazards and risk and risk treatment strategies, i.e. what to do to the environment to ensure implementation of prevention, preparedness, response and recovery programmes. Responding to the threats in the environments is the third element which helps the GoB officials involved in disaster management to clearly articulate the difference between risk reduction and emergency response (GoB 2010d).

2.4.3 Standing Orders on Disaster (SOD)

In 1997, the SOD was adopted based on the traditional 'relief and rehabilitation culture', and later in 2008, it was revised when the DDR concept was taken into consideration. The SOD outlines the disaster management arrangements in Bangladesh, describes the roles and responsibilities of persons and organisations involved in disaster risk reduction and emergency response management and establishes the necessary actions required for the implementation of Bangladesh Disaster Management Model, e.g. defining the risk environment, managing the risk environment and responding to the threat environment (GoB 1997b).

The plan and conduct of disaster management by the GoB involve mitigation, preparedness, response and recovery. In case of disaster mitigation, the GoB gives importance to structural mitigation like construction of cyclone and flood shelters, costal embankments, drainage, channels, etc., and nonstructural mitigation, i.e. framing of legislation and policy, imparting training and creating public awareness

(Baten et al. 2010). As per SOD and NPDM, the Disaster Management and Relief Division (DMRD) of the Ministry of Food and Disaster Management is the focal agency for DRR and ERM that takes lead role in risk reduction and management planning process.

Disaster Management Bureau (DMB) under the Ministry of Food and Disaster Management is the focal point for disaster management in Bangladesh. To consider disaster management in its wider context, including preventive measures, preparedness and response to disaster, to remove the institutional weakness in managing disaster, to manage disaster more effectively and efficiently and support to comprehensive disaster management, GoB created DMB as plan development (Das 1997). The DMB is (1) a professional unit to perform in the field of disaster preparedness, local-level disaster action and contingency planning, awareness training and facilitating improved collection, (2) a focal point committed to enhancing regular dialogue and fostering cooperation at all levels on practical disaster preparedness matters, (3) a catalyst for planning and self-arrangements at local level for arranging public education campaigns and for organising the systematic officials and personnel from national to community level and (4) a support to existing structures and other units of GoB in training and supporting disaster management (Choudhury 1998).

The establishment of the following various committees at national, district, thana and union levels is the significant plan development of GoB for effective disaster preparedness: (1) National Disaster Management Council (NDMC), (2) Inter- Ministerial Disaster Management Coordination Committee (IMDMCC), (3) National Disaster Management Advisory Committee, (4) Earthquake Preparedness and Awareness Committee (EPAC), (5) National Platform for Disaster Risk Reduction (NPDRR), (6) National Disaster Response Coordination Group (NDRCG), (7) Cyclone Preparedness Programme (CPP) Policy Committee, (8) CPP Implementation Board (CPPIB) (9) Committee for Speedy Dissemination and Determination of Strategy of Special Weather Bulletin, (10) Committee for Focal Points Operational Coordination Group, (11) Coordination Committee of NGOs relating to Disaster Management, (12) Disaster Management Training and Public Awareness Task Force at national level, and (13) District, City Corporation, Upazila, Pourashava and Union Disaster Management Committee and Disaster Response coordination Group. Besides that, there are also Bangladesh Meteorological Department (BMD), for forecasting natural disaster like cyclones, droughts and storms; Bangladesh Space Research and Remote Sensing Organisation (SPARRSO), for providing satellite images; Flood Forecasting and Warning Centre (FFWC), for forecasting; and Cyclone Preparedness Programme (CPP), for creating massive public and capacity development activities for pre-disaster preparedness at households and community levels. For emergency response, the GoB has established Emergency Operations Centre (EOC) to get activated with the first information of disaster; EOC ensures there are services from the Armed Forces and NGOs in emergency and relief management system and Directorate of Relief and Rehabilitation operates relief activities for distribution to the disaster area. In case of recovery and immediate rehabilitation, the GoB has a detailed system for immediate and long-term need

assessment at the grass-roots levels where the local-level committees play a vital role in providing data/information in predesigned prescribed forms. Disaster Management Centre has also been established to assist the ministry and the government with the information during normal time, warning and activation and emergency response relief and recovery.

2.4.4 Bangladesh Climate Change Strategy and Action Plan (BCCSAP)

Bangladesh has extreme environmental vulnerability to climate hazards. Thus climate change policy is added as a new element in national policy. Climate change was started to become a policy issue to mainstream it within a disaster management framework, and in policy terms climate change was incorporated as one of the components of first Comprehensive Disaster Management Plan (2004–2009). The GoB prepared the BCCSAP in 2008 and revised in 2009 to provide strategic direction on climate change with basic themes to:

(a) Ensure food security, safe housing, employment and access to basic services including housing for the poorest and vulnerable society.
(b) Strengthen disaster management system to deal with frequent and severe natural calamities.
(c) Ensure existing assets like coastal and river embankments are well maintained and urgently needed infrastructure like cyclone shelters and urban drainage is put in place to deal with the future impacts of climate change.
(d) Give emphasis on Research and Knowledge Management to predict likely climate change impacts on sectors of economy and socioeconomic groups, to underpin future investment strategies, to get access into global thinking/development on science/research and to ensure best practices of climate change management.
(e) Evolve low-carbon development options.
(f) Enhance the capacity of governmental agencies, civil society and private sector to meet the challenge of climate change and mainstream them as part of development actions.

The major focus of the plan is on the research of the impacts of climate change on the macroeconomy and linkage between poverty and health to identify suitable interventions. The plan was outlined to establish a centre for Research and Knowledge Management on Climate Change to acquire the latest idea and technology from around the world which include agricultural research to develop crop varieties, better surveillance systems for new existing disease risk and improving early warning systems for natural disaster like cyclone, storm surges and floods. Since the adaptation of BCCSAP, the GoB strategy is to integrate climate change challenges and opportunities into the overall development plan and programmes involving all sectors and processes for economic and social development.

2.4.5 *Comprehensive Disaster Management Programme (CDMP)*

Bangladesh adopted CDMP that aimed to establish a mechanism which facilitated the management of long-term climate risk as part of national planning (GoB 2008). It is a multi-development partner programme which is jointly managed by Disaster Management and Relief Division (DMRD), the Ministry of Food and Disaster Management of Bangladesh and UNDP. CDMP-I was implemented last 2004–2009, and CDMP-II (2010–2014) was being implemented based on the achievements, experience and foundation laid during CDMP-I to strengthen national capacity to reduce risks and improve response and recovery from the impacts of disasters and climate change in Bangladesh through:

(a) Development of strong, well-managed and professional institutions able to implement risk reduction programmes and interventions at national level
(b) Rural and urban risk reduction through structural and nonstructural interventions, improved awareness of natural hazard and planning for natural hazard event
(c) Early warning and emergency preparedness
(d) Capacity building for mainstreaming DRR activities across the concerned as good as 12 ministries
(e) Generating information on climate change impact situations

CDMP is an integrated national framework for CRM and DRR to understand climate change risks and impacts as well as capacity building for assessing risks and analysing them with sectoral and cross-sectoral perspective and implications. CDMP advocates greater investment in DRR and CCA actions to protect losses of lives and assets. CDMP has been contributing to understand disaster risk reduction and climate change risks to well-being and development by empowering communities to identify and analyse the hazards and risks through Community Risk Assessment (CRA), a participatory and inclusive tool for risk reduction, poverty alleviation and sustainable development. Designing and implementing community-level DRR interventions based on 'Community-Level Risk Assessment', 'Risk Reduction Action Plans' (RRAP) has been identified as one of the main successes of CDMP (Haque and Haque 2009). Limited analysis and interventions at the household level were identified as one of the drawbacks of CDMP, and thus, in case of CDMP-II, it is recommended to consider that existing frameworks such as IFAD's Household Food Security Framework and Household Vulnerability Assessment Framework as a starting point to think through CRA and RRAP processes can bring benefit at the household level and also to consider mainstreaming disaster management, risk reduction and adaptation to climate change through on-going development programmes and projects under ADP to scale up and spread its concept of DRR nationwide in a cost-effective manner (Haque and Haque 2009).

2.5 Resilient Investment

Consulting the sixth FYP, it is identified that with the support of development partners, GoB, over the decades, has invested in:

(a) Flood management schemes for raising agricultural productivity in low-lying areas and protecting them from extremely damaging severe floods
(b) Flood protection and drainage schemes for protecting urban areas from rainwater and river water intrusion during the monsoon season
(c) Over 2,000 cyclone shelters for providing refuge to the community affected from storm surges by tropical cyclone and 200 shelters from river floods
(d) Comprehensive disaster management projects and early warning systems for floods and cyclones
(e) Coastal 'greenbelt' projects involving planting along nearly 9,000 km of the shoreline

These investments, no doubt, have improved the country's ability to manage risks, especially floods and cyclones, and community-based systems have been put in place. Thus, the number of fatalities from natural disasters has declined over the last 10–15 years (GoB 2010b, c).

2.6 Budget Size for Disaster Management

FYP is a guideline and a framework for taking decision on specific policies and project. Annual budget provides the framework for government receipts and expenditure and links the spending plans of the government to its policy objectives. Resources are allocated in the budget on the basis of priority to meet the strategic objectives. Both annual development programme and nondevelopment budget are the components of annual budget, whereas annual development plan (ADP) is the annual investment that aimed to establish a mechanism which facilitated the management of long-term climate risk as part of national planning and programme for financing the public sector investment of the plans. ADP is the short-term tool to make FYP operation. The size of ADP and its sectoral allocations are finalised by the Planning Commission (PC) of Bangladesh on the basis of budget. The PC acts as advisor to the government in respect of programmes relating to climate and disaster along with other issues. To carry out the strategies and programmes for climate change and disaster management over the fiscal year (FY) from 2009–2010 to 2011–2012, the combined budget of the GoB for annual development programme and nondevelopment budget was BDT 92,181.70 million. Besides that, a Natural Disaster Risk Reduction Fund was established in 2004 from the government revenue budget with an average allocation of BDT 890.00 million for disaster risk reduction and climate change adaptation (GoB 2012). Moreover, a good number of projects have been implemented by NGOs on DRR with direct external financing. However, a summary of budgetary allocation and financial review for the FY 2009–2010 to 2011–2012 is listed below:

(a) Climate-related budget for the FY 2009–2010 was BDT 26,749.60 million, out of which 17.7 %, i.e. 4,734.98 million, was for disaster management against 13 programmes.
(b) Climate-related budget for the FY 2010–2011 was BDT 34,334.47 million, out of which 16.9 %, i.e. 5,799.09 million, was for disaster management against 17 programmes.
(c) Climate-related budget for the FY 2011–2012 was BDT 31,094.28 million, out of which 18.2 %, i.e. 5,640.69 million, was for disaster management against 18 programmes.
(d) Total 669 ADP programmes and 180 nondevelopment programmes were identified as climate dimension managed by 37 ministries/divisions.
(e) A significant portion of ADP was committed to climate dimension programmes; it was as high as 53 % in the FY 2010–2011.
(f) Around 60 % of the budget for climate-related programmes was sourced in the development programmes.
(g) The GoB provided 77 % of the fund for the climate dimension programmes and foreign resource contribution was around 23 %.
(h) Commitment of resources to the disaster and climate dimension programmes has increased by 16 % (GoB 2010b, c, 2012).

These statistics illustrate the priority of climate- and disaster-related activities as key part of development and development planning in Bangladesh.

2.7 Review of Project Implementation

Sidr (2007) and Aila (2009), the two severest cyclones, struck the southern districts of Bangladesh with unprecedented fury causing severe devastation to millions of people in coastal areas. In this situation, July 2008, a project was taken up named 'Emergency Cyclone Recovery and Restoration Project' to support the GoB efforts to facilitate restoration and recovery from the damage to livelihoods and infrastructure caused by cyclone Sidr and long-term disaster preparedness. Just after the commencement of the project in May 2009, Aila struck. However, the project covers the restoration of agriculture in Sidr-/Aila-affected areas, improvement of multipurpose shelters and construction of new disaster shelters, rehabilitation of coastal embankments and strengthening of the capacity of government in disaster risk reduction management and preparation of future operations for the long-term risk reduction programme. Besides that, the project has a monitoring and evaluation component and a management component to support the GoB in coordinating all the project-related activities and provide emergency support for future disasters during implementation period of the project. The initial estimated cost of the project was USD209 million which has been increased to USD220.96 for accomplishing all the components of the project within December 2017 with GoB finance, IDA credit and loan and Global Facility for Disaster Risk Reduction (GFDDR) grant (Ahmad et al. 2013). The project has been reviewed in January 2013 which depicts that:

(a) Majority of the households reported increase in their income due to the intervention of the project. Ninety-seven percent of them reported increase in income due to crops input, 83.7 % for improved farming practices and 99 % for fisheries intervention.
(b) Rehabilitation of existing shelters is 100 % completed. Seventy percent of the households are aware of the location of both new and repaired shelters in their neighbourhoods; 54 % are satisfied as they are accessible to their homes, having adequate water supply, sanitation and electricity facilities.
(c) Repair and rehabilitation of coastal embankments for the prevention of saline inundation under normal weather and sustained crop production made possible by reducing cyclone damage is not fully completed. However, 88 % of households reported that on completion of work, protection of lives and properties will improve form flooding/saline water intrusion. Thirty-eight percent of households stated that they are within the embankment protection; 73 % feel safer due to repair construction works.
(d) In case of disaster preparedness, 89 % of the households reported that they are aware of the Emergency Warning System (EWS) being provided to the community. Sixty-six percent said that EWS is effective; 32 % opined that it is somewhat effective. Eighty-three percent indicated that disaster preparedness information dissemination is ongoing.

2.8 Impact Analysis

The plan, policy and investment programmes of the GoB have made significant improvement in reducing risks and in the capability of disaster management to the frequent disasters. The comparative analysis of the last three devastating cyclones, Gorky (1991), Sidar (2007) and Aila (2009), helps to understand the said improvement as summarised in Table 2.1.

The statistics stated below indicate that the losses of life including damages were remarkably reduced during Sidr than Gorky and during Aila than Sidr, which hints the improvement of disaster management capability of Bangladesh.

Table 2.1 Comparisons of loss in Gorky, Sidar and Aila cyclones

Event	Gorky (1991)	Sidr (2007)	Aila (2009)
(a) Death toll	138,882	3,406	170
(b) People missing	20,000	873	48
(c) People homeless	10,000,000	1,522,077	637,851
(d) Homes damaged	1,000,000	2,300,000	181,028
(e) Corps damaged	3.5 million acres	2.4 million acres	95,920 acres
(f) Areas affected	11 %	48 %	12.5 %

Source: Banu (2011)

In fact, disaster management is one of the essential elements of economic development of Bangladesh. Economic development is based on the manifestation of welfare and well-being of the people of the nation and thus public awareness and capability of disaster management is an indicator of national development (ADB 1991). Through an appropriate policy/programme on disaster management, the people get more facility to know the information about the reduction of loss/damages, health, sanitation, education, family planning, mortality, etc., which are basic indicators of development. People can be involved in the particular programme relating to economic development, once they are aware of disaster management, needs and priorities. Disaster management is helpful to enhance the competence and skill which has substantive impact in increasing GDP in many ways (Carter 1991). Due to the plan and policy guidance of the government, disaster management programme is increasing every year, and thus, the impact of disaster management on the economy is clear, evident and positive.

Disasters in Bangladesh are the most vital threat to the development, especially to the development of the poor and marginalised people. Thus the policy measures on disaster management need to improve further to face threat of disasters and climate change effect: strengthening disaster management committees and existing institutions, improving coordination mechanism in the field level, organising extensive public education and community mobilisation activities, improving early warning system, developing preparedness at all levels, establishing improved arrangement for damage and need assessment, emphasising both structural and nonstructural components on disaster management and promoting wider knowledge of disaster risk and inclusion of disaster risk considerations into all development planning.

2.9 Road Map for Disaster Management

A 'road map' (Haque and Haque 2009) is proposed for the GoB to facilitate wider, comprehensive and continuous disaster management into the national development planning process which is:

(a) Understanding disaster and climate risk: All the actors in planning and project development should understand how the disasters impact on Bangladesh and what are risks involved and aspects of well-being and development. Introducing well-planned modules in training and workshops and addressing climate and disaster risks may be useful for understanding and learning feedback into the performance of roles in disaster management.
(b) Contextualising risk in relation to sectors and concerned agencies/departments: Commitment among concerned ministries/departments/agencies to understand the extent of disaster risks and climate change's adverse impacts will affect their sectoral mandate and responsibility and their roles in disaster management and overall sectoral planning through FYP and ADP. They may have also skill to

identify problems and set targets/objectives including training and enhancement capacity for support services to contextualise risks to their respective functional jurisdiction.

(c) Exploring the range of risk reduction options in relation to mandated goals and targets: Understanding the impacts of disaster and contextualising risk, the concerned ministry/department/agency will review and assess the range of disaster risk and risk reduction options in relation to their sectoral goals and targets which are locally proven or learnt from practices and technologies proven elsewhere. However, the options should be broad, covering the risk management of every section of the society, and should be shared widely within the sector and to those who are directly or indirectly shareholders in planning and implementing the DRR and CCA options.

(d) Identify priorities, needs, gaps and cross- and inter-sectoral linkages: Concerned ministry/sector shall identify its priorities, needs and gaps in reducing climate and disaster risk which will be guided by the planning guidelines such as SODs, BCCSAP, FYP and annual and sector development plans. Authorities will undertake to address the gaps, needs and priorities over the time in the development planning, implementation and review processes.

(e) Planning to address priorities, needs, gaps and cross- and inter-sectoral concerns: Planning requires knowledge and understanding of development risks including risk from disasters and climate change, contextualised to respective sectors, identified range of risk reduction options, etc. However, sectoral planning shall require coordination with other sectors involved in disaster management to reduce risk out of disasters and climate change.

(f) Mobilising resource, internal and external: Integration of disaster risk reduction and climate change adaptation into development and sectoral plan requires budget and allocation of resources both internal and external. It may be considered additional resources in prioritising DRR and CCA activities, and thus, concerned authority should look into how much losses and damages are reduced by investing in DRR and CCA and integrating them into development plans and subsequent implementation.

(g) Implementing priority risk reduction activities as anticipatory interventions, address and needs and filling the gaps: This will address the priority risk reduction activities to implement the needs and fill the gaps as identified. The authority responsible for the implementation of sectoral plans, programmes and policies should understand rationality and requirement of additional investment and resources for DRR and CCA integration.

(h) Review and monitor disaster and climate proofing of activities and feedback: Concerned authorities should review and monitor progress of DRR and CCA activities in line with the plan programme and project. This feedback mechanism may facilitate enabling situation to bring necessary changes in planning process and operational practices.

DRR and CCA are to be integrated into development planning and policy with an aim to achieve the desired goal. A 'continual learning by doing and practice' approach is required focusing on national capacity to ensure development planning and implementation across all levels integrate climate change and disaster risk.

2.10 Conclusion

The National Plan for Disaster Management (2008–2015) addressed disaster risk reduction and climate change adaptation comprehensively in all development plans, programmes and policies. Priorities for disaster risk reduction and adaptation through assessment of climate change risk, community-based programmes for risk reduction, public awareness, improving early warning systems and communication facilities, and strengthening emergency response systems are the basic elements of the GoB's plans and policies. Bangladesh has made significant progress in shifting its focus from traditional 'relief and rehabilitation' to 'disaster risk reduction (DRR)' approach, which emphasises cost-effectiveness in DRR, and in establishing an institutional framework for DRR. But many of the plans and policies are yet to witness implementation.

Disaster management is considered a great concern for the government and people of Bangladesh. Disasters in Bangladesh may happen due to human-induced hazards and natural causes out of global climate change. Disaster risk is dynamic and changing, and thus risk reduction effort is critical. With this reality disaster management has become an integral of the government's long-/medium-/short-term plan. It is also included in the educational curriculum at primary, secondary and major training courses of all public training institutions. The Executive Committee of the National Economic Council (ECNEC) gave decision to include information on lessons learnt from the previous project as well as risk identification and risk mitigation in Development Project Proposal (DPP) and working paper for the ECNEC (GoB 2010a) which is a milestone policy decision to ensure the integration of risk management in the development activities of Bangladesh.

Over the years, Bangladesh has developed a considerable experience and expertise in managing disasters. Experiences have showed that appropriate policy on emergent preventive measures on the eve of natural disasters may minimise the loss of lives and properties. Thus, having disaster management as national priority, there is no other alternative but to take short-/ medium-/long-term plan/policy/programme to mobilise national resources on regular basis to face the challenge of disasters and climate change effects. A distinct policy and administrative reforms for effective disaster management will improve the capacity of preventing and mitigating disasters and facilitating emergency response and recovery on disaster event.

References

ADB (1991) Disaster mitigation in Asia and the Pacific. Asian Development Bank, Manila

Ahmad M, Ahmed B, Ahmed I, Anis M, Alam MH, Hossain T, Islam MR, Kazi S, Khokhar MSM, Manan KMM, Sayeed M, Selim S, Talukder S (2013) Emergency cyclone recovery and restoration project: mid-term review mission (un-published document). IMED, Ministry of Planning, Dhaka

Banu N (2011) Disaster management in Bangladesh: the experience of cyclone Sidar and Aila. Seminar paper presented in the 8th NAPSIPAG international conference on strengthening governance for mitigation and adaptation to climate change, Kathmandu, 15–16 Dec 2011

Baten MA, Kumar U, Masud A, Osman KS, Rahman MM (2010) Cyclone Aila: one year on. Unnayan Onneshan, Dhaka

Carter WN (1991) Disaster management: a disaster managers handbook. Asian Development Bank, Manila

Choudhury MA (1991) Cyclone in Bangladesh. Bangladesh Public Administration Training Centre, Dhaka

Choudhury MNI (1998) Disaster and its management: an over view of Bangladesh. Bangladesh Public Administration Training Centre, Dhaka

Das K (1997) Disaster management in Bangladesh and the role of Disaster Management bureau. Disaster Management Bureau, Dhaka

Government of Bangladesh (GoB) (1973) First Five Year Plan (1973–1978). Planning Commission, Ministry of Planning, Dhaka

Government of Bangladesh (GoB) (1980) Second Five Year Plan (1980–1985). Planning Commission, Ministry of Planning, Dhaka

Government of Bangladesh (GoB) (1985) Third Five Year Plan (1985–1990). Planning Commission, Ministry Planning, Dhaka

Government of Bangladesh (GoB) (1990) Fourth Five Year Plan (1990–1995). Planning Commission, Ministry of Planning, Dhaka

Government of Bangladesh (GoB) (1997a) Fifth Five Year Plan (1997–2002). Planning Commission, Ministry of Planning, Dhaka

Government of Bangladesh (GoB) (1997b) Standing orders on disaster. Disaster Management Bureau, Disaster Management and Relief Division of Ministry of Food and Disaster Management, Dhaka

Government of Bangladesh (GoB) (2008) Comprehensive disaster management program (phase-I). Disaster Management and Relief Division, Ministry of Food and Disaster Management, Dhaka

Government of Bangladesh (GoB) (2010a) Comprehensive disaster management program (phase-II). Disaster Management and Relief Division, Ministry of Food and Disaster Management, Dhaka

Government of Bangladesh (GoB) (2010b) Sixth Five Year Plan (2010–2015), part-1. Planning Commission, Ministry of Planning, Dhaka

Government of Bangladesh (GoB) (2010c) Sixth Five Year Plan (2010–2015), part-2. Planning Commission, Ministry of Planning, Dhaka

Government of Bangladesh (GoB) (2010d) National plan for disaster management (2008–2015). Disaster Management Bureau, Disaster management and Relief Division of Ministry Food and Disaster Management, Dhaka

Government of Bangladesh (GoB) (2012) Public expenditure for climate change: Bangladesh climate public expenditure and institutional review. General Economics Division, Planning Commission, Ministry of Planning, Dhaka

Haque MSS, Haque N (2009) Enhancing national and community resilience: integrating disaster risks reduction and climate change adaptation measures into development planning and processes in Bangladesh. Ministry of Food and Disaster Management, Dhaka

Chapter 3
Politico-Administrative Response to the Impact of Hydropower on Nature and People: A Case Study

Sanjeev Kumar Mahajan and Anupama Mahajan

3.1 Introduction

The eighteenth century thinkers were deeply concerned about increasing the living standards of the people and tried to evolve different theories to exploit natural resources, the study of which is now called Economics. The classical economists of the last century primarily analysed the extraction and use of material resources from the environment to enrich the nations. The economists who tried to improve the mundane life of people through an increase in material production have been acknowledged as worldly philosophers (Sarma 1996). It is a well-established fact that the economic activity revolves around the production and consumption of goods. Production means application of energy. An increase in energy reserves will lead to optimum utilisation of production capacities and a boost in economy.

3.2 Literature Review

To understand the issue of politico-administrative response to the impact of hydropower on nature and power, the existing literature on this topic was studied intensively as well as extensively, out of which a few are mentioned here.

HIMURJA (Pradesh Energy Development Agency) came up with a document which mentioned that since 1996, the state government of Himachal Pradesh

S.K. Mahajan (✉)
Department of Public Administration, Himachal Pradesh University, Shimla, Himachal Pradesh, India
e-mail: mahajan4949@gmail.com

A. Mahajan
Shimla, Himachal Pradesh, India

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had taken initiatives to bring the private sector into the picture to streamline its processes and procedures to reduce various sorts of problems arising in establishing hydropower projects (Urja 2014). The Himachal Pradesh Development Report talks about the state initiating a programme of restructuring the plan and centrally sponsored schemes so that unproductive schemes are either eliminated or merged to bring rationalisation and achieve results that commensurate with investment.

The South Asia Network on Dams, Rivers and People published a report on the socioecological effects of small hydropower development in Himachal Pradesh in which it highlighted the impact of privatised, small, run-of-the-river hydropower projects in Himachal Pradesh (Thakkar 2013). It is based on field research conducted in 2012 on all the 49 commissioned small hydropower projects in the state.

Lata Renu et al. (2013) in their article "Socio-economic impacts of Sorang hydroelectric power project in District Kinnaur, Himachal Pradesh, India", state that electricity is one of the key determinants for economic growth of a nation. Over the past decade or so, hydropower projects (HEP) around the world have attracted much attention concerning the environmental and social impacts that have arisen from such developments. Construction and operations of dams have always been associated with changes in the physical and biological environment.

3.3 Theoretical Framework

The availability of energy is an essential prerequisite for the development of all productive economic activities. Demand for energy increases considerably as the tempo of development takes momentum. The Indian experience shows unusually high income elasticity of demand for energy to the tune of 1.8 MW (Ghuman 1991). Unfortunately, India is not capable to meet their energy requirements. Inadequate supply of energy in relation to its demand has raised serious concerns (Singh 1983).

3.4 Research Methodology

The methodology followed in this article was basically utilising the secondary data stated by the government of Himachal Pradesh, nongovernment organisations and some informal interviews with officials held anonymously owing to their positions.

Broadly speaking, the central theme of this article remains twofold: (a) identification of alternative sources of energy and utilisation of energy as a tool of development in the Himalayan region of India in general and Himachal Pradesh in particular and (b) impact and benefits to the people of the state by developing energy resources. Hydropower has a significant role to play in economic development of Himachal Pradesh and its impact on the nature and people of the state.

3.5 Findings and Discussions

In today's world, carbon dioxide is released into the earth's atmosphere. The increased content of carbon dioxide increases the heat on the planet. This was named as the "global warming effect". This has resulted in adoption of technologies which are comparatively better in emitting no or less carbon dioxide. This concept of alternative energy is gaining more attention around the world. The demand of world's energy will have to be met from different sources like solar, wind and other possible resources.

It is a well-known fact that the climate change, population explosion, the depletion of a fossil fuels, etc. mean that alternative/renewable energy will have to play a greater role in the coming period. Alternative energy resources are also renewable sources of energy. Another advantage of this strategy is that it will also lower the carbon emission vis-à-vis conventional resources. In the background of this, hydropower will ensure the survival and development of the mankind in this century and beyond.

Himachal Pradesh has been blessed with the vast hydroelectricity potential in its five river basins, namely, Chenab, Beas, Ravi, Satluj and Yamuna. As per the preliminary hydrological, topographical and geological investigations, it has been estimated that about 23,000 MW of hydel potential can be exploited in the state by constructing various major, medium, small and mini/micro level hydel projects on these five river basins. The basin-wise details of the assessed actualised potential have been given in Table 3.1.

In order to harness the assessed potential, the state government has adopted the multipronged strategy for power development through different agencies. The detailed breakup of the total identified potential has been given in Table 3.2.

It is evident from the above-mentioned information that about 23,000 MW of hydro potential can be exploited in the state by constructing various major, medium, small and mini/micro hydro projects on these five river basins. Only 7,913 MW, that is, about one third of potential, has been harnessed by different agencies as

Table 3.1 Assessed potential

Name of projects	Capacity (in megawatt)
Chenab	2,973
Beas	5,339
Ravi	2,952
Satluj	10,355
Yamuna	811
Self-identified/new identified	570
Total	23,000

Source: Planning Department, Government of Himachal Pradesh Shimla (n.d.)

Table 3.2 Total identified hydropower potential

Sr. no.	Particulars	State sector HPSEBL/ HPPCL	Central/joint sector (MW)	Private sector		Total (MW)
				Above 5 MW	Upto 5 MW (through HIMURJA	
1	Projects commissioned	473	5,644	1,621	175	7,913
2	Under execution/construction	522	2,763	658	175	4,118
3	Under implementation/ obtaining clearances	538	66	929	520	2,053
4	Under investigation	2,088	775	3,331	367	6,561
5	Under litigation/dispute			1,035	12	1,047
6	Abandoned schemes in view of environmental and social concerns			690		690
7	To be allotted			618		618
Total		3,621	9,248	8,882	1,249	23,000

Source: Planning Department, Government of Himachal Pradesh Shimla (n.d.)

mentioned in the Table. In order to give a boost to hydropower generation, the government of Himachal Pradesh has come out with a policy document named Hydropower Policy 2006.

3.5.1 Main Objectives of the Hydropower Policy 2006

The development of Himachal Pradesh, as the "Hydropower State" of the country to provide an affordable as well as reliable quality power to the consumers round the clock throughout the year, is one of the main objectives of the policy document. This would lead to create avenues for employment to the residents of Himachal Pradesh in the power projects and at the same time mitigate the social, economic and environmental impact. The policy also takes care of the various stipulates of the *Electricity Act 2003* which seeks to promote competition, tariff rationalisation, removal of subsidies, strengthening of the regulatory institutions and providing indiscriminate open access to different users and to protect the interest of the consumers.

The principal objectives of the hydropower policy are:

- To speed up the power development in the state and achieve capacity addition of 9,000 MW by the end of the 11th Plan
- To generate and provide employment opportunities to the people of Himachal Pradesh
- To make power sector a major source of revenue to the state

- To secure long-term financial interests of the state
- To achieve financial turnaround and commercial viability of power sector
- To achieve development of local area by creation of Local Area Development Committee financed through power projects

Various other areas of focus of this policy were to establish and promote a power trading entity in the state; to provide indiscriminate access of electricity to all the households in the Pradesh in the immediate near future and to protect the interest of the consumer; to make available reliable, regular and quality power on demand at affordable rates in the immediate near future; to protect the rights of the local inhabitants for irrigation and drinking water requirement; to address the problem of ecological imbalance and environment degradation caused by implementation of the projects by adopting suitable remedial/mitigating measures; and to promote and provide continued support for development of renewable energy sources like SHPs, biomass, water mills, etc. (Department of Power 2006).

The purpose of the Hydropower Policy of the State Government is to develop the conventional forms of energy for meeting the growing energy needs of the society at an affordable price.

3.5.2 Hydroelectric Power and Its Impact on Economic Development

There is no doubt in the fact that electricity is a vital infrastructural element for economic development. The availability of electric power affects industries in rural as well as urban areas in two ways. Firstly, the traditionally operated industries gradually change over to electric power and, secondly, new industrial units operated by power come up (Bhagat 1993). It helps in accelerating the economic growth and achieving higher standards of living which depends on the availability of adequate and affordable power. It is well accepted that electricity, a major source of energy, is regarded as an important factor for bringing about radical change in the socioeconomic life of the community (Tiwari 2010).

In Himachal Pradesh, the successive governments over a period of time have attached a lot of importance to create and strengthen infrastructure facilities to raise economic development. On the other hand, power development has also played a significant role in promoting social conditions.

Himachal Pradesh is the first state in the country which has achieved almost hundred per cent electrification of villages which is conducive to the fact that the electricity connection has been provided to almost each household. Therefore, an effort has been made to establish a relationship between hydropower development and economic development in Himachal Pradesh. The information related to this has been furnished in Table 3.3.

It is evident from Table 3.3 that the generation of electricity during the period of study has been increasing every year resulting in power consumption in general

Table 3.3 Relationship between hydropower development and economic development

Year	State income		Per capita income		No. of registered factories	No. of workers	Total generation of electricity in state (MU)	Electricity consumption (in million units)	Industrial consumption (in million units)
	At constant prices (in crores)	At current prices (in crores)	At constant prices (in crores	At current prices (in crores)					
1999–2000	12,467	12,467	20,806	20,806	1,855	72,014	1,201.30	2,181.07	1,111.40
2000–2001	13,262	13,852	21,824	22,795	1,972	76,336	1,153.20	2,205.90	1,069.00
2001–2002	13,938	15,215	22,543	24,609	2,037	78,605	1,149.50	2,331.80	1,324.80
2002–2003	14,617	16,751	22,234	26,627	2,097	80,114	1,277.29	2,516.50	1,452.60
2003–2004	15,596	18,127	24,377	28,333	N.A.	N.A.	N.A.	N.A.	N.A.
2004–2005	21,189	2,1189	33,348	33,346	N.A.	N.A.	1,295.40	2,954.20	1,491.90
2005–2006	23,009	23,743	35,806	36,949	2,743	137,496	1,332.40	3,568.70	1,979.10
2006–2007	24,819	26,247	38195	40,393	3,060	168,544	1,432.40	4,300.40	2,553.50
2007–2008	26,247	28,872	40,143	43,966	3,357	194,019	1,864.90	5,028.70	3,100.40
2008–2009	27,649	33,115	41,666	49,903	3,657	218,309	2,075.10	5,460.50	3,558.30
2009–2010(P)	29,023	38,004	43,305	56,704	3,949	244,944	1,804.10	5,814.30	3,596.90
2010–2011(Q)	31,877	44,348	47,106	N.A.	N.A.	N.A.	2,045.30	6,440.20	3,993.70

Source: Department of Economics and Statistics, Government of Himachal Pradesh Shimla. *Statistical Outline of Himachal Pradesh* (various issues)
P provisional, *Q* quick, *MU* million unit, *N.A.* not available

and industrial consumption specifically, which is quite positive and significant. The increase in consumption of power in industrial sector leads to establishment of more factories (evident from Table 3.3). This results in more employment opportunities being created. So, all these factors lead to a higher state income and per capita income. This implies that development of power can promote socioeconomic development by creating a base on which a higher economic activity can be carried out.

This viewpoint was further strengthened by different studies carried out by researchers indicating how sufficient supply of electricity has helped significantly in improving the socioeconomic development of Himachal Pradesh.

3.5.3 Indirect Benefits

There are various indirect benefits, few of which are discussed here:

Industrial Development: There are a large number of factories established in Himachal Pradesh primarily due to easily available and cheap power made available by the government. This is clearly evident from Table 3.3. A significant trend noted in Himachal Pradesh is the conscious effort made towards developing industrial areas. This has led to an increased employment of people drawn from the areas around the hydro project. Hydropower is seen as the most important renewable energy source of electricity. With an increase in power generation, we find that more and more industries developed in this area.

Rural Electrification: The population of Himachal Pradesh, according to 2011 Census, is 6,856,509 (provisional). The rural population was on the higher side, that is, 90 %, and the urban population was 10 %. Though the urban population is increasing gradually, the rural population is associated with economic activities as part of the rural economy. The entire rural population is populated in or around 17,495 villages. Out of 17,495 villages, 17,290 villages, that is, 98.37 %, are electrified. Thus, the electrification of villages helped the development of the industries. On the other hand, it gave a psychological boost to people living in villages as electricity and its use is linked with a higher living standard.

Pisciculture: Development and construction of hydro projects does not appear to be related to the fisheries directly. However, fish breeding began after the creation of the reservoirs of different hydro projects. Fishing activity carries on throughout the year resulting in full-time employment of people in the fishing industry. This helps the people to earn livelihood by exporting fish. The government of Himachal Pradesh is actively engaged in developing the fisheries.

Tourism and Recreation: The large Govind Sagar Lake, Pong Lake, etc., formed as a by-product of building dams, have become a major tourist attraction. Annually, about 12.812 million domestic tourists and approximately half a million foreign tourists have visited different destinations and location of Himachal Pradesh during 2010. The number of tourists, both domestic and foreigners, is increasing

constantly with every passing year. Moreover, reservoirs are homes for its migratory birds that come from Siberia and other parts of the world. The green forests surrounding the lakes/reservoirs, the high hills all round, the fresh air and calmness provide an ideal environment to the tourists to enjoy the nature's gift. The government of Himachal Pradesh has done a commendable job by having water sports complex on the banks of the Govind Sagar reservoir. Recently, the government has initiated ecotourism as an impetus to its industry of tourism.

Generation of Jobs: It is a natural deduction of hydropower generation projects that more jobs are created for the local people, especially, living in remote rural areas. The 2006 Hydropower Policy aims at accomplishing the insurmountable task of employment generation for the local employable population. It is stipulated in the policy that 70 % of the project's workers must belong to Himachal Pradesh. This could be a major factor in developing this backward and hilly state and would also discourage migration of labour and youth to other states. The permanent regular workers receive the benefit of government-approved pension plans; compensation for work-related accidents and injuries is protected from arbitrary dismissal. The project developer is also required to register all workers with the Department of Labour and the local police station every month.

3.5.4 A Critical Take

Hydro projects are an absolute medium in developing the state. They have their shortcomings which are highlighted below:

(a) *Displacement of People*: Displacement of people from their traditional homes along with cultivable land due to the submergence caused by hydropower projects to create reservoirs for the projects has resulted in inconvenience to their families and loss of traditional means of livelihood of the displaced people. Even though the law provides for them, but not much has been done for people. The rates for their land taken over and compensation remain less than the requirement. Since hydropower projects cater to the electricity needs of local people, their needs must be taken into account. Settlements along the basin must be included in the planning of the project so that their livelihood is not lost.

(b) *Inadequate Impact Assessment*: It has been observed that a holistic impact assessment ascertaining the impacts on ecology, wildlife, flora and fauna has not been carried out adequately. The law or the policies itself are not enough until they are implemented in a way that benefit people.

(c) *Impact of Blasting and Tunnelling*: The massive blasting of hills for tunnelling work involved in the construction of projects has led to the drying out of water resources. The impact of tunnelling in the rocky areas located above and below tunnels and blasting on agriculture at fields and on residential areas is also sidelined. Better technological innovations can be utilised to avoid such environmental issues that will harm the habitat of that area.

(d) *Seismic Impact Undermined*: As per seismic nation map of India, Himachal Pradesh along with other states of India's North West is located in Seismic Zone IV which is one of the most seismically vulnerable regions. Normally, the Detailed Project Report referring to seismicity with respect to the structure of dams does not reflect the environmental issues/risks associated with the hydel projects vis-à-vis seismicity. This neglected issue can lead to an irreversible damage as a result of a disaster.
(e) *Influx of Nonindigenous Population*: The construction of these hydel projects in Himachal Pradesh has also led to an influx of migrant workers to carry out construction activities. This has led to pressure on the states' resources, destroying the local cultural practices and rituals. The social dynamics are shifting towards a new dimension.

3.6 Conclusion

Apart from the benefits to Himachal Pradesh rendered by the hydel power resources, the politico-administrative response to the criticism of large hydel projects needs to be evaluated in terms of cost-benefit analysis. The state of Himachal Pradesh has initiated many policies like Model Rehabilitation and Resettlement Scheme apart from the environment concerns. Hence, it is required that the political and administrative response should assess and evaluate all the possible negative impact on the people and nature of the state.

References

Bhagat RP (1993) Rural Electrification and Development. Deep & Deep Publications, New Delhi, p 15

Department of Economics and Statistics, Government of Himachal Pradesh Shimla. Statistical outline of Himachal Pradesh (various issues). Department of Economics and Statistics, Government of Himachal Pradesh Shimla

Department of Power (2006) Hydro power policy – 2006. Government of Himachal Pradesh, Shimla, pp 33–34

Ghuman BS (1991) Growth of Power Sector in Punjab. In: Mahajan VS (ed) Studies in Energy and Economic Development. Deep & Deep Publications, New Delhi, p 219

Lata R, Rishi MS, Kochhar N, Sharma R (2013) Socio-economic Impacts of Sorang Hydroelectric Power project in District Kinnaur, Himachal Pradesh, India. J Environ Earth Sci 2(3):54–61

Planning Department, Government of Himachal Pradesh Shimla (n.d.) Draft Annual Plan 2012–13. Planning Department, Government of Himachal Pradesh Shimla

Sarma RP (1996) Energy and Economic Development. In: Subudhi RN (ed) Energy, environment and economy. Kanishka Publishers and Distributors, New Delhi, p 92

Singh MM (1983) The Management of Industrial Change. Training Division, Department of Personnel and Administrative Reforms, Government of India, New Delhi, p 3

Thakkar H (2013) Uttarakhand: existing, under construction and proposed Hydropower Projects: how do they add to the disaster potential in Uttarakhand? South Asia Network on Dams, Rivers and People, New Delhi

Tiwari AK (2010) Hydroelectricity, Environment and Quality of life. Regal Publications, New Delhi, p 53

Urja A (2014) Renewable energy Development in Himachal Pradesh. Ministry of New & Renewable Energy, Government of India, New Delhi

Chapter 4
Where Is Disability in Disaster Management in India?

Vanmala Hiranandani

4.1 Introduction

The recent World Report on Disability estimates that people with disabilities constitute 15 % of the world's population and up to 80 % live in low-income countries (WHO 2011). More than half a billion people with disabilities live in countries which are often affected by conflicts and natural disasters (Atlas Alliance & CBM 2011). While natural and man-made disasters can affect entire nations or regions, the most damaging impacts fall disproportionately on marginalised groups, such as women and children, and people who are disabled, elderly or impoverished. Though there is limited data, evidence suggests that people with disabilities are among the most excluded and marginalised from both immediate interventions and longer-term recovery or rehabilitation programmes. Evidence reveals that at the onset of a disaster, emergency or conflict situation, people with disabilities are more likely to be left behind or abandoned during evacuation. Besides, disasters and conflicts often result in injuries and permanent impairments, creating a new generation of persons with disabilities with diverse rehabilitation needs. The Latur earthquake in Maharashtra in 1993 and the Gujarat earthquake in 2001, for example, resulted in a manifold increase of stress and trauma, amputations and paraplegia. People with mobility impairments able to flee subsequently become more dependent because wheelchairs and other aids were necessarily left behind. Individuals with disabilities are at particular risk of being separated from family members and usual caregivers in a disaster. Correspondingly, rates of morbidity and mortality are much higher among people with disabilities than the rest of the population. Yet, disability

V. Hiranandani (✉)
Global Health and Nutrition Program, Department of Rehabilitation and Nutrition, Metropolitan University College, Copenhagen, Denmark
e-mail: vanmala_hi@yahoo.com

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DOI 10.1007/978-81-322-2373-3_4

issues have been under-reported and have received sparse attention in the discourse, research, practice and policies in the arena of disaster management.

The recent United Nations Convention on the Rights of Persons with Disabilities (CRPD) ratified by India in 2007 mandates that all policies and laws in the country must be revamped to be in consonance with the rights-based approach enshrined in the CRPD. Article 11 of the CRPD on situations of risk and humanitarian emergencies accentuates the obligation of States Parties to undertake 'all necessary measures to ensure the protection and safety of persons with disabilities in situations of risk, including situations of armed conflict, humanitarian emergencies and the occurrence of natural disasters' (UN Enable 2012). As India prepares to table its new Rights of Persons with Disabilities Bill in line with the CRPD, this is an opportune moment to take stock of disaster management policies and practices to assess to what extent are they truly inclusive of disability issues.

This chapter draws from a larger study that reviewed existing research, policy and practice documents of government and nongovernment organisations in Canada, India and the USA to understand the ways in which disability has been addressed or overlooked in crisis situations in the three countries. Focusing on India, this chapter first provides a brief background by mapping the disaster management mechanisms in the country. The subsequent section presents findings pertaining to the following research questions:

(a) Is disability included in disaster management policy and governance mechanisms and in what ways?
(b) To what extent and in what ways have the needs of persons with disabilities addressed in various phases of disaster management, such as early warning, relief and response, mitigation, recovery and rehabilitation and preparedness and risk reduction?
(c) Is disability included in the training and education on disaster management?
(d) What gaps need to be addressed to ensure that disaster management is disability inclusive?

The methodology adopted is a review of secondary data, including research literature, government documents, manuals and training modules, publications and reports of domestic and international organisations, disaster management curriculum of reputed institutions and media reports of major disasters that have occurred in the country between 2000 and 2010. Persisting gaps are highlighted, and attention is drawn to rethink the concept of 'vulnerability' as it relates to disasters.

4.2 Disaster Management in India: A Brief Background

The policy framework on disaster management in India has undergone a paradigm shift from a relief-centric, reactive strategy to a holistic, multidimensional and multidisciplinary approach incorporating pre-disaster, prevention, risk reduction and preparedness aspects to mitigate the impact of disasters (GoI 2011). This new

approach draws from the conviction, at least on paper, that given the susceptibility of the country to natural disasters, development is unsustainable unless disaster mitigation and response is mainstreamed and built into the development process. Therefore, disaster management has come to occupy an important place in the country's policy framework. With increased funding to disaster management, training of first responders, development of school safety plans, integration of disaster management in school curricula and various short-term and degree programmes to enhance awareness and professional skills in disaster management have been implemented (e.g. NIDM 2013a; Thiruppugazh 2003; UNCRD and SEEDS India 2008).

However, the concepts, theories and practices of disaster studies are based on research largely undertaken during the past 30 years and are still in a nascent state of development, collection and synthesis. This is evident given that there are very few comprehensive disaster studies academic programmes in India and, also, given that any professional association of disaster and conflict researchers has yet to be formed.[1] There is a dearth of trained professionals equipped to deal with a variety of hazards in various stages; such paucity extends to those who can plan and implement a holistic and complete disaster-response programme. Moreover, disaster response in India has been marked by mismanagement, duplication and exclusion of affected communities. There is still much scope for institutional learning from prior experiences (e.g. Özerdem and Jacoby 2006; Ray 2005).

4.3 Disability and Disaster Management in India

Within this evolving arena of disaster management, the concerns of people with disabilities have historically been non-existent or, at best, relegated to the periphery. Estimated to be nearly 15 % of the world's population (WHO 2011), counts of persons with disabilities in India are ambiguous. For example, the NSSO (2003) reported a total of 18.5 million persons with disabilities in India, while the 2001 Census identified 21.9 million persons with disabilities (Registrar General of India 2001), constituting a 20 % difference in government estimates. Estimating the prevalence of disability in India has been hampered by deep-seated social stigmas that result in the exclusion and invisibility of individuals with disabilities. People with disabilities in India have historically constituted a significant proportion of the poorest of the poor and continue to face inequalities with regard to education, health care, employment and opportunities for social and community participation (e.g. see Hiranandani and Sonpal 2010; National Disability Network 2012). Although the

[1] Despite claims of disaster management as an interdisciplinary field, from the author's own experiences of teaching in disaster management in a reputed university in India, the divergence between natural and social sciences backgrounds of those engaged in disaster and conflict arenas has hitherto inhibited true interdisciplinarity.

effect of natural disasters and conflicts is felt even stronger by disabled people and their relatives, the exclusion of persons with disabilities in disasters is even worse than in everyday situations.

Despite India's ratification of the CRPD in 2007, neither the National Disaster Management Act nor the state and district disaster management plans have been revised to include disability. When resources are scarce in the immediate response and long-term recovery period, discrimination on the basis of disability has often been noted (GPDD and WB 2009). Early warning, evacuation, relief and assistance, protection and rehabilitation measures designed for the majority very rarely meet the specific requirements of those with disabilities. Information regarding timings and venues of aid distribution are often inaccessible for persons with visual and hearing impairments, which consequently increases their exclusion.

Illustratively, during the tsunami relief efforts, food was distributed on a first-in-line basis, making it difficult for persons with disabilities to access food and water, who were competing with non-disabled persons. Likewise, toilets in relief camps in Tamil Nadu state (southern India) were located too far from the shelters for persons with disabilities to use them (IDRM 2005). Indiscriminate and hasty amputations often by inexperienced doctors made the fitting of prosthetic limbs problematic, thereby hindering rehabilitation (Rajendra and Mitra 2008). These problems are by no means limited to the tsunami; they remain consistent challenges in other large-scale natural and man-made disasters. Due to lack of identification and referral procedures, poorly adapted services and limited access, hundreds of thousands of people with disabilities are effectively deprived of the humanitarian aid to which they are entitled. The tardy rehabilitation after the Latur, Maharashtra (western India), earthquake in 1993 resulted in a manifold increase of stress and trauma: many individuals who became paraplegic awaited a humane response for several years. The devastating Gujarat earthquake of 2001 resulted in thousands of cases of amputations, paraplegia and other impairments, with no proper plans for their short- and long-term rehabilitation (IDRM 2005).

However, after the 2004 tsunami, the Indian government has taken several measures such as the Disaster Preparedness Training for People with Disabilities, where 'disaster task forces' are trained in villages to help disabled people during natural disasters. Such task forces are also charged with equipping disabled persons with skills to cope, such as reaching a place of safety until the arrival of rescue teams (GPDD and WB 2009). Training of disaster relief personnel in accessible formats such as Braille, special computer software, audio versions, large print, use of sign language interpreters and production and use of communication tools is likewise planned (GoI 2012). Moreover, to ensure accessibility of amenities in relief camps, the government plans to undertake training of local builders and architects in universal design (GoI and UNDP India 2008). The central government recently partnered with the UNDP to formulate a toolkit to promote an understanding of the needs of persons with disabilities and thereby assist in mainstreaming disability in disaster management (GoI and UNDP India 2008). However, to date there is no assessment about the utilisation and implementation of the toolkit by different stakeholders.

A Disaster Risk Management Programme covering 17 states has been developed to address the concerns of disabled people in the planning process for preparedness and response by ensuring that segregated data is available to the evacuation, search and rescue and first aid teams for effective response (GPDD and WB 2009). This disaster preparedness plan involves data collection on the location of persons with disabilities in towns and villages at risk of natural disasters (GoI 2012). Nonetheless, such efforts at collecting data, just as in the census count of disabled persons, often get mixed responses from the disabled community due to the fear that registration mechanisms would entail privacy violations and intrusion by the government that can easily use the data for other purposes (GPDD and WB 2009). It is telling that disability is still overlooked in official documents on disaster management such as *State Level Programmes for Strengthening Disaster Management in India* (GoI 2011), *National Disaster Management Guidelines-Preparation of State Disaster Management Plans* (GoI 2007) and *Standard Operating Procedure for Responding to Natural Disasters* (GoI 2010). While children, women with infants and pregnant women are included in the Standard Operating Procedures, persons with disabilities are not. Likewise, the government's guidelines on management of earthquakes, floods, biological, chemical and industrial disasters, cyclones and droughts, nuclear and radiological emergencies and tsunamis (NIDM 2013b) are completely lacking in disability sensitivity. Despite the pivotal importance of accessible early warning and communication mechanisms for persons with disabilities, national guidelines on disaster management information and communication systems still fail to take into consideration accessibility concerns of the disability community.

The national guidelines on minimum standards of relief recently developed by the National Disaster Management Authority (NDMA) in consultation with various stakeholders mention disabled people as a 'vulnerable group' on par with other at-risk groups such as women, children, widows, orphans, older people and people living with HIV/AIDS (GoI 2012). Disability is claimed to have been 'mainstreamed' since the minimum standards mention people with disabilities. While the 'special needs' of persons with disabilities (e.g. separate food distribution points for easy access, construction of accessible toilets) are recognised as an important feature in the guidelines on some minimum standards of relief, disability is still dealt with separately rather than inclusively.

The absence of professionals in inclusive disaster preparedness, especially at the policy and planning levels, is another challenge, although disaster management as a discipline has received increased government attention and funding. While disaster education has made rapid strides in India, disability perspectives are absent in these curricula, contradicting the government's stated claim of mainstreaming disability in disaster management. Indeed, disability and inclusive disaster management are mentioned in only one publication titled *Let's Make Schools Safer* prepared by SEEDS, a nongovernmental disaster-response organisation (SEEDS India 2011). However, to what extent this book is used in government and NGO training programmes remains to be ascertained.

In a more positive vein, the National Institute of Disaster Management acknowledges on its website that 'disaster is a key development issue and an inclusive

disaster risk reduction framework is being advocated by all disaster management and disability management stakeholders through the world' (NIDM 2011, para 7). However, a review of NIDM-designed modules for the training of disaster management personnel across the country reveals a complete oversight with regard to disability. For instance, there is no mention of disability in the modules on school safety, urban risk mitigation, flood risk mitigation and management or district disaster management plan (see NIDM 2013a for various modules). In a training module on psychosocial care in disaster management, disability is cursorily covered in a 2-page unit titled 'Working with People with Disabilities' within the broader category of 'Working with More Vulnerable Groups' (NIDM 2009). Thus, despite the rhetoric of mainstreaming, disability is either non-existent within the training curricula of this apex national training institute or, at best, disability constitutes an add-on component wherein people with disabilities are still perceived as a 'vulnerable group' in need of 'special services'. Thus, instead of mainstreaming disability as a cross-cutting issue, the government's own training modules reinforce disability segregation.

4.4 Persistent Gaps, Neglected Areas, and Future Directions

One of the main factors in the exclusion of persons with disabilities from many humanitarian responses is the dearth of data. As previously mentioned, disabled adults and children are often stigmatised by families and communities. Often hidden from view, literally and politically, they are demographically non-existent and thus excluded from humanitarian interventions. For instance, after the 2004 tsunami in Prakasam District (Andhra Pradesh), people with disabilities did not have basic documents such as identity cards and disability certificates. Moreover, the district did not have any facilities to provide support services or aids and appliances such as prosthetics or hearing aids that can facilitate inclusion. In Chennai, the state capital of Tamil Nadu, persons with disabilities registered with local government agencies did receive some relief following the tsunami, primarily food, clothing and medical support. However, those who were not registered and those without a fixed address, such as migrant workers, did not receive any state support (IFRC 2007).

Oxfam, Handicap International and several other organisations have compiled registers of disabled people since the tsunami. However, the issue of registration, like disability definitions, is problematic. Many persons with disabilities are not willing to identify themselves as disabled for fear of becoming labelled and marginalised. Statistics based only on visible impairments can, thus, be inaccurate and reinforce perceptions that disabled people are few and access issues are therefore unimportant (Kett et al. 2005).

Since the 1970s, researchers have argued that the impact of a natural hazard depends not only on the physical resistance of a structure, but on the capacity of people to absorb the impact and recover from the loss. The focus has moved to social and economic vulnerability, with evidence that the impacts of natural

hazards vary for different social groups and countries. The understanding of causal factors of disasters has, thus, shifted from natural hazards towards development processes that engender different levels of vulnerability (ISDR 2004). However, persons with disabilities are still constructed as a particularly 'vulnerable group' based on traditional assumptions that their vulnerability arises from their physical, sensory or cognitive limitations that are tragic but unavoidable (Hemingway and Priestley 2006). Even India's new Rights of Persons with Disabilities (RPD) Bill, currently in its draft stage, is limited insofar as it alludes to disaster preparedness cursorily and makes no specific mention of accessibility in early warning systems, although it states the needs of people with disabilities must be considered in relief, rehabilitation and recovery. The underlying ethos of the RPD Bill is that people with disabilities in disaster situations constitute a 'special' and 'vulnerable population' whose safety and protection must be ensured.

The field of disability studies and the social model of disability have made it amply clear that disability is not simply a natural consequence of impairment (e.g. Oliver 1990). Limitations seen as arising from physical, sensory or cognitive impairments of the individual result from socially created disadvantages and exclusions. As reports from the tsunami and the Gujarat earthquake demonstrate, disabled people's lives were put at risk, not simply due to their limitations but by social and environmental factors, such as inaccessible buildings and facilities, the absence of specific evacuation plans, inaccessible warning information, the lack of accessible evacuation transport and, in some cases, the attitudes and actions of neighbours, staff and rescue workers (Hemingway and Priestley 2006; IFRC 2007). Despite references to 'inclusive disaster management' in several national and international documents, the needs of persons with disabilities are still often overlooked by disaster planners, and the disability community has little or no input into disaster risk reduction and planning.

Examining vulnerability from structural and socioeconomic dimensions reveals how social disadvantage, poverty, structural exclusion and inequalities make disabled people disproportionately more vulnerable to natural hazards. In a disaster, the needs of persons with disabilities often correspond to those in the general population in a disaster (e.g. water, sanitation, shelter, food). Nevertheless, at stake is how such services are provided and goods distributed. This is not to deny that people with disabilities have particular needs. However, to consider them only as requiring special attention is disempowering.

Compared to the efforts of government and mainstream development agencies, there has been considerable evidence of the readiness and capacity for disaster response among disabled people's organisations (DPOs) and community-based advocacy organisations. This is reflected in informal networks of support and communication and in specific forms of disability expertise that are not readily available within the mainstream disaster-response systems. As Hemingway and Priestley (2006) contend, disability organisations have been quick to fill the gaps by mobilising limited resources and peer-to-peer requests for support. Within hours of the 2004 tsunami, for instance, disability activists and their allies with Internet access generated global support through websites and global email networks. In

contrast to mainstream relief efforts, these grassroots initiatives were different in that they adopted an inclusive, rights-based approach, addressing structural and social barriers faced by disabled people.

Thus, experiences of the tsunami suggest that DPOs and informal networks have the expertise and capacity to respond in disaster situations, which must be strengthened and included at all levels of planning, prevention and disaster risk reduction. Persons with disabilities are best placed to inform policy and practice for their rehabilitation and removal of existing barriers to inclusion. Discussions with disabled people can improve the layout, facilities and organisation of emergency shelters. The disability community can train staff in disaster management organisations on planning and preparation, including drills and exercises. For instance, after the 1999 earthquake in Turkey, a programme to support deaf people was initiated by an NGO. A core group of deaf people were trained as disaster awareness instructors, who then travelled the country training others (IFRC 2007). IFRC (International Federation of Red Cross) also cites a research study after the 1989 California earthquake, which found that persons with disabilities had a psychological advantage which made them less likely to become injured or to panic during and after the earthquake because they negotiate with difficult physical and environmental barriers on a daily basis. Their experience of constantly overcoming barriers is a unique source of knowledge that can inform policy and practices to make disaster management more inclusive. In sum, disaster, risk reduction programmes must be developed in partnership with persons with disabilities, their support networks and organisations.

4.5 Conclusion

Systematic research on disability in humanitarian situations in India is almost non-existent. Where evidence exists, large-scale neglect, lack of accessible evacuation, relief and response systems and the denial of the right to life and dignity of persons with disabilities stand out as stark realities. Disability, if at all mentioned in government documents, is addressed from an individual model perspective, viewing persons with disabilities as a ‘vulnerable group’ or ‘special population’ with ‘special needs’. India stands at crossroads: while India’s Disaster Management Act 2005 completely overlooks disability, the country has ratified the CRPD in 2007. Although there was a huge impetus towards designing the Rights of Persons with Disabilities (RPD) Bill that attempted to align the nation’s laws with CRPD principles, the Bill was shelved with the appointment of the new government in 2014. It remains to be seen whether the RPD Bill will see the light of the day in the new administration.

Mainly, this paper has emphasised that the ‘vulnerability’ of persons with disabilities is a function of social, institutional and environmental barriers that they face, rather than their impairments. Unless socioeconomic exclusion and structural inequalities are addressed and rectified, persons with disabilities will continue to

be disproportionately affected in situations of risk and humanitarian emergencies. While disaster management research, policy and practice no longer view disasters as natural consequences of environmental hazards but as consequences of human actions, the conceptualisation of disability in social model terms has not entered this most important arena that affects the lives of disabled people in poorer communities living in situations of risk. Thus, it is imperative for disability studies to interface with disaster management to ensure the safety of and equity for disabled people in all stages of disaster response, planning, rehabilitation, recovery and preparedness. Moreover, the rebuilding of communities in post-disaster and post-conflict situations can and should be(come) a collective and transformative experience by improving opportunities for inclusion of persons with disabilities and bringing about a much-needed shift in societal attitudes towards disability.

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References

Atlas Alliance & CBM (2011) Disability in conflicts and emergencies – a factsheet. Available at http://www.cbm.org/article/downloads/71140/Fact_sheet_Disability_in_Conflict_and_Emergencies.pdf. Accessed 20 Aug 2012

GoI (2007) National disaster management guidelines – preparation of state disaster management plans. National Disaster Management Authority, Government of India, New Delhi. Available at http://nidm.gov.in/PDF/guidelines/sdmp.pdf. Accessed 12 July 2013

GoI (2010) Standard operating procedure for responding to natural disasters. Disaster Management Division, Ministry of Home Affairs, Government of India, New Delhi. Available at http://nidm.gov.in/PDF/manuals/sop_ndm_2010.pdf. Accessed 12 July 2013

GoI (2011) State level programs for strengthening disaster management in India. Government of India, Ministry of Home Affairs, New Delhi. Available at http://ndmindia.nic.in/DM-Booklet-080211.pdf. Accessed 3 Jan 2013

GoI (2012) Poised for change: first country report of India – draft. Ministry of Social Justice and Empowerment, Government of India, New Delhi. Available at http://disabilitystudiesnalsar.org/CountryReportLatest.pdf. Accessed 2 Jan 2012

GoI and UNDP India (2008) Mainstreaming disability in disaster management: a toolkit. Government of India and UNDP India, New Delhi. Available at http://www.undp.org/content/dam/india/docs/mainstreaming_disability_in_disaster_managementa_toolkit.pdf. Accessed 2 Jan 2012

GPDD and WB (2009) The impact of climate change on people with disabilities. Report of the e-discussion hosted by The Global Partnership for Disability and Development (GPDD) and The World Bank (Human Development Network – Social Protection/Disability & Development Team. Available at http://www.cbm.org/article/downloads/82788/E-discussion_on_climate_change_and_disability.pdf

Hemingway L, Priestley M (2006) Natural hazards, human vulnerability and disabling societies: a disaster for disabled people? Rev Disabil Stud Int J 2(3):57–67

Hiranandani VS, Sonpal D (2010) Disability, economic globalisation and privatisation: a case study of India. Disabil Stud Q 30(3/4). Available online at http://www.dsq-sds.org/article/view/1272/1302

IDRM (International Disability Rights Monitor (2005) Disability and early tsunami relief efforts in India, Indonesia and Thailand. International Disability Network/Center for International Rehabilitation, Chicago. Available at http://www.ideanet.org/cir/uploads/File/TsunamiReport.pdf

IFRC (International Federation of Red Cross) (2007) Disability and disasters: towards an inclusive approach. In: World disasters report 2007. IFRC, Geneva, pp 86–111

ISDR (2004) Basic terms of disaster risk reduction. Available at http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm. Accessed 10 Dec 2012

Kett M, Stubbs S, Yeo R (2005) Disability in conflict and emergency situations: focus on tsunami-affected areas. International Disability and Development Consortium, Woking. Available at http://www.iddcconsortium.net/joomla/images/IDDC/emergency/kar_tsunami_%20paper_05.pdf

National Disability Network (2012) Key issues of 120 million persons with disabilities in India. Universal periodic review – India. National Center for Promotion of Employment for Disabled People, New Delhi

NIDM (2009) Psychosocial care in disaster management: a training of trainers (ToT) module. NIDM, New Delhi. Available at http://nidm.gov.in/PDF/modules/psychosocial.pdf. Accessed 22 July 2013

NIDM (2011) Recent activities – international day of persons with disabilities – 3 December 2011. Available at http://nidm.gov.in/guidelines.asp. Accessed 22 July 2013

NIDM (2013a) Training designs and modules. Available at http://nidm.gov.in/tdesigns.asp. Accessed 22 July 2013

NIDM (2013b) Guidelines of NDMA. Available at http://nidm.gov.in/guidelines.asp. Accessed 22 July 2013

NSSO (National Sample Survey Organisation) (2003) Disabled persons in India, NSS 58th round (July–December 2002). NSSO, New Delhi

Oliver M (1990) The politics of disablement. Macmillans, Basingstoke

Özerdem A, Jacoby T (2006) Disaster management and civil society: earthquake relief in Japan, Turkey and India. I.B. Tauris & Co. Ltd, London, pp 71–92

Rajendra KR, Mitra G (2008) Disability and disasters: challenges and responses in South Asia. Empowered 3(4):9–12. Leonard Cheshire Disability South Asian Regional Office, Bangalore

Ray CN (2005) A note on disaster management bill, 2005. Econ Pol Wkly XL(47):4877

Registrar General of India (2001) Census of India. Available at from http://www.censusindia.net. Accessed 20 Jan 2012

SEEDS India (2011) Let's make schools safer. SEEDS India, New Delhi. Available at http://www.seedsindia.org/pdf/letmakeschoolssafe.pdf. Accessed 25 July 2013

Thiruppugazh V (2003) Training and capacity-building with the policy perspective of a rehabilitation program: experiences from Gujarat, India. Reg Dev Dialogue 24(1):30–38

UN Enable (2012) Convention on the rights of persons with disabilities. Available at http://www.un.org/disabilities/default.asp?id=150. Accessed 14 Aug 2012

UNCRD and SEEDS India (2008) Disaster education in India: a status report. Available at http://www.hyogo.uncrd.or.jp/school%20project/awareness/india_disastereducation.pdf. Accessed 23 Jan 2013

WHO (2011) World report on disability. World Health Organisation, Geneva

Chapter 5
Disaster Risk Management and the Role of the Armed Forces: Critical Analysis of Reactive Disaster Management in India

Ramanand N. Garge, Huong Ha, and Susie Khoo

5.1 Introduction

India is a country with a vast territory, a large population and unique geo-climatic conditions. Frequent hazards, like floods, cyclones, drones and earthquakes, are strong evidence of India's vulnerability to natural catastrophes. These have caused major disruptions to the socio-economic order of the affected local communities and led to significant economic, physical and human losses (Fritz 2014; Ray-Bennett 2009). The increase in the number of disasters and the growing trends of forms of disasters due to urbanisation, population explosion and continuous degradation of environment cannot be matched by the global efforts to curb or manage these disasters and their impacts. The recent high magnitude disasters have changed stakeholders' mindset and attitudes towards more proactive and integrated approaches to manage disaster risk.

Disaster risk management refers to attempts to ascertain the process of (1) recognition of hazards turning into disasters, (2) identification of its causes with further rectification via governance and public policy and (3) managing resources to address all aspects of emergencies in order to mitigate the impact of disasters (International Federation of Red Cross and Red Crescent Societies n.d.; Ministry of Home Affairs 2005a, b; Perrow 2006; Ray-Bennett 2009).

R.N. Garge (✉)
Research in Integrated Security and Environment, Plot No. 5, Kapish Apartment, Flat No. 6, 3rd Floor, Erandawane, Pune, 411004, India
e-mail: ramanandgarge@inforise.org

H. Ha
UON Singapore, Singapore & University of Newcastle, Australia
e-mail: Huong.Ha@newcastle.edu.au

S. Khoo
Ngee Ann Adelaide Education Centre, 97 Tank Road, Teochew Building, 238066, Singapore
e-mail: Susie.khoo@naa.edu.sg

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The Government of India (GOI) has taken various initiatives to respond to natural disasters. However, the response of the civil administration/authorities is often slow and inadequate, and the armed forces are very frequently requested to assist the civil administration to lead a relief-driven disaster management process (Shivananda and Gautam 2012). The role of the armed forces is unparalleled. Given their professional training and spirit to deliver and assist the communities, the armed forces always become the first choice of any state civil authorities in the event of disasters. The flood incidents in the state of Jammu and Kashmir in September 2014 once again highlighted the incompetence of the civil administration with regard to the handling of, let alone, preventing crisis situations (Raj 2008). This further raised many questions to be addressed; for example, (1) why did the civil administration fail to discharge their duty in the incidences of crisis? (2) Why did the National Disaster Management Authority (NDMA), as a key nodal agency, have to rely so abjectly on the armed forces (whereas the key role of the armed forces is certainly not to be responsible for disaster risk management)? and (3) Did the administrative heads of the disaster-stricken states perform the delegated tasks competently?

There are several arguments for and against the role of the armed forces in disaster risk management in India, and the legitimate stand over the deployment of the armed forces for disaster relief, rescue and recovery seems dominant (Smedts 2012). Some authors argued that the Indian armed forces should focus on their core competence in military preparedness and safeguarding of national interests and should not dilute their military effectiveness by excessive participation in disaster management role (Shivananda and Gautam 2012). Others advocate the status quo, i.e. the armed forces should participate in disaster relief, rescue and reconstruction (Leong 2008; Harvey 2009). There is also an alternative view that the over-reliance on the armed forces has blunted the capability of the Indian civil administration, and thus, restraining them from establishing integrated disaster plans encompassing local *tehsil* (an administrative division of India) (Shivananda and Gautam 2012). Although there are many research studies on disaster management in India in general, there is insufficient research on the role of the armed forces in disaster risk mitigation, relief and reconstruction.

To fill this gap, this paper (1) examines the current state of disaster risk management in India, (2) critically analyses the role of civil authorities and the armed forces in disaster risk management and (3) proposes solutions to improve the current state of disaster risk management in the context of India. The analysis has been based on the study of policy documents, the authors' views and the volunteer experiences of the first author with various relief operations and rehabilitation initiatives during and after disasters across India. While analysing disaster risk management in India, it is essential to demarcate the role of the armed forces, and the duties of civil administration during various stages of disasters, and emphasise the importance of training and development to build capacity of disaster management authorities, their teams and the public, regarding disaster risk reduction and management at various levels of administration.

This study is significant for the following reasons. Firstly, given the frequent occurrences of disasters in India, it is essential to identify risks, vulnerabilities, hazards and the role of different groups of stakeholders for effective disaster risk

reduction (Birkmann 2007). This can be achieved by developing a comprehensive approach of combined efforts of multidisciplinary teams encompassing key social, technological and economic aspects. Secondly, this study is inter-disciplinary in nature because it includes research studies on governance, disaster risk management and non-state participation. It also covers various issues associated with disaster risk management in all stages, i.e. pre-disaster preparedness and mitigation, disaster relief and post-disaster reconstruction. Finally, the views of different groups of stakeholders, including the armed forces, are incorporated in the discussion to (1) produce comprehensive findings and analysis of the disaster risk management process and (2) introduce best practices in pre- and post-disaster management, the analysis of the respective roles of authorities and responsibilities of the Indian civil administration and the armed forces would help to improve the current disaster risk reduction and management mechanisms in order to mitigate economic and human losses during and after disasters (Ray-Bennett 2009).

5.2 Literature Review

5.2.1 Disaster Profile of India

Due to the adverse critical impact of climate change, India is among the world's most disaster-prone areas. The classification of disasters varies since different organisations may adopt different criteria, such as the origin (natural or man-made), the physical phenomenon (earthquake, landslide, etc.), the magnitude, the intensity (major or minor), the types of hazard (geophysical, hydrological, biological, climatological, meteorological, etc.) and so forth (Below et al. 2009). In this regard, the GOI formed a high-powered committee in August 1999, and this committee was headed by J.C. Pant who adopted the origin as the main criterion for the classification of disasters in India (National Centre for Disaster Management 2002). The committee prepared a comprehensive model plan for disaster risk management at the district, state and national levels. The committee also identified 30 critical types of disasters and categorised them into the following five groups, namely, (1) water and climate disaster, (2) geological disaster, (3) biological disaster, (4) nuclear and industrial disaster and (5) accidental disaster (Bajpal 2008; Sriramachari 2004).

According to the Disaster Management Division of Ministry of Home Affairs (MHA), (1) about 85 % of the land area in India is vulnerable to multiple hazards, (2) 57 % of the land is vulnerable to earthquakes (high seismic zones ranging from III to V), (3) 68 % is vulnerable to drought, (4) 8 % is susceptible to cyclones and (v) 12 % is susceptible to floods and tsunamis (Ministry of Home Affairs 2011a, b). These make disaster governance more challenging and complex. The disastrous tsunami that struck the Indian continent in 2004 brought about a significant shift in the national strategy towards disaster management, i.e. from a reactive focus to a pre-disaster proactive approach which encompasses all the stages of a disaster management process (Ministry of Home Affairs 2011a).

5.2.2 Disaster Risk Management in India

5.2.2.1 The Current State Disaster Risk Management in India

The Yokohama Strategy and Plan of Action for a Safer World 1994, acceded by many member states of the United Nations and other signatories, highlighted that disaster prevention, mitigation, preparedness and relief are four key elements in any disaster risk management process (Ministry of Home Affairs 2005b; World Conference on National Disaster Reduction 1994). These components are consistent with the concept of sustainable development (World Conference on National Disaster Reduction 1994). In this regard, the GOI has considered disaster mitigation and prevention as the fundamental components of its development strategy as emphasised in the *Tenth Five Year Plan* (Planning Commission of India 2006, 2012). The plan stated that the development cannot be sustainable without disaster mitigation and prevention being built into the development process (Planning Commission of India 2006, 2012). This clearly highlights the need to recognise the differential vulnerabilities of different areas and different groups of stakeholders, especially in a vibrant country like India. It is crucial for disaster mitigation activities to be developed in association with pre- and post-disaster developmental policies (Winchester 2013). For this reason, there is a need to constitute a multilateral approach for comprehensive disaster risk management which can address all issues associated with the four elements of a disaster risk management process. As per Luan Enjie, the administrator of China National Space Administration, countries in the Asia Pacific and South Asian regions need to establish a regional coordination mechanism for space-technology-based disaster mitigation and solidify cooperation among national administrations (China Daily 2004). Luan further explained that all-weather and comprehensive space-oriented disaster mitigation systems should be further explored so that countries in the regions can share timely and accurate information (China Daily 2004). There is also a need for the development of a realistic approach to reduce the impact of disasters. This can be done by formulating new policies and new institutional arrangements that support effective actions and execution of such policies and arrangements, encompassing various activities with regard to risk identification, disaster prevention and mitigation, risk transfer, emergency preparedness and response, post-disaster rehabilitation and reconstruction (United Nations International Strategy for Disaster Reduction n.d.).

While analysing the framework and mechanisms of various countries, the authors observed that there has been increased awareness of stakeholders in some developing countries pertaining to the concept and systems of disaster risk management. These countries have made special efforts to streamline disaster preparedness, response mechanisms and disaster rehabilitation at all levels (Dasgupta 2007). Yet, it is a well-known fact that many other developing countries, including India, are not always well prepared to deal with natural disasters which has caused more damage and hindered the process of growth and development (Antukorala 2012). In other words, this lack of a well-developed action plan and its effective implementation is the rationale for increased losses of human and animal lives and property when disasters occur (Anand 2009).

The way in which the Indian civil administration prepared for disasters has also been the centre of many political and policy debates. The recent Jammu and Kashmir floods have highlighted the poor level of preparedness and execution mechanisms by the civil administration. On the other hand, the Indian armed forces and paramilitary forces, together with other law enforcing agencies, have always done a superefficient job when they are requested to assist the state civil authorities, especially during natural calamities. In this regard, a comparative analysis was done by Banerji and Singh (2013) to develop a hypothetical scenario-based impact assessment of disasters in India. On 11 March 2013, the northern part of Japan was severely demolished by a magnitude 9 earthquake (i.e. Tohoku earthquake), followed by a tsunami (Impact Forecasting® LLC 2011). Despite the highest level of disaster preparedness by the Government of Japan, the impact of the disaster was huge. About 25,000 people lost their lives, 50,000 people were missing, 250,000 people were homeless, and the preliminary economic and human loss was estimated at US$310 billion (Banerji and Singh 2013). A pressing question is what would happen to India if a similar disaster were to hit the country. This clearly highlights the need of a proactive approach pertaining to disaster risk management.

Given the experience gathered during the first author's volunteer field work at various disaster relief and rehabilitation operations in India, it is suggested that the history is the best guide to (1) learn and avoid mistakes, (2) avoid large-scale losses of human lives and property and (3) promote the culture of a proactive approach to disaster risk management. Kautilya, in his famous creation of 'Kautilya Arthashastra' in Book 4 – *the Suppression of Criminal*, clearly presented what should be done and should not be done prior and during disasters. Sutras 4.3.6–4.3.8, stated in Section 78, Chapter 3, on remedial measures when one is faced with natural disasters, explain that:

> In rainy season, villagers situated near water should live away from the level of the floods (4.3.6).
>
> They should keep a collection of wooden planks, bamboos and boats (4.3.7).
>
> They should rescue a person being carried away by the flood by means of gourds, skin-bags, canoes, tree-stems and rope braids (4.3.8).
>
> Those who do not go to rescue, the fine is twelve panas, except in case of those without canoes (4.3.8). (Bapat 2014, p. 16)

This demonstrates the importance of the cyclic procedure of a disaster management process with regard to relief, rescue, mitigation and rehabilitation, and individuals' responsibilities in extending a helping hand to disaster victims were clearly defined several years ago.

As mentioned previously, the devastating tsunami of 2004 that struck the Indian continent has shifted the mindset and attitudes of policymakers and administrators in India towards a more proactive approach to managing disasters. Prior to the 2004 tsunami, the government apparatus in India had never expected that a tsunami could occur in such a large magnitude (Banerji and Singh 2013). It is also observed that pre-disaster mitigation and preparedness measures to deal with disasters of this scale were almost entirely non-existent in India (Minhans 2013). Despite such a critical situation, for the first time, India did not accept any assistance and aid from

foreign governments (Gilligan 2012). It is noted that the Indian armed Forces have spearheaded relief operations not only within the country but also in the region, and they have earned a deserving appreciation for their contribution.

5.2.2.2 Role of Different Government Agencies in Disaster Risk Management in India

According to the Constitution of India, disaster risk management is a state subject. The state is responsible for undertaking disaster preparedness, response, recovery and mitigation measures. Despite such stipulated responsibilities, ambiguity existed in the current mechanisms for disaster risk management because the subject of disaster management was not mentioned in any of the three lists, namely, Union, State and Concurrent Lists, in the seventh schedule of the Constitution of India (Second Administrative Reforms Commission, Government of India 2007, 2009).

As a result of the frequent occurrence of natural disasters in the Asia Pacific region, there has been an increasing consensus among the states in India for setting up effective disaster management mechanisms which encompass all stages, i.e. prevention, mitigation, preparedness, response, relief and rehabilitation. The tragic aftermath of the 2004 tsunami served as a catalyst for change in stakeholders' mindset and behaviour towards disaster risk reduction in India. This, in turn, influenced the formulation, enactment and implementation of the India's *Disaster Management Act* of 2005 which was passed on 23 December 2005 (Government of India 2005). This act provides clear strategies and directions for both state and non-state sectors to prepare for and deal with disasters and creates a blueprint for the following three-tier mechanisms:

1 National Disaster Management Authority (NDMA) which has to be the role model or serves as a 'guide' for civil authorities at the state level
2 State Disaster Management Authority (SDMA) which is headed by the chief minister and district-level head(s)
3 Disaster Management Authority (DMA) which is headed by collectors/magistrates for executing tasks in various phases of a disaster management plan

The GOI expected that these civil authorities would perform their duties competently and make disaster risk reduction and management a proactive phenomenon rather than a reactive one (Government of India 2005).

The *Disaster Management Act* of 2005 stipulated the statutory provisions for the constitution of the National Disaster Response Force (NDRF). The NDRF was established in 2009 for the purpose of effective and specialised response to both natural and man-made disasters (Indian Disaster Knowledge Network 2009a). The NDRF comprises a force of 10 battalions of Central Armed Police Forces of India including three battalions each of the Border Security Force, Central Reserve Police Force and two battalions each of the Central Industrial Security Force and Indo-Tibetan Border Police (Ministry of Home Affairs 2009b).

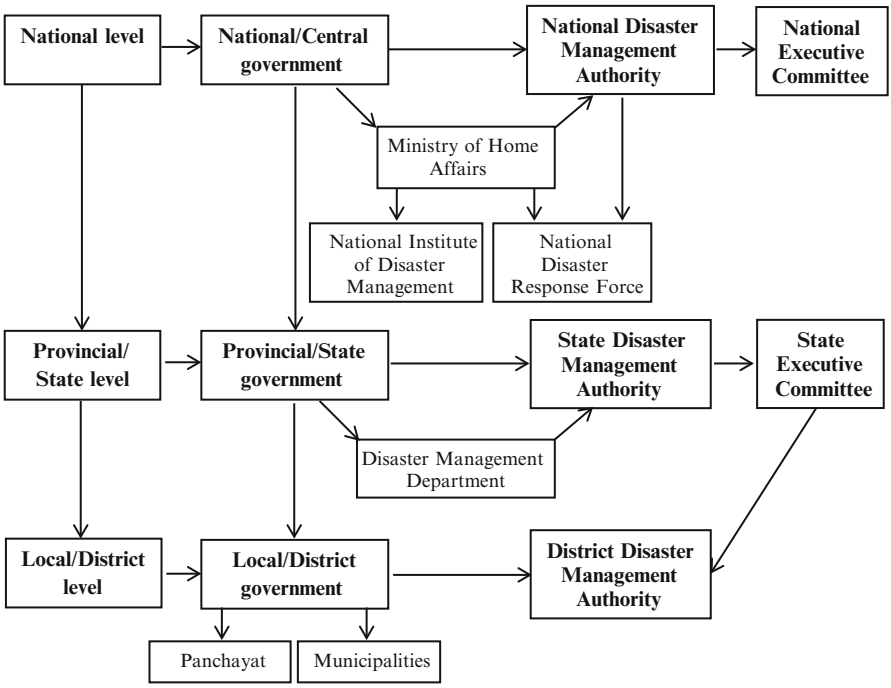

Fig. 5.1 The present disaster management institutional set-up (Source: Adapted from Indian Disaster Knowledge Network (2009b))

The MHA is the key nodal agency for coordinating natural disaster mitigation, relief and response and is in charge of the overall natural disaster management (National Disaster Management Authority 2009). As seen in Fig. 5.1, the MHA is supported by the NDMA, headed by the National Executive Committee (Union Cabinet Secretary). These authorities are bestowed with the responsibility of decision making and navigating through the functions of the crisis management group which is one of the principal authorities of relief operations. At the state level, the Disaster Management Department (DMD) is supported by the SDMA, headed by the State Executive Committee. However, the SDMA is yet to be operational across the country. Some states have changed the nomenclature of the existing departments, which are responsible for relief and rehabilitation, home guards and emergency fire services, to DMDs. These units are only provided with ad hoc human and physical resources when they need to respond to a disaster (Bandyopadhyay 2007).

Other nodal government agencies are also designated to deal with specific natural disasters. For example, the MHA, the Ministry of Earth Sciences and the India Meteorological Department are responsible for responding to earthquake, tsunami and cyclones. The MHA, the Ministry of Water Resources and the Central Water Commission have to handle flood-related issues. The Ministry of Agriculture deals with drought. The Ministry of Health and Family Welfare, the Ministry of

Environment and Forests and the Ministry of Atomic Energy have to respond to biological, chemical and nuclear disasters, respectively (Indian Disaster Knowledge Network 2009).

The National Institute of Disaster Management was established in New Delhi. Its main objective is to develop human resources and improve capacity building via training, research, documentation and policy advocacy (Indian Disaster Knowledge Network 2009; National Institute of Disaster Management 2013). Yet, considering the numerous vulnerabilities which India has faced, this current set-up is found to be grossly inadequate.

It is noted that when any natural or man-made disaster takes place in India, the armed forces (under the Ministry of Defence) is frequently deployed to support relief, rescue and/or reconstruction operations as part of their charter of 'aid to civil authority' (Dagur 2008, p. 16). Consequently, the dependency on the armed forces continues, whether it is to rescue a child from a bore-well or the relief operations during and post-tsunami or any other disasters of any scale (Oberoi 2013). As analysed by Colonel (Retd) P.K. Gautam about the involvement of the armed forces, the principle of the 'last to enter and first to leave' should be ideally applied in this case (Oberoi 2013). Yet, until today, in most post-disaster operations and rehabilitation processes, the armed forces have been the first to enter and the last to leave. This phenomenon can be observed in the recent Jammu and Kashmir flood incident as well (Gautam and Shivananda 2012). This practice is also evidenced via the information published in the annual reports prepared by the Ministry of Defence in which a separate section was dedicated to the armed forces for their aid to civil authorities (Ministry of Defence 2012). The comprehensive analysis of the policies and disaster-related legislation shows that technically, local and state civil administration should only request the armed forces' assistance if only a situation is out of their control, ability and capacity (Raj 2008).

Overall, relevant authorities need to conduct a comprehensive assessment of the scope and scale and seriousness of a disaster in a speedy manner in order to decide whether (1) a situation is beyond their control and (2) a request for assistance from the armed forces is necessary. This will help to facilitate the deployment of the required resources, including the support of the armed forces (Raj 2008). However, there have been either insufficient measures or mechanisms to assess the intensity and seriousness of a disaster or the assessment mechanisms have not been in place in India. As a result of these inadequacies, the state civil authorities have heavily relied upon the armed forces in all cases. This creates a further mire of the governance of civilian responsibilities.

5.3 Theoretical Framework

Disaster risk management is a complex and multifaceted task which cannot be addressed by any single sector, any single group or individual (Ha and Ahmad 2014). Thus, the theoretical framework of this chapter has been developed on the

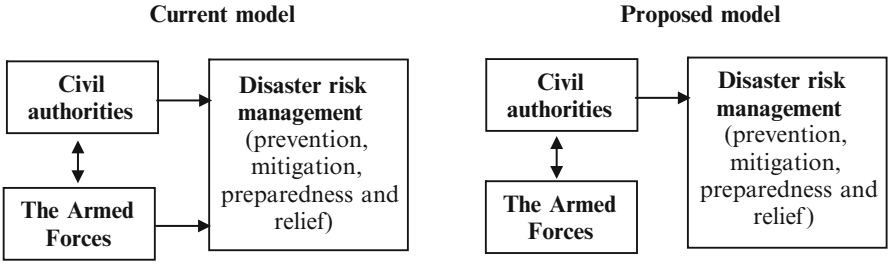

Fig. 5.2 The role of the armed forces in disaster risk management

arguments that disaster risk management is a collective responsibility of multi-stakeholders, including state, the private and civil society (National Council for Disaster Management n.d.). In the current situation, the state civil authorities have relied heavily on the armed forces to perform their duties regarding disaster risk reduction and management. While the armed forces has been considered as one of the stakeholders in disaster risk management, it is the civil authorities' responsibility to discharge their duties in disaster governance rather than outsource their responsibilities completely to the armed forces. Therefore, this study proposes that the armed forces should only play a supporting role to relevant civil authorities in pre-disaster risk reduction planning, disaster relief and post-disaster reconstruction (Fig. 5.2).

5.4 Research Method

This study is conceptual and explorative in nature since it reflects the views of the authors with regard to how disasters have been managed. The practical experiences gathered from voluntary humanitarian tasks and at the work place of the first author are also rich sources of information. Secondary data were obtained from various sources, including academic and nonacademic publications, reports and documents by supranational/intergovernmental institutions (e.g. United Nations, United Nations Office for Disaster Risk Reduction, etc.), government agencies (e.g. respective ministries and national committees in India) and nongovernment organisations.

The method of enquiry is to examine the role and activities of civil authorities and the armed forces in disaster risk management. The analysis will help to evaluate the level of support which the armed forces have played and should play in disaster reduction, relief, recovery and reconstruction. This article essentially explains who should be responsible for disaster risk reduction and management.

Content and policy analysis methods have been adopted to analyse the collected data. Firstly, the authors examined the current state of disaster risk management in India. Secondly, the authors identified the gaps via examining the respective

roles, responsibilities and authorities of different groups of stakeholders in disaster governance. In the final section, the authors recommended some solutions to improve the current state of disaster risk management, drawn from the lessons learnt from the case of India.

5.5 Findings and Discussion

5.5.1 Gaps Between Theory and Practice in Disaster Risk Management in India

This section discussed four key aspects regarding how civil authorities discharged their duty in disaster risk management. Firstly, the flood tragedy in Jammu and Kashmir and the Uttarakhand disaster indicated that the NDMA, which had been tasked to deal with natural and man-made disasters, did not discharge their duty competently, i.e. the NDMA did not perform its roles stipulated in the *Disaster Management Act 2005* (Union Government (Civil), Ministry of Home Affairs 2013). The delay in drafting and implanting a national disaster management action plan has created ambiguity pertaining to collaborative efforts and synergy among states. Coordination between the NDMA and key ministries is weak, and thus further improvement of coordination efforts is required (Union Government (Civil), Ministry of Home Affairs 2013). There are wide gaps between the prescribed roles/responsibilities and practices of the NDMA, the MHA and the National Executive Committee.

Secondly, The executive forces, at both central and state level are observed considerably inadequate since a considerable percentage of positions in the battalions of the NDRF, including specialist positions, are still vacant. Only Bihar, Odisha, Rajasthan, Gujarat, Maharashtra and Nagaland have raised their own State Disaster Response Force (SDRF) battalions, each with 1,000 personnel trained to rescue civilians in an emergency, as mandated by the NDMA (Unnithan 2013).

Thirdly, financial resources are the prerequisite for the execution of any legislation or policy. Hence, India has recently launched a National Disaster Relief Fund and a State Disaster Relief Fund based on the recommendation of the 13th Finance Commission, which is operational for a limited period of 5 years from 2010 to 2015 (Chakrabarti 2012). Yet, India has not introduced the National Disaster Mitigation Fund which led to constrains on major activities regarding disaster mitigation and preparedness. In addition, although the state civil authorities should be the first to respond to any disasters, only fourteen (14) states have submitted their disaster management plan to spend US$97.22 million dollars allotted to them (Auditor General of India 2013). Only eight (8) out of these states have raised money for the disaster management funds (Auditor General of India 2013). Regarding the infrastructure for disaster preparedness, India has one of the world's largest civilian remote sensing constellations. Eleven (11) satellites can detect a build-up of a

meteorological phenomenon in near real time (Ministry of Home Affairs 2005a; Unnithan 2013). The central authority taking care of disaster management, the NDMA chaired by the Prime Minister, has an annual budget over US$148.15 million (about 800 crore INR) (Ministry of Home Affairs 2005a). This central authority is expected to have strong coordination with the first responders of the crisis, i.e. state governments. Nevertheless, it is observed that the response to the recent Jammu and Kashmir floods and the Uttarakhand tragedy by the civil administration was painfully slow and ineffective (Ministry of Home Affairs 2005b).

Finally, trained manpower is one of the key determinants of an effective disaster management (Asian Disaster Preparedness Centre 2006). Yet, most of the state civil authorities are clueless with regard to human capital development since they were preexistent before the formation of the NDMA (Oberoi 2013). The state- and district-level authorities have done nothing to train their personnel to cope with different types of disasters. Most of the states in India do not have mobile hospitals or trained trauma management expert doctors who are desperately needed during any relief operations and play a crucial role in rehabilitation and mitigation of disaster impacts (Ministry of Home Affairs n.d.).

5.5.2 The Armed Forces and Disaster Risk Management in India

The primary tasks of the armed forces are (1) to defend India against external and internal threats and (2) safeguard the country's borders (Raj 2008). Intervening in civil affairs is not their main duty. The second role of the armed forces is to provide assistance to civil authorities which is considered as (1) one of the constitutional obligations and (2) one of the key elements of civil-military relations (Raj 2008). However, approaching the armed forces to aid civil authorities should only be an instrument of last resort to meet various contingencies when civil authorities are unable to perform their duty (Oberoi 2013). The armed forces should act as a second respondent if only all civil authorities' activities and supportive means, except in the incidences of nuclear, chemical and biological category (NCB), failed.

Principally, the armed forces should be the 'last to enter and first to leave'. However, in practice, they are the first to enter and the last to leave. The Indian armed forces personnel always become the first choice in the critical situations of disasters due to their high-quality training and effective execution of command, control and communication. The Mumbai rainfall on 26 July 2005 highlighted the growing tendency of civil administration to over-rely on the military. This, in turn, has effectively curtailed the initiatives, responsibility and accountability of the civil administration in times of disasters. The current operational locations of the armed forces vary from high-altitude regions to remote locations on hills, to sea and deserts and plateaus, forests and water-based locations. In any location or situation, the armed forces' personnel are known for their ability to readily and effectively handle disastrous situations.

With the introduction of NCB weapons, the armed forces have become a valuable asset because they have trained paramedics with extensive war experience and trained personnel on chemical, biological, radiological and nuclear aspects. The armed forces' personnel also have the capability of high-altitude rescue and possess watermanship skills.

The recent debate on disaster risk management also envisages the potential of a second front of youth organisations, such as National Cadet Corps and National Social Service Scheme, to support all community-based initiatives. These new members can be trained to handle disasters, except NBC disasters. While addressing a seminar on 'Disaster Management and the Armed Forces – A National Effort', the then Army Chief General S. Padmanabhan opposed the prolonged deployment of the armed forces in disaster relief and called on state-level governments to play a more important role (Padmanabhan 2002; The Tribune 2002). Padmanabhan said 'the state governments must carry out relief operations in a systematic way. Unfortunately, once the media cameras are switched off, people are left to fend for themselves' (The Tribune 2002, para. 2). He further explained that 'the bulk deployment of the armed forces in disaster relief works must be stopped in a fortnight's time and it may not be used for menial tasks ... such industries as those dealing with chemicals could be associated with the Territorial Army (TA) and separate battalions could be raised for disaster management' (The Tribune 2002, para. 3). In order words, the armed forces should focus on its primary role.

Overall, due to operational and resource constraints in the Indian context, the state civil administration will continue to depend on the armed forces for disaster response. Also, the armed forces often have to fill the lacunas in disaster governance and the vacuum in delivery mechanisms with their military 'spirit to deliver' and rigorous training. Further, it is observed that the state civil administration, most of the time, is ill-equipped for conducting such operations in an effective manner. Hence, there is a need to clearly demarcate the role of armed forces in disaster risk management.

5.6 Lessons Learnt from the Case

A few lessons have been drawn from the case of India regarding disaster risk management. Firstly, the Administrative Reforms Committee suggested that the military needs to be taken off from disaster management gradually (Gautam 2013). Prolonged deployment of the armed forces and military logistics may wear out protective equipment which is meant for the primary task of safeguarding and fighting wars (Shivananda and Gautam 2012). Thus, lack of suitable equipment will affect the capabilities of the armed forces with regard to performing their primary roles. Although the armed forces are undoubtedly strong enough to manifest efficient disaster management relief, that should not be a reason for the state civil administration to be overdependent on the armed forces.

Secondly, after every disaster in India, the relevant authorities do spend considerable time analysing the situations and responses. Yet, ironically very inadequate action has been taken to exterminate the weaknesses. This situation should be further improved in order to avoid waste of time, efforts and resources.

Thirdly, during rescue, relief and rehabilitation operations, the first author observed that civil society organisations (CSOs) are hugely divided, or mistrusted by the civil administration, or they simply are unable to respond to disasters in real time. The disasters, such as the Srinagar, Uttarakhand and Kosi incident in Bihar state, highlighted the need for stakeholders to be engaged in preparedness, relief and rehabilitation operations. Different groups of stakeholders should also be involved in constitution and effective execution of plans by the state government to reduce economic and human losses if such disastrous events occur.

Finally, information and knowledge are very important to any disaster risk reduction plans. In many disasters, the amount of economic and human losses was huge due to inaccurate and late information. In addition, apart from adequate investment in financial resources for supporting disaster preparedness, relief and reconstruction operations, it is critical to (1) provide formal education and training to professionals and personnel who are involved in disaster risk management and (2) identify target groups of young people/professional and train them under the capacity building programme so that they can be competent for disaster risk reduction.

5.7 Policy Recommendations

Disaster management is a self-motivated process involving many organisations, many stakeholders in different sectors working together to prevent, mitigate, prepare for, and respond to disasters and reconstruct after disasters. Although risk reduction and management is the collective responsibility of all sectors, different groups of stakeholders play different roles in this process, i.e. some organisations must take a leading role in risk reduction, whereas others should play a supporting role in this process. Therefore, there is an urgent need to reassess the role of the armed forces in aid to civil authorities with regard to disaster risk management. The following sections discuss what can be done to improve the current state of disaster risk management in India.

5.7.1 New Directions and Stakeholder Engagement

The *Disaster Management Act 2005* and *Disaster Management Policy 2009* have established clear institutional and policy mechanisms for disaster response, relief and rehabilitation (Alex 2006). They initiated change in the government's strategy and orientation from a relief centric approach to a holistic and multidimensional

approach. This approach embraces multi-stakeholders in all sectors (the public sector, the private sector and civil society) and encompasses diverse scientific, technical, social and financial processes in all the stages of disaster management (Ministry of Home Affairs 2009a). In this regard, the SDMA must be the architect of an effective disaster management action plan within the guidelines of the NDMA. The SDMA should work with relevant stakeholders to design and implement a comprehensive proactive approach to respond to disasters. In every district, town and village in India, there are nongovernment organisations (NGOs) involved in disaster and humanitarian crisis work. These organisations are willing to provide emergency assistance to the state and disaster victims. Thus, the government can utilise their services for capacity building and disaster relief and rehabilitation. However, the government should also provide financial and administrative support and training to such NGOs so that they can actively participate in disaster risk management at all levels.

Regional and international cooperation can only be facilitated when the basic infrastructure and adequate funds are available to cope with various types of calamities and disasters. Available infrastructure and equipment would allow civil authorities to deploy them immediately as one of the first responses for instant assistance and succour. Thus, separate budgetary allotment should be made available in order for state civil authorities to cover disaster management-related expenditure.

In practice, despite the availability of funds, resources and instructions from the central government and the NDMA, state governments in India are content with the staple policy '*call the Army*' when a disaster occurs. If state governments cannot prepare for and handle disasters without the armed forces' support, it can raise one or more TA battalions. Specially structured TA battalions can be recruited from and located at pre-identified sensitive locations as the first responders. They should be well trained and well equipped for the task. These service men with their local origins will have knowledge of the areas and would be able to respond to disasters effectively with the support of the local communities. Also, these trained staff can be utilised for training other personnel available in their localities. The state governments can also request the armed forces' assistance and expertise for strengthening the capabilities of civil authorities, including the SDRF. This action will enable the states to be self-reliant and reduce their dependence on the armed forces in disaster risk management. The states can prepare their own standard operating procedures (SOPs) in order to enhance the capability of state civil authorities and other disaster response forces for risk reduction. The SOPs should be consistent with and supported by legislative and regulatory mechanisms. There is a need to revamp policy and understand the consequences and its impact on the functioning of the armed forces.

An essential component of any emergency management mechanisms is effective command, control and communication which can navigate the effective execution of disaster risk management. As elected representatives of the citizens, policymakers must be at the forefront of handling all kinds of situations which affect public interest. The effective execution of a comprehensive disaster management process, adopting a scientific approach, can prevail over the impediments during a disaster

management process (de Ville de Goyet et al. 2006). These include a high level of centralisation in the decision-making process, insufficient leadership and political commitment, poor strategic and policy formation, weak enforcement and poor policy implementation, lack of ability to get actionable intelligence, lack of coordination among agencies and slow response of multiple agencies in dealing with crises.

In disaster-prone areas, state civil authorities can initiate multi-hazard mapping of their area of jurisdiction and maintain the database of details of stakeholders, who are affected by calamities, based on the vulnerability index (Ministry of Home Affairs 2005a). This will enable the civil administration to comprehensively and quickly assess whether they can manage all activities associated with disaster rescue and relief operations on their own or they need the assistance of the armed forces to handle such emergencies.

5.7.2 Knowledge Management and Training

Natural disasters cannot be totally avoided. However, risks can be better managed, and the impact of natural disasters can be better mitigated if information and knowledge are gathered and disseminated timely and accurately. This will enable relevant stakeholders to act accordingly. Thus, it is important for the GOI to (1) improve knowledge management via different channels, including electronic and print media, and social networking and (2) provide formal training and education for professionals, the public and other groups of stakeholders to enhance their resilience and capabilities to respond to disasters. The GOI can create a culture of disaster awareness and preparedness by conducting various educational campaigns mainly at schools and universities.

The GOI has to improve dialogue with academics, experts, researchers, professionals and nonacademic stakeholders and to bridge the gaps between policymakers and the rest. This healthy comprehensive participation would help the public and other stakeholders understand the hazards and improve their awareness of how disaster risk can be reduced in the long run. The GOI should (1) encourage public-private partnerships to mitigate risk and (2) promote active involvement of all sectors, i.e. government agencies, civil society and the private sectors, regarding knowledge management and training in the context of disaster risk management.

5.8 Conclusion

The rise in the number of natural disasters in recent years in both developed and underdeveloped nations has resulted in several humanitarian crises. Globally, many international agencies, such as the International Strategy for Disaster Reduction (2000), the World Conference on Disaster Reduction (2005), the Hyogo Framework

for Action (2005–2015) and the recent 2010–2011 World Disaster Reduction Campaign, have made important contributions to addressing such humanitarian crises. In India, institutional and policy frameworks are in place. Yet, there is plenty of scope for the civil administration to improve their performance without relying too much on the armed forces in the events of both small- and large-scale disasters.

Natural disasters cannot be completely prevented. Nonetheless, proactive measures can be adopted to reduce the impact of such disasters on the society, the economy and the environment. For this, the state civil administration in India should relinquish its traditional approach in disaster risk management, i.e. over-reliance on the armed forces. In the entire process of disaster management, not only the government or the armed forces but also all state and non-state stakeholders should share the common responsibility to respond to disasters and assist disaster victims.

This paper discusses how the state governments in India rely on the armed forces to perform their tasks pertaining to disaster risk management. A few lessons can be drawn from the case of India. Firstly, primary and secondary roles of each government agency should be clearly defined and observed. The armed forces should focus on their primary tasks and support the civil administration if only the latter has no ability to handle a particular disaster. Secondly, participation is one of the critical success factors in any disaster risk management process. Therefore, government at all levels should focus on creating and maintaining a participation culture where there are equal opportunities for non-state actors to involve in disaster governance. Participation is also one of the instruments for government to (1) build and foster trust with other sectors and (2) mobilise resources from other sectors in the governance process. Finally, training and education are imperative to enhance stakeholders' awareness of disaster risk and resilience to handle disasters.

In short, it is critical to continuously search for innovative approaches to improve disaster governance. Future research directions should focus on (1) measures to encourage non-state actors' participation, (2) how to effectively and efficiently utilise the support of the armed forces and (3) the degree to which each sector should involve in disaster governance.

References

Alex JP (2006) Disaster management: towards a legal framework. Indian Institute of Public Administration and UNDP, New Delhi

Anand R (2009) Disaster management and sustainable development: emerging issues and concerns, 1st edn. Pentagon Press, New Delhi

Antukorala P (2012) Indian Ocean tsunami: disaster, generosity and recovery. Asian Econ J 26(3):211–231

Asian Disaster Preparedness Centre (2006) Community-based disaster risk management. Asian Disaster Preparedness Centre, Bangkok

Auditor General of India (2013) Report of the Comptroller Auditor General of India on Performance Audit of Disaster Preparedness in India[Report No. 5 of 2013]. Ministry of Home Affairs, New Delhi

Bajpal A (2008) Disaster management: new approach. Pratiyogita Darpan 19(2008):1186–1188

Bandyopadhyay C (2007) Disaster preparedness for natural hazards: current status in India. International Centre for Integrated Mountain Development, Kathmandu
Banerji P, Singh N (2013) Comparative analysis of disaster management between Japan & India. J Bus Manag 13(6):62–74
Bapat A (2014) Disaster management in Kautilya Arthasastra. Aweshkar 17(1):13–21
Below R, Wirtz A, Guha-Sapir D (2009) Disaster category classification and peril terminology for operational purposes. Common Accord. Centre for Research on the Epidemiology of Disasters (CRED), Brussels, Belgium and Munich Reinsurance Company (Munich RE), Munich
Birkmann J (2007) Risk and vulnerability indicators at different scales: applicability, usefulness and policy implications. Environ Hazards 7(2007):20–31
Chakrabarti PGD (2012) Understanding existing methodologies for allocating and tracking DRR resources in India. UNISDR, Geneva
China Daily (2004) Satellites to be launched for better disaster management. China Daily 28:2004. Available at http://www.china.org.cn/english/environment/94185.htm (Accessed 12 Nov 2014)
Dagur OS (2008) Armed forces in disaster management a perspective on functional aspects of role, training and equipment. Manekshaw paper no. 4, 2008. Centre for Land Warfare Studies (CLAWS), New Delhi
Dasgupta R (2007) Disaster management and rehabilitation, 1st edn. Mittal Publication, New Delhi
de Ville de Goyet C, Marti RZ, Osorio C (2006) Natural disaster mitigation and relief. In: Jamison DT, Breman JG, Measham AR (eds) Disease control priorities in developing countries, 2nd edn. World Bank, Washington, DC, pp 1147–1162
Fritz A (2014) Tropical cyclone Nilofer explodes into category 4 in Arabian Sea. Washington Post, 28 October, p. newsite
Gautam PK (2013) Role of the Indian military in disasters. Institute for Defence Studies and Analyses, New Delhi
Gautam PK, Shivananda H (2012) Reassessing India's disaster management preparedness and the role of the Indian Armed Forces. J Def Stud 6(1):102–113
Gilligan, A (2012) India tells Britain: we don't want your aid. The Telegraph, 4 Feb 2012
Government of India (G.O. I.) (2005) Disaster management act, 1st edn. The Gazette of India, Government of India, New Delhi
Ha H, Ahmad A (2014) Bangladesh: natural disaster risk management. In: Ha H (ed) Land and disaster management strategies in Asia. Springer, New Delhi, pp 83–98
Harvey P (2009) Towards good humanitarian government: the role of the affected state in disaster response. Humanitarian Policy Group Overseas Development Institute, London
Impact Forecasting® LLC (2011) Tohoku earthquake & tsunami event recap report. Impact Forecasting® LLC, Aon Corporation, London
India Disaster Knowledge Network (2009a) Hazard profile. India Disaster Knowledge Network, South Asian Disaster Knowledge Network (SADKN), New Delhi
Indian Disaster Knowledge Network (2009b) Institutions. Available at http://www.saarc-sadkn.org/countries/india/institution.aspx. Accessed 12 Nov 2014
International Federation of Red Cross and Red Crescent Societies (n.d.) About disaster management. International Federation of Red Cross and Red Crescent Societies, Geneva, Switzerland. Available at http://www.ifrc.org/en/what-we-do/disaster-management/about-disaster-management/. Accessed 11 Nov 2014
Leong TK (2008) Humanitarian assistance disaster relief as a core military competency. EWS contemporary issues paper. United States Marine Corps Command and Staff College, Quantico
Minhans A (2013) Measurement of effectiveness and difficulty of traffic management measures in disasters. Jurnal Teknologi (Sci Eng) 65(3):41–51
Ministry of Defence (2012) Annual report. Ministry of Defence, Government of India, New Delhi
Ministry of Home Affairs (2005) Disaster management in India. Government of India, India
Ministry of Home Affairs (2009a) National disaster relief force. Ministry of Home Affairs, Government of India, New Delhi. [Online]. Available at http://ndrfandcd.gov.in/CMS/AboutUs.aspx. Accessed 13 Sept 2014

Ministry of Home Affairs (2009b) State level programmes for strengthening disaster management in India. Ministry of Home Affairs, Government of India, New Delhi. Available at http://ndmcindia.nic.in/DM-Booklet-080211.pdf. Accessed 16 Nov 2013

Ministry of Home Affairs (2011a) Disaster management in India. Ministry of Home Affairs, Government of India, New Delhi

Ministry of Home Affairs (2011b) UNDP – disaster management in India. Government of India, New Delhi

Ministry of Home of Affairs (2005) Report on disaster management in India. Ministry of Home Affairs, Government of India, New Delhi

Ministry of Home Affairs (n.d.) Guidelines for hospital emergency preparedness planning: GOI-UNDP DRM Programme (2002–2008). Ministry of Home Affairs, Government of India, New Delhi

National Centre for Disaster Management (2002) Report of high powered committee on disaster management. National Centre for Disaster Management, Government of India, New Delhi

National Council for Disaster Management (n.d.) National policy on disaster management. Ministry of Disaster Management Sri Lanka

National Disaster Management Authority (2009) National disaster management policy of India. National Disaster Management Authority, New Delhi

National Institute of Disaster Management (2013) Human resource and capacity development plan for disaster management and risk reduction in India. Government of India, New Delhi

Oberoi J (2013) Disaster management: why the army continues to take the lead. Independence Defence Review, 28(3): online. Available at http://www.indiandefencereview.com/news/disaster-management-why-the-army-continues-to-take-the-lead/. Accessed 12 Nov 2014

Padmanabhan S (2002) Disaster management and armed forces – a national effort. Delhi State Centre, New Delhi

Perrow C (2006) The disaster after 9/11: the Department of Homeland Security and the Intelligence Reorganisation. Homel Secur Aff II(1):1–32

Planning Commission of India (2002–2007) (2006) Disaster management – the development perspective an extract from the chapter in the tenth five year plan document, 1st edn. Planning Commission, Government of India, New Delhi

Planning Commission of India (2002–2007) (2012) Tenth five year plan. Planning Commission of India, New Delhi

Raj A (2008) Armed forces in disaster response: role reappraisal. Centre Land Warf Stud J (Summer 2008) 163–182

Ray-Bennett SN (2009) Multiple disasters and policy responses in pre- and post-independence Orissa, India. Disasters 33(2):274–290

Second Administrative Reforms Commission, Government of India (2007) Fifteenth report: public order. Second Administrative Reforms Commission Government of India, New Delhi

Second Administrative Reforms Commission, Government of India (2009) Fifteenth report state and district administration. Second Administrative Reforms Commission, Government of India, New Delhi

Shivananda H, Gautam PK (2012) Reassessing India's disaster management preparedness and the role of the Indian Armed Forces. J Def Stud 6(1):102–113

Smedts B (2012) The incremental role of the military in disaster relief: future prospects future prospects. Royal Higher Institute for Defence Centre for Security and Defence Studies, Brussels

Sriramachari S (2004) The Bhopal gas tragedy: an environmental disaster. Curr Sci 86(7):905

The Tribune (2002) Troops not for 'menial' jobs: Army chief. *Tribune News Service*, 11 September 2012. Available at http://www.tribuneindia.com/2002/20020912/nation.htm#1. Accessed 12 Nov 2014

Union Government (Civil), Ministry of Home Affairs (2013) Report of the Comptroller and Auditor General of India on Performance Audit of Disaster Preparedness in India. Report No. 5 of 2013. Union Government (Civil), Ministry of Home Affairs, New Delhi

United Nations International Strategy for Disaster Reduction (n.d.) Hyogo framework for action 2005–2015: building the resilience of nations and communities to disasters. United Nations International Strategy for Disaster Reduction, Geneva, Switzerland
Unnithan S (2013) Clueless on calamity. India Today, 5 July 2013
Winchester P (2013) Power, choice and vulnerability: a case study in disaster management in South India, 1st edn. Earthscan, New York
World Conference on National Disaster Reduction (1994) Plan of action for safer world, guidelines for natural disaster prevention. IFRC, Yokohama

Chapter 6
An Analysis of the Effectiveness of Implementing Public Awareness, Education and Training Programmes as a Risk Reduction Strategy in Disaster Management in Sri Lanka

R. Lalitha S. Fernando, M.W.M. Abeykoon, and K.M. Premathilaka

6.1 Introduction

6.1.1 Background of the Study

Sri Lanka is highly vulnerable to various disasters such as droughts, floods, cyclones, landslides and coastal erosions. Even though it is impossible to eliminate natural disasters completely, losses could be reduced through systematic disaster risk reduction strategies. The frequency and intensity of natural hazards have multiplied during the past few decades in Sri Lanka. There is a high probability of a disaster increase in the coming years due to climate change. When the frequency and intensity of disasters are increasing, people's expectation towards public safety through the government's intervention also increases. Any strategy for risk reduction should focus on community-based approaches through educational and public awareness programmes which could be considered as a more effective tool in building people's capacity of coping with disaster risks and reducing their vulnerability. Thus, public education is considered as a powerful strategy in disaster management as the community is regarded as both beneficiaries and also main actors in any risk management process.

Sri Lanka has prepared a *Disaster Risk Management Framework* in 2005 known as 'Towards a Safer Sri Lanka: Road Map for Disaster Risk Management' (Ministry of Disaster Management 2005). This framework consists of seven strategies, namely, (1) policy, institutional mandates and institutional development; (2) hazard, vulnerability and risk assessment; (3) multi-hazard early warning system; (4) disaster preparedness planning and response; (5) disaster mitigation and integration

R.L.S. Fernando, Ph.D. (✉) • M.W.M. Abeykoon • K.M. Premathilaka
Department of Public Administration, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura, Nugegoda, Sri Lanka
e-mail: lalithafernaando@gmail.com

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into development planning; (6) community-based disaster risk management; and (7) public awareness, education and training. This study focuses only on the 7th aspect of the *Disaster Risk Management Framework* in Sri Lanka since public awareness is considered as a main element of risk reduction in any disaster plan. The seventh strategy which is public awareness, education and training programmes consist of seven sub-strategies:

(a) Awareness through disaster safety day
(b) National public awareness programme
(c) Awareness through schools and school curriculum
(d) Awareness through continuing education or university education
(e) Training for government employees
(f) Training for emergency responders and enhancing training capacities
(g) Special awareness programmes

6.1.2 Research Objectives/Research Questions

The main objectives of this study are (1) to identify what are the activities carried out as public awareness, education and training programmes, (2) to examine whether those programmes were implemented as planned, (3) to identify the main problems and difficulties encountered upon the implementation of these programmes and (4) to propose guidelines for improving the implementation of the programmes.

6.1.3 Structure of the Paper

The first section of the chapter discusses the background and research objectives/research question of the study. The second section illustrates the review of the literature including the definition and meaning of the terms disaster and disaster risk management and the role of public education in disaster management and disaster risk management in Sri Lanka. The third section presents the methodology of the study. The fourth section of the study is the analysis and discussion. The final section summarises the key points, further research and limitations of the study.

6.2 Literature Review

6.2.1 Disaster, Disaster Risk and Disaster Risk Management

Disaster is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and

impacts that exceed the ability of the affected community or society to cope using its own resources (International Federation of Red Cross and Red Crescent Societies 2013). As per the United Nations International Strategy for Disaster Reduction (2009), disasters are often described as a result of the combination of the exposure to a hazard, the conditions of vulnerability that are present and the insufficient capacity or measures to reduce or cope with the potential negative consequences. 'Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation' (United Nations International Strategy for Disaster Risk Reduction 2009, p. 9).

Disaster risk attached to the 'potential disaster losses in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period. Disaster risk comprises different types of potential losses which are often difficult to quantify. With the knowledge of the prevailing hazards and the patterns of population and socio-economic development, disaster risks can be assessed and mapped' (United Nations International Strategy for Disaster Risk Reduction 2009). Disaster risk management is a multifaceted concept which embraces the broad areas of disaster prevention, mitigation, preparedness and relief (Institute of Policy Studies of Sri Lanka 2007). 'Systematic efforts have to be taken to reduce disaster risk through analysing and managing causal factors of disasters, including through reduced exposure to hazards, reduced vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events' (United Nations International Strategy for Disaster Risk Reduction 2009).

6.2.2 Role of Public Education in Disaster Management

Public education is considered as a powerful strategy in disaster management as the community is regarded as both beneficiaries and main actors in any risk management process. At the frequent and increased intensity of disasters, peoples' expectation towards public safety through the government intervention also increases. Nielse and Lidstone (1998) explained that 'governments are expected to provide the general public with safety and peace of mind, perpetuating the illusion that risk is controllable and manageable' (p. 14). Disaster managers adopt various strategies to minimise the potential risk of disasters. Among them, 'there has been renewal of focus, at both national and global level upon public education as a mean to disaster mitigation' (Nielse and Lidstone 1998, p. 14). The key approaches to public awareness and education for disaster risk reduction are campaigns, participatory learning, informal education and formal school-based interventions (International Federation of Red Cross and Red Crescent Societies 2011). If the community is acknowledged and educated through those approaches, peoples' participation in risk management could be enhanced.

The *Framework on Community based Disaster Risk Management in Vietnam* (McLaughlin 2010) introduces community-based disaster risk management (CBDRM) system in which at-risk communities are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities. If the community is educated through the educational and training programmes about the risk and how to minimise the potential risk, such community participation in the decision making and implementation of disaster risk management activities would become more effective. 'Capacities of local people are enhanced to help them assess the situation, identify risk reduction measures and implement them. Risk reduction measures include mitigation and preparedness activities before a disaster occurs as well as response and recovery activities during and after the disaster' (Burton et al. 2012, p. 24). Any strategy aiming for disaster risk reduction is required to address the main causes of disaster risk in order to reduce avoidable losses of peoples' lives and properties. In this context, public education in risk reduction is considered as a vital strategy.

6.2.3 Disaster Risk in Sri Lanka

Sri Lanka is affected by different kinds of natural disasters such as floods, cyclones, droughts, landslides and coastal erosion. Other localised hazards include lightning strikes, epidemics and environmental pollution. Earthquakes have been recorded over the past 400 years and the country is also exposed to various human-induced hazards which result from deforestation, indiscriminate coral, sand and gem mining and industrial pollution. The Indian Ocean tsunami of December 2004 has highlighted the country's vulnerability to low-frequency, high-impact events according to the Road Map for Disaster Risk Management in 2005 (Ministry of Disaster Management 2005). Table 6.1 shows the top ten disasters which occurred from 1963 to 2004. Droughts and floods were the frequent disasters which affected many people. In 1982, 1983 and 1987, nearly two million were affected by drought, although the number of deaths was negligible when compared to the 2004 tsunami where the number of deaths was recorded to be 35,399.

6.2.4 Disaster Risk Management in Sri Lanka

Sri Lanka has broadened its attention among Sri Lankan Government, civil society organisations and international agencies on disaster risk management after the severe losses caused by tsunami in 2004. The government has emphasised the importance of having a national-level comprehensive disaster risk management policy and institutional framework to mitigate the losses caused by frequent natural disasters. As a result, Disaster Management legislation and National Council for

Table 6.1 Top ten natural disasters – numbers affected

Disaster type	Date	No affected
Drought	1987	2,200,000
Drought	1982	2,000,000
Drought	1983	1,800,000
Flood	Dec 1983	1,250,000
Wave/surge	26 Dec 2004	1,019,306
Wind storm	24 Nov 1978	1,005,000
Flood	25 Dec 1969	1,000,000
Drought	August 2001	1,000,000
Drought	March 1989	806,000
Flood/landslides	17 May 2003	695,000

Source: EM-DAT: The OFDA/CRED International Disaster Data Base (http://www.em-dat.net) cited by Oxfam International (2007)

Disaster Management (NCDM) were established as the highest-level body under the leadership of the President of Sri Lanka. The Ministry of Disaster Management (2013, 2014) has been created to lead the strategic planning for disaster preparedness, response, risk mitigation and risk reduction. The Disaster Management Centre (DMC) has been established as per the Sri Lanka *Disaster Management Act No. 13* of 2005 to facilitate the implementation of these strategic plans.

The Road Map for Disaster Risk Management in Sri Lanka, prepared with the support of the United Nations Development Program (UNDP), is one of the first activities undertaken by the DMC, in collaboration with a range of stakeholders. Therefore, the road map will serve as the key document which guides the long-term direction of the Disaster Risk Management in Sri Lanka. The road map is focused on seven thematic components and under each of them, short-term, medium-term and long-term activities have been designed. Seven themes are included in the Disaster Risk Management Framework, namely, (1) policy, institutional mandates and institutional development; (2) hazard, vulnerability and risk assessment; (3) multi-hazard early warning system; (4) disaster preparedness planning and response; (5) disaster mitigation and integration into development planning; (6) community-based disaster risk management; and (7) public awareness, education and training. This paper examines the effectiveness of implementing the seventh strategy of the Disaster Risk Management Framework.

6.3 Methodology

This study is based on qualitative data. Observation and semi-structured interviews were conducted. Available videos of selected implemented programmes were analysed to assess the implementation success of those programmes. Semi-structured interviews were conducted by selected officials involved in the implementation

of those selected programmes. As secondary data sources, available plans, related documents, the *Disaster Management Act* in Sri Lanka, annual reports and publications of the Disaster Management Centre (2013) and other documents of the Ministry of Disaster Management in Sri Lanka were utilised. Data for the study gathered in relation to the disaster risk reduction activities conducted by the Disaster Management Center during 2006–2013. Content analysis and thematic analysis with substantial descriptions were involved in analysing the data. Thus, multiple methods (e.g. observations, videos, secondary data and interviews) were used to ensure the trustworthiness of the data.

6.4 Analysis and Discussion

It is evident that many attempts have been taken for putting those plans into actions. Almost all sub-strategies of the 7th strategy of the Disaster Risk Management Framework have been implemented, but some strategies were implemented partially. The following paragraphs examine how and to what extent these sub-strategies have been implemented and what are the main problems faced upon the implementation of those programmes.

6.4.1 National Disaster Safety Day

The objective of this commemoration is to increase awareness among the public on disasters as well as to create an attitudinal change to prevent and mitigate disasters and also prepare themselves particularly in response to disasters such as the tsunami that took place on the 26th of December 2004. This event is conducted on the 26th of December every year to commemorate the people who were killed in that devastating tsunami. The event has been arranged continuously for 7 years since 2006, and ceremonies have been held around Galle, Rathnapura, Kandy, Kurunegala, Jaffna, Batticaloa and Badulla. Many organisations such as Disaster Management Centre, ministries, media institutions, police and armed forces, fire brigade, government organisations and nongovernment organisations in disaster management are responsible for the implementation of Disaster Safety Day. The first Disaster Safety Day has been implemented in Ratnapura District even before the implementation of the road map in 2001 for the purpose of promoting public awareness, especially among school children, parents, teachers and the community. Ratnapura Disaster Safety Day was held to commemorate the people who lost their lives during the landslide at Helauda, Ratnapura, in 1994.

As per the road map, the first Disaster Safety Day was held in Galle in 2006 to memorise the catastrophic tsunami which took place in 2004 (Ministry of Disaster Management 2005). The second Disaster Safety Day was held in Ratnapura District in 2007 and the third was held in Kandy. The theme for this National Safety

Day commemoration was supporting human rights for mitigating disasters. For the year 2009, the same was held in Kurunegala District in conjunction with the District Secretariat and Provincial Council, and for the year 2010, it was conducted in Jaffna. The next Safety Day was held in Batticaloa on the 26th of December 2011 in collaboration with the District Secretariat, Batticaloa, and Urban Council, Kaththankudi. The objective of organising the National Safety Day was to remember all those who have lost their lives due to disasters and to create a culture of safety and disaster risk awareness among the general public, especially school children. Arrangements have been made to celebrate the National Safety Day 2012, centring around Badulla District under the main theme 'Towards a Safer Sri Lanka' through the subtheme 'be aware and prevent disasters' with the assistance of the Badulla District Secretariat (Ministry of Disaster Management 2006). Community, school children from selected schools, civil security services, rural disaster management committees and government employees participated in the event. On this day, several events such as a role play by school children and a march in collaboration with the participants had been organised to increase awareness in communities of natural hazards. It is evident that through the Disaster Safety Day, majority of the planned activities have been implemented.

Even though the aim of this Disaster Safety Day is to encompass nationwide awareness among the communities, it cannot be attainable as the programme was held in a specified area; the participation of communities from other areas is not practical. In many disaster safety days, more emphasis has been given for the potential risk of the tsunami; no awareness has been given for the potential risks of landslides, floods and other types of disasters or to funding.

6.4.2 Awareness Through Schools and School Curriculum

Separate sessions in relation to the disaster management have been incorporated into the school curriculum since 2007, such as life competencies and civic education, health and physical science, science and geography with the assistance of the National Institute of Education (NIE) (2013). From grade 6 to grade 9 in the science syllabuses, the most frequent disasters in Sri Lanka have been described, and mitigation activities before, during and after the disaster have been included in detail. In grade 6 syllabus, students are expected to acquire knowledge on several natural disasters such as floods, droughts, landslides, cyclones, lightning and tsunamis. In grade 7 syllabus, floods and landslides are explained to the students. Hurricanes, typhoons and tornados are described to the grade 8 students. In grade 9 syllabus, droughts and tsunami disasters are elucidated to the students. In grades 7 to 9 syllabuses, mitigation activities before, during and after the disaster are explained in relation to each disaster mentioned above. In health and physical education, grade 7 includes natural hazards and managing those hazards.

Challenges in facing natural hazards in schools and in the family are described under the grade 8 syllabuses. Grade 9 students are expected to learn pre-safety

methods in natural hazards, mitigation methods, facing natural hazards and rehabilitation. Grade 11 students are expected to study geography, learn natural hazards in the world, how they occurred, when they occur and other related problems. Also they learn natural hazards in Sri Lanka, such as landslides, cyclones, depression, droughts, floods, tsunamis and lightning, and how they occur, when they occur and their impact to the lives and livelihood of the people. In Life Competencies and Civic Education, environmental conservation methods are taught to the students. Under the advanced level geography syllabus, disaster management is described in detail to the students. Further, natural disasters in the world and natural disaster management in Sri Lanka are explained to the students. Under the Sri Lankan context, facing the hazard, assessing the danger, strategies in minimising the danger, creating awareness and early warning systems were discussed.

However, it was observed that there are several overlapping sections in the curriculum. For example, natural hazards taught to students are replicated. Grade 11 students who choose to learn geography will learn things that they learnt in science classes. As those sessions have been included as the final chapter in the syllabus, the focus and the time available to carry out those lessons seem not adequate.

At the school level, conducting teacher training on disaster management is another scheduled plan. Such training programmes are yet to be conducted by the responsible authorities. Even though several training programmes have been conducted by some District Secretariats for both children and teachers under the school disaster safety programme, the effectiveness of these programmes is problematic as these activities have to be properly coordinated by the Disaster Management Centre.

Few schools, those which have high potential for disasters, prepared a school emergency response plan. Those plans included how to react in a disaster situation. There are disaster safety committees in those schools to create awareness in other students in a disaster situation.

6.4.3 Awareness Through University Education

Disaster management subjects have been integrated into several undergraduate courses by three state universities at the undergraduate level and also short courses at the postgraduate level. Only three courses at the undergraduate levels are being offered presently under the Departments of Geography, Department of Public Administration and Department of Civil Engineering.

For the purpose of enhancing awareness among the university community, a certificate course, namely, ‘Certificate Course in Disaster Risk Management’, and a diploma course, namely, ‘Diploma in Disaster Management’, at the undergraduate level were introduced by two other universities. Several universities have introduced postgraduate level courses such as Masters in Regional Development and Planning, Masters in Science in Disaster Management and Postgraduate Diploma in Geographic Information Systems (GIS). However, it has been observed that capacity

building in disaster preparedness, GIS in disaster zones, modelling, oceanography, marine biology, coastal engineering and other health-related issues have not been adequately addressed by most of those programmes. Further, it is questionable whether adequate and qualified human and physical resources are available to conduct these programmes with more practical components.

6.4.4 Training for Emergency Preparedness and Response

It has been planned to establish a national training centre to train for emergency preparedness and response; necessary steps have yet to be taken to establish such a centre which requires a huge investment. Conducting training courses for operational-level staff including fire brigades is another planned activity. Evidence shows that several training programmes in this regard have been conducted. Forming 'volunteer emergency response teams' in both private and public sector organisations is another strategy, but the majority of these organisations have not organised and have no coordinated teams for the emergency preparedness and response. Even though the above activities have been set by the Disaster Management Centre, the partners needed to carry out these activities have not been clearly mentioned in the plan. Under this situation, the Disaster Management Centre faces a big challenge in achieving this wide spectrum.

6.4.5 National Public Awareness Programme

Under this heading, two programmes are being conducted at the district level and divisional level to create awareness about the activities of the DMC, the Ministry of Disaster Management, and about various disasters. The participants of these programmes were identified as school teachers, government officers, police, members of the army, navy and air forces, local authorities and schoolchildren. To coordinate these awareness programmes, a committee has been appointed by the Disaster Management Centre for each district, called District Disaster Management Committee headed by a district secretary and an assistant director of the District Disaster Management Coordinating Unit (DDMCU) who are working as convener and coordinator of the district disaster management committee. By conducting a proper need analysis, the required programmes for each district were determined by the district secretary annually. Based on the requirements, the Disaster Management Centre decides the number of programmes that they hope to conduct in the next year and approves them along with the estimated budget which is obtained through the national budget.

For the year 2007, the Disaster Management Centre conducted a considerable number of awareness programmes for divisional secretaries and officers attached to divisional secretariats of Anuradhapura, Kalutara, Kegalle, Kurunegala, Matale,

Nuwara Eliya, Mullaitivu, Kilinochchi, Polonnaruwa and Vavuniya Districts. The same programmes were conducted for elected members of Local Government Authorities of Kurunegala, Kuliyapitiya and Yatiyantota; Uva provincial councillors and officers; NGO participants in Ampara District in collaboration with the Green Movement; NGO participants in Anuradhapura District; youth corporative members of Polonnaruwa District; army officers of Welikanda Brigade; community leaders of Anuradhapura District; hospital staff of Matale Hospital for hospital preparedness; police officers in the Districts of Kegalle, Matale and N' Eliya; and provincial journalists of Polonnaruwa District. For the year 2008, several 1-day awareness programmes were conducted by the Disaster Management Centre for medical officers of the Central Province, Social Service officers, Land Use Policy Planning officers, and Vidatha Centre officers of Kurunegala District and police officers of the Ratnapura District. For the year 2012, the DMC with the DDMCU, district secretariat and divisional secretariat conducted 25 programmes at the district level (1 for each district) and 50 programmes at the divisional level (as 2 per district). The content of the awareness programme depended on the requirement of the participants.

For this purpose, the DMC designed two types of programmes, a common programme and a special programme. Under the common programme, awareness was created on all disasters and conducted through relevant DDMCU. The special programme was conducted for those who needed special awareness regarding a specific disaster, and these programmes were conducted with the assistance of the Departments of Meteorology, Irrigation, and Coastal Conservation, Sri Lanka Red Cross Society, and also the DDMCU. For the year 2013, a youth volunteer programme was conducted for the aim of enhancing awareness among youth in relation to first aid, camp management and search and rescue during a disaster situation. The volunteers are selected based on either to cover the vulnerability area or as a percentage to cover the whole district. In 2013, 20 programmes have been conducted island-wide. Throughout the period, national-level public awareness programmes focused only on government employees and not on the whole community.

6.4.6 Special Awareness Programme

Based on the level of exposure to a natural disaster, special awareness programmes have been scheduled for each disaster, for example, a 'boat handling training programme' for flood situations, an awareness programme for landslides, training for disabled people, an awareness programme for the fishery community regarding storm surges and a programme for fire safety in prisons. In 2010 a mobile training unit with sound systems and stage and video facilities was developed by the Disaster Management Centre as a special awareness campaign which is to be used in exhibitions and other public places with a large gathering all over the island. The programme was funded by the United Nations Development Program. A

'mobile training vehicle' was used to exhibit this programme in several districts in 2010. Recently, they have conducted an awareness programme for disabled children through the school teachers in Anuradhapura on disaster management.

It seems that the implemented special awareness programmes have developed a better focus by considering the community without any discrimination, specially the handicapped people among the community. Even though the Disaster Management Centre conducted a special awareness programme for disabled children in Anuradhapura, it is limited to few hours. A special attention was not given to the disabled community in a disaster situation. This is a huge gap identified in disaster management strategies implemented in the country.

6.4.7 Training for Government Officials

Under this category, several training programmes covering hazards, vulnerability, risk and disaster management, community-based hazard mapping, community-based risk assessment, participatory rural appraisal (CRPRA), evacuation planning and mock evacuation drills have been conducted by the Disaster Management Centre. For conducting programmes related to disaster communication improvement, the centre obtained assistance from the Sri Lanka Institute of Development Administration. A 1-day training programme has also been conducted by the Disaster Management Centre for the government administrative staff regarding disaster preparedness and response planning and also for the officers of the armed forces for those who are involved in disaster management.

Several training programmes were conducted for District Disaster Management Coordinators (DDMCs), assistant coordinators and staff affiliated with DDMCUs with regard to disaster management and participatory approaches to work at community level during the year 2006. They were also trained on how to conduct tsunami evacuation drills at the community level. Similarly, another programme has also been conducted for district coordinators and assistant coordinators to develop effective communication abilities with stakeholders. For the year 2007, the DMC conducted a training programme for all DDMCU staff members and seven 3-day workshops for newly recruited civilian district coordinators, coordinating assistants and military personnel.

In 2008, an induction training programme was conducted by the DMC at Rural Development Training Centre, Pilimathalawa, for newly recruited DMC staff, and a 2-day training programme was conducted on information technology and geographic information systems for assistant directors and assistant coordinators. In 2009, training of trainers programme on building codes was arranged for engineers and technical officers of government agencies in Ampara, Batticaloa, Trincomalee and Puttalam Districts with a participation of 32 personnel. In 2010, the Disaster Management Centre with the support of the UNDP Disaster Risk Management Programme organised a training programme on disaster risk assessment with special emphasis on coastal disasters. More than 25 officials from relevant agencies

were trained under this programme. In addition, for the same year, more than 75 government officers from the districts of Batticaloa, Trincomalee, Nuwara Eliya and Polonnaruwa were trained on the Incident Command System (ICS) which is a system used in efficient management of emergencies. Table 6.2 shows the other national-level training programmes conducted for public officers in 2010.

Under the training programmes for public offices, the Disaster Management Centre (2013) introduced a subject in the curricula to train the Sri Lanka Administrative Service and police officers. The Sri Lanka Institute of Development of Administrators which is the main training centre for the official of the government has included a separate module on disaster management in their annual training calendar.

It seems that many programmes for various types of officers have been implemented. Those training programmes on emergency preparedness and response which increased the capacity of government officials can be seen as a positive factor in increasing public awareness.

6.4.8 Enhancing Training Capacity

Through the assistance of donor agencies and foreign countries, the administrative staff, who are in charge of disaster management, have the opportunity to receive 1 year of foreign training. At least one officer has been selected to this foreign training in each year. In 2012, two officers of the Ministry of Disaster Management participated in overseas training programmes and/or seminars (Ministry of Disaster Management 2013).

Even though many programmes have been implemented under this strategy of public education, a lack of coordination between affiliated institutions is one of the major problems causing delays and replication of programme implementation. The Department of Meteorology, the National Building Research Organisation and the Disaster Management Centre function as separate institutions under the supervision of the Ministry of Disaster Management (2014). The National Disaster Relief Services Centre functions as a separate division. As several organisations are responsible for carrying out the programmes, proper coordination among these institutions is essential. However, poor coordination among the affiliated institutions reduces the effectiveness of the implementation. The performance report of the Ministry of Disaster Management (2013) also mentioned that some government institutions performed the same activity repeatedly in disaster operations and the poor coordination of various sub-organisations is the problem and obstacle encountered by the Ministry at the programme implementation level.

High focus on planning rather than on implementation is another issue. The Ministry of Disaster Management (2005) launched a plan called 'The Road Map for Disaster Risk Management in Sri Lanka' in December 2005. However, several strategies identified under the plan started operations in the recent past. Specially most of the programmes under *public awareness, education and training* have

Table 6.2 National-level training programmes conducted for public officers in 2010

Training module	Target group	No. of days	Date	No. of participants
Disaster management refresher training	Assistant coordinators of DMC	2 Programmes of 2 days duration	2, 3 Dec 2010	54
			9, 10 Dec 2010	
Guidelines on construction in disaster-prone areas supported by the UNDP, ADPC and Asia Foundation	Engineers, technical officers and lecturers from eastern province	2 Programmes of 3 days duration	17–19 May 2010	64
			30 Aug–1 Sep 2010	
Access database	DMC staff	5 days	September 2010	06
Training on Sri Lanka administrative service	Trainees of SLAS (Sri Lanka Administrative Services) and SLPS (Sri Lanka Planning Services Officers)	2 Programmes of 3 day duration	March 2010	08
Disaster management	Assistant superintendent of police	5 days	5–9 July 2010	106
Certificate course in Tamil language, University of Colombo	DMC staff	120 h (2 h per week)	Continuing	24
Incident command system supported by UNDP	Senior officers from districts of Batticaloa, Trincomalee, Polonnaruwa and Nuwara Eliya	2 Programmes of 8 duration	20–23 July	74
			17–20 Aug 2010	
			14–17 Sep 2010	

(continued)

Table 6.2 (continued)

Training module	Target group	No. of days	Date	No. of participants
Disaster management planning seminar supported by the US embassy	DMC staff, staff of stakeholder agencies	3 Programmes of 5 days duration	15–19 Feb 2010	25
			22–25 Feb 2010	25
			20–24 Sep 2010	43
Foreign training and workshops	DMC staff			14
Training on trainers programme on DM	Selected participants	3 Programmes of 3 day duration	10–12 Feb 2010	25
Save driving and first aid training supported by UNDP	Drivers of school van and private buses in Western Province	1 day	20 March 2010	3,000
SAVER command and control training	Staff of DMC and DDMCU	3 Programmes of 3 day duration	2–4 Aug 2010	20
			12–14 Aug 2010	
			16–17 Aug 2010	
Invest in future	School children and teachers	1 day	31 March 2010	500

Source: Disaster Management Centre (2013)

started its operations in 2012. The Ministry of Disaster Management and Human Rights (2006) launched another document called 'The Road Map for Disaster Risk Management in Sri Lanka – Volume II' in 2006 including over 100 detailed proposals. In 2012 a preliminary work of the Comprehensive Disaster Management Plan (2014–2018) was also commenced by the Ministry.

Fund allocation is another problem that affects the effectiveness of the plan. Due to limitations on allocation and distribution of funds, the intended objectives of the programmes have not been achieved as scheduled. Funds distributed to the relevant authorities were received quarterly. Hence, the programme implementation of the first quarter is impracticable due to not receiving funds on time. The implementing agencies received the required fund of the first quarter at the end of the first quarter. As a result, those authorities have to carry out both first and second quarter planned programmes in the second quarter.

6.5 Conclusion

It is highly uncertain to achieve the outcome of the overall plan even though it has been planned by 2015. The evidence shows that most of the sub-strategies under the public awareness education and training strategy have been implemented except for a few. The programmes under the awareness through school curriculum and university curriculum have been partially implemented. The proposed national training centre has not been established which was targeted under the emergency preparedness and response. A major weakness of this road map is the absence of proper indicators to evaluate whether the objectives of the plan have been achieved as intended. The plan has not precisely mentioned the responsible partners involved at each stage of implementation. In the plan, the expected outcome of some activities was repeated in other activities. Since there are a number of partners responsible for each activity, the plan has to specify the coordination among each party in order to avoid repetition. But it was not specified how each party's activity is going to be coordinated in order to avoid repetition, especially when implementing training programmes. The availability of the financial resources also was not specified, and even for some strategies, the allocated financial resources seem not to be adequate.

6.5.1 Recommendations

For all seven Disaster Safety Days, the attention was given for conventional methods to create awareness among the community such as speeches and poster presentations. However, during the day, it is important to confer hands-on demonstrations to understand the way they should prepare before and during the disaster. It is also important to launch parallel Disaster Safety Day programmes in a few other districts to achieve the nationwide awareness. When delivering speeches in relation

to disaster risk management, rather than presenting in informative way, the message should be spelt out in an attention-catching technique that blends both education and entertainment. Also, at the end of the day, feedback from the community should be taken to evaluate the success of the programmes.

There should be a national-level school emergency response plan since preparedness is an important aspect in a disaster situation. Principals, teachers and school children should be provided with the proper knowledge in order to prepare their own school emergency response plan. Since those subjects are incorporated into school curriculum and the training programmes are limited to only some districts, teachers should be trained by incorporating training sessions into their seminars and educational diploma programmes. The Disaster Management Centre should review the effectiveness of those programmes through proper coordination with the District Secretariats. School children should be utilised for community awareness programmes. A practical component should be incorporated along with the theories learnt in the class by creating videos in real-world examples. Also the importance of these topics should be highlighted to students; otherwise, they are seen as less important since they are in the final chapters.

Priority should be given at the university level to introduce disaster management subjects in the undergraduate level. Training programmes in relation to disaster preparedness and mitigation should be given to university undergraduates and lecturers. Once they join the public or private sector, it will be a better mechanism to create awareness among those organisations. It is necessary to recruit and train instructors, and also resources have to be provided to carry out those subjects in a more practical manner.

It is advisable to search for an existing community center instead of establishing a national level training center as mentioned in the plan which requires a huge investment. As there are Disaster Management Centres in each district, the officers in those training centres could be trained for emergency response, and through them communities and school children could be trained. From public and private sector organisations, teams should be selected and trained for emergency responses. Officers in local governments should be given the required training as the local governments play a central part in disaster management.

There is a possibility of using appropriate Information and Communication Technology (ICT) for the implementation of those programmes. This could enhance the cost effectiveness of the programmes.

6.5.2 Limitations of the Study

Based on several interviews of selected implementing officers, observation of videos related to implemented programmes and review of the official documents related to educational awareness on disaster risk reduction, this study investigated and identified the programmes for disaster awareness education and training, the means of programme implementation, whether those strategies were implemented

as scheduled and the issues and problems of implementation. The beneficiaries of any public education and training programmes are the communities which are affected by various disasters; their feedback is essential for the evaluation of the effectiveness of any programme. The input of the community feedback has not been incorporated in this study. This is a major limitation of this study. The rest of the strategies of the Disaster Risk Reduction Framework were not studied here, due to time, resources and other limitations.

6.5.3 Further Research

Further research can be conducted to examine the effectiveness of public awareness, education and training programmes with the inclusion of participants/beneficiaries of those training programmes as per the 'Road Map Towards a Safer Sri Lanka: Disaster Risk Management' (Ministry of Disaster Management 2005). Further policy evaluation can be conducted by incorporating seven strategies in the *Disaster Risk Management Framework*.

References

Disaster Management Centre (2013) Sri Lanka National progress report on the implementation of the Hyogo Framework for Action (2011–2013). Available at http://www.preventionweb.net/files/28829_lka_NationalHFAprogress_2011-13.pdf. Accessed 21 Oct 2013

Institute of Policy Studies of Sri Lanka (2007) Disaster management and policy and practice in Sri Lanka: sharing lessons among government, civil society and private sector, vol 11, Environmental Economic Policy Series. Institute of Policy Studies of Sri Lanka, Oxfam, pp 13–30

International Federation of Red Cross and Red Crescent societies (2011), Available at: https://www.ifrc.org/Global/Publications/disasters/reducing_risks/302200-Public-awareness-DDR-guide-EN.pdf

International Federation of Red Cross and Red Crescent Societies (2011) Available at: https://www.ifrc.org/Global/Publications/disasters/reducing_risks/302200-Public-awareness-DDR-guide-EN.pdf

McLaughlin K (2010) Framework on community based disaster risk management in Vietnam. Centre for International Studies and Cooperation, Montréal

Ministry of Disaster Management (2005) Towards a safer Sri Lanka: a road map for disaster risk management Dec 2005). Ministry of Disaster Management, Government of Sri Lanka, Colombo. Available at http://www.dmc.gov.lk/Publications/Roadmap%20Vol.1.pdf. Accessed 7 Nov 2014

Ministry of Disaster Management (2013) Annual performance report 2012. Available at http://www.parliament.lk/papers_presented/18062013/performance_report_ministry_of_disaster_management_2012.pdf. Accessed 14 Oct 2013

Ministry of Disaster Management (2014) Strategies to address the needs of the victims of Meeriyabedda Landslide at Haldumulla in Badulla District – 29/10/2014. Available at http://www.ndrsc.gov.lk/web/images/Appilcation/strategy%20for%20landslide%20at%20meeriyabedda.pdf. Accessed 7 Nov 2014

Ministry of Disaster Management and Human Rights (2006) Towards a safer Sri Lanka, a road map for DRM, vol 2: project proposals (April 2006). Available at http://www.dmc.gov.lk/Publications/Road_Map_Volume_2.pdf. Accessed 8 Oct 2014

NIE (2013) Syllabuses and teacher's instructional manuals. Available at http://www.nie.lk/pages/syllabus. Accessed 29 Oct 2013

Nielse S, Lidstone J (1998) Public education and disaster management: is there any guiding theory? Aust J Emerg Manag 13(3):14–18

Oxfam International (2007) Oxfam humanitarian field studies disaster management policy & practice: lessons for government, civil society, & the private sector in Sri Lanka October 2006. Oxfam International, UK

United Nations International Strategy for Disaster Reduction (2009) Disaster risk reduction in the United Nations, Available at:http://www.unisdr.org/files/9866_DisasterRiskReductionintheUnitedNat.pdf

Chapter 7
Effectiveness of Administrative Preparedness: A Case Study on Flooding Conditions in Ambagamuwa Korale Division of Nuwara Eliya District in Sri Lanka

R. Lalitha S. Fernando and Aruna Muthulingam

7.1 Introduction

Over decades, assurance for lives and livelihoods is being challenged by several disasters in Sri Lanka. As an island in the Indian Ocean, Sri Lanka is prone to frequent floods during monsoonal rainy seasons (Sri Lanka Disaster Knowledge Network 2012; Disaster Management Centre 2005). Impacts of floods are widening, which include insecure human settlements, losses in agricultural activities and degradation of soil fertility. Incidents of floods from 1974 to 2007 account for 35 % of total natural disaster records (Sri Lanka Disaster Knowledge Network 2012). It also reveals that floods have affected 3,424,150 lives including 648 deaths, 545,158 records of damaged and destroyed houses, 444,216 ha of damaged agricultural lands, economic damage valued US$105,750,000 and distribution of LKR 223,520,392 valued emergency assistance.

Although the Southern and Eastern Provinces of the country are affected by frequent floods, the tendency of vulnerability is increasing in the Central Province in recent years. Increasing concentration on infrastructure development programmes, particularly hydropower generation projects in the hilly Central Province, can be noticed in recent decades, e.g. Upper Kotmale Hydropower Project (2011), Rantambe Dam (1990), Randenigala Dam (1986), Victoria Dam (1984) and Bowatenna Dam (1981). These projects utilised watershed and catchment areas, but design uncertainties such as lack of flash flood areas were highlighted in environment impact assessments (Ceylon Electricity Board 1994; Hemantha 1998;

R.L.S. Fernando, Ph.D. (✉) • A. Muthulingam
Department of Public Administration, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura, Nugegoda, Sri Lanka
e-mail: lalithafernaando@gmail.com

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Ranasinghe 2002). Therefore, an execution of disaster preparedness mechanism is vital to secure the survival and sustainability of human lives, economy and environment.

The requirement of systematic organisational arrangements for disaster management in Sri Lanka has been the highlighted aftermath of the tsunami in 2004. The *Disaster Management Act No. 13 of 2005* establishes an institutional framework and national policy on disaster management. The *Hyogo Framework for Action (HFA) 2005–2015* identifies strengthening preparedness to response disaster as one of the key concerns. A National Emergency Operation Plan, creation of stakeholder awareness, provision of response plan and promotion of capacity building programmmes, early warning communication and strategic partnerships are the outlined aspects to operationalise the administration of disaster preparedness in Sri Lanka (National Policy on Disaster Management 2013). These induced national strategy initiations along with the administrative structure range from the national to the divisional levels. However, an adequate mechanism to follow up and evaluate outcomes of preparedness strategy is questionable. The Road Map for Disaster Risk Management 2005 is evident of disaster preparedness projects only in the short and medium terms. Therefore, sustainable operations strategies for disaster management in Sri Lanka are crucial to ensure administrative preparedness in long-term perspectives.

7.2 Background of the Study

This study examines how the administrative preparedness was executed in Ambagamuwa Korale Division which is subjected to high vulnerabilities to flooding. This division is located in Nuwara Eliya District, extended in 477 km^2 of land situated in the wet zone of Sri Lanka and enriched in watersheds and catchment areas. The total population of the division is 225,372 (Ambagamuwa Divisional Secretariat 2012a), living in 302 villages (including 136 tea estates) clustered into 67 Grama Niladhari Divisions.

Rainfall pattern in Ambagamuwa Korale indicates the tendency of heavy rain from May to July and from September to December. The average rainfall during those seasons is 648 ft and 517 ft, respectively (Ambagamuwa Divisional Secretariat 2012b). The selected area is affected by both south-west and north-east monsoonal rains.

The Divisional Secretariat identified landslides, storm and wildfire as frequent hazards in Ambagamuwa Korale and floods as the emerging trend of hazard. According to the Disaster Management Unit of the Divisional Secretariat, recent floods in May and June 2013 caused severe losses to 4,920 people of 1,199 families in 27 Grama Niladhari Divisions. Watawala and Dickoya, South, are the mostly affected villages (168 and 180 families, respectively), and the recorded casualties were three. The Divisional Secretariat set out 68 relief centres and also attended emergency needs of the victims for averagely 7 days through providing

LKR 950,000.00 valued assistance. The critical aspect of this scenario is that it was an unexpected flood, experienced in the division after 40 years. Villages were affected due to recurrence of floods in May and June 2013. Damages to lives had been less since the incidence of floods occurred in day times, which enabled to secure lives, although considerable losses to houses and belongings of villagers have been evident. In order to face such unexpected disasters and also to reduce their undesirable impacts, the government has implemented a mechanism of administrative preparedness in the selected division. However, the effectiveness of the government interventions is questionable.

7.2.1 Objectives of the Study

The main objective of this case study is to examine the effectiveness of the present mechanism of administrative preparedness to mitigate the impact of floods in Ambagamuwa Korale Division. It also identifies the strategies to improve the effectiveness of the current mechanism of administrative preparedness.

7.3 Administrative Preparedness in Disaster Management

The interrelated phases of disaster management – preparedness, response, recovery and mitigation – consist of coordination between multilevel governments and across local governments and between public and private organisations in various functional roles and responsibilities (Newkirk 2001 cited by Wilson et al. 2007). Thus, disaster management consists of mainly disaster preparedness and mitigation. Preparedness represents the enhancement of capacities of major stakeholders to foresee and respond effectively to potential disasters and, thereby, reduce the damages to lives and livelihoods. According to the United Nations International Strategy for Disaster Reduction 2008, preparedness is concerned as an action in the context of disaster risk management. This should incorporate appropriate analysis of disaster risks, early warning systems, contingency planning process, supply of equipment and materials, emergency services and stand-by arrangements, communications, information management and coordination arrangements, personnel training, community drills and exercises and public education. Further, it emphasises formal institutional, legal and budgetary capacities to facilitate preparedness.

As the impact of hazards and climate change obstructs the development process, the government intervention in handling disaster situations is inevitable. Traditionally, the distribution of reliefs was the only strategy in handling disaster situations. Recently, this strategy has been changed towards a holistic approach. India has been changed from a relief centric to a holistic, multidimensional and multidisciplinary approach involving diverse scientific, engineering, social and financial processes which requires political and legal commitment, scientific knowledge,

careful development planning and application of technology, law enforcement, community participation, early warning systems and effective disaster preparedness and response mechanisms (Ghosh 2013).

Any plan of disaster preparedness requires responding to the threat of potential disaster/s. By estimating the emergency needs, such a plan requires to identify resources for meeting the emergency needs. The best examples of preparedness activities are the development of local warning and community evacuation plans through community education, evolving local response structures and administrative preparedness by way of stockpiling of supplies and developing emergency plans for rescue and relief (The Municipal Corporation of Grater Mumbai 2013). The integral role of administrative preparedness in integrated disaster management approach includes forecasting capabilities, capacity of hazard monitoring, prearrangements to reduce impacts and response emergencies. The institutional and legislative arrangements for disaster preparedness are emphasised globally to sustain socio-economic and ecological developments. Prior to a disaster, it is desired that not only administrative bodies but also residents in local communities come up with community-based disaster preparedness measures by themselves, which are then reflected in administrative plans (Lindell and Perry 2000 cited by Wilson et al. 2007). It is necessary for a greater number of residents to participate in community-based disaster preparedness activities, in order for them to be successful (Lindell and Perry 2000 cited in Wilson et al. 2007).

Mitigation strategies mainly focus on eliminating or reducing the direct effects of the disasters. Increasing public awareness of disaster risk could be considered as most viable in any plan of disaster mitigation. Similarly, if administrators possess the knowledge and experiences to anticipate, respond and mitigate impacts of disasters, that would enhance the effectiveness of preparedness.

The HFA recognises disaster management as a critical social and economic development process that ensures sustainability and identified five major strategies for disaster risk reduction and strengthening preparedness for response as one of the core actions that plays an integrated role in disaster risk reduction approach. This strategy aimed to realise two objectives as capacity development to forecast, monitor and be prepared to mitigate potential threats and empower preparedness to execute response plans in an emergency. "At times of disaster, impacts and losses can be substantially reduced if authorities, individuals and communities in hazard-prone areas are well prepared and ready to act and are equipped with the knowledge and capacities for effective disaster management" (HFA 2005). The Road Map for Disaster Risk Management 2005 of Sri Lanka has also included administrative preparedness as the fifth objective of planning for disaster preparedness and response.

This induced national strategy initiations along the administrative structure range from national to divisional levels. In this context, Divisional Secretariats at the divisional level have to play a significant role in the subnational level by initiating preparedness plans and coordinating stakeholders at all levels. The National Policy on Disaster Management of Sri Lanka also recommends mechanisms for preparedness and response including establishment of early warning

system, communication of disaster management plan, emergency service availability, stakeholder participation and creation of emergency response system and response plan through national-, subnational- and community-level institutional arrangements. In this context, a holistic framework for administrative preparedness for disaster management in Sri Lanka has already been established. However, the effectiveness of the practice of disaster management in Sri Lanka needs to be investigated.

7.4 Methodology

This qualitative study adopts a single-unit case analysis. The unit of analysis is the Ambagamuwa Korale Division located in Nuwara Eliya District under the purview of the Central Province. Selection of this case was based on the recurrence of unexpected floods in this division which caused severe losses to 4,920 people of 1,199 families during 2013.

Purposive sampling method was used to select only the affected families due to floods caused by monsoonal rains in 2013. The identification of affected families was done through the snow-ball method. Selected respondents revealed that the mostly affected villages are Watawala and Dickoya, South, of Ambagamuwa Korale. A sample of 30 affected family units was interviewed. Unstructured interviews and observation methods were used to gather primary data from the affected families.

The UNDP Guidelines for Preparedness and Response, National Policy on Disaster Management of Sri Lanka, the Road Map for Disaster Risk Management of Sri Lanka, Nuwara Eliya District Disaster Management Plan, Divisional Disaster Management Plan of Ambagamuwa Korale and reports on disaster incidents are the secondary sources of data collection.

Thematic analysis was used to review and interpret the effectiveness of present administrative preparedness plans in Ambagamuwa Korale. Themes were derived based on the key concerns of preparedness and response, highlighted in the Disaster Management Policy of Sri Lanka. Consequently, this study examines the effectiveness of administrative preparedness of the division in terms of five themes including the nature of contingency plan, hazard monitoring practice, early warning systems, arrangements for emergency services and education and training for disaster preparedness. Strategies for improvement are discussed based on the analysis under each theme.

7.5 Findings and Discussion

The Divisional Disaster Management Plan of the Divisional Secretariat of Ambagamuwa Korale possesses preliminary administrative preparedness measures and depicts the potential disaster types and measures to mitigate those disasters. Hazard

profile of the plan includes frequency and duration of occurrence and forecast of affecting areas. However, this plan lacks a comprehensive record of historical data on disaster incidences.

The preparedness plan prescribes to establish separate subcommittees to execute different roles in disastrous situations. Hence, divisional-level subcommittees were formed for identification of potential hazards, dissemination of early warnings, evacuation of victims, provision of emergency services and execution of post-disaster recovery and health care and welfare services. Further, the plan integrates the details of the District Secretariat, other Divisional Secretariats in the district, regional government institutions, political leaders, police and other security forces and active nongovernment organisations to enable interorganisational coordination in disaster situations. The present plan assesses the resource availability as suppliers of equipment and machineries in the division to address emergency requirements and safety places or relief centres to mobilise affected people.

The present mechanism of administrative preparedness of the Divisional Secretariat and its constraints are discussed in subsequent paragraphs under the identified themes.

7.5.1 Effectiveness of the Contingency Plan

According to the United Nations (2009), contingency planning is a management process that analyses specific potential events or emerging situations that might threaten society or the environment and establishes arrangements in advance to enable timely, effective and appropriate responses to such events and situations. Subcommittees were assigned different scopes of jobs ranged from pre-disaster measures to post-disaster interventions. However, this plan does not identify hazard-specific preparedness and contingency plans. It is a general plan used as a framework to initiate disaster preparedness at divisional level. Therefore, a specific contingency plan to mitigate and respond to flood situations is not available.

People are not aware about the preparedness mechanism of the Divisional Secretariat, and they did not participate in the activities of the contingency planning process. Some villagers responded as “We don’t know how the officials handle disaster situations. Also, we never thought that our village will be affected by floods”. This indicates the unanticipated disasters lead to failure in assessing potential impacts, lack of people’s participation in contingency planning events and deficiency in village-level coordination. Therefore, the absence of people’s involvement in appreciation and adaptation of organisational readiness limits the successful implementation of the contingency plan.

Further, some villagers revealed that “We were hit severely by floods within two months. We require some arrangements to avoid this in future”. Therefore, devastating effects of recent flood incidents re-emphasise the importance of community

participation in contingency planning, specifically in anticipating hazards and arranging preparation to mitigate impacts.

It is evident that the affected people have collectively forwarded their requirements as a plan to the Divisional Secretariat to secure their lives and livelihoods against potential floods.

> Divisional Secretariat organised meetings to estimate losses and certain politicians conducted meetings in our village to discuss the effects of floods. They collected information on required assistance to recover damages and asked us to submit our requirements in writing. We submitted a collective claim along with a plan of village to the Divisional Secretariat. (A respondent)

This voluntary initiation reflects the possibility of development, examination and implementation of community-based contingency plans in addressing flooding conditions. The following are certain responses of several affected people which reflect individual approaches to be prepared to respond to potential floods:

> We planned to restore our important documents and belongings in a relative's places as an urgent measure. (A respondent)
>
> I have an idea to reconstruct my house as two storied building, if I can obtain financial assistance. (Another respondent)

These individual coping and survival strategies lay the foundation to create indigenous practices to be prepared to respond to floods in the division. However, a better mechanism is necessary to follow up and evaluate outcomes of preparedness strategy.

7.5.2 Effectiveness of Hazard Monitoring Practice

Hazard monitoring is the process of assessing risks of potential harm to lives, the environment and property due to hazards, its probability of occurrence and consequences. To ensure the effectiveness in eliminating or minimising risk, the process must be continuously reviewed and steps taken to implement revised control measures, where appropriate. It ensures that new hazards and those overlooked in the original exercise are identified and controlled (University of South Australia 2011).

In this case, the Divisional Secretariat identifies hazard types and its frequency of occurrence in the division. Flood is not considered to be the high-profile hazard in the division. Therefore, the appointed subcommittee for identification of potential hazards failed to assess rainfall patterns to predict floods.

People are not aware about the status of the flood monitoring system in the division:

> We don't know, whether Divisional Secretariat or any other officials have information on rainfalls and possibility of floods. We are not aware who is responsible to monitor flood situations. (A respondent)

Adverse effects of recent floods in the middle of this year induced the affected community to adopt individual observation of the water level of rivers during rainy days:

> After the first attack of flood in this May, we often observe the water level of river during rainy days to get prepared. (Another respondent)

This indicates that villagers have an informal and voluntary approach being practised to monitor potential floods at the village level.

7.5.3 Effectiveness of Early Warnings System

As per the United Nations (2009), early warning system is a set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organisations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss. The Divisional Secretariat planned to adopt an early warning system through the appointed subcommittee and assigned roles for its members. However, the divisional-level plan has several limitations in disseminating warning messages to all disaster-prone areas on time through one divisional team. The absence of a link between the divisional subcommittee and villagers hinders the prompt circulation of early warning in a reliable manner. It is evident that the people have initiated village-level informal network to disseminate warning messages during rainy days to reduce losses due to flooding conditions:

> We were not formally informed by any official. The villagers, who were accidently seen the overflow of river quickly inform other households about the possibility of severe flood. (A respondent)
>
> We did not believe that our area will be covered by flood, although certain villagers inform that the river is over flowing. (Another respondent)
>
> Police and army officials informed us that they will announce if they identified any possibility of floods in future. (Another respondent)

These responses indicate that there is no systematic and reliable mechanism of early warning system though certain informal mechanisms for communicating warning messages have been initiated. However, the reliability of this informal approach has to be ensured.

7.5.4 Effectiveness of Provision of Emergency Services

The pre-assessment of resource availability of the Divisional Secretariat to create emergency service network in the division revealed a complimentary success during recent floods. The following responses of people indicate the adequate provision of safety mobilisation, cooked food, water bottles, temporary shelters and other essentials soon after the evacuation process:

> Police entered the affected area to evacuate people. They secured our lives. (A respondent)
>
> Public officials firstly visited the affected places and after observing the situation, they discussed the responsive plans. (Another respondent)
>
> We have given cooked food, water bottles and clothes after locating all affected families in the school that in highly elevated area. (Another respondent)
>
> Several organisations, such as Divisional Secretariat, politicians, religious groups, business community and individuals provided us dry foods, clothes and other necessary things. (A respondent)

It is evident that there are several organisations including police, politicians, religious groups, business community and individuals who jointly provide necessities for victims resided in schools and religious places located in highly elevated area. However, limited accommodation and sanitary facilities in the disaster relief centres were severe problems faced by victims during their stay for 8–10 days.

7.5.5 Effectiveness of Education and Trainings for Preparedness

Several affected families revealed that there are deficiencies in capacity building and awareness programmes on disaster preparedness. People are not aware about whom to inform and how to organise and react to reduce the damages:

> We didn't aware how to react in such a situation. We felt helpless. We didn't know what we need to do at first and how to secure our lives and belongings. (A respondent)
>
> We faced floods almost three times within three months, but we didn't aware to whom we inform, how to organise and reduce the damages. It was an unexpected experience. (A respondent)

Therefore, it is the responsibility of the Divisional Secretariat to provide awareness and skill trainings and opportunities to perform disaster drills to empower villagers to implement response plan. The following section presents some main lessons learned based on the above discussion and analysis.

7.6 Lessons Learned

The experience of the Divisional Secretariat of Ambagamuwa Korale in executing preparedness plan in response to floods guides prospect applications of other authorities in responding to potential disasters. The key learning is that the effectiveness of administrative preparedness is determined by not only the experience and knowledge on disaster management of the administrative actors but also the degree of people participation throughout the planning and implementation processes. The collaborative approach leads to establish appropriate hazard monitoring and early warning systems, agile and responsive network for the supply of emergency service and creation of skills and knowledge to operationalise a preparedness plan.

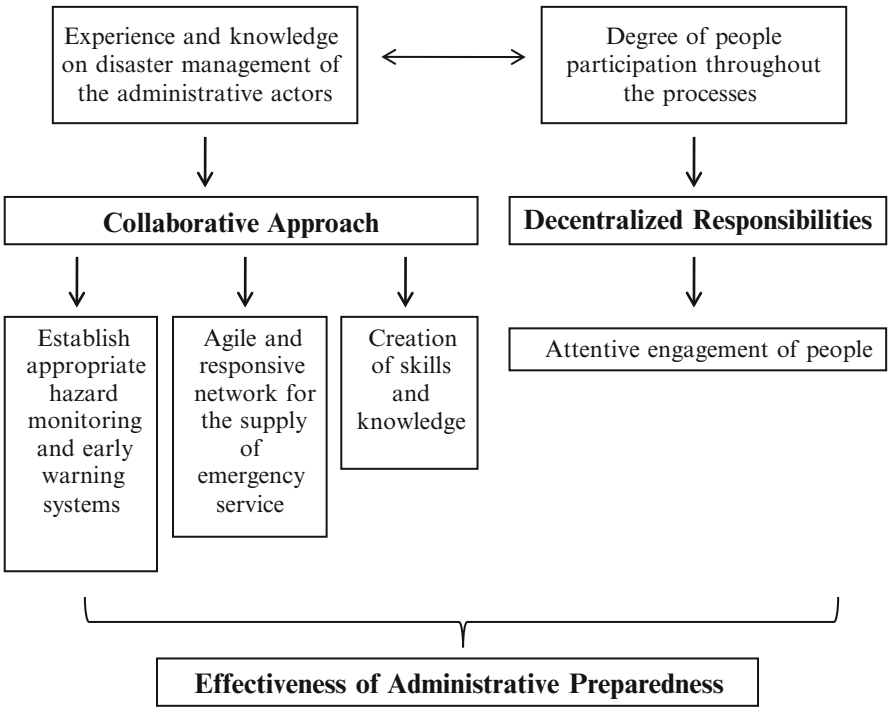

Fig. 7.1 Framework for effective administrative preparedness (Source: Derived from the Findings and Discussion)

Based on the responses of villagers, it assures the requirement of decentralised responsibilities to the community level to enable attentive engagement of people and greater support in implementing preparedness plan.

The main lessons learned from this study are depicted in Fig. 7.1. The authors propose this framework for effective administrative preparedness for disasters.

7.7 Conclusion and Recommendations

The responses of villagers and the official documents of the Divisional Secretariat and due public authorities revealed several factors inducing unexpected floods in this area. Those were encroachments in the river banks, unauthorised constructions closed to the river, installation of mini hydropower plants by blocking the flow of the river, dumped garbage and wastage into watersheds and lessened width of the river and narrowed river basin. Therefore, emerging trend of floods is alarming the requirement of institutional preparedness to mitigate vulnerability in the division.

Based on the study, authors recommend direct measures to ensure preparedness in short term as well as comprehensive long-term measures to mitigate destructive incidents of future floods.

The Divisional Secretariat required initiating urgent and adaptive measures to upgrade its preparedness mechanism and mitigate impacts of potential floods (Disaster Management Unit of the Ambagamuwa Divisional Secretariat 2013). It should adopt the participatory approach to form village-level teams, assign roles to team members by assessing their capabilities, provide skills trainings, adopt simple hazard monitoring methods (recording data and reviewing rainfall patterns) and ensure regular communication of field information to the divisional subcommittees (Disaster Management Unit of the Ambagamuwa Divisional Secretariat 2013; Meen 2001; Hossain 2011; Eyre 1999).

Many respondents emphasised that conducting awareness programmes to villagers is of vital importance to attain the outcomes of educating them on reasons of floods and adopting preventive strategies, identifying the different roles and formulating disaster response teams, communicating a responsive plan and preparedness mechanism of the Divisional Secretariat to facilitate successful implementation, empowering to organise and secure lives and belongings, executing emergency measures at village level and strengthening disaster recovery approach.

Establishment of an early warning system with the participation of the people is another key aspect that the Divisional Secretariat required to focus. It enables the communication, to inform people about who will provide warnings and how they circulate emergency messages. Despite the subcommittees at the divisional level, it is important to train public officials employed at village levels to respond to floods and strengthen links with Village Disaster Management Teams. This would ensure availability of skilled guidance in each village and execution of village response plan in the case of emergency.

Renovation of the river basin and widening of the river banks, reconstruction and establishment of periodical maintenance of canals and drainage systems, implementation of authorising new constructions only if it is flood resistant (buildings on high piles) and regulation of unauthorised houses and constructions could be suggested as a comprehensive approach to mitigate impacts of floods in the long term.

Limitations of the Study

This is a preliminary study to examine the effectiveness of concurrent administrative preparedness in the perspective of direct beneficiaries. In this regard, this study mainly relies on the responses of the affected people in the Ambagamuwa Korale Division which does not cover responses of public officials, other regional stakeholders as local government authorities, politicians, security forces, community-based organisations and religious institutions, who engage in facilitating integrated preparedness to mitigate impacts of disasters. To overcome this, the study utilises secondary sources published by relevant government authorities. A comprehensive study could be conducted by incorporating those stakeholders to assess the overall effectiveness of administrative preparedness of the selected Divisional Secretariat in future studies.

References

Ambagamuwa Divisional Secretariat (2012a) Administrative report. Ambagamuwa Divisional Secretariat, Nuwara Eliya, Ginigathhena, Sri Lanka

Ambagamuwa Divisional Secretariat (2012b) Divisional disaster management plan. Ambagamuwa Divisional Secretariat, Nuwara Eliya, Ginigathhena, Sri Lanka

Ceylon Electricity Board (1994) Environmental impact assessment report, upper Kotmale hydropower project; volume 1- main report. Ceylon Electricity Board, Sri Lanka

Disaster Management Centre (2005) Towards a safer Sri Lanka: a road map for disaster risk management in Sri Lanka. Disaster Management Centre, Colombo, Sri Lanka

Disaster Management Unit of the Ambagamuwa Divisional Secretariat (2013) Requirements statement on financial assistant for disaster relief. Disaster Management Unit of the Ambagamuwa Divisional Secretariat, Sri Lanka

Eyre A (1999) Disaster management in South-East Asia: emergency response and planning in the coming millennium. Risk Manage 1(2):67–70

Ghosh M (2013) Mainstreaming disaster risk reduction in development: from risk to resilience – a report on first session of NPDRR at Vigyan Bhavan, New Delhi, India. Emerald Group Publishing Limited, Bingley

Government of Sri Lanka (2005) The disaster management Act No. 13 of 2005. Government of Sri Lanka, Sri Lanka

Hemantha W (1998) Upper Kotmale hydropower project: another disaster in dam history. World commission on dams, documents and submission regional consultations South Asia, Sri Lanka

Hossain F (2011) Disaster management in Bangladesh: regulatory and social work perspectives. J Comp Soc Welf 27(1):91–101

Sri Lanka Disaster Knowledge Network (2012) South Asian disaster knowledge network, SAARC Disaster Management Centre, Delhi. http://www.saarc-sadkn.org/countries/srilanka/disaster_profile.aspx. Accessed 19 Oct 2013

Meen BPC (2001) A practitioner's view of disaster management in Nepal: organisation, system, problems and prospects. Risk Manage 3(4):63–72

National Council for Disaster Management (2013) National policy on disaster management. National Council for Disaster Management, Sri Lanka

Ranasinghe M (2002) Risk and uncertainty analysis of natural environmental assets threatened by hydropower projects: case study from Sri Lanka. Energy Sustain Dev VI(1):3–100

The Municipal Corporation of Grater Mumbai (2013) The mitigation strategy. The Municipal Corporation of Grater Mumbai, Mumbai

United Nations Office for Disaster Risk Reduction (2009) International strategy for disaster risk reduction. United Nations Office for Disaster Risk Reduction, London

United Nations Secretariat of the International Strategy for Disaster Reduction and the United Nations Office for Coordination of Humanitarian Affairs (2008) Disaster preparedness for effective response: guidance and indicator package for implementing priority five of the Hyogo framework. United Nations Secretariat of the International Strategy for Disaster Reduction and the United Nations Office for Coordination of Humanitarian Affairs, Geneva

University of South Australia (2011) Hazard management procedure V1 (1). University of South Australia, Adelaide

Wilson S, Temple B, Milliron M, Vazquez C, Packard M, Rudy B (2007) The lack of disaster preparedness by the public and it's affect on communities. Int J Rescue Disaster Med 7(2)

Chapter 8
Mitigating Disasters Through Community Involvement and Righteous Practices in Himalayan Region of Uttarakhand, India

Vinay Sharma, Kapil Kumar Joshi, and Rajat Agrawal

8.1 Introduction

8.1.1 Background

Uttarakhand came into existence on 9 November 2000, as the 27th State of the Republic of India. It is often referred to as the "Land of the Gods" due to many Hindu temples and pilgrimage centres found throughout the state. With a population of about ten million, this state is dominated by the followers of Hinduism (MOHA 2011). With a Hindu population of over 88 %, this Himalayan state of 53,484 km^2 is bestowed with the famous little four abodes/seats – Gangotri, Yamunotri, Kedarnath and Badrinath. Badrinath is also one of the four destinations of the longer four abodes/seats – Puri, Dwarka, Rameshwaram and Badrinath – which are located roughly at the four cardinal points of the subcontinent and whose formation is credited to the great eighth century reformer and philosopher Shankaracharya (Mittal 2004).

Uttarakhand is primarily a mountainous state with a total of about 65 % area covered in forest. Most of the northern part of the state is covered by high Himalayan peaks and glaciers while the lower foothills are densely forested with a variety and rare forms of flora and fauna. Two of the most holy rivers in India, the Ganga and the Yamuna, originate in Uttarakhand. Uttarakhand is, however, a place of pilgrimage not only for the Hindus but is equally religious for Sikhs and Tibetans. Hemkund Sahib and Mindrolling Monasteries are famous as prime pilgrimage centres for the Sikhs and Tibetan Buddhists (Uttarakhand Tourism Department 2011). Uttarakhand

V. Sharma (✉) • K.K. Joshi • R. Agrawal
Department of Management Studies, Indian Institute of Technology, Roorkee, India
e-mail: vinayfdm@iitr.ac.in; vinnu871@gmail.com; kapilkjoshi@rediffmail.com; dr.rajat07@gmail.com

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forms one of India's most spiritual and auspicious pilgrimage circuits where for more than a thousand years, pilgrims have been visiting the region in the hope of salvation and purification from sin.

In spite of its spirituality and religiousness, Uttarakhand is also famous for its panoramic Himalayan views, hill stations, national parks, wildlife sanctuaries, lakes, meadows and activities likes tracking, climbing, river rafting, camping and paragliding. Geographical and sociocultural uniqueness of the state sincerely promotes it as a final destination for religious and nature tourism. As a result, the Uttarakhand state has been rated as one of the fastest growing economies in India. Its gross state domestic product (at constant prices) doubled from 4 million USD in FY 2005 to 11 million USD in FY 2012 with a per capita income of 1,500 USD, which is much higher than the national average of 1,100 USD (Uttarakhand Planning Commission Report 2012).

Since the formation of the new state, a continuously increasing trend of leisure, adventure, nature and religious tourism in Uttarakhand played a prominent role in its economy, but while doing so, various significant features like proper infrastructure development, carrying capacity calculations, fragility of the area and issues of eco-friendly ethics were grossly overlooked. Within a period of 10 years, the annual influx of domestic and foreign tourists in Uttarakhand touched new records of about 30 million in 2011–2012 from less than 10 million in the year 2000–2001 (Uttarakhand Tourism Development Board 2012).

The pace and magnitude of land use transition in this part of the Himalayan Region has increased exorbitantly over the past few decades primarily as a result of human activity and may go beyond the ecosystem recovery capacity (Lambin and Geist 2006). Land use change includes sedentarisation, agricultural intensification, habitat modification, migration, change of livelihood and lifestyle, biodiversity loss and flash floods. It is a prime source of land, water and soil degradation (Sala et al. 2000). Such transitions are directly driven by state policies, a market economy and climate change (Xu et al. 2007). This transition has led to seriously altering the various ecosystem services in the state. These services include food, water, predator-prey relationship, flood control, disease control, spiritual benefits, recreational benefits, pollination and nutrient recycling. They maintain the condition of life on earth over which human health is totally dependent. Any alteration with the ecosystem services directly affects the ability of a biological system to support human needs (Vitousek et al. 1997).

Fragmented land use pattern, agricultural based livelihood pattern, mutated eco-system services along with unforeseen, unplanned and a systematic heavy inflow of visitors to Uttarakhand has led to many unprecedented climatic as well as manmade incidences in this state. One of such recent disaster is mentioned below.

8.1.2 "Kedarnath Disaster" of June 2013

Kedarnath is situated at a height of about 3,583 m near Chorabari Glacier, the head of river Mandakini, in Rudraprayag district of Uttarakhand state. It is strategically

located near the confluence of river Mandakini and river Saraswati on a plateau surrounded by snow-clad mountains and glaciers. Kedarnath is at a distance of about 2 km downstream from a snow-melt, rain-fed lake named Gandhi Sarovar, which is 400 m long, 200 m wide and 15–20m deep at a height of 3,960 m (Dobhal and Khandelwal 2013). Vulnerability of Kedarnath temple could be easily seen from the huge mass of ice and water accumulated just in the very close vicinity, upstream of it.

It started with an extremely unusual behaviour of monsoon, in the month of June 2013, over North India. The Indian Meteorological Department (IMD) linked heavy to very heavy rainfall on the higher Uttarakhand, Himachal and Nepal Himalayas because of the convergence of the southwest monsoon trough and westerly disturbances, which led to the formation of dense cloud over the Uttarakhand Himalayas (Wadia Institute of Himalayan Geology 2013). The Wadia institute of Himalayan Geology (WIHG) at Chorabari Glacier camp recorded 210 mm rainfall in 12 h between 15 June (5:00 a.m.) and 16 June (5:00 a.m.). On 16 June 2013, alone, from 5:00 a.m. to 5:00 p.m., 115 mm rainfall was recorded, causing 325 mm rain in 24 h. (*Incidentally NAPSIPAG – Network of Asia Pacific Schools and Institutes of Public Administration and Governance – was having their meeting and intermediary conference on Land and Disaster Mitigation on this very day at Rishikesh near the banks of Ganges in Uttarakhand, and two of the authors were the participants there.*) The surface atmospheric pressure also began to decrease on 15 June reaching as low as 832.4 mb on 16 June. Prolonged heavy downpour on 15 and 16 June resembled a cloudburst-type event in Kedarnath valley.

On 16 June 2013, at 5:15 p.m., the torrential rains flooded the Saraswati river catchment area, resulting in excessive flow across all the channels. As a result, large volumes of water struck the town which simultaneously picked up huge amount of sediments well en route. The voluminous water studded with debris from the surrounding regions and glacial moraines moved towards Kedarnath town, washing off the upper part of the city and leading to the biggest devastation ever seen in the region. The second event occurred on 17 June 2013 at 6:45 a.m. Overflow and collapse of the moraine dam at Chorabari Lake released a large volume of water which caused another flash flood in Kedarnath town leading to heavy devastation downstream (Gaurikund, Sonprayag, Rambara, etc.). Torrential rains also rapidly melted the thickly covered snow on Chorabari Glacier allowing millions of gallons of water to accumulate in the lake. A "no outlet type lake" could not bear the heavy potential energy of the accumulated water and the shear strength of the lake reduced to the level that this moraine-dammed lake breached causing an enormous devastation in whole of the Kedarnath valley (Why Kedarnath Happened 2013).

As per the figures provided by the Uttarakhand Government, over 5,700 people were presumed dead though the actual figures by various other organisations indicate around 20,000–30,000 casualties in this disaster. Heavy landslides were reported all along the Kedarnath valley; hundreds of houses and structures were damaged; entire villages and settlements like Gaurikund, Rambara, etc. were obliterated; thousands of vehicles were washed away by the water; over 70,000 people were stuck en route because of blocked and damaged roads. National

Highway 58, an important road network connecting the region with rest of the India, was washed away at many places. The Army, Air Force, Navy, Indo-Tibetan Border Police, Border Security Force and many other departments together were involved in the rescue operations. Thousands of people were airlifted to safer areas and over a million kg of relief material was air dropped for the affected pilgrims and locals (Flood turns Kedarnath into Ghost Town 2013). Seeing the severity of the disaster, the Prime Minister of India announced a 150 million USD aid package to disaster relief efforts in the state (Special Package for Kedarnath area 2013).

8.1.3 Factors Responsible for Disaster

A calamity like the Kedarnath downpour is primarily a result of the rapid global climate change phenomenon being observed worldwide. At present most of the Himalayan belt is badly affected by natural disasters induced by extreme weather events. Today the world's GHG (greenhouse gas) emissions are taking the earth's average mean temperature to a trajectory of 4 °C warming above the pre-industrial average mean temperatures. This rapid rise in the earth's temperature is clearly seen with various climatic extremes like change in global water cycle, reduction in snow and ice, extreme high-intensity but low-period rains and rising of global mean sea level. It is extremely likely that the human influence has been the single dominant cause of the observed warming since the mid-twentieth century (IPCC Secretariat 2013). To address the rapid global climate change issue is much a wider contest and is not included within the ambit of this paper. The equally important issue being handled in this document is related to the various anthropogenic reasons responsible for the massive and colossal loss of life and property caused by the abundant rains in this disaster. Various influences that contributed to such a vast loss in "Kedarnath incident" are narrated as follows:

(a) Administrative neutrality

1. *Uncontrolled tourist inflow* without a scientific assessment of the carrying capacity of the route
2. *Lack of proper sensitisation* and awareness of the visitors with the area

(b) Unscrupulous practices

1. Use of fragile river banks for various commercial constructions like hotels, resorts, houses, shops and other public amenities, thereby obstructing the natural flow of the water. Such constructions are mostly illegal and largely influenced by local factors. Controlling authorities remain either helpless or collude as these settlements grow extremely fast under a strong patronage. *This activity also devoid the river bank areas from vegetative cover which further accelerates landslides to a great extent.*
2. Uncontrolled detonation of explosives for roads, tunnels and dam construction severely increased the fragility of the area leading to a much lower threshold which resulted in frequent landslides. The debris disposal

generated during the above activities was completely overlooked. This results in severe land erosion on the lower hillside. Muck disposal being a costly affair is mostly avoided by the contractors, and the chance of fair connivances can never be overruled.

(c) Technical weaknesses

1. Least consideration for the appropriateness of the land type, material use and construction technology in developing the structures in and around the affected areas. It is worth mentioning that about 60 % of the houses constructed way back by the local inhabitants remained unaffected and intact primarily because of the fact that they strictly followed the *basic eco-ethics* of the area during construction.
2. No early warning was given by the agencies while it was heavily raining since the 14th of June. Any cautions and warning could have reduced death tolls and people could have taken shelter in higher places as many did starting from 16 June.

(d) Discarded participation

1. Lack of participatory approaches in decision making and administrative actions for the better management of the holy shrines has been a major reason for such a widespread devastation. Indigenous communities with their traditional knowledge can suggest amazing solutions to the local problems.
2. Local communities, in general, have a great respect and conviction for these shrines. They are almost radical and fanatic to various issues related to their belief and are really honest to their perceptions. They are certainly a great resource to the administrative and executive units working at these places, but unfortunately they remain highly underutilised or not consulted with the affairs of the area.

8.1.4 Research Objectives

The objective of the paper is to describe various anthropogenic factors leading to the mass extermination of life and property during a natural calamity and, based upon a real-life experiment, suggest few specific mitigation strategies to lessen the destruction caused by the devastating extreme weather events in the Himalayan state of Uttarakhand.

8.1.5 Structure

The paper is divided into four major parts:

(a) Introduction: Here the topographical description of the region concerned along with its tourism and economic importance in relation to the vulnerability of the

state encountering practical disasters led by its growth policy and administrative short-sightedness is detailed.

This section also describes one of the major disasters of the era which the State faced and briefly highlights the reasons related to the same. The reasons being explicit in nature, the section provides a clue to the approach of the paper where experiences of one of the authors as a practitioner would provide the direction towards mitigating large effects caused by such disasters.

(b) Literature review: This section is interesting for the readers and future researchers who wish to understand the aspects of life of the Himalayas and life with the Himalayas. The section also leads towards the justification of methodological inception and implementation as described further and also justifies the experiment conducted and the recommendations made.
(c) Methodological frame: This section logically pursues the need for the association of the impact of the cause and effect generated by one of the authors with the observations encountered during the disastrous holocaust witnessed in 2013.
(d) Discussion and proposition: This section discusses the findings and analysis.

8.2 Literature Review

The Indian Himalayan Region is full of glaciers and glaciological phenomena like avalanches and glacial floods. Such phenomena can have serious impacts upon the nearby residents over a very short timescale of few minutes, hours or days. Glacier's receding is a common activity going on in these glaciers primarily because of global warming. This is causing an increased number and volume of potentially hazardous moraine-dammed lakes in the region. Such lakes are formed and may increase in size within a very short period of a few years. For instance, Tsho, Rolpa, Imja and Thulagi lakes in Nepal are formed within a period of the last 30–45 years, expanding in length by an average of 33–71 m per year and in depth by 3 m a year (Yamada 1998). A catastrophic burst of such lakes have devastating effects causing *glacial lake outburst floods* (GLOF) with a maximum recorded discharge of over 30,000 m^3/s and a run-out distance of about 200 km, remobilising vast quantities of sediments and causing significant demographic changes (Richerdson and Reynolds 2000). They destroy property, land, vital infrastructure like roads and hydropower stations in addition to threatening the lives and livelihood of the local population.

There are two zones of maximum precipitation in the Himalayan Region: one near the foot of the mountain and another at an elevation between 2,000 and 2,400 m (Dhar et al. 1986). In addition to that short-duration, high-intensity rains (extreme rainfall) are also common over the entire Himalayan Region. For example, the town of Mandi and the Suketi valley in Himachal Pradesh (HP) experienced an unprecedented rainfall of 250 mm in 3 h in the early hours on 31 August 1960. Dharamsala (in HP) received 387 mm of rain in 1 day on 16 July 1934 and 363 mm on 21 September 1917. Haridwar, Dehradun and Kotdwara

(in Uttarakhand) received rainfall of 495 mm (18 September 1880), 487 mm (25 July 1966) and 350 mm (27 August 1982) in 24 h, respectively. In Teesta valley (Sikkim), the highest rainfall recorded in 24 h was 690 mm on 11–13 June 1915. In this valley, rainfall intensities exceeding 250 mm/day occurred more than 40 times between 1841 and 1965 (Bhandari and Gupta 1985). Once in every 10 years, the Ganga basin up to Haridwar sees the rainfall events of 100–300 mm/day and daily rainfall of 200–450 mm once in 100 years. There may be several other events of high-intensity rainfall in the Himalayan Region (Joshi 2006). In case of the recent Kedarnath disaster, within a span of 24 h over 325 mm of rains were recorded in the area.

The Indian Himalayan Region, though sparsely populated, has seen a continuous increase in the growth of population during the last few decades. The region shows a thin and dispersed human population as compared to the national figures due to its physiographic condition and poor infrastructure development. Interestingly, the growth rate in this region is much higher than the national average. The percentage contribution of its population has gone up to 3.86 % in 2001 from 3.6 % in 1991 due to the higher decadal growth rate (Premi 2011) of about 25.4 % as compared to national average of 21.35 % during 1991–2001 (Rani 2010).

Increased population pressure on the Himalayan Region has compelled masses to undertake cultivation on slopes that are traditionally considered unfit for such an activity. Kaliganga, Madhyamaheshwar and Kali valley of the central Himalayan Region of Uttarakhand suffered heavy landslides in August 1998 causing the death toll to cross the 300 mark. Field observations showed that landslide areas correlated positively with the agricultural lands on moderate-to-high slope category (Rautela and Paul 2007). Natural compulsion of bringing more land under cultivation forced increase in the height of the embanking walls, adding the instability of the terraces and destabilising the slopes during prolonged rains. Increased weight of the saturated soil under its own load for the destabilised terrace walls and the gushing water set the whole process of devastation in action (Johnson et al. 1982).

Other rapid land use changes for infrastructure building in the Himalayan Region have disrupted the fragile ecological equilibrium in the mountains. Indiscriminate deforestation, degradation of land resources and disruption of the hydrological cycle have significant and irreversible adverse impacts on the rural economy, society, livelihood and life quality of mountain communities (Tewari 2008).

The Himalayas are undergoing constant rupturing in the thrust belt zone in the Uttarakhand state, due to which earthquakes and mass movement activity are triggered. These processes of mass movement and landslides have been constantly modifying the landscape of the state (Pachauri et al. 1998). Landslide susceptible area works as a dominant source of soil erosion and high sediment yield causing further land use transition of some other places (Pachauri and Pant 1992).

The Himalayas as a whole is very susceptible to global climate change. The progressive increase in warming at higher elevations is already occurring at approximately three times the global average (Liu and Chen 2000). Some climate change impacts are already likely irreversible over the next 1,000 years even after

the greenhouse gas emission ceases (Solomon et al. 2009). Though the Himalayan Region holds the largest mass of ice outside the polar region, climate change is gradually causing loss of ice and snow affecting water availability, biodiversity, ecosystem boundaries, monsoon timings and loss of soil carbon in the area (Xu et al. 2009)

Though the Himalayas were known for its strong traditional resource use structures for ages, presently the rural people of these areas remain totally divorced from natural resource management and decision-making processes (Ribot et al. 2006; Agrawal and Chhatre 2007). This fact deprives the decision makers of the region from the advantages of their traditional and indigenous knowledge.

In its Nobel Peace Prize winning report of 2007, the Intergovernmental Panel on Climate Change (IPCC) Secretariat (2007) clearly highlighted the importance of the Himalayan Region for its glaciers and forests. The report highlights that glaciers in the Himalayas are receding faster than in any part of the world, and if the present rate continues, the likelihood of them disappearing by the year 2035 is very high if the earth keeps warming at the current rate. Gangotri glacier (the place where a participatory experiment was conducted by the author of this paper) in Uttarakhand is retreating with an average rate of about 25 m per year since 1977. The receding and the thinning of the glacier is attributed primarily to anthropogenic factors like land use change, high-density population near the glacier and deforestation (IPCC Secretariat 2007).

Uttarakhand laws do not provide for any specific ban on construction of buildings and other structures near the river side, as most of the river line falls beyond the purview of any regulatory body like municipality or the city board. It is only after the Kedarnath tragedy that the Uttarakhand chief minister called for a blanket ban on the construction of residential and commercial complexes on low-lying areas along rivers (Uttarakhand chief minister bans construction in 2013). The implications and the execution of these orders are yet to be seen.

A Himalayan state like Uttarakhand is situated in a highly sensitive area where disasters are repeatedly induced by extreme weather events. Climatic disasters may attribute to various climatic factors, but when anthropogenic factors like land use change, cultivation on steep slopes, heavy tourist influx, river basin encroachments, nontraditional structures, lack of prewarning facilities and undue adjustment with ecosystem services are also dominant and great tragedies become unavoidable as happened in the case of Kedarnath disaster.

8.3 Conceptual Framework

Can such disasters as discussed be avoided? Or at least the affect may be mitigated? Do we always have to work on the preparedness part or is it the time to harmonise with nature? The paper based on the practicality of the experiences earned by the authors and experiments conducted in this regard for around 25 years seeks not only the answers but also puts forth the propositions while identifying the problem in the right perspective.

8.4 Methodology

Reflexive experimentism is the methodological frame that emerged where reflexive approach holds the key and experiment (cause and effect) holds the validation of not only the research methodology but also the problem identification and the solution.

8.5 Conducted Experiment and Discussions

An experiment, in an equally fragile valley known as "Bhagirathi valley", was conducted by the authors in the year 2003–2004, in his capacity as "Divisional Forest Officer" cum "Director Gangotri National Park". It was an area of Gangotri pilgrimage with a track of 18 km to the Gaumukh glacier. Gaumukh being the origin point of the river Ganga is highly respected and regarded. Gangotri is situated in district Uttarkashi of Uttarakhand state at a height of 3,100 m and the height of Gaumukh is about 3,950 m. The track from Gangotri to Gaumukh is a simple, fair weather bridle path, covered with scanty vegetation of bhojpatra, burans, oak and chir pine trees. After Chirwasa, which is the only night shelter for the pilgrims, there is no vegetation in the area. The whole area is of utmost religious importance. As per the Hindu mythology, in order to purify the soul and wash away the ashes of deceased 60,000 sons of King Sagar, at this very place, the Goddess Ganga appeared on earth from heaven. Because of extreme spiritual feelings, hundreds of thousands of pilgrims visit this area annually.

In the year 2003, when the author first visited this place, the whole area around the Gangotri temple was just like a small slum and a concrete jungle consisting of hotels, shops, ashrams, offices and many other tourist amenities. The overall scenario of the pilgrimage was highly unpresentable as lots of unauthorised construction were going on; heaps of garbage were rotting behind every shop, hotel and ashram. An old incinerator of the municipality was regularly burning the plastics, just 100 yards away from the main temple shrine releasing highly toxic gases in the atmosphere. Pilgrims tracking to Gaumukh were totally unmanaged, and indiscriminate lopping of precious "bhojpatra" (*Betula utilis*) tree was going on primarily for the purpose of walking stick and secondarily as a memento to take it back home by the visitors.

Thousands of kanwariya (pilgrims tracking till Gaumukh to bring holy Ganges water) were indiscriminately destroying the whole ecosystem of the area by camping on the riverbed, cutting and burning wood, cooking food, leaving behind used clothes and footwear at Gaumukh and throwing all sorts of religious waste just at the onset point of the holy river Ganga. Though the pilgrimage area was vested within the recorded reserved forest and many government agencies were working, no regulation was ever imposed over their unethical and illegal activities. Any regulatory act was believed as if playing with the religious sentiments of the spiritual Hinduism.

Under the above circumstances, the author intentionally adopted a reflexive approach for setting things right. In this approach there were repeated discussions with almost all the stakeholders of the area. They included revenue department officials, temple committee members, municipal board authorities, local MLA (Member of Legislative Assembly), NGOs, nearby villagers, shopkeepers, hoteliers and many renounced saints living in the ashrams.

It was surprising to know that everybody was very keen and intense on doing something good for this pilgrimage but there was an extreme lack of initiative and leadership. An element of the transfer of responsibility prevailed among all of them. Their understanding of changing climatic components of the area was perfect but somehow they were unable to take corrective measures because of the absence of trustworthy leadership either in a department or in an individual. Through interpretation of the interpretations given by various stakeholders, we could well understand that everybody was willing to take certain initiatives for the betterment of the area which could be followed in the future but nobody was ready to make the call.

8.6 Conducted Activities

Within no time after understanding the basic problems of the area, we from the Forest side immediately initiated the following corrective but participative measures in this area in March 2003.

(a) Volunteer process for cleaning up the shrine area: As mentioned above the whole pilgrimage and the 18 km track was full with plastic and garbage heaps left by the tourists and pilgrims. In association with local energetic youths and the forest staff of the Uttarkashi Forest Division, a voluntary drive for cleaning up the Gangotri Dham was organised in the month of April 2004. Over 300 bags of plastic, glass, tin and other non-biodegradable waste were collected and the same was given to a scrap dealer for recycling purposes.

    This activity immediately fetched the attention of everyone. The first ever existence of a department like the Forest Department was felt by the whole of the Uttarkashi district as well as the Gangotri shrine area.

(b) Participatory process for people's involvement: Though the above-mentioned voluntary activity was primarily organised and participated by the Forest staff only, in order to have sustainability in this operation, active and long-term participation was ensured. A committee consisting of members of the temple committee and the local young enthusiastic villagers was formed and got registered under the Societies Registration Act of 1860. The prime mandate of this committee was mentioned as organising voluntary garbage collection programmes and ensuring wide publicity among visitors for a clean and green pilgrimage.

(c) Regulatory process for strict enforcement and to stop unscrupulous practices: After ensuring a little confidence among local stakeholders and receiving a goodwill gesture for the Department, an immediate step was taken to enforce following regulatory processes in the area.

1. A complete ban on burning of the plastic in the incinerator was ensured with the support of the Gangotri municipal body.
2. A complete ban on any sort of new construction was ensured with the help of the Gangotri Development Authority and the District Collector.
3. Provision for strict penalties was framed for the local commercial establishments if found disposing the waste they produced illegally.
4. Separate containers for degradable and nondegradable waste were placed in hotels and a scheme for producing organic manure from the degradable waste was initiated.

The above regulatory actions were taken with extremely high spirits by almost all the stakeholders of the area, and the pilgrimage was all ready to start the pilgrimage season of 2004 with a new wave of interdepartmental cooperation and collaboration.

1. Managerial process for consensus evolution: The "Kanwar Yatra" is an annual pilgrimage of devotees of lord Shiva, known as kanwariya, to Hindu pilgrimage places of Haridwar, Gaumukh and Gangotri to fetch holy water of river Ganga. Thousands of kanwarias reach Gangotri every year in the month of July–August. They move up to Gaumukh.

   All of them remain full with extremely fanatic concepts of spirituality and hardly accept any regulations en route. These pilgrims were very sensitively tackled and were humbly told about the misdeed they are causing unintentionally to the holy environment of this pious shrine. They were explained about the religious importance of the bhojpatra trees and were technically revealed the reason for the restricted entry in the Gaumukh area. Through a sequence of progressive and healthy conversations, an ever first barrier to regulate the entry of pilgrims was established at a place known as "Kankhu" just few yards ahead of Gangotri temple on way to Gaumukh.

   These arrangements of recording complete details of a "kanwariya" and restricting limited number of entry not only helped in restoring the degraded ecosystem but also worked as a great help during any mitigation-related activity (Neglected GNP to get more staff 2014).
2. Training, awareness and skill development process: Realising the sensitivity and vulnerability of the area, it was decided to train and coach a few Forest personnel so that they can handle any emergency that occurred with the visitors en route to Gaumukh. Four young members of the Forest staff were given a complete course of basic mountaineering at the National Institute of Mountaineering, Uttarkashi. This type of skill development is needed in case of any rescue operations and to lessen loss to life and property.

If we have an all-encompassing look over actions taken in the small experiment conducted in Gangotri at "Bhagirathi valley" and the factors responsible for the damages in "Kedarnath disaster" at "Mandakini Valley", we find a perfect correlation among them. If the actions taken in the experiment could be generalised on a larger level, the factors responsible for the heavy damages suffered in the Kedarnath disaster could be mitigated to a much larger extent. Natural calamities are beyond a man's control but moderation of loss and fatality to a lesser intensity is truly achievable.

> Determination of exact carrying capacity of a pilgrimage, ban on construction on fragile river banks and road side, participative approaches in decision making and implementation, regular training and skill development of the disaster management personal, use of proper material and construction technology, an advance and active disaster warning system, appropriate awareness and applicable managerial actions along with strict enforcement of regulations are some of the activities which when implemented as future course of action will certainly help in reducing the intensity and ferocity of the disasters, otherwise as happened in Kedarnath in the month of June 2013, land disasters will continue to happen.

On the national scenario according to one estimate, nearly 59 % of India's land area is prone to earthquakes of moderate to high hazard, nearly 12 % is flood prone, about 8 % is cyclone prone, 2 % is landslide prone and a long coastline is exposed to tsunamis and storm surges (Bhandari 2006). Drought, regarded as disaster in slow motion, affects as much as 68 % of India's land area of the 35 states and union territories, and as many as 27 are disaster prone. And if the perceived threats due to other disasters such as chemical and terrorist attacks are added, every square inch of India is vulnerable, calling for immediate attention and sustained effort. Losses due to disasters, both direct and indirect, elude reliable estimates. According to one World Bank estimate, reported direct losses are on the order of $30 billion over the past 35 years. In 2005 alone, disasters in India caused direct losses approaching $18 billion (Rs 87,500 crore). During the period 1994–1998, approximately 120 million people were affected by natural disasters in one way or another, and according to one estimate, economic losses piled to $10 billion (Rs 47,000 crore) during the period 1998–2003 (Bhandari 2006).

Two important issues are quite vital to discuss at this stage. One is how to avoid a natural calamity and the other is how to minimise the devastating effects of a natural calamity. The first issue needs a widespread knowledge of various aspects of climate change science and is a matter of prolonged research and observations. This is not the main content of this study but the second issue is rather more important as India suffers heavily with natural disasters and Uttarakhand state in not an exception to this fact.

As per the National Building Code – Annex-M (Clause 9.2), Uttarakhand state is listed under multi-hazard prone area. This state is highly vulnerable for water- and climate-related disasters like floods, hailstorms, cloudburst and snow avalanches; geologically related disasters like earthquakes, landslides and lake burst; and accident-related disaster like forest fires. Under these conditions, it is needed to adopt and implement some long-term prevention measures to avoid loss of life and property in climatically adverse circumstances.

A routine monitoring of high altitude lakes through satellite can reduce the hazards of glacial lake outburst floods. In a finest example of emergency remediation, lives of 25,000 people were saved at Carhuaz, the main town down valley of Hualcan lake burst in Peru in 1998 (Reynolds et al. 1998).

Landslide susceptibility zoning has been emphasised by the international community since the beginning of the 1990s as being the decade for natural hazard reduction. The whole of the state of Uttarakhand urgently needs such type of initiatives. Though some areas are designated as landslide-prone areas, it is mostly done in and around the already fragmented areas which need to be generalised and publicised over the state. Landslide hazard zonation of areas affected by landslides is essential for future developmental planning and organisation of various disaster mitigation programmes (Arora et al. 2004).

There is an urgent need of checking the pace and magnitude of land use transition in this state. Extensive agriculture and unplanned infrastructure development is quickly changing the indigenous natural wealth use practices. Under the compulsion of increased population, agriculture is often resorted to steeper and steeper slopes causing excessive soil erosion and landslides. Similarly all the major cities are being populated closer and closer to the riversides which are extremely vulnerable in case of flash floods. A check on such practices requires technically sound regulations along with political will. Promotion of non-land-based economic activities and declaration of eco-sensitive zones in and around the vulnerable natural resources like lakes, rivers, foothills and rich biodiversity areas may be viewed from the policy perspective of the state. Government should formulate and implement policies to discourage further settlements in flood vulnerable areas, and policies addressing downstream populations, urban infrastructure and large-scale agricultural systems must be integrated with those of local people living montane livelihood (Gleick 2003).

Strong institutional arrangements are required for ecosystem management in the state. Though a number of departments like Tourism, Forest, Revenue, Agriculture, Watershed, Disaster Management and Rural Development are working, there is a great dearth of horizontal and vertical integration among them. Departments are working in isolation which should be avoided, and a common umbrella should be provided to them while dealing with the creation of a suitable habitat for human well-being, i.e. the ecosystem. Already existing Department of Disaster Management should be properly strengthened to work as coordinating and nodal agency for all other departments. The scope of the Disaster Management Department may be extended to developmental activities also for providing their expert's opinion.

Uttarakhand is largely suffering climatic disasters primarily because of the climate change and the effect of global warming on its glaciers. Disasters associated with short-duration high-intensity precipitation, failure of landslide dams after continuous heavy rains, glacial lake outburst floods and extreme flood events triggered by inappropriate infrastructure development and its failure are attributed to rapid climate change in the Himalayan Region (Chalise and Khanal 2002). Though traditional knowledge of the hill people has vast value, either it remains unutilised or it is quickly disappearing among the young generation. A common understanding

of modern climate change science is needed among the residents of this area. It could be generated through regional- and local-level research studies which need to be coordinated with policy making for the state. This will certainly help in intensification and implementation of the mitigation and adaptation strategies.

Lastly, people's participation is largely absent in most of the decision-making processes in the less developed world of the Himalayan Region (Larson and Soto 2008). People at the lowest level are seldom consulted in developing a disaster management plan (Mirza et al. 2001). Therefore, in many cases, stipulated benefits and information are not delivered to the vulnerable population and area (Adnan 1991). Though top-down policy making has decidedly mixed track record in this region (Blakie and Muldavin 2004) and if local successful adaptation and mitigation to the past environmental changes are to be learned, local and regional government will need to reach out and collaborate more actively with the villagers.

8.7 Conclusion

Natural disasters associated with extreme weather events are quite prominent in Uttarakhand. The loss of life and property as well as damage to agricultural land and costly infrastructure is increasing. This is due to recent growth in settlements and physical infrastructure in alluvial fans and river valleys, which provide opportunities for economic development but are also more vulnerable to disasters. Risk assessment for different types of hazards, introduction of safety measures, guidelines for proper land use and construction standards and regulations are urgently needed for better preparedness and reducing the losses. An improved knowledge of the frequency, magnitude, causes and consequences of extreme events is also essential to develop short- and long-term mitigation measures. The main critical parameter that needs to be observed in the finest details is precipitation, which is the principal triggering factor. A denser observation network will surely help but has implications of costs and physical accessibility. Long-term monitoring of climatic, hydrological and other critical parameters in selected river basins of the state could help in understanding the underlying processes and develop mitigation strategies. However, the key still is held by the harmonisation with the nature with the help of the participation of people with sustainability and self-replicability of the efforts in the mind and as the vision.

References

Adnan S (1991) Floods, people and environment: institutional aspects of flood protection programmes in Bangladesh. Research and Advisory Services, Dhaka

Agrawal A, Chhatre A (2007) State involvement and forest co-governance: evidence from the Indian Himalayas. Stud Comp Int Dev 42:67–86

Arora MK, Das Gupta AS, Gupta RP (2004) An artificial neural network approach for landslide hazard zonation in the Bhagirathi (Ganga) valley, Himalayas. Int J Remote Sens 3:559–572
Bhandari RK (2006) Disaster management in India-a new awakening. Disaster Dev 1(1):1–19
Bhandari RK, Gupta C (1985) Problems of landslides in Himalaya and future directions. In: Singh JS (ed) Environmental regeneration in Himalaya: concepts and strategies. The Central Himalayan Environment Association and Gyanodaya Prakashan, Nainital
Blakie P, Muldavin J (2004) Upstream, downstream, China, India: the politics of environment in the Himalayan region. Ann Assoc Am Geogr 94:520–548
Chalise SR, Khanal NR (2002) Recent extreme weather events in the Nepal Himalaya. In: Proceedings of a symposium held at Reykjavik, Iceland, July 2000, vol 271, pp 141–145
Dhar DN, Kulkarni AK, Rakhecha PR (1986) Meteorology of heavy rainfall over Garhwal Kumaun regions of the Himalayas: a brief appraisal. In: Proceedings of workshop on flood estimation in Himalayan region. Central Board of Irrigation and Power, New Delhi
Dobhal DP, Khandelwal DD (2013) Kedarnath disaster: facts and plausible causes. Curr Sci 105:2–7
Flood turns Kedarnath into Ghost Town (2013) The Times of India, June 29
Gleick PH (2003) Global freshwater resources: soft-path solutions for the 21st century. Science 302:1524–1528
Intergovernmental Panel on Climate Change Secretariat (2007) Intergovernmental panel on climate change report. Intergovernmental Panel on Climate Change Secretariat, Geneva, Press Release
Intergovernmental Panel on Climate Change Secretariat (2013) Intergovernmental panel on climate change report. Intergovernmental Panel on Climate Change, Geneva, Press Release
Johnson KE, Olson AS, Manandhar S (1982) Environmental knowledge and response to natural hazards in mountainous Nepal. Mt Res Dev 2:175–188
Joshi V (2006) Extreme rainfall events and associated natural hazards in Alaknanda valley, Indian Himalaya region. J Mt Sci 3:228–236
Lambin EF, Giest HJ (2006) Land use and land cover change: local processes, global impacts. Springer, Berlin
Larson A, Soto F (2008) Decentralisation of natural resource governance regimes. Annu Rev Environ Resour 33:213–239
Liu X, Chen B (2000) Climatic warming in the Tibetan Plateau during recent decades. Int J Climatol 20:1729–1742
Ministry of Home Affairs (2011) Census of India, 2010–2011. Ministry of Home Affairs, New Delhi, India
Mirza MMQ, Warrick RA, Ericksen NJ, Kenny GJ (2001) Are floods getting worse in the Ganges, Brahmaputra and Meghna basin. Environ Hazards 3:38–48
Mittal S (2004) The Hindu world. Routledge, New York
Neglected GNP to get more staff (2014) The Times of India, September 16
Pachauri AK, Pant M (1992) Landslide hazard mapping based on geological attributes. Eng Geol 32:81–100
Pachauri AK et al (1998) Land slide zoning in Garhwal Himalayas. Environ Geol 36:325–330
Premi M (2011) Population of India. National Book Trust India, Delhi
Rani U (2010) Population rise in India. Globus Press India, Delhi
Rautela P, Paul SK (2007) August, 1998 landslide tragedies of central Himalayas (India): learning from experiences. Int J Environ Stud 55:345–350
Reynolds JM, Dolecki A, Portocarrero C (1998) Construction of a drainage tunnel as part of glacial lake hazard mitigation at Hualca, Cordillera Blanca, Peru. In: Maund JG, Eddleston M (eds) Geohazards in engineering geology, vol 15, Geological society., pp 41–48
Ribot J, Agrawal A, Larson A (2006) Recentralising while decentralising: how national governments re appropriate forest resources. World Dev 34:1864–1886
Richardson SD, Reynolds JM (2000) An overview of glacial hazards in the Himalayas. Quat Int 65(66):31–41
Sala OE, Chapin FS III, Armesto JJ, Berlow E, Bloomfield J, Dirzo R (2000) Biodiversity: global biodiversity scenarios for the year 2100. Science 287:1770–1774

Solomon S, Daniel JS, Sanford TJ, Murphy DM, Plattner G-K, Knutti R, Friedlingstein P (2009) Irreversible climate change due to carbon dioxide emissions. Proc Natl Acad Sci U S A 106:1704–1709

Special package for Kedarnath area: Bahuguna (2013) The Hindu, June 26

Tewari P (2008) Land use changes in Himalaya and their impacts on environment, society and economy: a study of the lake region in Kumaon Himalaya, India. Adv Atmos Sci 25(6):1029–1031

Uttarakhand CM bans construction along river banks (2013) Down to earth, July 2

Uttarakhand Planning Commission (2012) 12th 5 year plan and annual plan 2012–2013. Uttarakhand Planning Commission, Dehradun, India

Uttarakhand Tourism Department (2011) Pilgrimages of Uttarakhand, Uttarakhand Tourism Department report. Uttarakhand Tourism Department, Dehradun, India

Uttarakhand Tourism Development Board (2012) Report on tourist inflow. Uttarakhand Tourism Development Board, Dehradun, India

Vitousek PM, Mooney HA, Lubchenco J, Melillo JM (1997) Human domination of Earth's ecosystems. Science 277(5335):494–499

Wadia Institute of Himalayan Geology (2013) A report on Kedarnath disaster. Wadia Institute of Himalayan Geology, Dehra Dun

Why Kedarnath Happened (2013) Frontline, July 26

Xu J, Sharma R, Fang J, Xu Y (2007) Critical linkages between land use transition and human health in the Himalayan region. Environ Int xx:1–6. doi:10.1016/j.envint.2007.08.004

Xu J, Grumbine RE, Shrestha A, Yang X, Wang Y, Wilkes A (2009) The melting Himalayas: cascading effects of climate change on water, biodiversity, and livelihoods. Conserv Biol 23:520–530

Yamada T (1998) Glacier lake and its outburst food in the Nepal Himalaya. Monograph No. 1, Data Centre for Glacier Research. Japanese Society of Snow and Ice, p 96

Chapter 9
Administrative Planning and Political Response to a Post-disaster Reconstruction: A Study of *Aila* (Cyclone)-Devastated Gosaba Block in West Bengal (India)

Rabindranath Bhattacharyya

9.1 Introduction

Gosaba block, a part of the Sundarbans delta, in the vulnerable coastal areas of South 24 Parganas,[1] is spread over in nine islands separated by rivers/creeks like Matla, Bidyadhari, Durgaduani and Raimongol. The Block Development Office is situated at Gosaba Gram Panchayat, from where the farthest Gram Panchayat – Kumirmari – is a four-hour launch journey (calculated on normal wind and tides). Gosaba is the 'last inhabited area before the deep Sundarban forest starts' having an international border with Bangladesh. Gosaba block consists of 14 *Gram Panchayats* with a population of 246,598 (as per the 2011 census available at http://www.geohive.com/cntry/in-19.aspx, accessed on 10 October 2014). As per the *District Human Development Report: South 24 Parganas*, only 17.52 % among this population have got no shortage of food, 3.68 % get less than a square meal a day for the major part

[1] According to the *District Human Development Report: South 24 Parganas*, 'After the fall of Nawab Siraj-ud-Daulah, Mir Jafar, the new Nawab, concluded a treaty with the English East India Company on the 15th July 1757, by which the former ceded to the Company the Zamindari rights of 24 mahals. It was recorded that 'all the land lying to the south of Calcutta as far as Kulpi, shall be under the Zamindari of the English company; and all the officers of this Zamindari shall be under their jurisdiction.' These 24-mahals, or 24 parts, were given the name 24 Parganas .... Finally, in 1986, the district of 24 Parganas was divided into two separate parts mainly for reducing the administrative burden. The southern part came to be known as South 24 Parganas' (Human Development Coordination and Research Centre (HDRCC), Development and Planning Department, Government of West Bengal (2009, p. 1).

R. Bhattacharyya (✉)
Professor, Department of Political Science, University of Burdwan, Burdwan, West Bengal-713104, India
e-mail: srirab@gmail.com

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of a year, 11.74 % get generally one square meal a day but sometime fails, 33.15 % get generally two square meals a day but sometime fails and 33.91 % get at least two square meals a day during all seasons and 17.52 % have no shortage of food (Human Development Coordination and Research Centre (HDRCC), Development and Planning Department, Government of West Bengal 2009, p. 46). It is evident that Gosaba block consists of a marginalised community in terms of differential access to food. In such a community development block, disaster, whenever it occurs, is sure to hit hard especially on food security and livelihood. So for the purpose of human development in this region, political and administrative responses to any disaster should be assessed from the perspective of post-disaster reconstruction. On 25 May 2009, Cyclone [Category – I] *Aila* hit Sundarbans regions of both West Bengal (India) and Bangladesh, with a devastating impact. Four years have elapsed since then and a participatory approach to reconstruct Aila-ravaged areas as well as rehabilitation of the victims is greatly expected. This paper is an attempt to explore that process of reconstruction.

Utpal Kumar et al. (2010) reported about the devastation of *Aila* in Bangladesh that 'about 2.3 million people were affected by Aila and many of them stranded in flooded villages as they had no alternative to save themselves. The Cyclone Aila furiously hit the Satkhira and Khulna Districts of Bangladesh, entrancing immediate death of about 325 people including massive infrastructure damages' (p. 4). The impact of devastation caused by Aila in West Bengal especially in 24 Parganas (including both the North 24 Parganas and South 24 Parganas districts) was revealed in the news reports published by the *Times of India* (TOI) on 26 May 2009. Thus, one report in the TOI (26 May 2009) had the caption '24000 homeless in Sunderbans' (http://timesofindia.indiatimes.com/city/kolkata/24000-homeless-in-sunderbans/articleshow/4577684.cms, accessed on 2 October 2014), whereas on the same day another news report in the TOI had the caption 'Cyclone Aila death toll reaches 82, rescue on' (http://timesofindia.indiatimes.com/india/Cyclone-Aila-death-toll-reaches-82-rescue-on/articleshow/4579233.cms, accessed on 2 October 2014). In their report on 'Cyclone Aila in West Bengal: A Report by Jamsetji Tata Centre for Disaster Management, TISS', Sinha and Bhattacharyya (2009, p. 3) mentioned in the executive summary that Hingalganj block in the North 24 Parganas and Gosaba in the South 24 Parganas are the most affected administrative blocks in West Bengal. The three-member team on behalf of Tata Institute of Social Sciences, as mentioned in the executive summary of the report by Sinha and Bhattacharyya (2009), went to visit these two blocks 3 weeks after the onslaught of Aila and quoted an Internet source (not available now) that reported about the scale and intensity of the said disaster in this manner: 'It is estimated that while 1.5 million people have been directly affected by the disaster another 400,000 people are still marooned and do not have access to relief aid' (Sinha and Bhattacharyya 2009, pp. 5–6).

From the report of the Tata Centre for Disaster Management, it is clear that millions of people became marooned after the cyclone left. Also, the author of this paper has personally visited Gosaba block on 24 and 25 November 2013 where it was reported by the villagers of Bally II Gram Panchayat in the focused group

discussions that huge fertile farmland area became wasteland due to the intrusion of saline water. Ponds were also filled with saline water leading to failure in pisciculture. In fact, one pond within the campus of the Gosaba Block Development Office became waste due to intrusion of saline water caused by the tidal waves during Aila. Consequently there was extensive crop failure. Tagore Society for Rural Development, an NGO involved with the post-Aila relief support, wrote in their website (which is available at http://www.tsrd.org/aila.html, accessed on 2 October 2014) regarding the devastation of Aila: 'Repeated tidal surges breached more than 400 kms of embankments causing salt water from the many saline rivers in this area to rush in, flooding thousands of hectares of farmland and the densely populated villages .... Official [meaning thereby government] reports suggest that 88 persons died. Our estimates are higher' [i.e. the estimates by the Tagore Society for Rural Development].

Many are reported missing and some people are injured when roofs, trees, etc., crashed on them. Regional Specialised Meteorological Centre, Tropical Cyclone, New Delhi, under the India Meteorological Department, Government of India, reported in its 'Severe Cyclonic Storm, Aila: A Preliminary Report' (n.d.) that 'Based on media report, the state (West Bengal) chief secretary has put the number of storm-affected people at 2.2 million. More than 61,000 houses collapsed and more than 132,000 houses were partially damaged. About 100 people died in the state due to Aila' (p. 18).

Going by the reports from all sections as mentioned above, viz. from media (TOI), academics (Tata Institute of Social Sciences), the Government of India (India Meteorological Department) and NGO (Tagore Society for Rural Development), it becomes obvious that although there is some problem in identifying the total number of death due to Aila, which stands in between 82 (TOI) and 100 (Government of West Bengal), there is no doubt about the range and depth of devastation caused by Aila. TOI reported the very next day after the devastation and hence could not grasp the range of devastation, which has been reflected in the West Bengal state Chief Secretary's statement that 'more than 61,000 houses collapsed and more than 132,000 houses were partially damaged. About 100 people died in the state due to Aila' (Regional Specialised Meteorological Centre, Tropical Cyclone, India Meteorological Department 2009, p. 18). Based on this background, this paper is an attempt to understand the administrative planning and political response to a post-disaster reconstruction in one of the most affected community development blocks in West Bengal, viz. Gosaba in South 24 Parganas district.

The research questions that have been attempted to explore in this paper are the following:

(a) How have the local governments planned and administered post-Aila reconstruction in the Gosaba block?
(b) What were the issues involved in this planning and its implementation?
(c) How did the communities respond to those post-disaster reconstruction planning and administration?
(d) How are the collusions of power between the economic groups and the political structure putting its impact on the post-Aila reconstruction in Gosaba block?

9.2 Literature Review

Natural disasters are inescapable part of human life cycle. The Brussels-based Centre for Research on the Epidemiology of Disasters (CRED) as cited in *World Disasters Report 2002: Focus on Reducing Risks* (Walter 2002, p. 10) revealing the data on 'Thirty years of 'natural' disasters' since 1970 shows that during 1970–1979, the number of reported disasters throughout the world was 1,110, whereas the number of the same in 1980–1989 was 1,987 and during 1990–1999 was 2,742. *World Disasters Report 2002* also focuses on the opportunities and challenges that we face in reducing the risks from natural hazards since 'disasters threaten development'. The said Report emphasises (p. 9) on three issues in disaster mitigation and preparedness:

(a) 'Disaster mitigation and preparedness must form part of the wider context of risk reduction – relevant to all those working in hazardous regions, whether in relief, development, business, civil society or government;
(b) Long-term partnerships based on good governance across many sectors and disciplines provide the best basis for tackling the threats posed by disasters; and
(c) Setting targets for risk reduction could provide a way to focus political will and adequate resources on the problem' (Walter 2002, p. 9).

CRED *Annual Disaster Statistical Review 2010 – The numbers and trends* reports that 'In 2010, 42 more disasters were reported than in 2009. The number of reported disasters (385) approximated the average yearly disaster occurrence from 2000 to 2009 (387)' (Guha-Sapir et al. 2010, p. 21). So the total number of disasters during 2000–2009 is 3,870. It is evident that the numbers of natural disasters are growing with a multiplicative increase since 1970 (Guha-Sapir et al. 2010).

Lindell (2013), in his paper on 'Recovery and Reconstruction after Disaster', views that

> disaster recovery has three distinct but interrelated meanings. First, it is a goal that involves the restoration of normal community activities that were disrupted by disaster impacts – in most people's minds, exactly as they were before the disaster struck. Second, it is a phase in the emergency management cycle that begins with stabilisation of the disaster conditions (the end of the emergency response phase) and ends when the community has returned to its normal routines. Third, it is a process by which the community achieves the goal of returning to normal routines. The recovery process involves both activities that were planned before disaster impact and those that were improvised after disaster impact. (p. 812)

Hence, Lindell (2013) concludes that 'Disaster recovery is most rapidly and effectively achieved when communities engage in a pre-impact planning process that addresses the major recovery functions and incorporates hazard mitigation and hazard insurance into a recovery operations plan' (pp. 821–822).

In his book *Planning for Post-Disaster Recovery*: *A Review of the United States Disaster Assistance Framework*, Gavin Smith (2011) highlights that the physical characteristics and spatial patterns of development, economic interdependencies, social bonds and sense of place in effect define the communities:

> Disasters disrupt and fracture these constructs. Thus, it is not surprising that the principal impulse after an event is to return to what is familiar – that which defined the community prior to the event – even if the pre-event conditions may have been fraught with social injustice, high hazard vulnerability, inadequate housing and public infrastructure, economic fragility, and poor leadership. (Smith 2011, p. 3)

Smith (2011) also wrote that 'Such reactive decisions – including whether to adopt more stringent reconstruction standards; how to reconfigure the physical footprint of a community; how to allocate scarce resources; how to return the community to a sense of normalcy – fail to take advantage of opportunities to enact positive change' since these 'decisions are frequently made with limited information during a time when there is an intense pressure to act and show tangible progress' (p. 3). Smith (2011) also viewed that 'the information that *is* available then regarding all aspects of disaster is subject to different interpretations and constant revisions during the recovery process. Thus, members of the community may resist taking the time to think through, adopt, and implement a more meaningful process that has the potential to alter pre-event conditions. And in so doing, they may fail to protect against actions that may not be in the community's best interests . . . ' (Smith 2011, p. 3). To get rid of such occurrence, Smith (2011) explicates in Chapter 1 of the said book his disaster recovery assistance framework 'defined by the actions of a fragmented network of different stakeholder groups who provide disaster recovery assistance' through the participation of different networks, quasi-governmental and non-governmental organisations and non-profit relief organisations in the pursuit, distribution and management of financial responses (p. 11).

The focus on this participatory approach for the post-disaster reconstruction has been analysed in detail in the book entitled *Post-Disaster Reconstruction and Change*: *Communities*' *Perspectives* edited by Barenstein and Leemann (2013) by integrating the community perspectives of a post-disaster reconstruction in a multidisciplinary way. The book has been developed in the context of various types of post-disaster reconstruction, e.g. post-tsunami, post-earthquake, and post-Mitch (hurricane), in various countries like India, Sri Lanka, Indonesia and Nicaragua. The authors in this book have not viewed the 'communities' as a homogenous concept, underplaying social and economic inequalities and power differentials within the communities, who may in fact capture extra aid excluding the real needy members of the 'communities' (Barenstein and Leemann 2013). That way, decentralisation of post-disaster reconstruction without enhancing the capacity of the local leaders and without establishing the network of institutions that may ensure accountability and transparency may lead to 'clientelism' and 'local elite capture'. Quoting another author, editors have in fact observed that 'participation gives reconstruction projects a morally legitimate theoretical framework, but its impact on practice often remains weak' (Barenstein and Leemann 2013, p. xxiii). The said book focuses on the one hand on 'the multiple risks of ignoring people's own aspirations for and perspectives on reconstruction' in a post-disaster situation and on the other hand on the point that 'empowering communities to assume a leading role in reconstruction is no magic recipe against poverty and inequality, given their heterogeneity and power structures' (Barenstein and Leemann 2013, p. xxix).

In the third chapter entitled as 'Policies for guiding planning for post-disaster recovery and reconstruction' of the guide book *Planning for Post-Disaster Recovery and Reconstruction*, Schwab et al. (1998, pp. 43–74) have discussed the 'short-term recovery issues that affect long-term reconstruction goals'. Although these issues have been discussed with the examples from various post-disaster reconstructions in America, the said issues have general relevance for all societies. Thus, the chapter has focused on infrastructural reconstructions like the location of temporary housing, the siting of temporary business locations, the selection of sites for dumping disaster debris, road closures and reopening and economic recovery like job loss of the local people, the restoration and enhancement of employment opportunities, building a disaster-resistant (sustainable) economy and the linkage with land use regulations with the comprehensive plan for post disaster reconstruction. Chapter 4 (pp. 75–111) entitled as 'The planning process' of the same book (Schwab et al. 1998) has examined 'the steps a community should follow in preparing such a plan, based in large part on the experiences of a number of communities that have already done such planning' with reference to three case studies in the USA. Chapter 5 ('A Planner's Toolkit', pp. 112–167) focuses on both emergency measures and the larger roster of tools appropriate to long-term hazard planning.

Thus, huge literature already exists on the meaning, stress and framework of disaster, on various disaster reports by various government as well as nongovernment organisations like CRED and on post-disaster reconstruction planning and policies to be followed; but there is comparatively less literature on political responses to a post-disaster reconstruction, more specifically focusing on the reconstruction in the Aila-hit areas of West Bengal (India).

9.3 Theoretical Framework

Firstly, we may start with a basic question: Why should one at all need to study post-disaster reconstruction? One simple way to answer this is that such studies will minimise the risk of undesirable consequences of the policies to be undertaken in such context. But more important is that post-disaster reconstruction 'provides an explanation for the reestablishment of the status quo ante, not as the result of the 'natural' self-restoration of a social organism, but through the exercise of power' (Stallings 2002, p. 296). Such exercises of power in social organisms normally remain covert, which becomes overt during a post-disaster reconstruction. That way, 'Disasters provide opportunities to examine aspects of social structures and processes that are hidden in everyday affairs' (Stallings 2002, p. 283). This is more so since the impact of a disaster is bound to be social in nature as the same range of natural devastation in an uninhabited area would have been merely a matter of environmental or geographical research interest. So the essential questions from the perspectives on political science that revolve round disaster management are: (1) How has the disaster been socially constructed in a particular context? (2) What were the administrative planning and political responses, so that the damage of that disaster can be lessened on a sustainable basis? And, in what

way communities can get back the 'normalcy', i.e. the pre-disaster construction of social life? Since 'disasters are rationalised or interpreted according to the canons and preoccupations of the contemporary period' (Alexander 2005, p. 38), the planning and responses in the post-disaster period should focus on the socially constructed causes, which mostly consist of the negligence of taking preventive steps for resisting the disaster in the perception of the community. Hence, a proper response for risk management and not just crisis management is integral nowadays with the administrative planning for post-disaster reconstruction. Consequently, it is expected that administrative response in formulating policy for post-disaster reconstruction will prioritise the need for planning, especially in consultation with the disaster victims, so that in the future, potential risks of recurrent loss of lives and property may be avoided. However, this depends largely upon a few factors: a transparent and accountable administration that focuses more on risk management rather than providing benefits for crisis management; a decentralised democratic structure, where popular will can be realised; and finally, an awareness of the people to make sustainable management of environmental resources.

Secondly, disaster occurs as an exception rather than a rule, making people confused in general. Consequently, the collusions of power between the economic classes and the political structure, which normally remain covert, become very much overt in a post-disaster situation. Thus, regarding both – the crisis management and risk management – in a post-disaster situation, the material interests of the higher-income groups as well as of the ruling elites in that particular context, whose interests are reflected through the political structure, get priority. This marginalises the people already marginalised by the disaster. To fight this tendency, a participatory and people-centred planning and implementation during a post-disaster reconstruction are required, and that is best possible under a decentralised political framework. David Alexander (2005) wrote: 'If, for the purposes of argument, we consider representative democracy to be 'top-down' in its organisation and participatory democracy to be 'bottom-up' or grass-roots based, then there is clearly a need for more of the latter in disaster mitigation and management throughout the world, for risks and emergencies cannot be tackled effectively without robust local organisation' (p. 35). Hence, long-term administrative planning and political response to a post-disaster reconstruction and rehabilitation should mobilise the participation of the people in the decision-making process.

Thirdly, political response to a post-disaster reconstruction is vital for the sake of credibility of a local government. The important difference between administrative planning and political response is that while the first one remains operative within a bounded rationality, the latter one often reflects the disagreement and conflict over problems and solutions leading to a coalition building. That way, political responses remain inherently pluralistic upholding conflicting goals in a post-disaster reconstruction. The changes that occur in post-disaster reconstruction, particularly in land use, building codes, population densities, infrastructure development and property ownership, put their impacts on the political will to do the 'right thing', by providing local benefits of hazard mitigation, so that people can be mobilised in the future on the basis of support extended by a local government.

This paper is an attempt to find out whether such focuses existed in the post-Aila reconstruction in Gosaba block in South 24 Parganas in West Bengal (India) and to explore the participatory approach to a post-disaster reconstruction with empirical evidences focusing on administrative planning and political response.

9.4 Research Methodology

As stated earlier, Gosaba was one of the most affected community development blocks in South 24 Parganas, ravaged by the Aila cyclone in 2009. Hence, this paper took Gosaba block as the field of study. After the 73rd and 74th *Constitution* (*Amendment*) *Acts*, a decentralised form of local government exists both in rural and urban areas of India, where community participation takes place in the political decision-making process on the basis of direct election. The three-tier decentralised form of local government in the rural area is termed as Panchayat Raj Institutions, the bottommost level of which consists of Gram Panchayat, the community development block level (intermediary level) institution is called as Panchayat Samity and the institution at the district level (topmost level) is termed as Zilla Parishad. Within South 24 Parganas Zilla Parishad, 29 community development blocks are there, in each of which Panchayat Samity has been established. Under the jurisdiction of Gosaba Panchayat Samity, 14 Gram Panchayats are there. Among these 14 Gram Panchayats, Bally II Gram Panchayat had a greater impact of Aila, which is evident from the study of Bhattacharyya et al. (2010) on 'Socio-demographic Comparison and Impact of Aila: The Super Cyclone in Gosaba of West Bengal'. In that comparative study, conducted over randomly selected 166 individuals of 'four villages of Gosaba island: Rangabelia, Gosaba, Chhota Mollakhali and Bally II, which were selected on the basis of geographical clustering' (pp. 429–432), Bhattacharyya et al. (2010) evaluated aspects of post-traumatic stress and other symptom clusters within individuals. On the basis of that study, one may see that going by stress disorder and by dissociative symptoms across the zones, Bally II Gram Panchayat had the second rank. Hence, the present author selected Bally II Gram Panchayat to understand the post-disaster reconstruction process.

The techniques of data collection in this study were focused group discussions of the villagers of Bally II Gram Panchayat and unstructured focused interviews of important officials at state level and block level, both line and staff. Thus, the Joint Secretary, Disaster Management, the Government of West Bengal; the Chief Engineer I and Project, Irrigation and Waterways Directorate, the Director Aila Project under the Directorate of Irrigation and Waterways; and the Block Development Officer, Gosaba block, were interviewed. Besides, the Panchayat Pradhan (Chairperson of Panchayat) and Upa Pradhan (Vice Chairperson) of the Bally II Gram Panchayat have also been interviewed. Data have also been collected from the various reports on Aila made by the government as well as nongovernment organisations. Although the data profile is modest, the study can be replicated in the case studies of other deeply affected Gram Panchayats with similar results

through inductive analyses. Since there was no structured schedule for interview, the analyses remain qualitative in nature.

9.5 Findings

It may be noted that in a post-disaster context, political authority usually becomes more interested in crisis management, since that gives short-term political gain. Since 1992, the West Bengal government had a Department of Relief. But the Department claims to have 'a paradigm shift from relief centric approach to a comprehensive disaster management approach' after the promulgation of the *Disaster Management Act 2005* by the central government of India, and 'keeping with the change the department was rechristened as the Department of Disaster Management in 2006'. Despite the change in approach that has been publicised in the website (http://wbdmd.gov.in/Pages/Profile.aspx, accessed on 11 October 2014), result in the ground reality is yet to yield.

Going by the first research question, i.e. how have local governments planned and administered post-Aila reconstruction in the Gosaba block, it was found that the reconstruction plan of the Aila-devastated Gosaba block has two aspects: crisis management by providing relief and rehabilitation to the disaster victims and risk management by developing sustainable solution to the problem of the repeated surges of tidal waves encroaching into the fertile land with saline water. Regarding relief and rehabilitation, house building grant to the victims (Rs. 2,500, for partial damage of the house and Rs. 10,000, for wholly damaged house) and house building grant for damaged office (including panchayat) and school buildings have been provided. Regarding risk management, the major task is to reconstruct the damaged river bank and schools, panchayat offices and public service utility infrastructure. The records, received from the Aila Project Manager (Head Quarters), Irrigation and Waterways Department, reveal that the approximate length of embankment to be taken up in Gosaba block in the 1st phase was 70 km; but up till 31 October 2013, the length of embankment that was taken up, was 3 km and land acquired up till 31 October 2013 for the purpose was only 276 acres [out of 1, 610 acres as proposed in the 1st phase proposal for land acquisition]. This should also be noted that up to 31 October 2013, total project fund amounting Rs. 632.86 crore [Rs. 107.11 crore (state share) and 525.75 crore (central share)] was released. Also two multipurpose cyclone shelters have been built – one in Bally I (visited during survey) and another at Kumirmari (block profile as received from the office of the Block Development Office [BDO] on 25 November 2013) as for sustainable risk management in the future.

When asked about the obstacles regarding embankment, the BDO reported that although record shows of land acquisition, in effect, acquisition could not be done due to four basic problems, which are common with any land acquisition in West Bengal:

(a) Land to be acquired had been held by a person, who had purchased the land without official registration. So when the compensation cheque was prepared, the person, who was the current landowner, did not get the money as the cheque was prepared in the name of the old landholder. This made the present occupier of the land unwilling to vacate the land to be acquired.
(b) The landholder had constructed a house on the land, the value of which was not covered under the compensation, and hence he remained unwilling to vacate his home.
(c) Some people, occupying the vested land in unlawful manner, could not be given compensation by the government as per rules, and hence they remained unwilling to vacate the vested land occupied by them.
(d) In some cases, most of the legal heirs remained outside the block, and one of them who remained unwilling to vacate would occupy the land.

The BDO intimated that an Aila-related Block-Level Monitoring Committee on Aila *bandh* land acquisition had been developed consisting of the BDO or its representative, Pradhan of the concerned Gram Panchayat, leader of the opposition in the concerned panchayat and an elected representative of rural bodies. Such monitoring committee also existed at the subdivision and district levels. The BDO also intimated that a new package addressing the above-mentioned issues had been launched which had addressed the land acquisition issues mentioned above. Thus, despite the existence of decentralised local government and monitoring committee ensuring people's participation, the fact remains that only 3 km embankment out of total 70 km has been taken in 4 years, which reveals the lack of political will in risk management.

Regarding the issues involved in this planning and its implementation [the second research question], it came out that Aila has been a cause for outmigration of a large number of farmers in Bally II Gram Panchayat to various parts of India for semiskilled work like masonry work. For 3 years since Aila occurred, due to the intrusion of tidal waves and the consequent impact of salinity thereon, the land became barren throughout Gosaba block [as reported by the BDO, Gosaba block, the Upa Pradhan Bally II Gram Panchayat as well as by the villagers at focused group discussion at Bally II Panchayat]. Also almost all the ponds in the Aila-affected area became flooded with saline water that destroyed all the fishes there and made all those ponds ineligible for fishing. So the major issue after the disaster was to get a livelihood in the vicinity. But that was very difficult since Gosaba block and particularly Bally II Gram Panchayat remained in a peripheral vulnerable zone consisting of villagers, who were unskilled and would earn their bread by cultivation or by fishing. However, the job of loading and unloading of construction materials for the construction of 'Aila bandh'[2], being done by a big developer in Bally II Gram

[2] *Bandh* is a Bengali word that means embankment. Old embankment was made of slender mud before Aila, which collapsed due to the waves during Aila. But now in the post-Aila reconstruction, a huge mud embankment is being constructed, the top of which will be concrete.

Panchayat, had been allotted to the unskilled local labourers, with the initiative of local panchayat, which had a sustainable impact upon the incomes of local poor.

It was observed that other than providing with these jobs of unskilled labourers, little efforts have been initiated by the local government as well as by the Disaster Management Department of the Government of West Bengal to develop capability among the villagers for earning through other livelihoods. When Aila occurred, the Left Front [among the 12 seats in the Gram Panchayat of Bally II, 5 seats were won by the CPI(M) and 7 seats were won by the RSP, both being the partners of Left Front] would run Bally II Gram Panchayat. But in the Panchayat General Election 2013, this scenario has been changed, and in all Gram Panchayats in Gosaba, All India Trinamool Congress Party overwhelmingly has won. The author visited the area in the post-2013 election. In the focused group discussions, villagers in Bally II Gram Panchayat resented that the relief materials were distributed in accordance with party affiliation in the post-Aila situation, when Left Front was in power in Gram Panchayat. So the credibility of the then local government was widely damaged in the perception of the community, since the political authorities in the local government did not and could not assess the issues of livelihood of the victims in a proper manner.

The third research question focused on the responses of the community to the post-disaster reconstruction and planning. It came out that the responses were mixed and complex at the same time. Thus, some people, whose lands were being acquired for Aila *bandh*, were happy with the compensation package for land acquisition, although they were unhappy in parting their lands. Here, one should note that disaster changes the meaning of certain social concepts, which becomes relevant for administrative responses in a post-disaster reconstruction process. The responses of the community were also visible in Bally II Gram Panchayat through the development of new terms or the change in the meaning of some old social concepts. Hence, Aila produced new meaning of 'property' in the face of uncertainty of livelihood. The victims understood that if land owned by them remained barren for consecutively 3 or 4 years (what actually happened because of salinity over land due to flood of saline tidal waves) and they had to go out for livelihood, then it might be better to leave some land for the benefit of the community, so that the cause of barrenness of land due to disaster can be removed in a sustainable manner. Hence, they agreed on developing a high embankment on the land of their own with a reasonable compensation package. On the other hand, the administrative planning also focused on this community understanding of sustainable resistance to disaster and hence evolved a suitable package for compensating the occupiers of land, authorised or unauthorised, whatsoever. The administrative response regarding service delivery also led to the development of some new concepts. Therefore, it was seen in the Gosaba case study that people remember certain service delivery in the context of the disaster. Special rice distribution programme after the disaster was constructed as *Ailachal* (Aila rice), or the new embankment was named as *Aila bandh* (Aila embankment) by the village community in Bally II Gram Panchayat of Gosaba block in West Bengal.

Besides, disaster creates an awareness of imminent danger of short-term growth in an unsustainable manner within the community, and at least for a substantial period, issue of sustainable environmental governance hammers on the community awareness. In Bally II Gram Panchayat, it was observed that tree plantation, especially plantation of trees (like *sonajhuri – Acacia auriculiformis*) having deep and spread over roots, important for resisting soil erosion, has been an essential part of the National Rural Employment Guarantee Scheme in post-Aila period. These schemes are taken by the panchayats on the basis of local needs and available fund. Thus, environmental governance has become an essential component of local-level planning in post-Aila Gosaba.

As for the last research question on the collusions of power between the economic groups and the political structure putting its impact on the post-Aila reconstruction, it may be noted that economic resources are always objects of power and disaster provides perfect opportunity to the political authority as well as to the opposition to mobilise that power on the basis of disaster relief distribution. That way, from the perspective of political responses, pursuit of competing interests is always based on relief distribution narrative in a post-disaster situation. As for crisis management, in the case of Gosaba, the narrative that the ruling party, especially in panchayat, distributed relief material in accordance with political allegiance was very much operative. This is more so particularly in the context of the political profile of the Gosaba block, where in 2008 panchayat election, All India Trinamool Congress (AITMC) came to power in 6 Gram Panchayats and Left Front, mainly Revolutionary Socialist Party, came in 8 Gram Panchayats out of a total 14 Gram Panchayats in the Gosaba block. All the more, Panchayat Samity of Gosaba block was in the hand of Left Front and Zilla Parishad was in the hand of AITMC. However, in 2013 election, completed in the month of July, all the panchayat structures (Zilla Parishad, Panchayat Samity and Gram Panchayats) have been overwhelmingly captured by the AITMC in Gosaba. Related studies (Mukhopadhyay 2009) have discussed this narrative in detail. From the focused group discussion and from the interviews of the Pradhan and Upa Pradhan of Bally II Gram Panchayat, it became evident that post-Aila election, whether at state level or at panchayat level, was fought largely on these narratives of distribution of compensation for house building or of compensation for land acquisition or of aid for the desalinisation of ponds.

9.6 Conclusion

To sum up, any post-disaster systematic reconstruction requires an administrative planning for restoring pre-disaster socio-economic infrastructure including livelihood arrangements and capability development for the victims. At the same time, it should also keep an eye on long-term goals of risk management in a sustainable manner. The disaster in fact changes the meaning of many social concepts and

also develops certain new social concepts and new issues. Political responses to the network of human relations should target an assessment of these new concepts and issues in social life. But, as study on Gosaba shows, the ruling elite in the local government structure in a post-disaster situation becomes more interested in mobilising the community through the crisis management sometimes even to the extent of morally legitimising the bias of the ruling elite through the decentralised structure. The point of sustainable risk management depends upon the nature and intent of political responses, which reflect the collusions of power between the economic groups and the political structure.

References

Alexander D (2005) An interpretation of disaster in terms of changes in culture, society and international relations'. In: Perry RW, Quarantelli EL (eds) What is a disaster? New answers to old questions. International Research Committee on Disasters, USA

Barenstein JE, Leemann E (2013) Post-disaster reconstruction and change: communities' perspectives. Taylor & Francis, New York

Bhattacharyya R, Sanyal D, Dutta SK, Ghosh M, Bhattacharyya S (2010) Socio-demographic comparison and impact of Aila: the super cyclone in Gosaba of West Bengal. Indian J Community Med 35(3):429–432

Guha-Sapir D, Vos F, Below R, Sylvain P (2010) Annual disaster statistical review 2010 – the numbers and trends. CRED, Brussels, p 21. Available at https://www.google.com/webhp?rct=j#q=Guha-apir%2C+Debby%2C+Vos%2C+Femke%2C+Below%2C+Regina+with+Sylvain+Ponserre%2C+2010.+Annual+Disaster+Statistical+Review+2010+%E2%80%93+The+numbers+and+trends%2C+CRED. Accessed 2 Oct 2014

Human Development Coordination and Research Centre (HDRCC), Development and Planning Department, Government of West Bengal (2009) District Human Development Report South 24 Parganas. HDRCC, Development and Planning Department, Government of West Bengal, Kolkata

Kumar U, Baten MA, Masud AA, Osman KS, Rahman MM (2010) Cyclone Aila: one year on natural disaster to human sufferings. UnnayanOnneshan, Dhaka, p 4. Available at http://www.unnayan.org/documents/Climatechange/ailareport_humansuffering.pdf. Accessed 5 Nov 2014

Lindell MK (2013) Recovery and reconstruction after disaster. In: Bobrowsky PT (ed) Encyclopedia of natural hazards. Springer, Dordrecht, pp 812–824

Mukhopadhyay A (2009) Cyclone Aila and the Sundarbans: an enquiry into the disaster and politics of aid and relief. Mahanirban Calcutta Research Group, Kolkata, pp 18–20

Regional Specialised Meteorological Centre- Tropical Cyclone, India Meteorological Department (2009) Severe cyclonic storm, AILA: a preliminary report. Regional Specialised Meteorological Centre-Tropical Cyclone, India Meteorological Department, New Delhi

Regional Specialised Meteorological Centre, Tropical Cyclone, New Delhi, India Meteorological Department, Government of India (n.d.) Severe cyclonic storm, Aila: a preliminary report. Available at http://www.imd.gov.in/section/nhac/dynamic/aila.pdf. Accessed 11 Oct 2014

Schwab J, Topping KC, Eadie CD, Deyle RE, Smith RA (1998) Planning for post-disaster recovery and reconstruction (PAS 483/484). American Planning Association Planning Advisory Service, Chicago, Chapters 3–5, pp 43–167

Sinha S, Bhattacharyya P (2009) Cyclone Aila in West Bengal: a report by Jamsetji Tata Centre for Disaster Management, TISS, p 5. Available at http://www.iagwestbengal.org.in/downloads/archives/Aila_2009/Aila_TISS.pdf. Accessed 5 Nov 2013

Smith G (2011) Planning for post-disaster recovery: a review of the United States disaster assistance framework, vol I. Public Entity Risk Institute, Fairfax

Stallings RA (2002) Weberian political sociology and sociological disaster studies. Sociol Forum 17(2):281–305

Tagore Society for Rural Development (2007) Application for emergency relief support: cyclone "Aila" Sunderban. Available at http://www.tsrd.org/aila.html. Accessed 25 Nov 2013

Walter J (ed) (2002) World disasters report – focus on reducing risk. International Federation of Red Cross and Red Crescent Societies, Geneva. Available at https://www.ifrc.org/Global/Publications/disasters/WDR/32600-WDR2002.pdf. Accessed 7 April 2015

Chapter 10
Missing Link Between State and Community: Post-tsunami Reconstruction and Rehabilitation of Alappad Panchayat, Kerala, India

Neena Joseph

10.1 Introduction

The Indian Ocean tsunami of 2004 had the most devastating effect in the Alappad Panchayat region of Kerala. The area experienced one of the highest death tolls in India for the tsunami and also saw the destruction of property and utilities. After the disaster not less than 252.31 crores of rupees ($42,084,000)[1] was pumped into the Panchayat for R&R programmes by the government and various other agencies. The various reconstruction and rehabilitation (R&R) initiatives after the tsunami which hit Alappad Panchayat had different degrees of success and failure. The existing decentralised system of governance was not utilised systematically for identification, formulation, and implementation and monitoring of R&R programmes. The programmes were conceived and implemented through the hierarchical bureaucratic system of governance. In this context, the major hypothesis of the study is that wherever there is under- or non-delivery of envisaged services, the reason could be the failure to ensure participation and decision-making of the community. The objective of this paper is to analyse the participation and decision-making in the R&R programmes of the Kerala Government for the tsunami-affected region of Alappad Panchayat.

In a post-disaster scenario, R&R follows after the response and relief phases. Reconstruction phase refers to that phase in which rebuilding of the basic physical infrastructure and shelter for the affected community takes place. This extends

[1] 1 US dollar = 60 rupees. In this paper, $ denotes US dollar
1 crore = 10,000,000.

N. Joseph (✉)
Institute of Management in Government, Kerala, India
e-mail: facultyimgdrnj@gmail.com

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up to 2 years immediately after the relief phase. Reconstruction involves partial or complete relocation and rebuilding so that vulnerability is reduced. Reconstruction prepares the ground for rehabilitation and helps people to start afresh. The rehabilitation phase is concerned with long-term inputs of reinstating lost livelihoods, introducing new economic opportunities and also improving land and water management processes so as to reduce the vulnerability of the people and also to enhance their capacities to handle calamities in the future (Niazi 2012). The outcome of the programmes which are placed into the post-disaster scenario in a region may not converge with the declared goals and objectives in spite of the fact that planners and executives who conceive, formulate and implement the projects do so with undiluted zeal.

Often the missing link is the preferences, needs, wants, aspirations and goals of the citizens (who are directly affected by the disaster) shaped strongly by the lived realities of their culture, traditions, livelihood patterns, social networks and safety nets and also by their access, control and manoeuvrability over the entire spectrum of natural, financial, social and human capital. Again the inputs have to pass through the institutional (regularised practices or patterns of behaviour which are often open to divergent interpretations by the players) processes of many organisations and many layers of different organisations. Alappad Panchayat was selected for the study in order to analyse the missing link between state and community in post-tsunami R&R programmes. Framework (Scoones 1998) was used for the analysis of livelihood security of the community after the R&R programmes.

A specific research problem of the study is: R&R endeavours involve the expenditure of huge funds from the exchequer. Funds are also sent into the community out of the philanthropy of individuals, NGOs and corporate entities. But the R&R programmes may not be satisfying the needs of the community, and some of the projects may be even culturally incompatible. The programmes and projects need to be based on the grass-roots sociocultural realities and the sustainable livelihood of the community. The objectives of the study are, first, to analyse the participation and decision-making in the R&R programmes of the Kerala Government for the tsunami-affected Alappad Panchayat region; second, to identify the issues and problems related to R&R at Alappad Panchayat after the tsunami; and, finally, to analyse the livelihood security of the community after the R&R tsunami programmes. The specific research questions addressed in this paper to satisfy the above objectives are as follows: (1) Firstly, were there participation and decision-making processes in the various R&R activities in the Panchayat? (2) Secondly, what were the issues consequent to relocation? (3) Thirdly, were there issues and problems related to livelihood security?

The chapter is divided into six sections. The first section is the introduction dealing with the background of issues, research objectives and research questions and finally with the structure of the chapter. The second section contains the literature review. Theoretical framework is given in the third section. Research

methodology is discussed in the fourth section. Findings and discussions are given in the fifth section. The sixth section furnishes the conclusion.

10.2 Literature Review

Reconstruction and rehabilitation principles, policies, plans, programmes and processes are being seriously discussed globally with special reference to India, Sri Lanka, Taiwan, Indonesia, Australia, etc. (Athukorala and Resosudarmo 2005; Alexander et al. 2006; Jayasuriya and McCawley 2008; Fernando 2010; Mulligan and Nadarajah 2011; Kang 2013). The major R&R activities are identified as mainly housing, infrastructure, livelihood and cultural restoration. Forced relocation for ecological restoration (Light and Higgs 1996; Higgs 2005; Clasen et al. 2006; Chandrasekharan et al. 2008; Régnier et al. 2008; Ruwanpura 2009; Kang 2013), disruption of social relationship, the loss of social capital (Aldrich 2002; Munasinghe 2007), the efforts in building up fresh social capital, threat to livelihood due to improper relocation, cultural issues arising out of relocation into a different cultural scenario (Fard et al. 2010) and ecological restoration as route to sustainable livelihood have been researched. Cultural restoration though invisible is also being discussed. Issues of different types of vulnerability have attracted many studies (Dall'Osso and Dominey-Howes 2010; Khazai et al. 2006).

The significance of building back the infrastructure of public utilities and for the relocated habitats is recognised through studies. Housing problems in the relocated sites are tangible, distinctly recognizable and identifiable. They are amenable to clear articulation unlike sociocultural problems. Many researches had happened in that direction. Three distinct actors undertake R&R activities: state, community and civil society. R&R activities are undertaken by different combinations of these actors according to the geopolitical, ecological and governance system characteristics of the tsunami-affected territory. Community participation can differ in degree ranging from transformative participation to marginalised non-participation. The four factors which form the basis of the degree of participation are stakeholder power, legitimacy, trust and urgency for action (Chandrasekhar 2010). R&R efforts should target at maximum self-reliance for the victims and their least dependence on government. The responsibility for building up homes is to be on the homeless themselves. R&R operations based on this principle enhance the ability of the survivors to participate in reconstruction. In spite of this fact, bureaucratic processes hindered the success of participatory processes (Fallahi 2007). The indigenous knowledge of the survivors needs to be tapped, and this has to be integrated with scientific knowledge to minimise community vulnerability to environmental hazards (Mercer et al. 2009). Collaboration between state and community is inevitable for the success of R&R initiatives. The missing link between state and community is participation, and establishing this link is the key to effectiveness of R&R activities.

10.3 Theoretical Framework

Sustainable R&R by rural livelihoods is a framework for analysis that deals with how different strategies for sustainable livelihood depend on the access to different livelihood resources (Scoones 1998). Livelihood resources include natural, economic, human and social capitals. The notion of capital could be expanded to accommodate other forms of capital, comprising of tangible and intangible capitals including personal capabilities. The various capitals are combined to pursue different livelihood strategies. But the livelihood outcomes depend on the formal and informal organisational and institutional factors. Institutions may be both formal and informal and amenable to diverse interpretations by various players. Power relationships are embedded in institutional practices and operations. So institutions are part of social negotiations. To analyse the participation and decision-making, Gray's participatory governance framework (2005) was used.

Figure 10.1 provides a visualisation of the conceptual framework that the study followed. The first part of the chart deals with the participation aspects of governance. Participation of political leaders, community leaders and the actors of the decentralised governance setup and NGOs is necessary right from the identification of programmes and projects, formulation, organisation, implementation and monitoring/evaluation. The R&R governance process should take into account the ecological sensitiveness and vulnerability of the area. It should also account for the institutional processes of the interplay between the natural, social, financial and physical capital to ensure that the outcome of the R&R processes are sustainable. Livelihood is much more beyond income-generating projects.

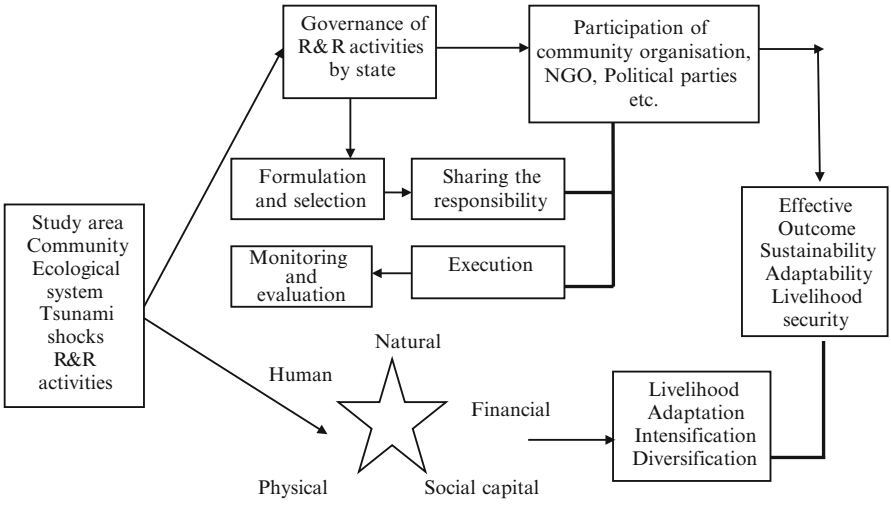

Fig. 10.1 Conceptual framework of the study

10.4 Research Methodology

In the southern area of Alappad, 10 acres of land is given on lease to Indian Rare Earths (IRE) for sand mining. The senior citizens of Alappad say that due to sand mining in the southern tip, there is attrition of the land all along the western coast, and at least 1 km of land along the coast is already lost to the sea. The seniors say that at least 7,200 ha is lost to the sea (Alappad 2012). In the pre-tsunami days, there was only one bridge connecting the eastern side of the peninsula to the mainland – Panikkar Kadavu Bridge situated at about 3 km from the southern tip of Alappad.

The main occupation of the people is fishing. Most of their houses used to be situated near seashore as close as 20 m. Since the Panchayat is approximately 5 m above sea level, the community used to occasionally face the fury of the sea. According to coastal regulation zone norms, construction is not permissible within 200 m of the coastline and beyond 100 m of canals (Coastal Zone Regulation Notification 2011).

During the Indian Ocean tsunami of 2004, the most devastating effect in Kerala was at Alappad Panchayat which had a death toll of 143 out of the 196 in Kerala. About 2,194 houses were completely destroyed and 3,000 houses were seriously damaged. Alappad received the maximum attention from the government for R&R activities. Hence, Alappad Panchayat was selected for the study to analyse the missing link between state and community in post-tsunami R&R programmes.

Primary and secondary data were used. Primary data was collected through personal interviews with key informants, four focus group discussions and a survey of 200 households of relocated persons using the interview schedule. Secondary data was collected from the Collectorate and the Panchayat. Interviews with key informants were conducted. The senior official who was looking after the R&R operations from Quilon Collectorate (Mr. Vinod) and the Panchayat presidents (PP) during various phases of tsunami were interviewed. The PP during the time tsunami struck, the PP during R&R activities (Mr. Raj Das) and the current Panchayat president were informants. The member looking after Jangar service, the presidents of Karayogams at the northern and southern parts of Alappad, current Panchayat secretary, engineers of Harbour Engineering Department (Smt VK Lotus) and PWD (Roads and Bridges) (Dr. Sini) were interviewed. Focus group discussions were conducted with four groups: Panchayat members (15 members), group of women from the tsunami-affected wards (25 women), members of Pukkott Devi Kshetram Karayogam (20 members) situated in ward 3 and members of Pandathuruthu Karayogam situated in the 15th ward (10 members) during October, November and December 2013.

10.5 Findings and Discussion

10.5.1 Analysis of the Governance System of R&R Programmes in Alappad Panchayat After Tsunami[2]

In this section, the various post-Tsunami R&R programmes undertaken at Alappad Panchayat are discussed. The main programmes were: (1) TEAP (Tsunami Emergency Assistance Project) funded by ADB (Asian Development Bank), (2) TRP (General) i.e. Tsunami Rehabilitation Programme (General Package) funded by Central Government and (3) TRP (Special) i.e. Tsunami Rehabilitation Programme (Special Package) funded by Central Government. The three types of programmes had distinctly different governance structures and implementation mechanisms. The levels of participation by citizens were different in the three kinds of programmes. The programmes and their governance structures are illustrated with typical cases followed by analytical discussion.

10.5.2 Tsunami Emergency Assistance Project in Alappad Panchayat

Tsunami Emergency Assistance Project (TEAP) funded by the ADB assisted in livelihood restoration; putting up transportation facilities like roads, bridges and harbours; restoring local infrastructure in the area of water supply and sanitation; and introducing capacity building initiatives. The total assistance to the 13 coastal districts of both Tamil Nadu and Kerala was Rs 629.93 crores ($104,988,354). The TEAP funds allocated for the 32 projects were distributed through the Public Works Department (PWD) Roads and Bridges, Kerala Water Authority, Kerala State Electricity Board (KSEB), Fisheries Department and Harbour Engineering Department (HED). Together these agencies spent Rs 97.45 crores ($1,6,274,150) for Alappad.

Regarding the governance structure for TEAP projects, the District Collector was the central authority. The Collector allocated the funds among different departments. The departments conceived the projects, and then there would be joint discussion of the departments and the Panchayat committee.[3] The projects were modified

[2]The statistics were obtained from the records of Quilon Collectorate from Mr. Vinod Kumar G, the Collectorate official who had played a pivotal role throughout all phases of tsunami relief management. Collaborating data was also collected from the records and pamphlets of the Panchayat.

[3]Panchayat committee is constituted by people's elected representatives from each ward. Thus, decisions taken at committees are by representatives of citizens. Direct participation by citizens happens in Grama Sabhas which are convened at ward level by the ward member. It is statutorily required that Grama Sabhas need to be convened at least once in 6 months, and if three ward Sabhas are not convened within a period of 1 year, the ward member will become disqualified to hold that

after discussion with the Panchayat committee. Identification and selection of the projects, execution and monitoring/evaluation were done by the bureaucratic administrative system. Participation happened only at the Panchayat committee level. There was no discussion at Grama Sabhas which is the statutory forum for grass-roots participation. There was no direct interaction with citizens who are directly affected by the disaster.

Under the Theeramytri project of the Fisheries Department, different projects were launched including mussel cultivation. Bakery, shop, units to manufacture value added products from fish, stitching units are examples of enterprises which were initiated. Some of the units are still functioning, while some others have already died or are in the process of dying. A stitching unit is functioning in the house of one of the group members[4] for the lack of space. A timber unit has stopped functioning, because there is no approach road near the place of business. The problem with another stitching unit is the lack of power. In a sari designing unit, the reason for the failure was inadequacy of training. They do not know how to use the sewing machine. The irony of the situation is that at the Panchayat under TEAP, a Cluster Production Centre and a Community Resource Centre were constructed with all the modern facilities including a conference hall with air conditioner which cost a total of Rs 92.43 lakhs[5] ($154,358). Had the community known the utility of these buildings, demand and pressure would have come from the community to utilise these as a common facility and a training centre. It is a paradox that unmet needs and unutilised facilities which could have been used to meet the needs existed in the same Panchayat, but the community was not empowered enough or does not care enough to demand the utilisation.[6]

Two case studies may be examined – one success and another failure – to see the effectiveness or otherwise of top-down hierarchical model (Box 10.1).

Box 10.1: Case Studies 1 and 2

Case 1: Infrastructure Development – Success Story

The main programmes under TEAP were the construction of two bridges: Alummoottil Kadavu Bridge costing 17.3 crores ($2,889,100), completed in 16 months and inaugurated in February 2009 and Ayiramthengu-Azheekal Bridge costing Rs 21.72 crores ($3,627,240), completed in 5 years and inaugurated on 2 March 2010. The advent of these bridges enhanced the connectivity of Alappad to the mainland. Earlier, the only one bridge connecting

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position. Any number of special Grama Sabhas could be convened based on the special subjects. There was a possibility of conducting any number of Grama Sabhas for R&R projects.

[4]Projects are allotted to women's group of five to ten members from the affected areas.

[5]1 lakh = 100,000.

[6]From the survey.

Alappad to the mainland was Panikkar Kadavu Bridge situated at a distance of about 3 km from the southern tip (see map). The construction of two bridges resulted in substantial time saving for the inhabitants of the peninsula who had to depend on the ferry service (with all its unpredictability and arbitrariness) to transport them to the mainland. It was also psychologically boosting, because now there are two more solid bridges to carry them across to the mainland in the eventuality of any other future disasters. There was unanimous opinion regarding the utility of the bridges for Alappad Panchayat. The community holds the assistant executive engineer, V.K. Lotus, in high esteem for her dedicated service.

The project was a success because of three reasons: (1) this was a very obvious and undisputable need of the community considering the ecological fragility and connectivity to the mainland; (2) the dedicated service of the concerned engineer under the able stewardship of a very dynamic and selfless district collector, Mr. E. Sreenivasan; and (3) seamless coordination and synchronized teamwork of the district collector, engineer, and the local body leader, Mr. Raj. Although the project was a success in spite of non-participatory nature, it cannot be taken as the case of effectiveness of top-down hierarchical model. It was a success due to the very obvious nature of the need of the project and because of the dedication of the officials. But R&R activities are too crucial to be left to the chance of having dedicated officials and also to the chance of unerring judgment of officials regarding the needs of the community. Need identification assessment in its details are bound to fail if undertaken in a non-participatory fashion as revealed by Case 2 furnished below.

Case 2: Ochira Drinking Water Scheme – Failure Story of Project

The main project of Kerala Water Authority was Ochira Drinking Water Scheme. There was an old project report for drinking water resting on the shelf of the department. Since tsunami R&R activities were to be undertaken on a war footing within minimum time, this report was drawn out and given for implementation. The water requirement mentioned in the report was not updated. The calculation of demand did not take into consideration the additional population in the Amritanandamayi Madom and also the additional water requirement generated by the operations at the Kayamkulam Harbour. The scheme was to pump water from Achankovil, purify it at Ochira and from there store it in two overhead tanks at Alappad for distribution. The project is in operation, but it is sufficient for only nine wards out of 16 wards. The project cost was Rs 3.88 crores ($647,960). Even a preliminary discussion with the community might have revealed the need for revising the water requirement of the community, consequent to the additional population in the northern wards.

10.5.3 TRP Special Package for Alappad Panchayat

Tsunami rehabilitation programme (TRP) funded by the Government of India started in 2008. The work was carried out in Alappad under two TRP schemes: TRP special package of Rs 43.3 crores ($7,231,100) for Alappad alone and TRP general package for the whole of Quilon District Rs 1,441 crores ($240,647,000), out of which Alappad was allocated a good amount.

Box 10.2: Case Study 3

Case 3: Bridges – Success Story of Incorporation of Community Suggestions

Edathuruthu is a small island and is a part of the Panchayat situated in the canal off the eastern part of the main portion of Alappad Panchayat (peninsula). Many tsunami victims were rehabilitated there. A bridge costing Rs 4.37 crores ($729,790) was proposed under the special package to connect the peninsula and the Island. The inhabitants put up stiff resistance and demanded to increase the height of the bridge so as to enable the easy passage of their country boats. Increasing the height meant increasing the span, and consequently it will entail land acquisition from tsunami-affected families. The department did not have the technology to increase the height without increasing the span. The department engineers themselves explored the possibility of such designs and finally arranged technology from IIT Chennai to build a bridge without pillars, but with towers at both ends supporting the bridge. The community was satisfied to get a bridge without affecting their livelihood. If the bridge was built too low, they could not get their boats for fishing pass under it. Dr. Sini, Engineer (Roads and Bridges), was remembered with love and respect by the community for organising the correct technology aligned with the needs of the people.

Box 10.3: Case Study 4

Case 4: Public Buildings – Failure Story of Formulation and Selection of Projects

The old age home was constructed at Kakkathuruthu which is an island and a part of Alappad Panchayat, but situated in the canal off its eastern coast. It was started with Member of Parliament fund (in India, Parliamentarians are allotted funds to use according to their discretion in the country). Additionally, Rs 26.5 lakhs was earmarked from TRP special package. Nirmithi Kendra constructed a beautiful building by the canal in a beautiful setting with all

(continued)

the physical facilities. There was change of the Panchayat committee by the time work was completed. The idea of dumping seniors in old age homes was culturally incompatible. The Panchayat also did not have a vision regarding its operation. Some members would like to use it as a day care home for seniors. It might be handed over to the Social Justice Department. At present, antisocial elements are frequenting this deserted place. This is a classic example of how a project conceived without taking into account the cultural realities of the community will not take off. Again it is an issue of governance wherein the operational plan is not in place while the project is being planned.

Public Works Department (PWD) (Buildings) mainly completed five construction projects: Model Village Office, IP and OP Blocks for Home Department, Veterinary Hospital and Building for Integrated Child Development Programme. During FGDs (focus group discussions) with Karayogams and women's group, the participants said that these projects did not reflect their priorities.

Expansion of the existing community health centre (CHC): There were no inpatients in the Homeo Hospital. Actually Panchayat had asked PWD to construct facilities for outpatients. But PWD constructed an inpatient (IP) block as well. The Panchayat was not consulted. The Panchayat knew that there was no scope for an IP facility there. Staffs were not appointed for IP operations. The upgradation of the public health centre into the CHC involved an expenditure of Rs 1.90 crores ($317,300), out of which Rs 39.5 lakhs was from TRP special. Since doctors were not appointed, the facilities are sitting idle.

The governance structure and process for implementing TRP special package are as follows. District Planning Officer held discussions with the president of Panchayat along with three members selected by the president and made a draft plan for R&R activities. The three members were chosen by the Panchayat president from among three ward members. This plan was discussed in the Panchayat Samiti, and based on the discussion, it was modified. Projects were allotted to wards. The projects were placed in the respective Grama Sabhas and their suggestions were incorporated. The modified projects were discussed in the Panchayat Samiti in the presence of the District Collector. The Grama Panchayat was the nodal agency entrusted with the task of prioritisation and fund allocation across different projects. Some projects were implemented directly by the Panchayat, while others were implemented through the ten government departments/agencies.

Under a TRP special package, 724 houses were constructed at Alappad. People were given Rs 3 lakhs each to construct houses on their own land in Alappad Panchayat itself. Under this package, houses were reconstructed for those in Alappad Panchayat who resided on the eastern side of the road. The cost of each house was Rs 3 lakhs. The total expenditure under TRP special as of 27 April 2013 was 95 % of the allotted funds. Harbour Engineering Department (HED), PWD (Roads and Bridges), PWD (Buildings), KSEB, Minor Irrigation, District Nirmithi Kendra (construction of the old age home), Social Justice Department (construction

of Anganwadis), Industries Department, Education Department (procurement of school buses), Health Department (equipment and supplies for health centres) and Alappad Grama Panchayat (construction of shop rooms) were the main departments through which projects were implemented. Out of the total outlay of Rs 43.29 crores, housing by Alappad Panchayat (53.73 %), HED infrastructural development works (19.44 %) and PWD (Roads and Bridges) (13.67 %) together constituted 87 % of the total outlay of Rs 43.29 crores ($7,229,430).

It would be appropriate to examine two cases in the construction sector since construction sector constitutes 87 % of the total expenditure (Box 10.2). Since construction in these sectors constitutes 87 % of expenditure, it would be appropriate to examine two cases from these sectors.

The above case illustrates how a democratically oriented official cared enough to listen to the voice of the people and strived to incorporate their livelihood concerns into the design of the bridge. But all officials cannot be expected to have this orientation. The community cannot afford to place reliance on the work ethic and ethics of an official for integrating his or her needs and concerns into the design of construction structures. Structures and systems have to be institutionalized to capture their needs and aspirations. Of expenditure of TRP (special) is committed for construction (Box 10.3).

Instead of the programmes being identified, formulated, implemented and monitored through the hierarchical bureaucratic system, the civic consciousness already existing in the people could have been leveraged. If programmes were identified and implemented consultatively and participatively, there would have been more ownership and hence more follow-up action to put them into operation.

But R&R programmes are too important to be left to the chance of having good souls at the bureaucratic hierarchy. Participative structure incorporating all the stakeholders like Karayogams and senior citizens is needed. Grama Sabhas could have been used as a forum of discussion in all types of R&R activities. Participation of Karayogams could have been ensured because they represent more than 95 % of the population. Karayogams play a vital role in all facets of the community life. They are the defacto police stations. marriages are conducted under their auspices. Disputes are settled there. Karayogams know the pulse of the people. If allowed participation, they could have suggested need based projects. Even property transactions happen through documentation at Karayogams. Incorporating them in the governance process could have made the R&R governance more inclusive.

10.5.4 TRP General Package for Alappad Panchayat

The TRP general package was for the entire Kollam District. Different departments had different schemes under TRP general. Out of this some funds were set apart for Alappad. Funds went to Minor Irrigation Department (24 drainage canals, groynes Rs 500 lakhs), Health Department (building PHC Rs 110 lakhs); HED (road construction Rs 16.2 lakhs), PWD (road construction Rs 100 lakhs), Anganwadi (Rs 3 lakhs) and the Inland Navigation Department (lining the side of TS Canal

Rs 322.68 lakhs). Fisheries Department, Animal Husbandry Department, Agriculture Department and KSEB also received funds, but their contribution designated exclusively for Alappad could not be obtained from the Collectorate. As mentioned earlier, the total allocation of Rs 1,441 crores under TRP (General) is for the entire Quilon District. The expenditure made by the government was coordinated by collectorate where records of location-wise expenditure were supposed to be kept. But the location-wise segregated expenditure data of all departments were not available there. Hence it was difficult to assess how much of TRP(General) funds were expended in Alappad alone. But it was informed by Collectorate personnel that being the most affected, Alappad was given priority in funds allocation by the departments.

This was the scheme with the least participation from the community. The projects under this category were implemented through departments. There was no discussion with the Panchayats except for some doubt clearance. There was no grass-roots-level discussion. The only projects where discussion was held with Panchayat were those of drainage canals.

Different departments had different schemes under the TRP general. Regarding the work of some departments, the allocation to Alappad for these projects could not be segregated from the records of the Collectorate. However, these schemes were implemented in Alappad Panchayat and focus was mainly on Alappad Panchayat (Box 10.4).

Box 10.4: Case Study 5

There was the decision to build three separate buildings in three different schools – one high school and two secondary schools. The deputy director of education was in charge of implementation. Administrative and technical sanctions were already obtained. The then District Panchayat did not do the necessary follow-up for completing the project. Due to the laxity, the contractor abandoned the work and left. The project could have been started in 2009; however, only recently the work has started.[7]

The lack of ownership by the community is very evident when the present situation of the programmes is analysed. The project remained an orphan till recently. Building the school structure is indeed an important need of the community. If the community was involved right from the formulation to implementation and also for monitoring/evaluation, the schools might have been functioning in good buildings since at least 2 years. This assertion is made based on the experience of the Karayogam at Pandarathuruthu which came forward with the task of operating the school bus without charging any fees from the children.

[7]Mr. Raj Das, the PP during R&R operations.

10.5.5 Overview

Only through these processes, the needs of the community can be captured in the plans, programmes and projects. During the FGDs with Panchayat members, they said in the initial stages of R&R operations that they were not aware of any schemes and had no idea what the government would do for the Panchayat. If through Grama Sabhas, the different schemes were introduced, grass-roots suggestions could have emerged regarding how to identify projects that aligned with their needs. FGDs with the members and Karayogams identified that the priorities were of course houses with all the amenities of water, electricity, drainage, approach roads and pathways. Maintaining the road in good condition was another demand. The community was concerned about the sustainability of their livelihood especially in the context of land attrition. The unanimous opinion is that groynes[8] with sea wall are the solution. There was no difference of opinion regarding bridges. So it can be concluded that grass-roots-level involvement is required regarding the identification of projects. In Kerala, the Panchayat members are conversant with preparation of projects (40 % of plan funds are devolved to local bodies) in all its sequential steps, viz. objectives, formulation, organisation (who should do what), activity calendar, financial analysis, cost-benefit analysis, gender and environmental impacts. There is a process of formulating projects based on these lines. The thought framework is familiar to the people. The projects could be done consultatively through these frameworks. Such skills already exist in all the Panchayats, thanks to the People's Planning campaigns.

10.5.6 The Issues and Problems of Reconstruction and Rehabilitation Programmes in Alappad Panchayat

Those who were relocated into the land purchased by District Administration on the eastern side of the canal and whose houses were constructed mainly by Panchayat with participation and with respect to money and labour were satisfied.[9] But those who were displaced into the acquired land into housing colonies were thoroughly dissatisfied**.** After completion, houses were allotted to them on lots. The persons relocated into other local bodies had complaints regarding the quality of materials used for the houses, the inadequacy of approach roads, drinking water problems, sewage and drainage problems, the lack of proximity to bus stops and fish landing spots, which resulted in untold hardships to fishermen whose livelihood facilities

[8]Groynes are the stones which are laid into the sea perpendicular to the coast. When groynes are laid intermittently, they trap the water in between and regulate the flow of water. This can prevent the attrition of coastal land.

[9]Survey, FGDS, Interviews of key informants.

were threatened. Back on their original habitat, although they lived in small houses, the entire beach was open to them for common use. The colonised persons felt suffocated and constrained in the confined four cents of land. Their culture was to cremate their deceased ones near their own house. This became impossible in the new waterlogged and walled 4 cent compound newly owned by them. Basic amenities like street lights were lacking. Alappad Panchayat had nine schools and seven libraries which are more than 100 years old. The new habitats is remotely located. Instead of allotment of houses on lot basis, if people were partnered in designing, building with option to finance, better-quality housing could have been the result. Placid (2005) had tried out with success this self-help and self-reliant model during even the relief phase of tsunami rehabilitation. Ganapati and Ganapati (2009) advocates participatory planning in post-disaster reconstruction in the background of Turkey experience. Sri Lanka's experience also upholds the success of owner-driven programmes (Hidalge and Usoof 2010). Lyons (2010) envisages reconstruction as development and as an opportunity to build back a better life. Schilder (2010) also speak about putting people at the focus during R&R programmes.

10.5.7 Discussion of Post-tsunami R&R Sustainable Livelihood Issues of Alappad

In this section, post-tsunami livelihood restoration programmes undertaken for Alappad Panchayat are discussed. The analysis of the situation is done under the four types of capital: natural, social, human and financial.

10.5.7.1 Natural Capital

Traditionally, fishing is the livelihood of the community. The main natural resources of the Panchayat are sea and mineral sand. The Government of India Company Indian Rare Earths Ltd (IREL) and the Government of Kerala Company Kerala Minerals and Metals Ltd (KMML) are the main parties of mining. IREL is the chief player. It is estimated that the net profit accrued out of mining one cent of land with black soil is Rs 2 crores ($334,000).[10] The community expects that at least a decent portion of the gains should be passed on to the community.[11] At present, mining is going on in the 16th and 15th wards. 14th and 13th wards are also marked for mining. Many negotiations had been going on between the Karayogams in the southern tip of Alappad and between IREL regarding the terms

[10]FGD with Karayogam at Pandarathuruth and draft document regarding the lease package submitted by the concerned Karayogams to the government.

[11]Saleena, member, Alappad Panchayat.

and conditions of mining. According to the meeting on dredge mining on 31 August 2011 at Secretariat, between the Karayogam presidents from the southern tip of the island, the Panchayat president, two advocates of Karayogams and three officials from IREL, 68.15 acres (0.276 km^2)[12] of land will be leased out to IREL for 3 years at Rs 50,000 ($8,333.3) per each cent of land for dredge mining.

The lease package also included cost of the goodwill charges ranging between Rs 35,000 and Rs 45,000 ($583.3–$750) for the different types of buildings. Traders and merchant will also be compensated. Although house rent was negotiated, it was not granted. Permanent employment for one member in the family was requested, but not granted. Yet, one member from the displaced family would be engaged on rotation basis when dredging is in progress. The request of the Karayogam for welfare contribution from IREL was turned down on the grounds that IREL was already contributing to Mining Area Welfare Board. The lease package also included clauses on sea wall and groynes. At present, two wards are taken for mining. The place looks desolate. No developments can be done for 3 years after mining operations. The seniors at Alappad say that along its western coast, one and half km is lost to the sea. About 50 years back,[13] one could not see the sea. There were huge sandhills propped up in position with a special kind of local cactus. The reason cited for the attrition of the land is the surface mining or sea washing as they call it. When sand is removed from the southern tip of Alappad, waves carry sand from the northern part to compensate it. If this activity goes on, the community fears that gradually the land of Alappad will vanish. In Karithura and Puthenthura also, sand mining is done.

However, using separator machine, the sand other than the black sand is put back into the mining area. But it is said that in those areas, mineral sand constitutes only 30 %, and hence when it comes to refilling, only 30 % need this operation. In those areas refilling is viable for IREL, whereas in Alappad, 70 % constitute the sand actually required by IREL. This continuous and indiscriminate sand mining could wipe out the entire Panchayat let alone the livelihoods[14] of its inhabitants. The solution unanimously agreed by the community is putting up groynes, i.e. seabed sufficiently far into the sea from the shore. Ten such sets costing a total of Rs 30 crores ($5,010,000) will be sufficient to protect the entire western coast.[15] By this method, the groyne will be able to retain sand for about 7 months in a year.

[12] 1 acre = 0.00405 km^2.

[13] Ms. Babay, vice president, Alappad Panchayat, during FGD with members.

[14] Mr. Harshan.

[15] Mr. Sagar, Panchayat member: One set is composed of six individual groynes. The structures need to jut out up to 30–35 m into the sea. The distance between individual members in one set would be between 90 and 150 m. The distance between the sets could be 500 m. To protect the sea coast with groyne, it would take at least 11 sets to cover the 17 km of sea coast of Alappad (the distance between individual members in 1 set is taken as 100 m). The cost of one set of groyne is estimated to be Rs 3 crores per set. With 33 crores, the entire west coast could be protected with groynes.

The Panchayat is planning to cultivate mangroves there, so that the sand could be retained, and also it would be good for spawning of fish.[16] There was also a unanimous agreement that groynes with sea wall are the solution. Sea walls require annual maintenance and also involve logistical issues of bringing it from far distant spots (meaning opportunity for engineers and contractors to make money). Hence, there is ample scope for corruption in sea wall construction. In the two FGDs of Karayogams, the scope for corruption was pointed out as the reason for the government including engineers to prefer sea wall solution over groynes. As mentioned earlier, the additional cost of groynes to protect the entire west coast will be only Rs 18 crores. The general perception of the community is that IREL is against constructing groynes, because the sand will not be deposited at the southern portions, and then they would have to resort to dredging which will involve more cost both for the process and then also for refilling back the dredged area. Sea washing, i.e. just scooping sand from the shore, works out to be easier and cheaper option for IREL.[17]

Groyne had been a recurrent demand of the community. The late Mr. MS Rudran (the first to be reported as dead during tsunami), a poet and thinker, had written about the necessity of groynes and had organised the community to advocate for groynes. In this context, it would be interesting to analyse whose voices are heard in such matters and whose interests finally get protected. The local population knows best what is good for them. Protecting the very existence of their land is the prime concern in livelihood. R&R activities done in a participative manner might have captured this indigenous knowledge for ecological sustainability.

The community feels that the vested interests of corrupt people holding power in government and corporates like IRE and KMML get precedence over the real needs of the community. R&R should be taken as an opportunity to build back a better life. Land attrition is a threat to the community where the very land they inhabit is at the threat of vanishing slowly. R&R activities could have prioritised this work seriously. The opportunity of getting R&R funds could have been thus utilised to build up a sustainable ecology which will ultimately facilitate sustainable livelihood. There is need for preserving and protecting livelihoods in R&R programmes after disasters (Niazi 2005). Shaw (2006) advocates the oft neglected environment-disaster synergy. Policy makers need to be acutely aware of this link between R&R programmes, ecological issues and sustainable livelihood.

10.5.7.2 Physical Capital

The old age home, community cluster centre and community resource centre are examples of post-tsunami structures. But local people do not feel that these

[16]Mr. V Sagar, member, Alappad Grama Panchayat – already he had given a proposal to the Panchayat.

[17]FGD of members of Pandanthuruth Karayogam.

structures belong to them. These structures were not developed based on needs identified by them. Nobody told them how these structures could be used. That is why these structures are left unused. A new culture needs to be developed to use these spaces. A secular place where all the community can come together and discuss issues is needed. Even now there is fragmented thinking. People in the south are not worried about Jangar.[18] People in the north are not worried about mineral soil mining and how it is systematically causing attrition of the land. Common issues like groynes as the priority need of the entire Panchayat population need discussion. This fragmented thinking is seen in the way TRP special projects are distributed among the wards. A holistic thinking for the entire Panchayat is missing. The Community Resource Centre and Production Centre need to be utilised. The physical capital created under R&R projects can be thus utilised to preserve the livelihood and rebuild lives.

10.5.7.3 Social Capital

The strong religious culture is an offshoot of the fear of the fury of the sea. The men hazard risks while venturing out into the sea. Fishing is the fulcrum about which the whole of Alappad life revolves. More than 98 % of the population belongs to Hindu faith. Karayogams are community organisations associated with each temple. That is to say, for 98 % of the population, Karayogams are the pivots of social life. Traditionally, there were nine Karayogams in the Panchayat. The community under each Karayogam formed a thura.[19] Karayogams were in place much before the Panchayats. They have the exact statistics of the number of boats and nets in the Panchayats. Karayogams have a very deep rooted foothold there. As mentioned earlier, Karayogam is the place where people run to solve all kinds of problems including marital issues and disputes of any kind in the Panchayats. Marriages are first registered at Karayogams and then only it would be registered in the Panchayats. While going to the sea, a complete novice would get as much share of the money as a veteran fisherman. People from one thura used to go out to the sea together. They had some unwritten mutual obligations (financial and otherwise). When they were relocated, they lost the old network of obligations. Since houses were allotted on the basis of lots, people from thuras are now living together in different colonies. When men go out to sea, womenfolk used to walk about in the beach unescorted at any time of the day and night, but without threat of assault.

[18]Jangar is a vehicle for transportation in sea and canals. Since there is no bridge between the northern end of the Panchayat and Alleppey District in the north, Jangar is in the priority list of the citizens in the northern wards.

[19]Thuras are traditional fish landing centres. Families affiliated to each temple were divided into groups called thura. Thus, each thura is a cluster of contiguous families. There are close relationships and mutual social obligations between members in a thura. The men in each thura go to fishing jointly.

In colonies, this situation has changed. Thus, the community used to enjoy the benefits of a strong social capital. Due to displacement, this social fabric is damaged or obliterated.

10.5.7.4 Human Capital

The women in the Panchayat are educated, and most of them have completed their 10th standard. There are nine schools in the Panchayat. The next generation is not much likely to accept fishing as their main source of income. Graduate boys of the community also engage in fishing in the interim period while waiting for a job. At present as in all jobs, many labourers come from other states. The modern technique of fishing does not involve much skill. According to the socialist culture, a new comer is able to get as much as a veteran. The number of labourers from other states is increasing.[20] At Alappad and also in the townships, there is fear regarding the safety of ladies. In Alappad, even costly vessels used to be strewn in the backyard of houses. There was no apprehension of these being stolen. Now the scenario has changed. The key informants had the opinion that R&R had made men lazier and alcoholic consumption had increased. The abandoned houses (whose occupants were evicted) along the western coasts of Alappad and also the north western portions of Alappad which became more windy (the bioshields put up for shore protection) became congenial spots for leisurely liquor consumption. Training on life skills, swimming, counselling, music therapy, etc., were reported to be very beneficial by the four or five persons who had undergone the same. This shows the utility of the same but also the lack of coverage. These were conducted by NGOs on their own initiative. It is recommended that such programmes are to be taken very seriously by the government and be done extensively to cater to the emotional needs of the disaster-affected people. The government can think of collaborating with NGOs in this regard. Policy makers need to consider such the subtleties while planning R&R activities.

10.5.7.5 Financial Capital

During tsunami relief, higher-quality nets were given to fishermen who owned only small boats. These nets were sold by them. Due to the time lag in the government honouring the terms of the lease agreement, some members in the community had to resort to private financiers to meet their credit needs. All their land documents are with IREL.

Before the tsunami, many persons had taken loans from cooperative banks. During the visit of the minister, there was the promise that the loans could be written off. But in spite of persistent efforts, the writing off of those loans did not happen.

[20] Saleena, ward member, Alappad Panchayat.

Now the interest has piled up and people are in a debt trap. Even people who did have money did not pay back anticipating that it would be written off.[21] Actually the then Chief Minister[22] and the opposition leader had made a populist promise that the debts would be written off. The directors of Alappad Panchayat Service Cooperative Bank acted in the anticipation that loans would be written off. This again was a populist stand. There were 2,050 loanees and the outstanding debt (capital alone) for the bank is Rs 5 crores and the bank is now running at a loss of Rs 6 crores (1,002,000).[23] This is a typical example of how institutional factors influence the financial capital.

10.5.7.6 Intensification and Diversification of Livelihood

There is no reason to believe that there was an intensification of livelihood due to R&R activities. Even if tsunami had not occurred and even if R&R activities had not taken place, there would have been a shift to harbour fishing. Usually 10–20 youngsters collect money and buy an inboard boat and net for, say, Rs 40 lakhs. The catch is being auctioned to a buyer, and with this money they repay their debt.

At Alappad, there was no culture of women working. So in spite of the various programmes organised for women by Fisheries Department and others, ventures were not generally carried out after training on a commercial basis. What they learnt was used for stitching clothes for the family, making soap for the group and making pickles for the family. As mentioned earlier, some training provided a handsome stipend of Rs 300 per day, and there was good response to 10-day training programmes. Some skill training programmes were not long enough or intense enough, thus leaving them with inadequate training that did not serve the purpose of sustained livelihood. They need to be handheld, escorted and empowered through chosen interventions at strategic points till they are confident enough to be on their own.

10.6 Conclusion

Globally, there has been increasing occurrence of natural calamities, and the Indian experience is not any different. Therefore, R&R programmes are gaining more and more relevance. The core objective of R&R programmes is to facilitate the adaptability of the community to absorb the shocks. In this context, we analysed the R&R programmes in Alappad Panchayat after the 2004 Indonesian tsunami. The foregoing analysis found that when there is a high degree of participation with community and government in conceiving, formulating and implementing,

[21] Mr. Baby, Pukkot Devi/Kshetram Karayogam president during FGD.

[22] Chief Minister is the political head of each of the 29 states in India.

[23] PS Lalitha, secretary, Alappad Panchayat Cooperative Bank.

R&R programmes are effective and successful in fulfilling the needs and aspirations of the community. The first finding of the study is that R&R programmes were launched through bureaucratic hierarchical administrative systems. Hence, the community's choice of R&R activities was not reflected in the programmes. Consequently, a missing link between state and community emerged. This was seen to exist in all R&R activities in the Panchayat. Therefore, the Government of India should formulate a policy of a governance system for participatory R&R. The second finding of the study is that there was failure to ensure accountability and sustainability of the R&R programmes. In the case of livelihood security, the bureaucratic approach is anchored on income-generating activities. The other forms of capital – natural, physical, sociocultural and human – obtained only nil or scant attention. The common property right of rich mineral resources is being shifted to the state after the R&R programmes. This could be called silent eviction in the light of the re-emerging sand mining debates in Kerala.

This study could be the basis of foundational research in participatory decision-making specifically in a conflict-ridden arena of multiple interests in a post-disaster R&R scenario. It is hoped that this study may encourage studies to be undertaken to explore the issues and problems faced by bureaucrats while implementing post-disaster R&R activities. A further hope is that this study will trigger new studies focused on ensuring participation and involvement of the community in the decision-making processes.

References

Alappad (2012) Development report, Alappad panchayat, 2012

Aldrich DP (2002) Building resilience: social capital in post – disaster recovery. University of Chicago Press, Chicago

Alexander B, Chan-Halbrendt C, Salim W (2006) Sustainable livelihood considerations for disaster risk management: implications for implementation of the Government of Indonesia tsunami recovery plan. Disaster Prev Manag 15(1):31–50

Athukorala PC, Resosudarmo BP (2005) The Indian Ocean tsunami: economic impact, disaster management and lessons. Asian Econ Pap 4(1):1–39

Chandrasekhar D (2010) Understanding stakeholder participation in post-disaster recovery (case study: Nagapattinam, India), Unpublished doctoral thesis. University of Illinois, Urbana-Champaign

Chandrasekharan H, Sarangi A, Nagarajan M, Singh V, Rao D, Stalin P, Natarajan K, Chandrasekharan B, Anbazhagan S (2008) Variability of soil-water quality due to tsunami-2004 in the coastal belt of Nagapattinam district, Tamilnadu. J Environ Manage 89(1):63–72

Clasen T, Smith L, Albert J, Bastable A, Fesselet JF (2006) The drinking water response to the Indian Ocean tsunami, including the role of household water treatment. Disaster Prev Manag 15(1):190–201

Coastal Zone Regulation Notification (2011) Coastal Regulation Zone Notification Ministry of Environment and Forests, Department of Environment, Forests and Wildlife. Gazette of India, Extraordinary, Part-II, Section 3, Sub-section (ii) of dated the 6th January, 2011

Dall'Osso F, Dominey-Howes D (2010) 'Reducing the loss': using high-resolution vulnerability assessments to enhance tsunami risk reduction strategies. Aust J Emerg Manag 25(4):24–30

Fallahi A (2007) Lesson from the housing reconstruction following the Bam earth quake in Iran. Aust J Emerg Manag 22(1):26–35
Fard AK, Ahmad MH, Ossen DR (2010) Cultural identity expressions through visual analysis in post- disaster housing. Am J Appl Sci 7(10):1412–1419
Fernando (2010) Forced relocation after the Indian Ocean Tsunami, 2004. Case study of vulnerable population in three relocation settlements in Galle, Sri Lanka. Unpublished PhD thesis, Colombo
Ganapati NE, Ganapati S (2009) Enabling participatory planning after disasters: a case study of the World Bank's housing reconstruction in Turkey. J Am Plann Assoc 75(1):41–59
Gray T (2005) Participatory fisheries management, theory and practice. Springer, Netherlands
Hidallge V, Usoof A (2010) Scaling up – people – cantered reconstruction: lessons from Sri Lanka's post-tsunami owner-driven programme. In: Lyons M, Schilderman T, Boano C (eds) Building back better: delivering people cantered housing reconstruction at scale. Practical Action, London
Higgs E (2005) The two-culture problem: ecological restoration and the integration of knowledge. Restor Ecol 13(1):159–164. doi:10.1111/j.1526-100X.2005.00020.x
Jayasuriya S, McCawley P (2008) Reconstruction after major disaster: lessons from the post tsunami experience in Indonesia, Sri Lanka, and Thailand, vol 125, ADB Institute Working Paper. ADB Institute, Tokyo
Kang J (2013) From original home land to 'permanent housing' and back: the post-disaster exodus and reconstruction of South Taiwan's indigenous communities. Soc Sci Dir 2(4):83–105
Khazai B, Franco G, Ingram JC, del Rio CR, Dias P, Dissanayake R (2006) Post-December 2004 tsunami reconstruction in Sri Lanka and its potential impacts on future vulnerability. Earthq Spectra 22(3):S829–S844
Light A, Higgs SE (1996) The politics of ecological restoration. Environ Ethics 18(3):227–247. doi:10.5840/enviroethics199618315
Lyons M (2010) Can large scale participation be people cantered? Evaluation reconstruction as development. In: Lyons M, Schilderman T, Boano C (eds) Building back better: delivering people cantered housing reconstruction at scale. Practical Action, London
Mercer J, Kelman I, Taranis L, Suchet-Pearson S (2009) Framework for integrating indigenous and scientific knowledge for disaster risk reduction. Disasters 34(1):214–239
Mulligan M, Nadarajah Y (2011) Rebuilding community in the wake of disaster: lessons from the recovery from 2004 tsunami in Sri Lanka and India. Routledge, New Delhi
Munasinghe M (2007) The importance of social capital: comparing the impacts of the 2004 Asian tsunami on Sri Lanka, and Hurricane Katrina 2005 on New Orleans. Ecol Econ 64(1):9–11
Niazi Z (2005) Reconstruction and rehabilitation: a response strategy for creation of sustainable livelihoods. Available at http://www.devalt.org/newsletter/may01/lead.htm. Accessed 8 Oct 2013
Niazi Z, Anand MC (2012) Handbook on eco-habitat for village panchayats, Lok Awas Yatra, 1st edn. Basin South Asia Secretariat at Development Alternatives, New Delhi, September 2012
Placid G (2005) Disaster mitigation: role of local governance institutions, lessons from Kerala. Centre for Collective Learning and Action, Thiruvananthapuram
Régnier P, Neri B, Scuteri S, Miniati S (2008) From emergency relief to livelihood recovery: lessons learned from post-tsunami experiences in Indonesia and India. Disaster Prev Manag 17(3):410–429
Ruwanpura KN (2009) Putting houses in place: rebuilding communities in post-tsunami Sri Lanka. Disasters 33(3):436–456
Schilder T (2010) Putting people at the centre of reconstruction. In: Lyons M, Schilderman T, Boano C (eds) Building back better: delivering people cantered housing reconstruction at scale. Practical Action, London
Scoones I (1998) Sustainable rural livelihoods: a framework for analysis, vol 72, IDS working paper. Institute of Development Studies, Brighton
Shaw R (2006) Indian Ocean tsunami and aftermath: need for environment-disaster synergy in the reconstruction process. Disaster Prev Manag 15(1):5–20

Chapter 11
Ridge to Reef to Peace and Development

Charlita Andales-Escano

11.1 Introduction

Mindanao, situated in the southern part of the Philippines, is known as the food supplier or food basket of the country due to its abundant agri-fishery production. The fertile soil and being free from typhoons and flash floods prompted the government to make it as the agri-fishery export zone of the Philippines. However, several areas have increasingly becoming exposed to risks associated to natural disasters such as typhoons, flooding, mudslides and earthquakes. The occurrence of two super typhoons, namely, Typhoon Sendong in 2011 (international name: Washi) and Typhoon Pablo in 2012 (international name: Bopha), had caused huge damages to agriculture and infrastructure and claimed many lives as well. The two major typhoons' severity and unpredictability are equated to climate change – therefore, it is a clear and present danger. These types of disasters are considered as the new normal in Mindanao. People were caught flat-footed and helpless when disasters hit their areas because they were not prepared to handle such a new normal. This resulted to unorganised approaches undertaken by many actors during and after the occurrence of typhoons. Further, this new normal combined with violent conflicts escalated the vulnerability and insecurity of environments in Mindanao.

At the national arena, super typhoon "Yolanda" (international name: Haiyan) tagged as category 5 typhoon was the most powerful and devastating tropical cyclone that struck the Philippines in recent record. Weather officials posited that Haiyan had sustained wind speeds exceeding 185 km per hour (kph) when it made landfall in the country. The strong winds ripped off the roofs of thousands of houses and knocked down shanties, trees, power and telephone lines and mobile cell towers.

C. Andales-Escano, C.E., M.B.A., Ph.D. (✉)
University of Southeastern Philippines, Obrero, Davao City, Philippines
e-mail: charlie.escano@minda.gov.ph; charlie_escano@yahoo.com

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Storm surge waves as high as six (6) to seven (7) metres or comparable to a two-storey building were also recorded that claimed thousands of lives and destroyed billions worth of properties that included government buildings and infrastructures.

Apparently, the Philippines, particularly, the National Capital Region, Central Luzon and Visayas, has been tattered by many catastrophic storms and other natural and man-made disasters since ancient times due to its geographic location both at the typhoon belt and the Ring of Fire. The country is prone to multiple recurring hazards such as cyclones, floods, earthquakes and landslides. At the height of Haiyan's catastrophic destruction, the weaknesses and significant gaps in the country's disaster response and management system were noticed. Despite a solid and functioning disaster risk reduction and management (DRRM) structure, the government's response still came across as reactive and not proactive, insufficient, inefficient and for the most part, too slow (COA undated).

With the new normal in Mindanao, there is no other way but head-on the issue. There seemed a critical need to come up with a holistic and integrated approach to the preservation, utilisation, restoration, rehabilitation and development of the environment. The "ridge-to-reef approach through the Mindanao Nurturing Our Waters Program" as a platform in which all stakeholders have clear roles to play before, during and after disasters has been adopted with emphasis on Mindanao context. This approach would require tremendous involvement of many government agencies, private sector, business community, academe, non-governmental organisation, local government units and host communities to achieve the goal of addressing the new normal in Mindanao. Currently, the "ridge-to-reef approach" is being implemented and continuously advocated by the subnational agency, the Mindanao Development Authority, as an integrated approach to address the pressing concern on the new normal in the island. In view of the new realities, vital sectors, such as power, irrigation, water supply, flood control, marine, other infrastructure subsectors and watershed protection, need to adopt synergetic approaches in addressing the challenges.

The ridge-to-reef approach to environmental and disaster management has been put into practice in some parts of the country as espoused through successful projects implemented by mostly non-governmental organisations in partnership with some government agencies, local government units and academe. However, the application of the concept was done in a project or an influenced area basis only, but no platform at the subnational level. This prompted the Mindanao Development Authority (MinDA) to champion the ridge-to-reef approach in Mindanao under its banner programme "Mindanao Nurturing Our Waters (MindaNOW)".

Noteworthy, this environmental approach is considered by Mindanao stakeholders as a venue to facilitate addressing of the long-term conflict in Mindanao as it knows no boundaries. It is seen as an opportunity that would bridge, bind and bond together among Christians, Muslims and indigenous peoples in Mindanao. The recent development of the peace process through the signing of the Comprehensive Agreement on the Bangsamoro (CAB) is also a notable impetus towards the apt implementation of the ridge-to-reef approach in nurturing the natural resources in Mindanao.

11.1.1 Disaster Risk Reduction and Management in the Philippines: Unfold History

Reports revealed that the Philippines, from its pre-Commonwealth days up to the present, has advanced a scheme to respond to the effects of disasters, both natural and human induced. The country's disaster management system traces back its origin to 1941 when then President Manuel L. Quezon issued Executive Order (EO) No. 335 establishing the National Emergency Commission and implementing measures to control and coordinate civilian participation to meet serious crises. Subsequently, the Provincial Emergency Committee was created, responsible of the supervision and control over the Municipal Emergency Committees and City Emergency Committees. In 1954, the National Civil Defense Administration (NCDA) was established through *Republic Act* (RA) 1190, which also created national and local civil defence councils. Later, in 1968, the NCDA was designated as the national coordinator to oversee and implement EO 159 that mandated the establishment of a disaster control organisation by all government offices including departments, bureaus, offices, agencies, instrumentalities and political subdivisions of government, including all corporations owned and/or controlled by government. The NCDA is tasked to report on the degree of preparedness of all government offices to the Office of the President.

In 1970, then President Ferdinand E. Marcos recognised the need to establish a disaster and calamity plan that was formulated by an interdepartmental planning group on disasters and calamities. Consequently, in 1972, the Office of Civil Defense (OCD) was established through Letter of Instruction No. 19. The OCD was mandated to coordinate national-level activities and functions of the national government, private institutions and civic organisations. In 1978, through *Presidential Decree* (PD) 1566, the National Disaster Coordinating Council (NDCC) was established as the highest policy-making body and the central organisation for disaster management in the country. The law also provided for the establishment of regional, provincial, city, municipal and barangay disaster coordinating councils.

In 2009, the Congress passed the *Climate Change Act* of 2009 and in 2010, *Republic Act* (*RA*) *10121* or the *Philippine Disaster Risk Reduction and Management* (*PDRRM*) *Act*. These twin laws on DRRM have common goals and objectives, which are (1) to increase the resilience of vulnerable communities and the country against natural disasters and (2) to reduce damage and loss of lives and properties due to disasters. Specifically, RA 10121 provides for the development of policies and plans and the implementation of actions and measures pertaining to all aspects of DRRM, including good governance, risk assessment and early warning, knowledge building and awareness raising, reducing underlying risk factors and preparedness for effective response and early recovery. The law recognises that there is a need to "adopt a disaster risk reduction and management approach" that is holistic, comprehensive, integrated and proactive in lessening the socioeconomic and environmental impacts of disasters including climate change and promote the involvement and participation of all sectors and all stakeholders concerned, at all levels, mainly the local community.

11.1.2 Present-Day Disaster Management in the Philippines

The National Disaster Risk Reduction and Management Council (NDRRMC) is a body empowered to perform policy-making, coordination, integration and supervisory functions, as well as monitor the preparation, implementation and evaluation of the National DRRM Plan (NDRRMP) to ensure the protection and welfare of the people in times of disaster. The new law transformed the NDCC to the NDRRMC, which is still headed by the Department of National Defense (DND) but with four Vice-Chairpersons, namely, the Secretary of the Department of Science and Technology (DOST) for disaster prevention and mitigation, the Secretary of the Department of the Interior and Local Government (DILG) for disaster preparedness, the Secretary of the Department of Social Welfare and Development (DSWD) for disaster response and the Director General of the National Economic and Development Authority (NEDA) for disaster rehabilitation and recovery. In addition to government agencies, the council's membership includes financial institutions, local government leagues, the private sector and civil society organisations which mirrors the holistic approach on disaster risk reduction. The NDRRMC is supported by the DRRM Council (DRRMC) Networks. The council is replicated in the regional level down to the barangay level, hence linking all disaster-related offices and LGUs which have specific roles to play in disaster management. However, at the subnational level, there is still a pressing demand to establish a platform or mechanism that coordinates all the regions, in particular, in Mindanao where peace and security has always been challenged by varied types of conflict drivers that even worsen the effects of natural disasters.

Recent assessment of the Philippine Commission on Audit (undated) revealed that a basic institutional and legislative framework is in place and there are existing policies that support an effective disaster risk management. Notably, there is a significant improvement in terms of developing a regulatory framework that promotes and supports dialogue, exchange of information and coordination. Yet, the complexity of large-scale disasters generally undermines existing policies and structures. An organisational structure with a multi-sectoral, multiagency and multilevel approach renders it difficult to come up with an appropriate and immediate response, thus delaying critical disaster response and recovery. RA 10121 and other laws passed by the Philippine government have provided concrete plans, but there have been substantial questions about its implementation, both in terms of the funding made available to support implementation and the consistency in approach throughout all levels of the government.

11.1.3 Objectives and Significance of the Study

This study intends to answer the questions: (1) would the ridge-to-reef approach as a strategy at the subnational level facilitate disaster risk reduction and management

in Mindanao? And (2) what mechanism or institution can appropriately implement the approach?

This study may be significant to policy-makers, decision-makers and practitioners as a reference in dealing with the nuances of the environment with a similar context in Mindanao.

11.2 Literature Review

11.2.1 Mindanao Demography and Challenges

Mindanao has a total land area of 133,656 km^2, approximately 39 % of the total land area of the Philippines, the second largest island in the country that consists of six (6) regions, 26 provinces, 33 cities, 422 municipalities and 10,083 barangays (NSCB 2011). As of 2007, the Mindanao population had reached 21.58 million or 19.02 % growth as compared to 2,000 figures (NSCB 2009). Southern Philippines and Mindanao in particular is strategically located within the East ASEAN region, almost equidistant to the eastern sections of Indonesia, Malaysia and Brunei Darussalam, that underscores its potential to be a major transhipment hub and centre of trade in the region (ADB 2002). Mindanao is likewise endowed with rich mineral resources, which include metallic deposits such as lead, zinc, ore, iron, copper, chromite, magnetite and gold that accounts for nearly half of the national gold reserves and non-metallic mineral resources such as marble, salt, sand, gravel, silica, clay and limestone (MGB 2009). Cultural diversity and the island's natural beauty make Mindanao one of Asia's favoured tourist destinations; its white sand beaches, scenic volcanoes, vast orchid gardens and various ethnic festivals are only some of its unique tourist attractions (DOT 2011).

Despite the modest growth, Mindanao has not shown significant impact in reducing poverty incidence because growth has not been sustained continuously and current economic structures do not support the wide distribution of the benefits to growth and it has not been broad based and inclusive (MinDA 2011a). NSCB statistics (2011) showed high levels of poverty, income inequality and wide disparities across areas in Mindanao. Among the regions in Mindanao, Caraga, ARMM and some parts of the Zamboanga Peninsula remained to have the highest poverty incidence among families all over the country. In the bottom list of provinces, six (6) out of the bottom ten provinces with the highest poverty incidence are from Mindanao – along with Bohol, Masbate, Eastern Samar and Northern Samar. Prominently, seven (7) Mindanao provinces are still among the ten provinces with the lowest HDI; ARMM provinces remain among the poorest in Mindanao (NSCB 2011). Mindanao lags behind in terms of achieving the Millennium Development Goals' (MDGs) targets. Thus, it requires purposive geographical targeting and viewing the provision of basic services and other assistance in the context of peace and development that will have an impact on the peace process (NEDA 2007).

11.2.2 General Climate

In the Philippines, rainfall is primarily brought about by myriad rainfall-causing weather patterns inter alia, monsoon, the intertropical convergence zone (ITCZ) and tropical cyclones. Monsoons are winds prevalently blowing from the northeast or southwest. The northeast and southwest monsoons trigger the onset and recession of the rainy season in the Philippines. The southwest monsoon may begin in mid-April and may last until early November. The northeast monsoon, on the other hand, prevails from November to March. During the period, May to October, when the southwest monsoon and tropical cyclone seasons are dominant, the northern and central parts of Mindanao receive heavier rainfall compared to the rest of the year that triggers flooding and landslides (DENR 2012).

Another phenomenon, the ITCZ is formed from a band of clouds that bring rain showers accompanied by occasional thunderstorms. The ITCZ then moves north during the high-sun season of the northern hemisphere. It starts moving back southward in August and passes south by November and finally reaches the southernmost portion of the country during the months of January and February. On the average, 20 tropical cyclones bring damages to the country, with voluminous rains and strong winds. But, an average of 0.6 tropical cyclones hit Northern Mindanao per year (DENR 2012). Most tropical cyclones traversed Northern Mindanao and even far from Mindanao.

11.2.3 Climate Change

Climate change refers to the changes that are occurring in the Earth's climate system and the impacts such changes are having on ecosystems and society. Climate change is a better choice than the term global warming because it avoids the misleading implications that every region of the world is warming uniformly and that the only dangerous outcome of growing greenhouse gas emissions is higher temperatures, when that, in fact, is just the tipping point for a cascade of changes in the Earth's ecosystems (CRED 2009).

In an issue paper by the International Union for Conservation of Nature (IUCN), it says that "... the understanding about the potential impacts of climate change on livelihoods and cultures of indigenous and traditional communities is fragmented. Furthermore, there is a lack of recognition of the importance which traditional people may play in their own future adaptation to climate change" (Macchi 2008).

11.2.4 Mindanao's New Normal

For the longest time, Mindanao is tagged as a typhoon-free zone of the country. But recently, this adored part of the country is no longer free from super typhoons that marked significant devastation and destruction. Mindanao has eight (8) major river

basins covering 43 % of its total land area where major rivers flow across several regions. These resources endowed us with abundant water supply for agriculture, hydropower, industries and drinking water. Mindanao ranked the second best quality of water in the world. The major mountain ranges need rehabilitation and protection due to its critical role in ecology. Magpantao and Pantaron ranges are the headwaters where the two (2) large hydropower plants draw out water for electricity, as the primary source of power in Mindanao. The Masara and Kaban Mountain Ranges were wiped out by Typhoon Bopha. The rest have been over the years degraded due to illegal logging, kaingin, mining and monocropping. Mindanao has registered a forest cover of 21 %. Based on reports, 51 % of land is considered as moderately to severely eroded. The riverways are heavily silted. During heavy rains, flooding frequently happens in the low-lying areas. The total flood-prone areas in Mindanao have reached to 1,384 ha.

In the special report of MinDA (2011b), several areas have increasingly become exposed to risks related to natural disasters such as flooding, mudslides and earthquakes. For example, Caraga, Davao del Norte and Davao del Sur experience constant landslides and mudslides that have been directly linked to mining activities, and Cotabato, Sultan Kudarat and Maguindanao regularly suffer flooding and mudslides, partly from the overflow of the Tamontaka River/Rio Grande de Mindanao. In some areas, such as Maguindanao and Cotabato, these risks combined with violent conflicts escalated the level of vulnerability and insecurity of the environment (MinDA 2011c).

11.2.5 Watershed Management: A Twofold Concept

Watershed management is both a technical and social undertaking. From a technical view, it encompasses reducing soil erosion, promoting vegetative cover and harnessing rainwater resources, whereas, from a socioeconomic perspective, it involves coordinating the actions of numerous land users in a watershed who may have multiple, conflicting objectives. In the 1980s, watershed management was treated largely as a technical problem, but the lack of attention to socioeconomic snags challenged various projects because people declined to adhere to the technical plans that differed with their varying interests. Watershed professionals, nowadays, are prioritising the socioeconomic aspects of watershed management and are integrating genuine, cohesive and participatory processes. Watersheds are considered as a unit of management for many natural resource-related issues including land degradation, water conservation and non-point source pollution, among others. Most often watershed boundaries do not correspond to administrative boundaries (Edwards n.d.).

The management of watershed externalities requires cooperation among the stakeholders and thus the need to develop mechanisms that would promote collective action. Institutional arrangements for such cooperation exist in the local watershed and forestry management committees or water user associations (Edwards

n.d.). These local-level organisations need support and to be strengthened. In some localities, new mechanisms may need to be developed, ideally by building on existing institutional arrangements, i.e. social norms and laws, to develop systems of mutual sharing the responsibilities and benefits associated with watershed management.

11.2.6 Environmental Peacebuilding

Environmental peacebuilding is a new subject in the field of development and cooperation though with little research and only a few case studies conducted, until recently it was considered a cause of conflict and not of reconciliation and peace (Harari and Roseman 2008). Many studies were devoted to the relationship between environmental degradation and violent conflicts and not to environmental cooperation and peacebuilding. However, since Kofi Annan's speech at the World Day for Water 2002, this notion has changed. He emphasised that:

> [. . .] the water problems of the world need not be only a cause of tension; they can also be a catalyst for cooperation. [. . .]. If we work together, a secure and sustainable water future can be ours.

The 2004 report of the UN Secretary-General's High-Level Panel on Threats, Challenges and Change highlighted the fundamental relationship between the environment, security, social and economic development in pursuit of global peace in the twenty-first century. In addition, a historic debate at the UN Security Council (2007) concluded that poor management of high-value resources constituted a threat to peace (UNSC 2007). Climate change is the major, overriding environmental issue of this time and the single greatest challenge facing decision-makers at many levels (Ban Ki-Moon 2008). Conca and Dabelko (2002) suggested that environmental cooperation between conflict-ridden nations might help overcome political tensions and that civil society plays a crucial role in this process. The underlying logic of this argument is that environmental issues do not recognise any state, ethnic or religious boundaries and have the potential to affect all dimensions of human life. Emphasis on its preservation, or dealing with its problems collectively, might thus lead the conflicting parties to construct a common identity, which can then transform the conflict communication and the interests of the parties involved (Clayton and Opotow 2003). It stems from new understandings of borders as social and dynamic constructions that are open to new and multiple meanings and identities through societal changes (Pace and Stetter 2003) and new studies on transformation of ethno-territorial conflicts that have shifted from state-centred solutions to a wider human-needs framework (Richmond 2001). Increasingly important is the intervention of a third party that has a genuine interest in the successful resolution of the conflict (Miall et al. 2005).

11.2.7 Conflict over Natural Resources

In Mindanao and elsewhere, violent conflict is linked in part to grievances over access to and control over natural resources, especially with regard to indigenous peoples. Small-scale mining and the use of metallic mercury had negative impacts on both environment and health of local population (Escano 2009). Environmental cooperation plays a significant role when aiming at transforming conflict in a constructive way as it literally constructs new and better realities in regions where either the environment was devastated or concern for environmental hazards was put aside due to the conflict situation (Harari and Roseman 2008). As shared management of environmental resources develops and parties to a conflict are integrated in cooperative negotiation processes, political tensions can be overcome, and due to the establishment of mutual trust, a creation of a common regional identity and the idea of mutual rights and expectations are likely to emerge (Carius 2006). To facilitate a vision of a shared future, experiences and understanding of the upheavals adverse societies have faced and the ways they have dealt with them are deemed necessary (Boulding 1991).

Environmental factors are rarely, if ever, the sole cause of violent conflict, but it is clear that the exploitation of natural resources and related environmental stresses can become significant drivers of violence (UNEP 2009). Environmental scarcity and conflict have link to the devastating effects of resource scarcity on the production of societal ingenuity, which is in turn required to overcome poverty-related debility (Homer-Dixon 1994). Inequality in access to or control over limited land, water or other environmental endowments can be intensified when inequalities are based on ethnicity, religion, race or class (Nafziger and Auvine 2000). Since internal armed conflicts are mainly found among the poorest countries in the international arena, the issues of environmental degradation, scarcity of resources and poverty are thought to be parts of a process that has trapped poor countries in a vicious cycle (De Soysa 2000). Gleditsch (1998) and Homer-Dixon's (1994) efforts to link environmental scarcity and conflict through the inability of resource-poor countries to adapt to economic conditions and pressures, revealed a clearly testable hypothesis linking resource scarcity to conflict.

Noteworthy, several conflict lines in Mindanao hinder a peaceful and sustainable development (Escano 2015). The continued degradation of natural resources from the mountain ridge down to the reef begins to manifest its effects across the ecosystems (e.g. decreasing quantity and quality of water supply, damage to marine resources) that occurs mainly through small-scale timber and mining operations as well as illegal fishing. Other emerging and merging conflicts involve competing environmental and economic priorities and interests of stakeholders that may be aggravated by insufficient public services, lack of consultation of affected groups concerning developmental initiatives and overlapping mandates among government and other agencies.

11.2.8 Ridge-to-Reef Approach

It is an ecosystem-based approach to biodiversity conservation and development. In a perfect condition when forest cover is adequate, soil is undisturbed, rivers are healthy, rainwater is absorbed by the soil through the trees and vegetation, there is less soil erosion and floodwater is confined in rivers. Over the years, population multiplies, forest trees were cut and replaced with industries and settlement agricultural areas expanded encroaching high-slope areas causing erosion and siltation. In Mindanao, 40 % of municipalities and 13 cities are located in river deltas and coastal areas where increasing number of informal settlers reside (MinDA 2013).

11.2.9 Mindanao Nurturing Our Waters (MindaNOW)

It is a flagship programme of MinDA that aimed to contribute to achieving improved quality of life of the people in Mindanao. Primarily, it serves as an overarching advocacy and coordination platform for all sectors and actors in walking through the ridge-to-reef approach in the planning and implementation of watershed and river basin management programmes in Mindanao (MinDA 2013). The programme consists of integrated interventions designed to facilitate effective management of natural resources, adopting the ridge-to-reef approach to planning and policy development which is anchored on various frameworks. It recognises the major role of multi-sectoral river basin/watershed mechanisms as the frontline in the management of natural resources for environmental integrity and sustainability of development.

In particular, the programme promotes a broad "ecosystem-based approach" that recognises the importance of functioning ecosystems to enhance communities' resilience to climate-related impacts and manages risks through green or nature-based approaches and interventions that can be combined with hard infrastructure, if deemed necessary. The programme is concerned with all natural hazards and assesses vulnerabilities and solutions on a ridge-to-reef basis, recognising the essential link between processes occurring in different parts of the catchment in Mindanao.

As the implementor of the programme, MinDA adopted a ridge-to-reef approach in the protection, utilisation and rehabilitation of the environment from the mountains to the seas. The Mindanao 2020, the integrated peace and development road map for the island, qualifies the implementation of this approach (MinDA 2011a). MinDA was created by Republic Act No. 9996 on 26 January 2010. It started with the Mindanao Economic Development Council (MEDCo) which was created in 1992 under the Office of the President. The law mandates MinDA to (a) promote, coordinate and facilitate the active and extensive participation of all sectors to effect the socioeconomic development of Mindanao, (b) advocate to the constituents of

Mindanao national policies that will foster the balanced and integrated development of Mindanao and (c) provide strategic direction for Mindanao.

Under the programme, various initiatives are undertaken through partnership, beginning 2011, with government agencies, such as the Department of Environment and Natural Resources (DENR), Office of the Civil Defense (OCD), Department of Public Works and Highways (DPWH), Department of Science and Technology (DOST), Department of Agriculture (DA), Department of Agrarian Reform (DAR), local government units (LGUs), non-governmental organisations (NGOs), academia and professional groups, among others.

One of the significant initiatives under the programme was the "Treevolution" – a massive tree planting activity carried out on 26 September 2014 that gathered about 196,000 planters that planted about four (4) million trees of various species including paper tree, cacao and coffee, among others, in various National Greening Program (NGP) areas in Mindanao based on MinDA's latest unofficial report (MinDA 2014). This initiative has an ultimate goal of addressing the perennial problem on flooding, while helping uplift the lives of the people in the countryside through the planting of cacao and coffee seedlings.

11.2.10 Philippine Experiences on Ridge-to-Reef Approach

In the Philippines (Canoy and Roa-Quiaoit 2011), the ridge-to-reef approach is showcased in various emerging and merging initiatives, namely:

(a) *Knowledge, Networking and Learning (KNL) Ridge-to-Reef Initiative Project* – It brings together nine (9) civil society organisations made up of eight (8) non-governmental organisations and a marine research institution (Canoy 2011a). The strength of the KNL network lies in the members' commitment, genuine friendship and solidarity and trust in one another. The opportunities for sharing and continued learning in doing one's work, and seeing in a broader context, the adversities brought about by climate change and the lack of a united global action, evoke renewed challenges and inspiration as the partners choose to continue what they have been doing and commit to making contributions to managing, restoring and protecting our frail and threatened Mother Earth. It is a social formation that demonstrates the essential and realism of an initiative that recognised the interconnectivity of ecosystems.

(b) *Linking the Reefs to the Ridges: The Macajalar Bay Experience* – The McKeough Marine Center (MMC) as the research and social outreach arm of Xavier University in the field of marine science, a multidisciplinary and wide-ranging research initiative of the academe, in partnership with the DENR; Bureau of Fisheries and Aquatic Resources (BFAR); Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA); NGOs and the local government units of the provinces of Misamis Oriental and Bukidnon. Programmes implemented include the resource ecological assessment, reef

rehabilitation, stock enhancement and conservation (e.g. seaweed seed banking and giant clam stock enhancement), ecotourism in Agutayan, networking and alliance building and integrated coastal enhancement–coastal resource evaluation and adaptive management (Roa-Quiaoit 2011).

(c) *Bridging Mountains, Seas and Peoples of Northern Mindanao: Expanding the Kitanglad Experience* – Kitanglad Integrated NGOs, Inc. (KIN) was established in 1995 by a group of NGOs and community-based environment and human rights advocates from Cagayan de Oro and Bukidnon (Canoy 2011b). With the implementation of the ridge-to-reef (R2R) ecosystem project of the KNL Project of EGP-IUCN NL, the chance to link forest protection efforts with those of the Macajalar Bay Development Alliance was realised. KIN and its KKP project comprise the ridge component of the KNL project, while the work of Xavier University's McKeough Marine Center in the 14 localities constituting the Macajalar Bay Development Alliance makes up the reef component. These R2R initiatives illustrate the relationship between the land use and lifestyles of the population in upstream and downstream. Proper utilisation of resources and ecosystem-wide conservation initiatives are accountabilities that need to be undertaken equally in both forest and marine areas.

(d) *Multi-stakeholdership Approach: Ridge-to-Reef Protection and Restoration of Key Biodiversity Areas of Mt. Hamiguitan Range* – The environment-based NGO established in 1987, Interfaith Movement for Peace, Empowerment and Development Inc. (IMPEDE), is committed to helping communities in their struggle to improve their lives while striving to be true stewards of the natural resources, from the forest to coastal areas (Paglinawan 2011).

(e) *Geographic Rediscovery of Endangered Environment and Nature in Mindanao or Green Mindanao* – It started as a voluntary organisation engaged in forest and mountain exploration and documentation, anti-logging direct action campaigns, endangered species monitoring, experimental community organising and livelihood assistance pilot projects. Most of its activities revolve around community-based initiatives in partnership with LGUs, research institutions, NGOs, national and international agencies and other private and public sector stakeholders (Lawas 2011).

(f) *Murcielagos Bay (MB) PUKUT Partnership: An Impetus for Change* – It is an epitome of a people's organisation that has risen from disintegration to become whole and strong, to fulfil its vision for Murcielagos Bay (Panorel 2011). Enhancing the capacity of MB PUKUT as a strategy to sustain the protection of critical marine ecosystems and the livelihood of dependent communities affirms the vital role of the community in coastal resource management. The transformation of this institution as a lead community actor in resource management and protection is an evidence to a fruitful and meaningful outcome of an NGO–PO partnership that is nurtured through constant knowledge sharing, networking and learning individually and collectively (Panorel 2011).

(g) *Danao Bay Resource Management Organisation* – It promotes proper resource management for the sustainability of livelihoods. It envisions an improved

quality of life for the fisherfolk by providing them with secure livelihood opportunities (Laureano 2011).

(h) *Biri Larosa: Saving and Restoring the Bounty of the Land and Seas* – Its gains may be measured in terms of the improved state of the natural resources and increased income of the fisherfolk. But the most critical success factor for the Center for Empowerment and Resource Development, Inc. (CERD) throughout the two (2) decades of working with coastal communities is the participation not just of the organised man and woman fishers but also of the rest of the community members in the entire project process (Cleofe 2011). However, the reef-to-ridge initiative will entail a series of discussions within the CERD across its project sites and hopes to come to a decision on where and when to start and how to approach the challenges (ibid. p 110)

(i) *Network of Sustainable Livelihood Catalysts, Inc.* – It envisions rural communities that are empowered to conserve and manage their natural resources and thus ensure the sustainability of their livelihoods as well as environment (Demesa 2011). The NSLC project has proven the following statement: "The community-based marine protected area (CB-MPA) is an effective management tool in replenishing fish stock and protecting marine habitats beneficial to the present and future generations". The establishment of CB-MPAs in Lamit Bay and capacity strengthening of the local people and local government have brought ecological, social and economic benefits to the community (ibid p 119).

11.2.11 Panay Island Framework Plan, from Ridge to Reef

The framework plan of Panay considers the ridge-to-reef perspective in planning that encompasses the forest land use, agricultural land, built-up or settlement areas and coastal zone (Salas 2012).

Despite the many networks and initiatives on environment and social development causes, the R2R initiative is unfolding from its early beginnings (Canoy 2011a).

11.2.12 International Good Practice on Ridge to Reef

UNDP-GEF (2010) elucidated the need for improved and proper management of river mouths and estuaries (otherwise known as transitional waters) that has recently garnered a high-level distinction in the international literature and management fora. Along this line, the publication of the Water Framework Directive of the European Communities in 2000 first popularised the term "transitional waters" as a means of completing the continuum between freshwaters and coastal waters. More importantly, the Directive commits European Union member states to achieve good qualitative and quantitative status of all water bodies by 2015 (UNDP-GEF

2010). Relatedly, Gamito (2008) posited that the Water Framework Directive of the European Communities is widely considered to encompass best practice in respect of the management of transitional (estuarine and coastal) waters.

In Madagascar, in particular Antongil Bay, conflicts occur between poor artisanal fishers and industrial fleets. Fish populations and their habitats have been damaged by destructive fishing resulting to loss of habitat. To resolve the conflict, a ridge-to-reef approach was adopted that creates a platform for dialogue and an environment that encourages stakeholders to work together (Ervin undated).

Moreover, WorldFish et al. (2013) cited the livelihood development for the ridge-to-reef project that was pursued with the aim of implementing small-scale environment-friendly technologies that are envisioned to meet the daily need of project participants as well as improve local supply of produce for the benefit of local consumers in the area. Apparently, thorough planning and study were done to identify proven technologies and its suitability to local environmental conditions and social processes. Inputs for the development of livelihood project were solicited from local leaders and other stakeholders in the area through consultations and focus group discussions.

Ervin shared the vital elements of a ridge-to-reef approach which are the following: (1) considers the entire island, coast, nearshore and ocean as one entity, (2) focuses on the overall resilience of the entire set of ecosystems and (3) examines upstream impacts on downstream and coastal processes.

11.3 Theoretical Foundation

11.3.1 Science of Ridge to Reef

The R2R is a holistic ecosystem approach for sustainable resource management particularly suitable for the context of Mindanao. The R2R emphasises connectivity within and between sub-ecosystems such as upland, lowland, freshwater and the sea. Thus, the concept focuses on the protection and restoration of ecosystem functions and processes, with the aim to mitigate further degradation of land, water and coastal areas and the implied land and resource conflicts.

The science on the ridge refers primarily to the supply of sediment to nearshore waters which has likely changed following human occupation. Native plant communities have been transformed by invasive species, wildfires, agriculture and grazing by feral animals. This has changed the hydrologic cycle and caused reductions in vegetation canopy and root cohesion, which makes the soil more vulnerable to erosion. Sediment supply to reefs under these altered transport processes may become greater and more persistent. Meanwhile, the science on the reef shows the evidence that sediment, nutrients and other pollutants from human activities have harmed many coral reef ecosystems and around the world. The examination of pathways and concentrations of sediment and other pollutants revealed how they stress the reef communities.

Basically, the R2R approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way and was adapted during the Second Conference of Parties of the Convention on Biological Diversity in 1995. The Convention on Biological Diversity outlines 12 principles that form the basis for the ecosystem approach (Secretariat of the Convention on Biological Diversity 2004). The principles served as guides in the implementation of the project, and these are the following:

1. The objectives of management of land, water and living resources are a matter of societal choice
2. Management should be decentralised to the lowest appropriate level
3. Managers should consider the effects of their activities on adjacent and other ecosystems
4. Recognising potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context
5. Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target
6. Ecosystems must be managed within the limits of their functioning
7. Action should be undertaken at the appropriate spatial and temporal scales
8. Objectives for ecosystem management should be set for the long term
9. Management must recognise that change is inevitable
10. Action should seek the appropriate balance between, and integration of, conservation and use of biological diversity
11. Action should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices
12. The approach should involve all relevant stakeholders of society and scientific disciplines.

USGS (2007) posited the goal of R2R which is to provide new scientific information that watershed and coastal resource managers can use to prioritise decisions for maximum benefit. Information from R2R can also be used to guide approaches such as adaptive management and understand how ecosystems will respond to changes in climate.

This study likewise captures the statement of Kofi Annan at the World Day for Water in 2002, where he emphasised that:

> [. . .] the water problems of the world need not be only a cause of tension; they can also be a catalyst for cooperation. [. . .]. If we work together, a secure and sustainable water future can be ours.

In addition, the Kyoto Protocol, Philippine constitution and environmental laws, Agenda 21 and other empirical studies of the environment, such as Saleem (2007) . . . sharing common interests among countries on common aversion to environmental harms; Tippett et al. (2005) . . . river basin management; Conca et al. (2005) . . . civil society-to-civil-society dialogues, espoused the vital role of environmental management, protection and preservation to sustainable development. Environmental cooperation plays a significant role when aiming at transforming

a conflict and vulnerable environment; thus, peacebuilding frameworks linking environment and natural resources are likewise adopted as platforms in this study.

The interconnectedness of what UN Secretary-General Kofi Annan has identified as "freedom from fear" and "freedom from want" human security examines the underlying political, economic and social factors that promote or hinder people's security in a comprehensive sense and addresses problems of socially excluded groups. During a conflict situation, the poor and disadvantaged groups suffer more where their vulnerability, lack of opportunities and recognised helplessness come to fore. The effects of armed conflict are most apparent in certain areas of Mindanao, especially in the provinces of the Autonomous Region in Muslim Mindanao (ARMM). Cognizant of Mindanao's role as a primary resource base of the Philippine economy, the conflict certainly affects the nation's gross domestic product.

Apparently, as national economies develop, river basin water resources are progressively diverted, channelled, dammed and consumed that creates conflict over water uses within countries. Transformative actions must be needed in how we view the ridge-to-reef system.

The implementation of the ridge-to-reef approach is based on five basic principles (Soonthornawaphat et al. n.d.):

(a) Identifying and supporting actors to build relationships, power and impartiality.
(b) Supporting the free flow of knowledge by using the participatory process of collecting information and data together and building internal capacity to collect that information.
(c) Recognising that collaboration needs to have tangible benefits for all and working towards building relationships among stakeholders.
(d) Recognising that stakeholders have their different views and identifying approaches of support within those limits. Frequently, government officers at the local level are constrained with limited powers, e.g. in some areas they can only provide help when asked, or are constrained by guidelines set at a higher level. Finding solutions to those situations is imperative.
(e) Highlighting practical examples of working together and recognising the contributions of those involved as key knowledge holders (learning from your peers).

11.3.2 Legal and Environmental Framework

In the past, the world witnessed the actual explosion of international agreements and national legislations seeking to protect the environment – "Mother Earth". The 1972 Stockholm Declaration, regarded as the foundation of modern international environment law, was the first widely accepted international endeavour to address environmental concerns. In 1983, the Brundtland Commission's report espoused the concept of sustainable development; the 1992 United Nations Conference

on the Environment and Development (UNCED) resulted to the Rio Declaration on the Environment and Development as well as Agenda 21, this generation's international blueprint on environment. The international agreements conferred a greater sense of importance and urgency on the issue of environmental protection – the significant headways made in confronting environmental problems in developing and industrial nations. Environmental protection has long been well established and institutionalised in Philippine institutions and structures. The country has some of the most progressive and impressive environmental policies among developing countries in Asia.

The Philippine Agenda 21 or PA 21 is a major breakthrough and a commitment as well of the country to the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in June 1992. The PA 21 is the country's own national agenda for sustainable development that also follows up on initiatives already in place before 1992 such as the Philippine Strategy for Sustainable Development (PSSD), the formulation of the Social Reform Agenda (SRA) and the Conference on Human Ecological Security (CHES). It also acknowledges indigenous or traditional practices as a heritage of sustainable development in the country. Through Executive Order (EO) No. 15 signed in September 1992, the government formed the Philippine Council for Sustainable Development (PCSD), a multi-sectoral body, to fulfil the country's commitments to the UNCED. The PCSD, which spearheads the functions of PA 21, has a Coordinating Secretariat and a PO–NGO Counterpart Secretariat. Part of the process that created PA 21 was the formulation of a people's covenant, which reflects the mandate of the PCSD. Several memorandum orders strengthen and support the operations and implementation of Agenda 21. It recognises three (3) key actors in sustainable development and their roles in the different realms of society. Business is the key actor in economy, which is mainly concerned with producing goods and services for people. Government as the key actor in polity is concerned with democratic governance and security of human rights. Civil society is the key actor in culture, which is concerned with the development of the social and spiritual capacities of human beings.

11.3.3 UN Resolution No. 46/182

One of the first UN resolutions acknowledging the necessity of creating an overarching framework for disaster prevention and preparedness including early warning systems of disaster is UN Resolution No. 46/182. One of the guiding principles ingrained in the resolution states:

> Special attention should be given to disaster prevention and preparedness by the Government concerned, as well as by the international community". The resolution further provides: "In order to reduce the impact of disasters there should be increased awareness of the need for establishing disaster mitigation strategies . . . There should be greater exchange and dissemination of existing and new technical information related to the assessment, prediction and mitigation of disasters . . . .

This also emphasises the intricate relationship between development and disaster preparedness, and the UN declares that "economic growth and sustainable development are essential for prevention of and preparedness against natural disasters and other emergencies".

11.3.4 Hyogo Framework for Action (HFA)

The Hyogo Framework for Action presents the priorities that the participating states to the Hyogo Conference should develop and where focus should be given for the years 2005–2015 with respect to disaster prevention and preparedness. Among the guiding principles of the Hyogo Framework for Action are (1) the primary responsibility of the state to ensure "sustainable development and for taking effective measures to reduce disaster risks; (2) establishment of an "integrated, multi-hazard approach" and gender-sensitive framework taking into consideration "cultural diversity, age and vulnerable groups" in considering the state policies towards disaster risk preparedness and management; (3) empowerment of "communities and local authorities" in disaster risk reduction and management; and (4) promotion of the "culture of prevention". The Hyogo Framework for Action further identified the "gaps and challenges for the coming years" as well as the corresponding priorities for action that the participating states must emphasise.

11.3.5 ASEAN Agreement on Disaster Management and Emergency Response (AADMER)

The AADMER aims to provide effective mechanisms to achieve substantial reduction of disaster losses in lives and in the social, economic and environmental assets of the Parties 12 and to jointly respond to disaster emergencies through concerted national efforts and intensified regional and international cooperation. This should be pursued in the overall context of sustainable development and in accordance with the provisions of this agreement. Based on the agreement, the parties have the following general obligations: (1) Cooperate in developing and implementing measures to reduce disaster losses including the identification of disaster risk, development of monitoring, assessment and early warning systems, standby arrangements for disaster relief and emergency response, exchange of information and technology and provision of mutual assistance. (2) Immediately respond to a disaster occurring within their territory. When the said disaster is likely to cause possible impacts on other member states, respond promptly to a request for relevant information sought by a member state or states that are or may be affected by such disasters, with a view to minimising the consequences. (3) Promptly

respond to a request for assistance from an affected party. (4) Take legislative, administrative and other measures as necessary to implement their obligations under this agreement.

11.3.6 The Philippine Disaster Risk Reduction Management Act of 2010

In line with the Hyogo Framework for Action and the ASEAN Agreement on Disaster Management and Emergency Response, where the Philippines is a party, the Fourteenth Congress passed the Philippine *Disaster Risk Reduction and Management Act of 2010* which aims among others to adopt a disaster risk reduction and management approach that is holistic, comprehensive, integrated and proactive in lessening the socioeconomic and environmental impacts of disasters including climate change and promote the involvement and participation of all sectors and all stakeholders concerned, at all levels, especially the local community.

The law directs various government agencies to develop, promote and implement a comprehensive National Disaster Risk Reduction and Management Plan (NDRRMP) that aims to strengthen the capacity of the national government and the local government units (LGUs), together with partner stakeholders, to build the disaster resilience of communities and to institutionalise arrangements and measures for reducing disaster risks, including projected climate risks, and enhancing disaster preparedness and response capabilities at all levels.

11.3.7 The Climate Change Act of 2009

It bears stressing that climate change and disasters are closely intertwined. This prompted the passage of the *Climate Change Act 2009*, and right thereafter the Philippine *Disaster Risk Reduction and Management Act* was enacted in 2010. The *Climate Change Act* 2009 recognises the indispensable part that the LGUs play in responding to climate change. The LGUs shall be the frontline agencies in the formulation, planning and implementation of climate change action plans in their respective areas, consistent with the provisions of the Local Government Code, the framework, and the National Climate Change Action Plan. Barangays shall be directly involved with municipal and city governments in prioritising climate change issues and in identifying and implementing best practices and other solutions. Municipal and city governments shall consider climate change adaptation as one of their regular functions. Provincial governments shall provide technical assistance, enforcement and information management in support of municipal and city climate change action plans. Interlocal government unit collaboration shall be maximised in the conduct of climate-related activities.

11.3.8 ASEM Manila Conference on Disaster Risk Reduction and Management

The conference held on June 2014 adopted the Post-Haiyan Tacloban Declaration, which captured the commitment of the conference's participants to put forward the DRRM cooperation and collaboration, drawing on the best practices developed and lesson learned after super typhoon Haiyan. In addition, the conference endorsed the submission, through the ASEM Senior Officials' Meeting, of the Post-Haiyan Tacloban Declaration to ASEM leaders during the 10th ASEM Summit in Milan on 16–17 October 2014 and endorsed the same as an ASEM contribution to the post-2015 framework for DRR. It further agreed to endorse the declaration and invited other ASEM partners to consider advocating the Post-Haiyan Tacloban Declaration in the upcoming international, regional, national and local DRRM meetings and events, especially during the discussions on the post-2015 framework for DRR.

11.4 Research Methodology

Qualitative research was employed in this study using scoping, metasynthesis, focus group discussion (FGD) and expert panel discussion (EPD). In scoping, various initiatives and approaches of mandated agencies including programmes and projects that apply the ridge-to-reef concept were revisited and analysed. Metasynthesis, however, captured relevant frameworks, studies and reports, among others, conducted by many agencies regarding the natural disasters in Mindanao. The FGD which was guided by four critical questions served as venues for technical sessions among various sector players, namely, national government agencies, local government units, donor agencies, business community and NGOs that generated inputs and validated the results of the scoping and metasynthesis.

Meanwhile, the expert panel discussions, which were carried out through asking three questions, composed of decision and policy-makers and sector experts in the country and abroad strengthened the findings generated from other research approaches. Data gathered from scoping, metasynthesis, FGD and EPD were triangulated using taxonomic content analysis.

11.5 Findings and Discussion

The triangulation of research methods revealed that considering the new normal in Mindanao and the degree of preparedness of agencies on DRMM, the ridge-to-reef approach under the Mindanao Nurturing Our Waters (MindaNOW) Program as an overarching platform is found significant. In particular, the study presented that:

(a) The ridge-to-reef approach at the subnational level as a strategy in pursuit of DRRM in Mindanao under the new normal scenario is found viable and suitable.

The headwater of Mindanao which is found in Bukidnon flows down to Central Mindanao, the Davao Region and some parts of the Caraga Region during heavy rains, thus bring about flooding in the said areas.

(b) The legislative and institutional framework are truly in place along with policies that support an effective disaster risk management, yet the nature of the existing DRRM organisational structure made it difficult to come up with appropriate and immediate responses to disasters. This is evident on the experience of Haiyan where DRRM mechanisms in the affected communities were not able to respond quickly because they were also greatly devastated by said calamity.

(c) There is a need to have a subnational coordinative mechanism in Mindanao through the Mindanao Development Authority whose mandates can ably rally support from all sectors. The MinDA Board is composed of the Chairpersons of the Regional Development Councils and Regional Economic and Development Planning Board in the Autonomous Region in Muslim Mindanao.

(d) A pilot project "Treevolution" under the MindaNOW which was conducted on 26 September 2014 marked a history through the coming together of about 196,000 planters throughout Mindanao that planted about four (4) million seedlings of various species of trees including coffee and cacao.

(e) Former MNLF combatants that turned into peace and development advocates (PDAs) are now partners of MinDA in pursuit of preparing the communities both nature and man-induced disasters in Mindanao. However, continued capacitation of PDAs in DRRM is extremely necessary especially that most coastal municipalities where they mostly reside are now affected by the typhoons.

Moreover, this study revealed the following environmental issues that encompass the ridge-to-reef approach: (1) uplands with severely degraded forests; (2) agriculture that adapts unsustainable land use practices; (3) expansion of banana and pineapple plantations; (4) rivers containing high concentrations of sediments indicative of severe soil erosion; (5) water pollution attributed to poor methods and unregulated use of pesticides and fertilisers; (6) inappropriate land use practices; (7) inadequate monitoring of industrial and commercial premises and activities; (8) poorly maintained hydropower plants; (9) major rivers having no sufficient flood control; (10) poor maintenance of septic tanks and absence of a sewerage system; (11) obsolete base map for physical planning; (12) unconsolidated data; and (13) most of the population having limited awareness on disaster management and planning.

Considering the interplay of the various elements of the ridge-to-reef approach, several issues brought about by the new normal in Mindanao have impacts on the following:

(a) Economy – Agriculture may be affected due to more pronounced wet and dry season. Increased incidence of rural (farmland) and urban flooding.

(b) Land use – Settlements along danger zones will have increased risks on flooding, landslide and storm surges.

(c) Energy – Demand may increase due to the additional warm days that need immediate rehabilitation of major hydropower plants.

(d) Health concerns – Increasing incidence on dengue, malaria, leptospirosis and other precipitation- and flood-related diseases.
(e) Budget – Mindanao stakeholders especially governments need budgetary allocations.

Moreover, it was disclosed that various government agencies are involved in environment and natural resource management, resulting to overlaps and conflicts. Overlaps and conflicts are evident in the following ways: (1) different aspects of management of a specific resource are divided among several institutions or agencies; (2) management of two or more resources is lodged with two or more agencies, whose policies and programmes are conflicting when applied to a specific locality; (3) delineation of responsibilities of national government agencies and special, multi-jurisdictional bodies is unclear; and (4) delineation of responsibilities of NGAs and local agencies, or of two or more local agencies, is unclear. In addition, it was revealed that provisions of laws are contradicting; DENR roles are inconsistent; political intervention of and volatility in the bureaucracy are evident and graft and corruption are aggravating the earlier cited issues.

Many agencies in the country mandated to protect and preserve the environment are doing their respective tasks but are poorly coordinated. Agencies are not necessarily working together in achieving their respective mandates. Laws and regulations protecting and preserving the environment are also in place. However, laws and regulations need revisiting for harmonisation because these become the cause of nuances among players in trying to forestall the present challenges. The need to revisit them still remains a challenge which should have been a priority of the lawmakers and decision-makers.

In pursuit of addressing the new normal in Mindanao, MinDA initiated a synergetic and holistic approach among Mindanao stakeholders, the ridge-to-reef approach through the implementation of the Mindanao Nurturing Our Waters Program. The ridge-to-reef approach is not necessarily a new approach, but realising this requires revolutionary strategies. In particular, all players regardless of affiliations come together, share ideas and opinions and provide respective interventions and/or implement programmes and projects at the same spectrum. This would provide long-lasting effects towards addressing the new normal – the mechanism would complement the existing mechanisms at the national, regional and local levels. For instance, the following agencies and institutions have agreed to deliver their respective mandates in coordination with concerned agencies in response to the challenging new normal in Mindanao:

(a) The Department of Environment and Natural Resources spearheads the National Greening Program in all watershed and sub-watershed areas. It also intensifies initiatives and advocacies on shoreline protection.
(b) The Department of Energy is moving towards upgrading/rehabilitating the mega hydropower plants alongside with the promotion for the development of new mega hydropower plants.
(c) The Department of Agriculture and National Irrigation Administration are pursuing the development of irrigation facilities.

(d) The Department of Public Works and Highways is preparing the implementation of major flood control projects in major river basins.
(e) The Department of Science and Technology is updating the hazard maps.
(f) NAMRIA is completing the topographic map for Mindanao as an essential basic tool in physical planning and advocacy.
(g) The Office of the Civil Defense takes the lead in the implementation of policies stipulated in the DRRMC.
(h) Academe and research institutions are undertaking further studies and researches on the elements of ridge-to-reef approach.
(i) The Philippine Institute of Civil Engineers is aggressive on its efforts on quick response during emergencies.
(j) Non-governmental organisations are also involved in the activities.

Apparently, LGUs in Mindanao especially from recently affected communities are actively working with concerned agencies in coming up with their reconstruction plan. Context-based contingency planning and disaster response management training modules and synchronising these with contingency/disaster response planning processes that follow a bottom–top approach will optimise resource complementation among LGUs. Meanwhile, there are NGOs that have undertaken greening programmes and other projects and activities with the indigenous peoples especially those living around the headwaters. The NGOs' initiatives have become the source of livelihood of the IPs and other highland settlers in Mindanao.

Moreover, partnership on environmental initiatives gained support from the LGUs and the former combatants (i.e. Moro National Liberation Front) in Southern Philippines. In some projects, the experience revealed that the sustained use of the consensus-building mechanism through the trained members of the local conflict resolution mechanism, facilitated the resolution of armed conflict involving the utilization of natural resources. For example, the resolution of a decade of rido over a 100-ha boundary dispute between two (2) barangays in North Cotabato, Central Mindanao, was resolved due to peace dialogues that resulted in a declaration of settlement.

In furthering these developments, the role of MinDA as the primary coordinative and facilitative mechanism in Mindanao is crucial. Apparently, this agency is effective in steering and providing strategic directions and partnerships with stakeholders. More importantly, many LGUs manifested efforts as the forerunner of all endeavours through institutionalising initiatives of protecting the environment, specifically through the issuance of executive orders and ordinances. The national government is allocating and mobilising resources for the implementation of programmes and projects that address the new normal in Mindanao.

Despite the intricacies of Mindanao context, the MinDA has proven to be an effective mechanism in the realisation of the ridge-to-reef approach to peace and development in Mindanao. It can be best to convene all stakeholders across political boundaries and individual interests in pursuit of addressing the increasing new challenges. Noteworthy, it is armed with mandates and authority to call on all players and stakeholders in Mindanao. It has also established a Mindanao databank and initiated the formation of various island-wide mechanisms as development

planners and advocacy groups. It has proven its credibility as a subnational agency that facilitates and coordinates peace and development in Mindanao.

11.6 Conclusion

Evidently, the Philippines has ratified the Biodiversity Convention, the Kyoto Protocol, the Ozone Depletion Multilateral Agreements and the International Tropical Timber Agreement among other key international instruments on environment protection and several local laws and ordinances at the local level as well; however, actualisation is still a heightening challenge to the current leadership. In particular, achieving the goals of many agencies require revolutionary mindset to implement the laws and provide budgetary allocations as well. There seemed a need to implement the following strategies to achieve a dynamic, inclusive, resilient and green Mindanao economy: (1) ensure sustainable use and management of natural resources; (2) reinforce agriculture and fisheries as linchpins for growth; (3) make available adequate and reliable infrastructure; (4) make available enabling policies and mobilise resources accordingly; (5) advance public–private partnerships to support Mindanao's development; (6) fast-track the completion of the Mindanao topographic map and capacitate the end users; and (7) sustain and capitalise a knowledge bank of reliable, updated and accessible information.

Clearly, to attain these, all actors have equal critical roles and must be proactive in delivering their mandates under the ridge-to-reef approach through the MindaNOW Program:

(a) National government agencies (national and regional offices) to institutionalise the system and platform of collaboration and complementation to ensure sustainability of endeavours.
(b) Lawmakers, from the national down to the barangay level, have to formulate and enact laws and ordinances that will effectively translate the principle of reducing vulnerability and enhancing preparedness into enforceable manuals and procedures.
(c) Non-governmental organisations are heavily engaged in empowering various stakeholders to adapt to climate change. For instance, the tri-media sector should continue to serve as the channel between scientists and communities they work with.
(d) Local government units (from provincial, municipal and barangay) officials must be proactive in implementing policies and laws. To accomplish this role, they must widen the avenues for sharing and communicating knowledge, skills and experiences.
(e) Academe through higher educational institutions (HEIs) and other research institutions should provide practical knowledge to the community around them by including climate change in their research agenda.

Moreover, considering that watersheds have no boundaries and environmental cooperation has the opportunity to transcend beyond political borders, it becomes apparent that environmental initiatives or efforts can provide important contribution to peacekeeping, peacemaking and peacebuilding. As an outcome of some projects, it is evident that environmental cooperation is part of a long-term solution to the more than 40-year conflict in Mindanao. It provides sustainable solutions for the future. It contributes to the improvement of living conditions of the people, for instance, the supply of water and electricity, while it fosters the building of confidence and trust among adverse societies. Environmental issues and the mutual ecological dependence across territorial boundaries facilitate and encourage cooperation that often take a first step towards the commencement of a dialogue, which would be difficult to intercede through official and political channels. Thus, the development must be sustainable to achieve peace in Mindanao. Post-disaster recovery both natural and man-made (i.e. armed conflict) must address the conditions that threaten human security including poverty and access to natural resources. This can be done through sustained synergetic and holistic responses among stakeholders and sectors that link peace, security and long-term sustainable development. The signing of the Comprehensive Agreement on the Bangsamoro (CAB) which is one significant milestone in the country is one of the opportune ways to bring together communities for disaster mitigation, reduction and adaptation.

In conclusion, MinDA as a subnational agency in Mindanao that has proven its credibility and transformative leadership shall continue to provide the strategic guidance and leadership in pursuit of attaining the ultimate twofold goal of the R2R in Mindanao that is stabilising peace and accelerating development. Considering that the R2R under the MindaNOW is just about 2 years old since its inception, there is need to do an impact evaluation of the programme after five (5) years to determine the ultimate results and impact on the lives of Mindanaoans with respect to DRRM. Noteworthy, identified gaps for improvement and good practices for replication must also be established in the future evaluation.

References

Asian Development Bank (2002) Guidelines for financial governance and management of investment projects financed. Asian Development Bank, Tokyo

Boulding E (1991) The challenges of imagining peace in wartime. Futures 23(5):528–533

Canoy ME (2011a) Knowledge, networking and learning: a ridge to reef initiative in the Philippines. In: Canoy ME, Roa-Quiaoit HA (eds) Ridge to reef in the Philippines. A showcase of nine emerging and merging initiative. Xavier University Press, Cagayan de Oro City

Canoy ME (2011b) Bridging mountains, seas, and peoples of Northern Mindanao: expanding the Kitanglad experience. In: Canoy ME, Roa-Quiaoit HA (eds) Ridge to reef in the Philippines. A showcase of nine emerging and merging initiative. Xavier University Press, Cagayan de Oro City

Canoy ME, Roa-Quiaoit HA (eds) (2011) Ridge to reef in the Philippines. A showcase of nine emerging and merging initiatives. Xavier University Press, Cagayan de Oro City

Carius A (2006) Environmental peacebuilding. Environmental cooperation as an instrument of crisis prevention and peacebuilding: conditions for success and constraints. Adelphi report, Berlin

Clayton S, Opotow S (eds) (2003) Identity and the natural environment. MIT Press, Cambridge, MA

Cleofe J (2011) BiriLaRoSa: saving and restoring the bounty of the land and seas. In: Canoy ME, Roa-Quiaoit HA (eds) Ridge to reef in the Philippines. A showcase of nine emerging and merging initiative. Xavier University Press, Cagayan de Oro City

Commission on Audit (n.d.) Disaster management practices in the Philippines: an assessment. Commission on Audit, Philippines

Conca K, Dabelko G (eds) (2002) Environmental peace-making. Woodrow Wilson Centre, Washington, DC

Conca K, Carius A, Dabelko G (2005) Building peace through environmental cooperation. In: Conca K, Carius A, Dabelko G (eds) State of the world 2005. World watch Institute, New York, pp 144–155

De Soysa I (2000) The resource curse: are civil wars driven by rapacity or paucity? In: Berdal M, Malone D (eds) Greed and grievance: economic agendas and civil wars. Lynne Rienner, Boulder

Demesa C (2011) Network of sustainable livelihood catalysts. In: Canoy ME, Roa-Quiaoit HA (eds) Ridge to reef in the Philippines. A showcase of nine emerging and merging initiative. Xavier University Press, Cagayan de Oro City

Department of Environment and Natural Resources (2012) Mindanao river basin master plan. Department of Environment and Natural Resources, Philippines

Department of Tourism (2011) Profile of Philippine tourist destinations. Department of Tourism, Philippines

Edwards T (n.d.) Community-based water resources management: lessons from the ridge to reef watershed project. Sustainable watersheds branch (National Environment and Planning Agency) Karen McDonald Gayle, Deputy Team Leader (Environment), (USAID/Jamaica-Caribbean). Jamaica

Ervin J (n.d.) Protected areas and climate change: resilience through spatial and sectoral integration: a presentation. UNDP, Dakar, Senegal

Escano C (2009) Review of environmental related laws in the Philippines with special focus on mining laws, unpublished. Davao City, Philippines

Escano C (2015) Peacebuilding model for diverse conflict lines: southern Philippines. In: Ha H (ed) Land and disaster management strategies in Asia. Springer, New Delhi

Gamito S (2008) Water framework directive: defining the ecological quality status in transitional and coastal waters. In: Gŏnenç et al (eds) Sustainable use and development of watersheds NATO science for peace and security series, vol 3. IMAR – University of Algarve, Portugal, pp 323–335

Gleditsch NP (1998) Armed conflict and the environment: a critique of the literature. J Peace Res 35(3):341–346

Harari N, Roseman J (2008) Environmental peacebuilding theory and practice: a case study of the good water neighbours project and in depth analysis of the Wadi Fukin/Tzur Hadassah communities. EcoPeace/Friends of the Earth Middle East, Aman

Homer-Dixon T (1994) Environmental scarcities and violent conflict

ISECentre for Research on Environmental Decisions (2009) The psychology of climate change communication: a guide for scientists, journalists, educators, political aides, and the interested public. Centre for Research on Environmental Decisions, New York

Laureano E (2011) Danao Bay Resource Management Organisation. In: Canoy ME, Roa-Quiaoit HA (eds) Ridge to reef in the Philippines. A showcase of nine emerging and merging initiative. Xavier University Press, Cagayan de Oro City

Lawas DB (2011) Chapter 5. Geographic rediscovery of endangered environment and nature in Mindanao. In: Canoy ME, Roa-Quiaoit HA (eds) Ridge to reef in the Philippines. A showcase of nine emerging and merging initiative. Xavier University Press, Cagayan de Oro City
Macchi M (2008) Indigenous and traditional peoples and climate change. International Union for Conservation of Nature, Gland
Miall H, Ramsbotham O, Woodhouse T (2005) Contemporary conflict resolution. Polity, Oxford
Mindanao Development Authority (2011a) Mindanao 2020 peace and development framework plan. Mindanao Development Authority, Philippines
Mindanao Development Authority (2011b) Special report on effects of flooding in Mindanao regions. Unpublished report. Mindanao Development Authority, Philippines
Mindanao Development Authority (2011c) Action for Conflict Transformation (ACT) for peace programme terminal report. Mindanao Development Authority, Philippines
Mindanao Development Authority (2013) Reports of MindaNOW team and Riverbasin Organisations. Mindanao Development Authority, Philippines
Mindanao Development Authority (2014) Partial and unofficial report of MinDA on treevolution. Mindanao Development Authority, Philippines
Mines and Geosciences Bureau (2009) Geologic setting and mineral resources potential of Mindanao Island, Philippines. Presented by Dir. Edwin G. Domingo of the mines and geosciences Bureau during the Philippines 2009, Department of Environment and Natural Resources
Moon BK (2008) Opening statement to high level segment of the UN climate change conference. United Nations, New York
Nafziger WE, Auvine J (2000) Economic development, inequality, and humanitarian emergencies. Available at http://www.k-state.edu/economics/nafwayne/ecdev10-1.pdf. Accessed 5 Nov 2014
National Economic and Development Authority (2007) Philippines midterm progress report on the millennium development goals. National Economic and Development Authority, Philippines
National Statistical Coordinating Board (2009) Philippine national statistical yearbook. Philippines. National Statistical Coordinating Board, Philippines
National Statistical Coordinating Board (2011) Philippine national statistical yearbook. Philippines. National Statistical Coordinating Board, Philippines
Pace M, Stetter S (2003) A literature review on the study of border conflict and their transformation in the social sciences. EU Border conference project. University of Birmingham, Birmingham
Paglinawan LG (2011) Chapter 4 Multi-stakeholdership approach: ridge to reef protection and restoration of key biodiversity areas of Mt. Hamiguitan range. In: Canoy ME, Roa-Quiaoit HA (eds) Ridge to reef in the Philippines. A showcase of nine emerging and merging initiative. Xavier University Press, Cagayan de Oro City
Panorel A (2011) Chapter 6. MB PUKUT partnership: an impetus for change. In: Canoy ME, Roa-Quiaoit HA (eds) Ridge to reef in the Philippines. A showcase of nine emerging and merging initiative. Xavier University Press, Cagayan de Oro City
Richmond OP (2001) A genealogy of peace-making. Alternatives 26(2001):317–348
Roa-Quiaoit HA (2011) Linking the reefs to the ridges: the Macajalar Bay experience. In: Canoy ME, Roa-Quiaoit HA (eds) Ridge to reef in the Philippines. A showcase of nine emerging and merging initiative. Xavier University Press, Cagayan de Oro City
Salas J (2012) Common land, common waters, the island perspective in watershed management: the case of Panay Island. Foundation for the Philippine Environment, Quezon City
Saleem HA (2007) Peace parks. MIT Press, Cambridge, MA
Soonthornawaphat S, Petchrung S, de Silva J (n.d.) Demonstrating ecosystem rehabilitation and management using a reef to ridge approach: field experience from the North Andaman Coast. IUCN Thailand Programme Asia Regional, Bangkok
Tippett J, Searle B, Pahl-Wostl C, Rees T (2005) Social learning in public participation in riverbasin management. Environ Sci Policy 8(3):287–299
UNDP-GEF (2010) Scoping a ridge to reef approach: interaction between the Orange-Senqu river basin and the Benguela current large marine ecosystem. Technical report 1 Rev 1, 23 September 2010. UNDP-GEF
UNEP (2009) Yearbook 2009: new science and developments in our changing environment. UNEP

United Nations Security Council (2007) Resolution 1747 adopted by Security Council at its 5647th meeting on 24 March 2007. United Nations, New York

USGS (2007) From ridge to reef: forecasting the effects of changing Pacific islands on reef ecosystems, Nov 2007. US Geological Survey, USA

World Fish et al (2013) From ridge to reef: an ecosystem based approach to biodiversity conservation in the Philippines fourth quarter performance report year 2 (October to December 2012). February 2013, USAID, Philippines

Chapter 12
Humanitarian Logistics in Asia: A Missing Link in Disaster Management and Practice

Janki Andharia

12.1 Introduction

It is well documented that Asia and the Pacific are the world's most disaster-prone regions. They registered the largest number of people affected as well as killed by disasters between 2002 and 2011 (UNESCAP 2013). In particular, the vulnerability of the South Asian region to natural disasters is extremely high. Many cities are located on earthquake fault lines and river deltas. Studies suggest that losses and deaths are a result of unplanned urbanisation and the concentration of people, economic activities and assets in hazard-prone areas. In rural areas, poor investments in agriculture and widespread rural poverty magnify the impact of a disaster.

Each of the disasters in Asia such as cyclone Haiyan (Yolanda, 2013), the Uttarakhand tragedy (2013 deluge) or the more recent typhoon Rammasun (Glenda, July 2014) that affected South China, Vietnam, Thailand and the Philippines indicated that challenges of disaster response are amplified if a region lacks infrastructure such as roads, storage facilities, electricity and so on. This is particularly true in the hilly terrains (such as Uttarakhand in India and the seismically active Himalayan ranges) or in islands (as in the Philippines and Indonesia). The impact of a disaster is usually high in poorly developed and peripheral areas far from administrative headquarters and capital cities. Although hazard vulnerabilities have been mapped and disaster-prone areas may be known, what are some of the key factors responsible for poor disaster response? Despite possessing knowledge, resources and human power, what is missing in the organisation of disaster management

J. Andharia (✉)
Jamsetji Tata Centre for Disaster Management, Tata Institute of Social Sciences,
Sion Trombay Road Deonar, Mumbai, India
e-mail: jankiandharia@gmail.com; andharia@tiss.edu

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system? This paper makes a case for a sharper focus on humanitarian logistics to improve disaster management and practices around disaster preparedness and response. Its objectives are:

(a) To highlight the significance of logistics
(b) To discuss the complexities involved in managing logistics during emergencies
(c) To present some of the positive practices by some of the specialised agencies to enable their adoption by countries in the Asian region

From the perspective of survivors of a natural disaster, during the first few weeks, four major functions are significant:

(a) Where houses are affected, setting up of good-quality protective relief camps with food, water and sanitation
(b) Provision of health-care facilities including psychosocial care
(c) Credible damage assessment including enumeration of survivors, the dead and missing
(d) Clear communication from the government about what people should expect as the next level of help and assistance

Is it safe to resettle in their village or town? When can they return to their homes? What kind of support can they expect? How would aid and relief be disbursed? On what terms? The government needs to take several decisions quickly.

Thomas and Kopczak (2005) of Fritz Institute in California rightly argue that the speed of response for major humanitarian programmes involving health, food, shelter, water and sanitation interventions is dependent on the ability to procure, transport and receive supplies at the site of a disaster and then distributing in a timely and effective manner to the affected population. This is a function of logistics – a field that is reasonably well evolved in the commercial realm but remains weak in the humanitarian sector.

Several critical decisions are involved: judging where to locate relief camps and warehouses, sourcing relief items, at what cost, in what quantities, with what kind of packaging and what one is to do to minimise pilferage and wastage.

It is common for resources to flow after a disaster has occurred rather than in advance for preparedness. It is the very nature of humanitarian response where aid organisations, governments, private sector and common people donate or contribute finances, food, equipment, shelter, medical teams and other support personnel. Ensuring that these reach the site of relief effort requires a robust relief supply chain.

The terms humanitarian logistics, relief logistics and humanitarian supply chain managements (SCM) are often used interchangeably in literature. However, supply management subsumes logistics. Writing about humanitarian logistics, Thomas and Mizushing (2005) define disaster logistics as:

> The process of planning, implementing and controlling the effective, cost-efficient flow and storage of goods and materials as well as related information, from point of origin to the point of consumption for the purpose of meeting the end beneficiaries' requirements. (p. 28)

It is a tactical and operational system that begins to function after a disaster has occurred. It is execution oriented and expected to match demands of the affected

population (the beneficiaries) with supply in a timely manner. Disaster supply chain management is a broader system, more long term. According to Day et al. (2012), disaster SCM is

> The system that is responsible for designing deploying and managing the processes necessary for dealing with not only current but also future humanitarian/ disaster events and for managing the coordination and interaction of its processes with those of supply chains that may be competitive/ complementary. It is also responsible for identifying, implementing and monitoring the achievements of the desired outcomes that its processes are intended to achieve. Finally it is responsible for evaluating, integrating and coordinating the activities of the various parties that emerge to deal with these events. (p. 28)

There are multiple perceptions of logistics. Some like Tatham (2011) suggests that logistics is one element of the totality of the preparation and response effort. Other scholars such as Waasenhove (2006) assert that logistics constitutes 80 % of disaster response effort, and unless it is recognised as a critical support function, the extent and quality of the outreach of relief will be severely impacted. Regardless of how disaster logistics is positioned, it is increasingly recognised that it constitutes a missing link between preparedness and response.

Internationally the Hyogo Framework for Action (HFA) has been the key instrument for implementing disaster risk reduction and was adopted in 2005 by the member states of the United Nations (United Nations International Strategy for Disaster Reduction n.d.). Its overarching goal is to build resilience to disasters among nations and communities by achieving a substantive reduction in disaster losses by 2015 – in terms of lives and social, economic and environmental assets of communities and countries. The HFA offers five areas of priorities for action, guiding principles and practical means for achieving disaster resilience for vulnerable communities in the context of sustainable development. Improving disaster logistics and supply chain management would help build resilience of nations and communities too. Currently, it constitutes a blind spot among agencies responsible for disaster preparedness in most Asian countries.

This chapter is organised into six sections. The next section underlines the significance of disaster logistics. This is followed by a section on challenges and complexities of a disaster situation which make supply chain management difficult. International practices which could be adapted to the Asian context are discussed in the fourth section. The fifth section proposes creating synergies and coordination systems with the private sector. Building warehouses rapidly and the use of information technology and of geographic information system (GIS) in disaster logistics are some of the examples. In conclusion, the paper suggests that disaster logistics constitutes a critical component of resilience building of regions and nations.

12.2 Logistics: A Crucial but Missing Link in Disasters

Disaster SCM serves as a bridge between disaster preparedness and response through the establishment of effective procurement procedures, supplier relationships, pre-positioned stock and knowledge of local transport conditions. An

integrated understanding of these processes is still evolving in most developing countries of Asia, and working towards robust logistics remains a neglected area in disaster response, a point made forcely by Boon and Li (2012).

The significance of disaster logistics is evident from the fact that relief supplies such as food, water, shelter and health care for survival must be made available quickly to the survivors of a disaster (Jacob et al. 2008). As populations shift to relief camps and their densities increase, risk of outbreak of epidemics is high. This makes efficient and high-pace deliverance of relief efforts and health-care facilities even more crucial. Facilitating procurement and flow of goods to specific sites is a critical part of this equation.

At the same time during a disaster, a flood of relief supplies without direction can prove to be a serious problem for disaster management. Supplies often pile up at the central level, while acute shortages are painfully evident at the disaster sites where they are desired most. This was evident in Carnicobar after the 2004 tsunami, while islands such as Katchal, not on the air route, remained deprived. The execution of supply chain operations can make or break the relief support (Ergun et al. 2007). Therefore, mere procurement of emergency goods and equipment is not enough but also management of those supplies.

The national governments of a country have the primary responsibility in organising disaster relief. Since the development of codified procedure in many Asian countries is at a nascent stage, there is no uniformity in the management of logistics across all provinces within a country. In the absence of a proper logistics mechanism, not only a large part of the scarce resources lie idle or may turn wastage but also the affected people remain deprived.

Agencies such as the World Food Programme have a well-developed understanding of humanitarian supply chain management from purchase, to shipment, to clearance, to storage and transport and finally to distribution. However, it is a support function and not a programme (Oloruntoba and Gray 2006).

In many Asian countries, commercial supply chain management is recognised as the strategic and value-producing component in the overall operations of business organisations. In the humanitarian sector, however, it has received relatively little attention. Although there are clear distinctions between the two, leveraging expertise from logistics firms would help the situation on ground immensely.

12.3 Complexities and Challenges

The complexities of managing supply chains in humanitarian settings are many especially because no two disaster contexts are identical. It is difficult to plan for all the supplies, their quantities and the location. Accurate forecasting in procurement and effective planning is not possible. Further, procurement is affected by demand and pricing after a natural catastrophe. At the same time, minimising the response time of the relief supplies is vital as that could save lives.

In most disaster locations, surface transportation infrastructure is often heavily damaged; alternative transportation mediums such as air and shipping routes need to be explored. In addition, one does not immediately know the number of survivors, their immediate needs and how much food, medicine, weather conditions and water is still good at their homes. While detailed damage assessments take time, rapid assessments are required. This implies that information coming from diverse sources – and sometimes contradictory in nature – must be interpreted with diligence, accepting uncertainty. For example, when disasters cause massive displacement, people often move from one camp to another – either in search of their relatives or in order to be with their friends and neighbours. So the number of people living in specific camps would keep changing during the first few weeks.

Temporary relief camps are generally not so temporary, and people are forced to live in them often for months together especially when they are survivors of ethnic strife. As in the case of post-Godhra relief camps after the communal riots in Gujarat (Human Rights Watch 2002) and in Dhubri (northern state of Assam, India, 2012), Muslims were too scared to go back to villages where the dominant communities lived and were in majority.

Needs of the affected people are required to be segregated by age and gender. Some are individual needs while others are collective in nature. Hence a system that ensures an effective way of mapping needs for the right donors and suppliers, not just in terms of the services or material but also systems of outreach for and the needed quantities is crucial.

Relief and development efforts, whether in the immediate aftermath of a natural disaster or in a prolonged conflict, are dependent on the efficient procurement of the right supplies, security and storage of well-packaged goods, so that they can finally be made available to the people who need them (Thomas 2004). Heavy traffic, inadequate or poor supply of fuel, damage due to heavy rain or looting of storage facilities can pose serious problems.

Experience from all disasters suggests that storage, warehousing and appropriate packaging for distribution is another level of challenge. Poor packaging often affects transportation and delivery. Next, packaging material at the site of disasters can become a problem. After the tsunami, the eco-fragile Nicobar Islands had to deal with huge piles of plastic waste. With careful planning, recycling of packaging waste could be undertaken, and this requires a good understanding of reverse logistics.

Next, systematic transportation and distribution is possible if the relief camps are mapped, and there is a good flow of information. Unreliability and incomplete information may aggravate the chaos. Malik (2010) stated that 'it becomes very difficult to transport supplies when information is scattered at various levels within the logistics chain or is simply unreliable' (p. 14). Nonexistent demand pattern, irregularities in material flow and time management are the major challenges on the field. Lack of recognition of the importance of logistics, inadequate use of technology and limited collaboration are some of the common challenges in humanitarian aid logistics in Asia.

There are a number of other factors that create constraints on logistics, such as pre-existing logistics infrastructure in a country, political and cultural factors, the sheer number of humanitarian actors (often uncoordinated), the damage caused by the disaster and sometimes the security environment which complicate legal dimensions of organising relief. Similarly, border issues and technological limitations of reaching or communicating with the affected region create unique challenges. Besides, international relations and political stability/instability impact the flow of humanitarian aid. After cyclone Nargis in 2008, the military junta of Myanmar refused to grant permission to some organisations to enter the country with aid. Ships were anchored for 2 weeks before leaving (Day et al. 2012). Therefore, there is a need to develop a sharper understanding of logistics in disaster management based on past experiences, and considerable work needs to be done in order to refine practice in specific contexts. Typically, various components of logistics need to be attended to simultaneously, which can be demanding.

Some challenges emerge with consistency in all disasters. Management of food grain logistics has remained an area requiring much improvement in most Asian countries in a disaster situation. Almost all relief camps are overcrowded, and they face issues of safety, poor hygiene and lack of systematic planning of the camp in terms of adequate demarcation of sleeping and eating areas, washing areas, toilets and waste disposal. Regular cleaning of areas surrounding the camps is also necessary. In Assam, tube wells were installed near the relief camps that were drawing water from 20 ft, and the likelihood of contamination of water was very high.

Managing disaster logistics is also difficult because of the uniqueness of each disaster event which implies that every situation needs specific and innovative approach. Case studies of both positive practices and poor logistics management from across diverse countries would offer valuable insights and lessons.

12.4 Learning from International Humanitarian Agencies

It is rightly argued that logistics management may prove to be a deciding factor in the success or failure of any humanitarian initiative. In Asia, the significance of logistics in disaster relief operations is often underestimated, and it is only from 2005 onwards that humanitarian logistics has been receiving considerable attention within countries as many agencies began to understand the value of logistics as a core function and a key element of successful operations. In fact, the 2004 Indian Ocean tsunami which affected 14 countries and took 2,228,000 lives (Cosgrave 2007) is regarded as a turning point in disaster logistics (IRP n.d.; Kovacs and Spens 2011).

The armed forces all over the world have a specialised logistics branch. Established international organisations and humanitarian agencies such as International Federation of Red Cross and Red Crescent Societies (IFRC), UNICEF, the World Food Programme (WFP), Doctors Without Borders/Médecins Sans Frontières and

Oxfam, with a mandate to respond to disasters, recognise the significance of logistics and have well-articulated supply chain management systems. Knowledge and information is compiled and made readily available through tools such as the Logistics Cluster (LogCluster) website and Logistics Operational Guide, and software solutions like HELIOS are ready for use by NGOs to support their logistics operations (Impact Forecasting 2014).

The UN's WFP distributes large quantities of food assistance to people spread in large number of geographical locales and over the last 40 years or so has developed a complex and sophisticated logistics infrastructure (Frankenberger et al. 2010). It has invested in staff and technology to be able to move cargo fast and efficiently while controlling costs. When the humanitarian community undertook reforms after the 2005 Indian Ocean tsunami, because of its experience, the WFP was asked to lead the Logistics Cluster and share its experience and expertise with the wider humanitarian community. The WFP has now developed a number of tools. These tools include:

(a) Logistics Capacity Assessments (LCAs) – LCAs are in essence an inventory of logistics infrastructure within any given country and act as a guide at the start of an operation to inform all actors about what can be expected on the ground, logistically.
(b) The Global Logistics Cluster Support Cell – An interagency team of logisticians who set standards and best practices in humanitarian logistics, build response capacity and provide operational support.
(c) Logistics Response Teams (LRTs), which are sent out at the beginning of a new emergency to asses logistics capacity within a country, coordinate and manage a logistics response and, if need be, provide common logistical services such as warehousing and/or transport.
(d) Humanitarian Response Depots (HRDs) – The HRD network allows NGOs, government organisations and the UN agencies to stockpile emergency response equipment in five strategically positioned warehouses around the world for immediate deployments at the onset of an emergency. HRDs are located in Dubai, Panama, Ghana, Italy and Malaysia.
(e) Partnerships – Through public and private partnerships with other UN agencies, non-governmental organisations and the private sector (such as the Logistics Emergency Teams (LETs), made up of DHL, UPS and Agility). The WFP has developed skills and relationships with other organisations in order to share knowledge and respond better.

As mentioned earlier, SCM in the context of disasters refers to a network of people and organisations that are involved through upstream and downstream linkages, in different processes and activities that provide and deliver commodities and services to the affected population. It therefore includes distribution networks of supply and procurement, transportation, warehousing and inventory management, accountability systems and the vexed issue of last mile connectivity which requires multi-pronged approaches. Clearly, the field of disaster logistics is highly dynamic.

12.5 Creating Synergies and Coordination Systems with the Private Sector

Developments in communication technologies and extensive spread and use of the Internet and cell phones enable people to watch a disaster unfold in real time, demanding immediate action. As a consequence of global interconnectedness, disaster impacts are not just localised, but second- and third-order effects are visible through supply chains around the world. What happens in one part of the continent affects other regions in social, economic and emotional realms. Developing coordinated strategies for managing disasters and their cascading impacts is an imperative, and several scholarly articles discuss issues of coordination (see Bharosa et al. 2009).

Disasters test the capacity of different actors – such as government agencies, military units and voluntary agencies providing relief, to work together. Several Asian countries have anywhere between 1,000 and 10,000 voluntary agencies that could potentially get involved in disaster response. Many of these agencies have little reason to partner and collaborate otherwise, and a disaster suddenly requires them to coordinate their capabilities (Tosmani and Van Wassenhove 2009). Information sharing and activity coordination requires special effort.

The Indian Ocean tsunami which affected several Asian countries in 2004/2005 revealed that large-scale relief operations pose several difficulties, and the concept of clusters to develop better coordination mechanisms is useful. It involves organising humanitarian aid along specific sectors where each sector has a predetermined leader. According to OCHA (2007), clusters were introduced to enhance efficiency in five key areas:

(a) Sufficient global capacity to meet current and future emergencies
(b) Predictable leadership at a global and local level
(c) Strengthened partnerships between UN bodies, NGOs and local authorities
(d) Accountability, both for the response and vis-a-vis beneficiaries
(e) Strategic field-level coordination and prioritisation

Currently, clusters operate in 25 countries. However, it does not mean that all clusters are active in all operations. Clusters can be mobilised individually too. As a concept, the idea has considerable appeal, but intercluster coordination is not always easy to achieve. During the Pakistan earthquake, Hollingworth (2009) observed that clusters cooperated very rarely. This points to the fact that there are many gaps in practice. The learning here is that for clusters to work well, organisations and people holding positions within them must have the requisite maturity to recognise the benefits of such coordination. Jahre and Jensen (2010) offer a detailed discussion on coordination in humanitarian logistics through clusters.

In the private sector, relationships within commercial supply chains that demonstrate collaboration in spheres of information sharing, joint efforts and dedicated investments lead to trust and commitment, which in turn, lead to greater satisfaction

(Nyaga et al. 2010). Partnerships and collaborations have been studied empirically and proven to have a positive outcome. However, partnerships and coordination are not easy to achieve in a conflict zone as humanitarian agencies possess varying degrees of credibility of organisation from the perspective of the local population and that of the government – which may not necessarily converge. Therefore, creating coordination systems requires special efforts, experience and insights into the strengths of each organisation. Several initiatives are under way, one of which is the formation of 'interagency groups' promoted by the UN and Sphere.

After most disasters, industry is keen to assist and reach out. It generally does so by providing relief – donations of clothes, blankets, food, water and other materials. While this is needed, the ability of governments to create a framework within which it can leverage expertise that exists in the private sector is important. Collaboration requires recognising the significance of providing logistics support so that governments seek and logistics firms provide this support. One of potentially effective ways of partnering would be to use the existing corporate supply chains rather than look for new ones. For example, companies that manufacture and supply consumer goods (soaps, oil, toothpaste, etc.) which have a logistics outreach right into the villages may be invited to help with mapping the flow of relief goods or inventory management. This idea received considerable applause in 2010 during an International Roundtable on Humanitarian Logistics organised by the Jamsetji Tata Centre for Disaster Management established by the Tata Institute of Social Sciences. The conference was the first of its kind in the Asian region where speakers who came from government, industry professional organisations, humanitarian agencies and academia presented and discussed ideas around disaster logistics.

It would be of immense value if supply chain specialists from the private sector could step in and assist the affected state administration with their expertise. Many industries prefer to intervene directly through their own personnel rather than merely provide donations (Andharia, 2013). A good professional team of supply chain experts, cognizant of the challenges on the ground, could work with government officials and help put together a system which will adapt to the context.

12.5.1 Warehousing and Relief Camps

Supply chain specialists from the private sector could also assist the affected areas with critical expertise such as establishing warehousing facilities, assisting with optimising transportation and distribution networks and in helping set up systems of coordination. In almost all disasters, the one aspect that is lamented with unfailing regularity is the absence of coordination.

Logistics companies from the commercial sector can, for example, be invited to set up quality, temporary warehouses. This would help avoid the wastage that occurs when grain and material is dumped in poorly constructed godowns

or merely stocked under a tarpaulin cover. After the 2008 Kosi floods (Bihar, India), many relief camps were in poorly constructed tents on uneven ground or *shamianas* (marquee or large-size tents) that were no barrier against inclement weather (Andharia 2013).

In fact, specialised agencies could be requested to construct better relief camps with appropriate levelling off the ground. They could assist in creating better organised camps with earmarked kitchen and eating spaces, enclosures that serve as medical rooms and enclosures where pregnant and lactating women could get some privacy. These critical facilities can easily be created in relief camps if governments identify these requirements and request logistics companies with specialist capabilities to provide such support. If insulated well, they could easily help people through the harsh winters since no government is able to complete reconstruction within 6 months of a disaster. Indeed, the location of each of these will have to be approved by geologists, hydrologists and planners as being safe sites (Andharia 2013).

This kind of partnership will go a long way in creating synergies between government agencies, nongovernment organisations, corporates, civil society initiatives and so on. It would facilitate better quality, coordination and reach of humanitarian response and ensure that the expertise and goodwill that exists within the country is brought to the service of those affected by disasters.

In the recent flooding (September, 2014) of Srinagar, the capital city of Jammu and Kashmir (J & K) state in northern state of India and the vast number of villages in adjoining districts, it is very likely that a similar scenario would unfold. Quality warehouses could easily be redesigned to function as health centres in a situation where buildings and health-care infrastructure or hospitals are devastated by a disaster. In many developing countries, tents are often in short supply and insufficient to cater to the needs of the affected population especially when it is as large as four to seven million as in the case of J & K floods or typhoon Haiyan. Well-conceived warehouses, easy to put up, can fulfil several functions – ranging from temporary housing to clinics or hospitals and as places for community meetings and later for trainings too. Sheppard et al.'s (2013) writing in the context of the Philippines, which passed a Disaster Management Act only in 2010, suggests that warehouses could also accommodate control facilities for local disaster management coordination or later serve as training centres at the regional level. Lai Yuhung et al. (2009) propose a Disaster Response Training and Logistic Centre under the Association of Southeast Asian Nations which provide mutual support to countries affected by a disaster, leveraging strengths of each nation. They argue that such support would be in the form of aid which is politically neutral, well coordinated and effectively governed. While a regional approach is certainly desirable since disasters do not follow any boundaries, achieving political neutrality is easier said than done.

Similarly, forms of expertise that exist in many countries in the commercial realm, like maintaining computerised records, inventory management systems and establishing distribution networks, need to be mobilised.

12.5.2 Using IT and GIS

Information technology (IT) in the modern corporate sector provides critical information to the management, influencing its decision-making process. On the other hand, the humanitarian world has only recently witnessed IT initiatives on a large scale for better management of relief logistics. IT can help effectiveness of humanitarian relief organisations' operational management and control. For example, IT initiatives can support warehouse management systems, inventory maintenance and also provide solutions for logistics tracking and tracing of relief commodities. It can also help accounting and reporting functions of organisations for donor accountability. Blue Star Infotech has had experience of developing software for supply chain management in humanitarian contexts for the IFRC.

Similarly, GIS has emerged as a very important tool for effective planning and communication, making spatial information available to all users. Internet-based GIS offers a huge potential to improve the way disaster response is organised in the disaster-prone regions of Asia (Andharia 2013). Absence of robust disaster databases remains a critical challenge and hinders response as well as evidence-based policy making that integrates disaster risk reduction measures into national and state/provincial development and preparedness plans. There is an urgent need to improve disaster databases, technical standards and methodologies. Each of these would help enhance preparedness and organisation of disaster logistics.

Considerable work needs to be done to develop the field of humanitarian logistics in Asia, and the private sector along with the government can innovate and develop strategies. Fostering cooperation and exchanges between logistics companies would help improve quality of humanitarian response manifold. Many lessons and practices in logistics from commercial world could be used in humanitarian effort. With a little creative thought and concerted effort, the nature and quality of contribution of industry could be very useful. For this, mapping of agencies with appropriate expertise and training volunteers in information management as well as communication with state and district administration needs to be undertaken (Andharia 2013).

Rising international interest in disaster response and globalisation of humanitarian response offer vast opportunities to strengthen SCM in disaster management. Since industry does have a humanitarian intent in participating in relief operations in addition to providing finances for food and other kits, requesting them for logistics support – an expertise that they possess as part of their core business – may be far more effective than asking them for food or other material aid. Indeed the application of SCM practices from the commercial to disaster contexts will not be direct and linear with necessary adaptation.

In order to develop the field of humanitarian logistics in Asia, the expertise and experience of the private sector should be drawn on, creating synergies between the government and civil society organisations – each adapting and innovating approaches and frameworks of commercial supply chain management. This would

facilitate improved quality and reach of humanitarian response and ensure that the expertise and goodwill that exists within the country is brought to the service of those affected by disasters.

12.6 Conclusion: Disaster Logistics and Resilience

Unpredictability and escalating intensity of emergencies means higher degree of damages to life and property. The efficiency and timely supply of appropriate relief and rehabilitation to the affected population define adequacy of disaster response.

Building resilience of nations, of provinces, of districts, of cities, of villages and of communities to disasters is emerging as a key theme in disaster management discourse. At a national level, it refers to the capacity of countries to withstand, adapt to and recover from natural disasters and major crises so that populations can continue to lead the lives they value. Development of logistics and proper supply chain in the pre-disaster period is the key to effective and efficient relief administration. Preparedness could save lives and costs in the future.

Since the adoption of the HFA, many global, regional, national and local efforts have addressed disaster risk reduction more systematically; much, however, remains to be done in the area of disaster logistics. Sheppard et al. (2013) also make a persuasive argument about the need for logistics practices to become more relevant to the needs of the local people on ground and at municipal and village levels, especially in the developing world. They propose strategies of how local populations might engage in logistics preparation and response processes which would enhance their effectiveness and efficiency.

To use the clichéd definition – humanitarian logistics is getting the right assistance to the right place at the right time at the right cost. Logistics and supply chain management are key global functions which ensure that the operational implementation of programmes is structured through clear definition of individual responsibilities, appropriate processes and ways of working.

The challenges faced by logisticians on the field especially during disasters and what it would take to expand the scope of developing this domain cannot be underestimated. Every positive effort where new practices or partnerships are sought to be established will have some bottlenecks. With political will and commitment, these can easily be overcome. With the rising number of disasters, the significance of comprehending the ‘uncertainties’ involved in humanitarian logistics and developing a robust system for crisis situations can go a long way in saving lives and property.

References

Andharia J (2013) All for the want of a horseshoe nail. The Hindu, July 19, p 201

Bharosa NJ, Lee K, Janssen M (2009) Challenges and obstacles in sharing and co-ordinating information during multi-agency disaster response. Inf Syst Front 12:49–65

Boon TT, Allen L (2012) Disaster management in Southeast Asia: issues and challenges. Available at http://www.internationalpolicydigest.org/2012/05/15/disaster-management-in-southeast-asia-issuesand-challenges/. Accessed 10 Sept 2014

Cosgrave J (2007) Synthesis report: expanded summary, joint evaluation of the international response to the Indian Ocean tsunami, Tsunami evaluation coalition

Day JM, Melnyk SA, Larson PD, Davis EW, Whybark DC (2012) Humanitarian and disaster relief supply chains: a matter of life and death. J Supply Chain Manag 48(2):21–36

Ergun O, Keskinocak P, Swann J (2007) Humanitarian relief logistics. OR/MS Today 2007: 28–30

Frankenberger TR, Walters T, Kiff E, Awasth GD (2010) Nepal: an evaluation of WFP's portfolio vol I full report. Report number: OE/2010/010. World Food Programme. Office of Evaluation file:///home/user/windows/D/Janki%20Andharia/JTCDM/Masters%20Course%20in%20DM/New%20Syllabus%20April%202014/MDM%202/1277.pdf

Human Rights Watch (2002) "We have no orders to save you": state participation and complicity in communal violence in Gujarat. Hum Rights Watch 14(3):1–68

Hollingworth M (2009) Keynote speech. Paper presented at the 2nd international humanitarian logistics symposium, Faringdon, March

Impact Forecasting (2014) Annual global climate and catastrophe report impact forecasting 2013. Available at http://thoughtleadership.aonbenfield.com/Documents/20140113_ab_if_annual_climate_catastrophe_report.pdf. Accessed 5 Nov 2014

International Recovery Platform (n.d.) Indian Ocean tsunami, 2004, brief overview of the disaster by countries. Available at http://www.recoveryplatform.org/countriesand_disasters/disaster/15/indian_ocean_tsunami_2004. Accessed 2 Sept 2014

Jacob B, Mawson AR, Guignard JC (2008) Disaster mythology and fact: Hurricane Katrina and social attachment. Public Health Rep 123(5):155–166

Jahre M, Jensen L (2010) Co-ordination in humanitarian logistics through clusters. Int J Phys Distrib Logist Manag 40(8/9):657–674

Kovacs G, Spens KM (2011) Trends and developments in humanitarian logistics – a gap analysis. Int J Phys Distrib Logist Manag 41(1):32–45

Lai YA, He JA, Tan TB, Phua KH (2009) A proposed ASEAN disaster response, training and logistic centre enhancing regional governance in disaster management. *Transition Studies Review*, 16:299–315

Malik AM (2010) Integrated logistics systems in disasters. Abstract book of the third international roundtable conference humanitarian logistics: scope and challenges, 13–14 December 2010. Tata Institute of Social Sciences, Mumbai

Nyaga G, Whipple J, Lynch D (2010) Examining supply chain relationships: do buyer and supplier perspectives on collaborative relationships differ? J Operat Manage 28(2):101–114

OCHA (2007) Appeal for building global humanitarian response capacity. Office of the Co-ordination of Humanitarian Affairs, New York

Oloruntoba R, Gray R (2006) Humanitarian aid: an agile supply chain? Supply Chain Manag Int J 11/2(2006):115–120

Sheppard A, Tatham PH, Fisher R, Gapp R (2013) Humanitarian logistics: enhancing the engagement of local populations. J Humanitarian Logist Supply Chain Manag 3(1): 22–36

Tatham P (2011) Improving the civil-military dimension of disaster-related humanitarian logistics, civil – military working papers 01/2011 – Australia. Available at http://acmc.gov.au/wp-content/uploads/2011/11/5870R-CIVMILCOE-Tatham-Working-paper-A4-FA-WEB-PDF.pdf. Accessed 15 Sept 2014

Thomas A (2004) Elevating humanitarian logistics. Int Aid Trade Rev 2004:102–106

Thomas A, Kopczak LR (2005) From logistics to supply chain management: the path forward in the humanitarian sector. Fritz Institute, San Francisco

Thomas A, Mizushima M (2005) Logistics training necessity or luxury? Forced Migr Rev 22: 60–65

Tomasini RM, Van Wassenhove LM (2009) From preparedness of 'swift trust' to humanitarian logistics. Int Trans Oper Res 16(5):549–559

UNESCAP (2013) Statistical yearbook 2012 for Asia and the Pacific. Available at http://www.unescap.org/stat/data/syb2013/F.5-Natural-disasters.asp. Accessed 15 Sept 2014

United Nations International Strategy for Disaster Reduction (n.d.) Hyogo framework for action 2005–2015: building the resilience of nations and communities to disasters. United Nations International Strategy for Disaster Reduction, Geneva, Switzerland

van Wassenhove LN (2006) Humanitarian aid logistics: supply chain management in high gear. J Oper Res Soc 57(7):475–489

Chapter 13
Disaster Management and Corruption: Issues, Interventions and Strategies

Vikas Saharan

13.1 Introduction

Disasters occur due to the interaction between natural events that cause them and social, political and economic vulnerabilities that structure the lives and the livelihoods of different groups of people (Pielke 2006). Disaster causes massive disruption of community functions involving large-scale human, economic, material and environmental losses. It surpasses the existing coping capacity of the affected community; due to this situation, intervention in the form of disaster-related aid is provided to people to reduce their suffering by ensuring their immediate needs. Disaster management is cyclic in nature as it involves pre- and post-disaster activities; during an emergency situation, there is a national and international response leading to urgent relief activities on recovery and rehabilitation measures. The initial response to natural disaster at the local and national level is led by the government and civil society of the affected country; appeals for international assistance are made when local and national capacities are overwhelmed. Disaster-related aid originates from different sources, i.e. local, regional, national and international, and it comes out from public, private and corporate purses. It is the nature and magnitude of emergency which decide the role of the government. Nature of emergencies also differs ranging from natural disaster to war; along with this, they are differentiated on the basis of their intensity: sudden events, i.e. earthquake, tsunami, floods, etc., and slower events, i.e. drought.

After a natural disaster, the role of the government becomes important both in the countries affected by disaster and in aid-originating countries. During an emergency situation, the government's first priority is to provide disaster-related aid to victims and also to minimise losses. The initial relief is in the form of

V. Saharan (✉)
Jawaharlal Nehru University (JNU), New Delhi, India
e-mail: Vikas.Sw18@gmail.com

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rescue and recovery (emergency services, dispatching rescue teams, searching missing people, identifying and treating casualties), material relief assistance and services (shelter, medicines, water and sanitation), emergency food aid (obtaining, transporting and delivering basic supply of food and setting up alternative feeding centre) and coordinating relief and support services (re-establishment of basic logistics, infrastructure and communication). Humanitarian aid is given to assist those affected by natural disasters, human conflict or other forms of severe political, economic or social breakdowns. Its aim is to prevent and alleviate human suffering in the context of life-threatening situations. During disaster, humanitarian aid agencies' role includes direct project implementation, cash or in-kind contributions, project funding, direct budget support and debt relief (Willitts-King and Harvey 2005).

An important determinant of aid effectiveness is the ability of humanitarian agencies to accurately target beneficiary groups and distribute aid accordingly. The entire global humanitarian aid system is both extensive and complex. Despite serious efforts to rectify its weakness, certain existing and functioning patterns of the system provide scope for corruption in humanitarian aid. In humanitarian aid, usually there is transfer of resources from a developed nation to a deprived nation. This donation of aid is a voluntary act, and this external assistance is very crucial for disaster-affected countries. This imbalance of power between recipient and donor countries leads to different patterns of accountability especially in terms of sanction and spending of money for relief measures. Disaster and its related rescue and rehabilitation operations create condition for profit, legitimate or otherwise. The manner in which humanitarian aid is given can also influence opportunities for corruption. Humanitarian emergencies generally create condition for corruption to flourish in affected countries, for example, urgency to reach affected communities leads to non-bureaucratic procedures.

Corruption is also aided by relaxed procedures to ensure speedy aid delivery, Aid given in the context of humanitarian relief can assume a number of forms. Most of the resources during humanitarian aid relief process are from unknown sources and through unusual channels which gives chances for corruption to those who desire to exploit it; one of the glaring example of this is the reconstruction of physical infrastructure during disaster rehabilitation process which gives an opportunity for misuse of power and resources. Kickbacks and cuts have emerged as a common corrupt practice during disaster procurement of items as logisticians and warehouse managers during this time have discretionary power to influence purchasing and contracting decisions (Cremer 1998). This diversion of resources not only puts extra burden on humanitarian aid agencies but also causes mistrust among employees. Things are further compounded by poor infrastructure, weak public services and legal systems, non-transparent systems including collusion of staff with third parties, less qualified staff, staff that are no longer independent but owe obligation to other people and decline in public image. Corruption is a complex phenomenon with its root in bureaucratic and political institutions. It acts as an important obstacle to development and growth in disaster-affected countries as disaster-related aid may be corruptly diverted during the whole of the disaster

management cycle. Therefore, disaster preparedness and response is a continuous process of education as it involves awareness building, resource planning, sharing information and flow of communication at all levels, i.e. from the village level to the regional and national level, and to international coordinating bodies. Among many things, disaster management and mitigation also include adoption of low-cost disaster mitigation measures, leadership training and exchange and establishing communication linkages that cut across geographical and political boundaries.

13.2 Research Questions

During disaster, international humanitarian aid organisations along with local aid community continuously inject resources into the affected area. This study identifies how disaster affects a wide segment of the population which in turn demand mitigation, rehabilitation and relief process through food aid, shelter and health. The study examines the role of various organisations in providing humanitarian relief to the affected population and vulnerability of these organisations in terms of corruption. This study also identifies factors that cause corruption at the cutting-edge level during humanitarian assistance to people affected by sudden extreme events and measures adopted by humanitarian aid organisations to minimise risk of corruption and diversion in relief responses. The study explores the role of the government in providing relief and participation of disaster-affected community in the planning, implementation, monitoring and evaluation of relief process.

13.3 Literature Review

There are very few studies on linkages between corruption and disaster management across the world. Disaster occurs when ecological relationship between man and his immediate environment is disrupted; this disruption comes in a sudden or slow manner that it needs extraordinary external effort for the affected community (Gunn 1994). Disaster results from environmental phenomena or armed conflict, and it causes stress, personal injury, physical damage and economic disruption of great magnitude (Cuny 1992). Emergency management has always been the important component of governance, and it always assumes importance whenever there is natural or man-made disaster. Limitations and shortcomings of public administration always come to the limelight during incidents of natural disaster. This put more serious pressure on public officials and policymaker to focus their attention on policy domain of disaster management. There is less study on the role of organisations in dealing with disaster management across the world (McEntire 1997).

During disaster, people, infrastructure and environment become vulnerable due to the insensitive system of the state, and people are compelled to live in hazard-

prone places due to poverty, oppression and lack of choice (Lewis and Kelman 2010). Chances of corruption during disaster increase due to ineffective and insufficient supervision mechanism, and things become more complex when resources are captured by local powerful forces (Treisman 2000). Linkage between corruption and disaster becomes more visible during post-disaster phase; this hierarchical greed increases the cost of goods and services (Ambraseys and Bilham 2011). Extensiveness and spread of corruption is always linked to the political context of the affected country (Golden and Picci 2005). Turkish earthquake disasters of 1999 and 2003 were less the products of violent seismic events and much more the result of corrupt political decisions and negligent government. The human catastrophe which followed each of these earthquakes can be attributed in large part to government and industry corruption, gross negligence and state links to organised crime or to state-orchestrated organisational deviance. It is a community political system that decides authoritatively through the public policy process who will get how much life safety and who will pay for it (Olson et al. 1999). Poorer countries with weaker institutions and governance are the places where global disaster risk is highly concentrated (UNISDR 2009). The Turkish disaster of 1999 is generally used as a great reminder of the role of corruption and its association with weak enforcement of building codes (Kreimer et al. 2003; Özerdem 2003). Green and Ward (2004) pointed six types of state organisational deviance relevant to understanding natural disasters, i.e. state crimes: systemic corruption, state collusion with corporate crime, government collusion in the illegal activities of its own elites, war crimes, negligence and post-disaster cover-ups. Natural disasters are breeding grounds for fraud and corruption as services are provided quickly. Extreme weather triggers an infusion of reconstruction cash from federal, state and local governments (Sorensen 2014). Corruption, conflict and their interactions should seriously be addressed in disaster risk reduction policies as there is a direct linkage between disaster risk and different levels of conflict (Le Billion 2003). The study of disaster relief and corruption in the United States found positive and direct relationship between disaster relief amount received through FEMA (*Foreign Exchange Management Act 1999*) and corruption by public officials (Leeson and Sobel 2008).

13.4 Theoretical Framework

Theoretical framework provides a base for research. During disaster, the biggest challenge for the government is to restore normalcy by acting fast in search, rescue and evacuation operation with collaboration with other institutions, but during this entire process, institutions are prone to external forces which may divert the goal of relief operation. Therefore, understanding roles of institutions and governance in dealing with disaster risk assumes greater importance. The organisational state deviance theory states that disasters are a direct result of wrong decision made by corrupt politician under a negligent government with linkage of state to systematic

crime because decisions are made by the existing political system which selectively decides the distribution of resources during relief operation. These omission and commission by the state directly lead to human rights violation which tantamount to state crime (Green and Ward 2000).

Broadly, there is supposed to be six types of state organisational deviance, i.e. systemic corruption, collusion of state with corporate crime, government collusion in the illegal activities of its own elites, war crimes, negligence and post-disaster cover-ups. Rational decision theory suggests that during decision-making of the political process, there should be transparency. Rational choice theory explains the ideal condition of disaster management cycles which has to be adopted during disaster risk ranging from mitigation to rehabilitation. But this theory suffers from limitation because each individual has limited rationality due to several factors which leads them to commit mistakes. Public choice theory highlights that government disaster relief activities are prone to serve the wants and needs of politicians rather than those of disaster victims, i.e., elected decision-maker's pursuit of self-interest is dependent on their ability to gain and remain in office. This reality creates strong incentives for the politician to be most responsive to those individuals and groups with the greatest ability to affect their political tenure. Thus, when government relief efforts extend beyond the immediate emergency, they tend to be politically allocated. During disasters, public goods may include search and rescue operations, evacuation and coordination. For this, government institutions are well suited to provide public goods that form the infrastructure of a community. This non-exclusive characteristic of public goods makes them non-profitable for the private producer, i.e. private firms unlikely to produce it.

The government's poor performance in disaster relief is best explained not by reference to incompetent officials but instead by the centralised nature of the government and the incentives that accompany government decision-making. Public choice economists have identified certain factors that explain why the government cannot be expected to perform well during relief and rebuilding tasks that have been assigned to it, i.e. bureaucratic institutional structure, lack of effective feedback mechanism, moral hazards, etc. Jane Addams social democratic theory (1909) focuses on solidarity, participatory democracy, action orientation, flexibility and education for disaster planning and preparedness. However, tenets of this theory again suffer from lack of applicability. New institutional economics theory points that incentive or disincentive structure of a society is controlled by the institution because institutions provide incentives that may influence actors' decisions and preferences to reduce or produce or amplify or attenuate disaster risk. Therefore, disaster risk reduction is heavily dependent on institutional regimes (old/new, formal/informal) or the enforcement of existing formal/informal rules. Self-organisation theory focuses on a reallocation of resources on the spot in order to achieve common goals during disaster relief process, but this theory fails to address a long-term goal. These theoretical frameworks fall short of methods that reduce vulnerability of different institutions during disaster relief measure, and they do not provide theoretical guidance on how to design and implement broader recovery programmes in response to sudden events.

There is a need to evolve a theoretical framework to understand institutional vulnerability during relief operations at the global and local level which takes into account institutional arrangements, political systems, cultural values and numerous other idiosyncratic factors which pose a serious challenge to stakeholders. This type of theoretical framework improves and strengthens state vulnerability capabilities for handling issues of corruption during planning, preparedness and long-term disaster recovery process. For the planning, design and implementation of all types of social service programmes being carried out by the government and other network institutions, it is necessary to devise a theoretical framework which provides organising principle for the institution, which in turn helps administrators in designing programmes, implementing policy and evaluating current efforts. The theoretical framework should also focus on a specific disaster risk management policy and mainstreaming disaster risk management and reduction into development policy and planning. This type of framework helps in avoiding the creation of parallel structures and ensures that development does not construct new risks; thereby, it reduces disaster vulnerability and risks and strengthens key capacities by ensuring effective participation and engagement of different sectors of society ranging from the government to the civil society and the private sector.

13.5 Research Methodology

In order to address the question related to corruption and disaster management, this study is based on qualitative research methods, and for the purpose of this study, secondary sources in the form of documents and reports of government and nongovernment organisations and institutions have been used along with this interaction with various experts working as serious actors in the field of corruption, and disaster management during national and international conferences has also facilitated this study.

13.6 Findings and Discussion

Every year, millions of people are affected by natural disasters; this brings a number of institutions together to work for humanity by helping affected people and recreating their infrastructure. Ewins et al. (2006) highlighted that the risk of corruption during humanitarian aid depends on the type of the assistance, i.e. relief, rehabilitation or reconstruction. Whether it is in developing or developed countries, it is the public works, procurement, construction contract and later rehabilitation programmes that are a major part of the disaster response programme, and these programmes are most vulnerable to corruption. Things become more complex when such disaster relief programmes are carried in a condition which lacks monitoring, transparency and accountability (Galtung 2005). Along with siphoning of funds

during humanitarian aid relief programme, insecurity of staff also plays a major role in precipitating corruption as staff members are unable to visit field for direct supervision or monitoring. This atmosphere of insecurity acts as an obstacle for auditors to visit construction sites and monitor results (Nawa 2006).

The 2004 Asian tsunami, the 2010 Haiti earthquake and floods in Pakistan are some glaring examples of sudden tragic events which led to massive donations for relief efforts. But this strong philanthropic gesture fails to deliver the anticipated result at grass-roots level due to corruption (Nadgrodkiewicz 2013). In the era of climate change, there is a strong acknowledgement of the relationship between corruption and natural disaster, and it has to be addressed at all levels of the government. Regular and increased instances of extreme weather are unavoidable, but it is not possible to ignore corresponding epidemic of fraud and waste. It is imperative for the state and local executive to include issues of fraud and corruption in their disaster preparedness law and policies because in the modern age, public safety demands no loss. A dynamic relationship exists between state power, corruption and corporate power especially in the context of natural disaster-precipitated catastrophe. This relationship plays an important role in creating man-made natural disaster through network and chair of responsibilities, opportunities and pressure which indirectly tantamount to a crime committed by the state in the form of human rights violations.

There are more chances of corruption, when an organisation or person has monopoly over the goods or service, i.e. discretionary power to decide and unaccountability. Natural disasters are massive breeding grounds for fraud and corruption because during an emergency situation, services, i.e. water, electricity, gas, restoration of infrastructure and public transport, are provided speedily leading to siphoning of funds. The large interjection of resources, speedy activities and quick delivery of aid during disaster put tremendous pressure on already damaged or weak institution and on human resources. Disasters also aggravate pre-existing weakness in affected countries such as an inadequate internal control system and weak or vulnerable political and legal system along with huge humanitarian inequality; the situation is further compounded when issues of corruption and fraud activities are seen as routine and common business practices in the disaster-affected country.

Humanitarian aid is vulnerable to corruption in countries where there are low levels of transparency and accountability (Polzer 2001). In order to tackle corruption during disaster, institution plays an important role, and failure of institution during the crisis phase dramatically increases disaster risk and corruption. In contrast, if these issues are addressed, then risk can be reduced and human development is protected (UNISDR 2009). UNDP (2004) defines vulnerability as a condition resulting from physical, social, economic and environmental hazards that determine the likelihood and scale of damage. Many established aid agencies have developed sophisticated mechanisms that have greatly improved their capacity for financial accountability. Corruption in aid programming, especially in the construction sector, acts detrimental to addressing the requirements of most vulnerable sections of the population. The compelling situation to deliver quickly leads to a poor and substandard quality of assignment which fails to meet the required standard,

thereby making affected people more vulnerable. The existence of corruption in the construction industry is an open secret because everything about these from design, foundation and occupancy permission is decided by local authorities and municipalities. Corruption during disaster is evident by severely damaged roads and bridges. In the Philippines, in order to give kickback to government officials, contractors deliberately lowered construction standards. In 2008, the Sichuan earthquake of China that killed 75,000 people brought destruction to a number of schools including the death of 900 children in one school and was a result of corruption in the construction sector (Lewis 2008). Corruption continues abated despite a lot of investigations, and it has emerged as the most potent source of public resentment (Branigna 2011).

In some African countries, millions of dollars of international aid have been sent to private external bank accounts, most of which are located in aid origin countries; had these funds been used properly internally, then it could have boosted development, poverty alleviation and alleviation of other disaster-related risks (Baker et al. 2008). In Tajikistan, available funds disappear due to leader corruption; in spite of that, it has high disaster vulnerability and needs serious disaster risk reduction measures (Harding 2010). In poorer countries with weak governance institution, corruption aids in increasing poverty making communities more vulnerable (Lewis 2011). In Italy, all the four mafias are based in the southern part known as Mezzogiorno which has more numerous and larger earthquakes with high illiteracy and lower income and standard of living (Alexander 2005).

In Iraq, large proportions of post-conflict US-funded reconstruction budgets disappeared due to corruption (Glanz 2006). The geography of natural disasters in the United States maps the geography of corruption; throughout America, there is a positive relationship between public corruption and natural disaster, i.e. more natural disaster-hit states are more corrupt. In the United States, more than 10,000 public officials were convicted of corruption-related crime in 1990 and 2002 (Lesson and Sobel 2008). During the 1999 earthquake of Turkey, corrupt construction practice was identified as the main reason for the collapse of buildings. During the 2005 earthquake of Japan, numerous buildings and hotels were declared dangerous as the architect has submitted false earthquake resistance data due to pressure from the client during the preconstruction phase.

In Haiti, due to earthquake, 100,000 buildings collapsed; this reflects that a state with low regulatory quality, ineffective government, lack of rule of law and endemic corruption makes institution vulnerable, thereby creating condition for higher disaster risks. Therefore, it reflects a clear relationship between disaster risk, disaster mitigation and corruption in the implementation of building codes (Ahrens and Rudolph 2006). Corruption causes serious social and ecological imbalance, and diversion of fund along with inside dealing, cartels, price fixing and substandard construction, contributes to vulnerability of health, agriculture, construction, commerce and industry by denying their share in the development process (Salih 2010). A survey in Nairobi, Kenya, revealed that people are more concerned about corruption and poverty in comparison to flooding, El Niño rainfall and global warming (Shisanya and Kyayesi 2007).

In response to the 2004 tsunami, an expert meeting in Jakarta was convened by the Asian Development Bank, Organisation for Economic Co-operation and Development, Transparency International and Anti-Corruption Initiative for Asia and the Pacific which identified main elements to curtail corruption and reduce waste during disaster relief operation and reconstruction phase. These elements are country ownership; community-driven and participatory process; transparency in aid flow; financial safeguards and administrative capacity; oversight, monitoring and evaluation; and effective anti-corruption enforcement and complaint handling. As millions of dollars in cash and goods come from around the world during natural disaster, due to this, corruption emerges as a serious issue making donor and recipient countries reform the process of donation by structure paying, increasing or decreasing donation according to need and taking necessary step to improve the overall level of governance.

In the Philippines, corruption was obvious whenever typhoon struck it, as a result large sum of money meant relief and rehabilitation and was siphoned off. In order to curb this menace of corruption and manage disaster, government launched an online platform called Foreign Aid Transparency Hub to track donations and provide status updates on relief and rehabilitation efforts. The result of this effort was visible when there were no typhoon-related casualties in the place called Iloilo in the Philippines due to serious effort of the local disaster risk reduction management council. Apart from Transparency International, numerous institutions and organisations are working to combat the problem of corruption in humanitarian aid. Among this, the Institute for Solidarity in Asia has devised an innovative performance governance system to curb corruption and to deliver action-oriented positive results.

Corruption is the most important factor in a formal system of government which increases vulnerability to disaster risk (Peduzzi 2006). During disaster relief, power is devolved to local authorities to make them more responsive to ground situation, but abuse of power by them leads to poor enforcement of disaster reduction policy; along with this, disaster mitigation suffers heavily due to official corruption in land use, planning and building code enforcement (DFID 2006). There are three particular reasons which make humanitarian aid more prone to corruption, i.e. conditions inherent in humanitarian emergencies, characteristics of the humanitarian aid system and levels of transparency and accountability in recipient countries. Types of corruption that can potentially affect the provision of humanitarian aid include fraud, embezzlement, misuse of aid agency assets, diversion of aid resources and bribery.

During humanitarian aid relief, collusion between bidders or between a particular bidder and aid agency staff and targeting, registration and distribution processes offer numerous opportunities for corruption which includes illegitimate double claims and levying of fees for releasing aid. Along with this, things are further compounded by supply of lower quality of goods, staff interest in the items and opportunity to take them away, large amounts of overspending, significant budget adjustment, unusually large transactions and unauthorised balances or transactions, failure to use serial numbered documents, unusual discrepancies between the entity's records and confirmation replies, unusual balance sheet and changes in important financial statement ratios.

The various approaches for tackling corruption in humanitarian aid can broadly be grouped into preventive, enforcement and ownership-based mechanisms. Although humanitarian aid agencies develop their own mechanism to fight corruption during relief operation by using various means, i.e. transparency in decision-making and recruitment procedures, publicity and openness in handling information, a four-eye principle throughout all procedures and enforcement mechanisms for rules and regulations, but humanitarian aid agencies have to procure a lot of things during relief operation; as a result, there are chances of kickbacks and cuts as suppliers and vendors with the help of insiders in the organisation find numerous ways to cheat the system, and there are a number of external factors which act as obstacle to humanitarian aid agencies in fighting corruption, i.e. threats to aid personnel, the threat of legal action taken against them and the agency, worsening of public image of agency by sensationalist media and danger of being confronted with false allegations. This makes it imperative for humanitarian aid agencies to remain alert in order to ensure that sensitive information is well controlled, and tender openings must be done in public or at least by a committee of people which includes representatives of third parties, i.e. civil society groups, churches and other like-minded organisations.

Along with this range of enforcement mechanisms, it is required to deal with instances of corrupt practice by keeping regular cheques on suppliers; issuing public tender by proper advertisement; taking legal action against the guilty; blacklisting supplier firms; evolving robust financial system by ensuring payment through cheques which have been signed by two people; public exposure of the guilty and exchanging experiences; sensitisation of organisation staff and information with other agencies; transparency in setting up selection criteria and consistency in applying them; physical controls of all stocks and equipment; buying less valuable and minimum quantities of equipment; reducing short-term recruitment of both expatriate and national staff; systematic involvement of communities and the intended beneficiaries; using sophisticated budget formulation; accounting, reporting and audit mechanisms; developing capacity of operational managers to read, understand and act upon financial data; and post-distribution monitoring and evaluation which are a number of precautionary measures which play an important role not only in tackling, eliminating and avoiding the cases of diversion and misappropriation of funds during humanitarian aid relief but also in dealing effectively with nepotism in the allocation of public contracts. These types of preventive mechanisms reduce opportunities for corruption and mismanagement, and they emerge as a basic deterrent to those intending on diverting aid for corrupt purposes and provide assurance and confidence to donors that there will be optimum use of their funds.

Corruption in humanitarian relief programme is detrimental to address the needs of the most vulnerable sections of the population. Therefore, minimising corruption during humanitarian aid is important for improving efficiency and building stability. In order to promote and develop a culture of prevention and preparedness of disasters, it is imperative that disaster management receives the highest priority in all planning processes. Handling of disaster rescue operation

involves sophisticated diplomatic and political skills at all levels. The government is responsible for organising administrative arrangements in dealing with disaster. When disaster occurs, effective cultural and gender-appropriate measures must be adopted by putting more emphasis on vulnerable group such as the children, women, elderly, developmentally disabled, physically challenged, grass-roots communities and others with special needs. The effectiveness of response depends upon the level of preparedness at the time of disaster. Effective policies and sound building capacities formulated by public servants play an active role in reducing loss of life and property by mitigating the impact of disaster. Corruption during disaster phase can be curbed by designing a better system, dismantling monopolies, regulation of official discretion, enhancing transparency and enforcing penalties for corruption. Reducing the risk of corruption during disaster relief not only improves efficiency, but it also brings stability in affected areas. In order to meet all these standards, disaster management should be planned integrally within long-term sustainable development systems.

13.7 Conclusion

Disaster damage to society is so enormous that local resources are inadequate to cope with the magnitude of the damage; thereby, resources from outside the area are required to deal with the damage. The issue of corruption has emerged as a key concern for practitioners involved in humanitarian assistance (relief and reconstruction activities) especially on the aftermath of both natural disasters and civil conflicts. Therefore, managing corruption during disaster needs urgent attention. Corruption in emergency operations manifests itself in many ways and requires differentiated means of dealing with it. There are tendencies which see disaster in terms of profiteering, the over- or mis-supply of the aid system. There is a need to address the issue of corruption in humanitarian aid in order to prevent and alleviate further human suffering. There are methods and devices to address the issue of corruption by putting the proper mechanism in place which reduces their frequency and severity.

Humanitarian community, donor governments, United Nations agencies and NGOs should be vigilant and active to ensure that accountability reaches to the bottom of the supply chain through regular evaluation and monitoring. Systems of accountability within humanitarian aid agencies and other institution should be actively promoted by creating inter-agency monitoring and evaluation offices and the use of common audit and logistics tracking systems along with checking fast and furious spending. The government should ensure that funds are allocated on the basis of the need of people, not on the basis of politics, by ensuring targeting and timely delivery of aid and enforcing mechanism that aid is delivered to needy people. Monitoring and evaluation during humanitarian aid should be strengthened by promoting forwards accountability by ensuring participation of the local people in planning, implementation, evaluation and reporting as they have the potential and

capacity to identify malpractice in aid delivery. This empowerment of communities to take ownership of aid efforts not only contributes in minimising corruption by increasing beneficiaries' awareness of their entitlements and their stake in the success of aid programmes but also helps humanitarian aid organisation in sharing of performance results with beneficiaries and other stakeholders.

In order to provide meaningful disaster response, an attempt should be made not only for institutional strengthening and capacity building of human resources but also upgrading the existing resources and facilities available with the various agencies involved in disaster management. Traditional knowledge, practice and values of local communities should be incorporated in disaster preparedness and mitigation measures; early warning systems should be developed through efficient communication and information technology to ensure coordinated and effective response. Political commitment should be demonstrated through legislation and policymaking; disaster risk reduction should be integrated into socioeconomic and development planning; awareness and capacity building of community and their participation must be encouraged to ensure accuracy and effectiveness of humanitarian aid efforts. Documentation, identification, sharing of best practices and addressing proper policy and practice gaps are tools for minimising the risks of corruption and help in combating siphoning of fund. Direct citizen and community involvement including pressure from horizontal structure, i.e. the role of academic institutions, scientific bodies, the media and advocacy organisations, also plays an important role in improving institutional vulnerability and preventing corruption in humanitarian relief and reconstruction activities.

References

Ahrens J, Rudolph PM (2006) The importance of governance in risk reduction and disaster management. J Conting Crisis Manag 14(4):207–220

Alexander D (2005) The Italian mafia's legacy of high-rise death traps. In: Transparency International (ed) Global corruption report. Pluto Press, Berlin. Available at: http://www.transparency.org/publications/gcr/gcr_2005

Ambraseys N, Bilham R (2011) Corruption kills. Nature 469:153–155

Baker R, Christensen J, Shaxson N (2008) Catching up with corruption. The American Interest Online: September–October

Branigan T (2011) China launches corruption inquiry into railway minister. The Guardian, 13 February

Cremer G (1998) On the problem of misuse in emergency aid. J Humanit Assist, http://sites.tufts.edu/jha/archives/131

Cuny FC (1992) Introduction to disaster management: the scope of disaster management. Pre-Hosp Disaster Med 7(4):400–405

DFID (2006) Reducing the risk of disasters-helping to achieve sustainable poverty reduction in a vulnerable world. Available at http://www.dfid.gov.uk/Documents/publications/disaster-risk-reduction-policy.pdf. Accessed 5 Nov 2014

Ewins P, Harvey P, Savage K, Jacobs A (2006) Mapping the risks of corruption in humanitarian action. ODI, London

Galtung F (2005) Introduction: the corruption dimension of post-war reconstruction in corruption in post war reconstruction confronting the vicious circle. The Lebanese Transparency Association/TIRI/UNDP, Beirut
Glanz J (2006) Idle contractors add millions to Iraq rebuilding. The New York Times, 25 October
Golden MA, Picci L (2005) Proposal for a new measure of corruption, illustrated with Italian data. Econ Polit 17(1):37–75
Green P, Ward T (2000) State crime, human rights, and the limits of criminology. Soc Justice 27(1):101–115
Green P, Ward T (2004) State Crime: Governments, Violence and Corruption. Pluto Press: London
Gunn SWA (1994) Multilingual dictionary of disaster medicine and international relief. Kluwer Academic Publishers, Boston
Harding L (2010) Wikileaks cables paint bleak picture of Tajikistan, central Asia's poorest state. The Guardian, 13 December
Kreimer A, Arnold M, Carlin A (2003) Building safer cities: the future of disaster risk, Disaster risk management series no. 3. World Bank, Washington, DC
Le Billon P (2003) Buying peace or fuelling war: the role of corruption in armed conflicts. J Int Dev 15:413–426
Leeson PT, Sobel RS (2008) Weathering corruption. J Law Econ 51(4):667–681
Lewis J (2008) Corruption and earthquake destruction: observations on events in Turkey, Italy and China (online). Available at http://www.radixonline.org/resources/lewis-corruption-and-earthquake-destruction_condensed-refs.doc. Accessed 24 Oct 2014
Lewis J (2011) Climate-proofing development: corruption risks in adaptation infrastructure. Global Corruption Report: Climate Change Item 5.3. Transparency International, Berlin
Lewis J, Kelman I (2010) Places, people and perpetuity: community capacities in ecologies of catastrophe. ACME Int E-J Crit Geogr 9(2):191–220
McEntire DA (1997) Reflecting on the weaknesses of the international community during the IDNDR: some implications for research and its application. Disaster Prev Manag 6(4): 221–233
Nadgrodkiewicz A (2013) Tackling corruption in disaster relief efforts. Available at http://www.cipe.org/blog/2013/12/09/tackling-corruption-in-disaster-relief-efforts/#.VE5g0CKUfIc. Accessed 30 Oct 2014
Nawa F (2006) Deconstructing the reconstruction, Corpwatch investigative report, 2 May 2006. Available at http://www.corpwatch.org. Accessed 5 Nov 2014
Olson RS, Olson RA, Gawronski VT (1999) Some buildings just can't dance: politics, life safety, and disaster. JAI Press, Stamford
Özerdem A (2003) Disaster as a manifestation of unresolved development challenges. In: Pelling M (ed) Natural disasters and development in a globalizing world. Routledge, London, pp 199–213
Peduzzi P (2006) The disaster risk index: overview of a quantitative approach. In: Birkmann J (ed) Measuring vulnerability to natural hazards: towards disaster resilient communities. United Nations University Press, Tokyo, pp 176–186
Pielke RA (2006) Disasters, death, and destruction making sense of recent calamities. Oceanography 19(2):138–147
Polzer T (2001) Consultation report: transparency and accountability in humanitarian aid. Transparency International, Berlin
Salih MA (2010) Corruption carries high cost, World Bank says. Inter Press Service: Journalism and Communication for Global Change, 16 March. Available at: http://ipsnews.net/news.asp?idnews=50679
Shisanya CA, Kyayesi M (2007) How is climate change perceived in relation to other socio-economic and environmental threats in Nairobi, Kenya. Clim Change 85:271–284
Sorensen J (2014) Natural disaster funding corruption. Available at http://talkingpointsmemo.com/cafe/natural-disaster-funding-corruption/March3. Accessed 5 Nov 2014
Treisman D (2000) The causes of corruption: a cross-national study. J Public Econ 76:399–457

United Nations Development Programme (2004) Reducing disaster risk: a challenge for development. A global report. UNDP-Bureau for Crisis Prevention and Recovery, New York

United Nations International Strategy for Disaster Reduction (2009) Global assessment report on disaster risk reduction: risk and poverty in a changing climate. United Nations International Strategy for Disaster Reduction, Geneva

Willitts-King B, Harvey P (2005) Managing the risks of corruption in humanitarian relief operations. Humanitarian Policy Group, Overseas Development Institute, London

Chapter 14
Disaster Management in Border Sensitive Area: Case Study of Amritsar District

Vinita Yadav and Hemant Sharma

14.1 Introduction

14.1.1 International Borders and Disaster

With rapid urbanisation, intensity of disasters as well as its impact increases manifold. The impact of climate change on the environment causes losses of human lives and their properties. A heavy rainfall leading to a flood used to be a rare phenomenon, but in recent times this has been causing flash floods. The impacts become severe when there are violations of building by-laws in disaster-prone areas. The Bhopal gas tragedy and disasters in nuclear plants are examples of man-made disasters. Shelling on borders by military and paramilitary sources also falls under the category of man-made disasters. The people staying in the vicinity of international borders are caught between war-torn nations and learn to live between the cross lines. The natural disasters are also occurring because of the disturbances in equilibrium caused by the greedy exploitation of natural resources by human beings (Goel 2009).

14.1.2 Research Objectives

The paper aims at analysing the disaster preparedness of a border sensitive region and suggesting mechanisms to handle any unprecedented events. The objectives are to (1) understand how an international border increases conflict and leads to man-

V. Yadav (✉) • H. Sharma
Department of Regional Planning, School of Planning and Architecture, New Delhi, India
e-mail: v.yadav@spa.ac.in

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made disasters, (2) identify the areas that are impacted by the disaster and their impact and (3) suggest strategies for reducing the impact of natural and man-made disasters.

14.1.3 Structure

The paper is divided in three sections. The first section is the introduction, which gives the background, objectives of the study and structure of the chapter. The second section provides the literature survey. This section also provides the description of disasters, which occurred in the study area. Findings and recommendations are given in the third section.

14.2 Disaster: Types, Seasonality and Management

Disaster means a catastrophe, calamity or grave occurrence in any area. It arises from natural or man-made causes or by accident or negligence, which results in substantial loss of life or damage to property or degradation of environment (Sections 2(d) and (e) of Disaster Management Act 2005). It becomes a disaster only when it is beyond the coping capacity of the community of the affected area. According to the National Disaster Management Authority, different types of disasters are divided into two categories on the basis of their genesis or inception. Natural disasters consist of earthquakes, floods, landslides, cyclones and tsunamis, while man-made disasters consist of usually nuclear disasters, chemical disasters, radiological disasters, industrial disasters and accidents. Across the world, natural disasters are growing in number and destructiveness, and their human toll is escalating. The probable time of occurrence of the different types of natural disasters and their potential impact is described in Table 14.1.

There shall also be a third subset of category within man-made disasters generally not mentioned in literature. The category is disasters due to conflicts at an

Table 14.1 Probability period/seasonality of disasters

Type of hazards	Time of occurrence	Potential impact
Flood	June–September	Loss of life, livestock, crop and infrastructure
Epidemics	Anytime	Loss of human life
Fire accidents	Anytime	Loss of human life and damage to houses
Earthquakes	Anytime	Loss of life, livestock and infrastructure
Drought	July–October	Crops damage
Landslides	June–October	Loss of human lives, paddy, livestock, infrastructure, houses

Source: District Disaster Development Plan Amritsar (Draft) (2012)

international border. The conflicts result in shelling across border by paramilitary or military forces and evacuation of civil population from a particular area in the case of a breakout of war. It involves emergency action when a bomb hits civilians or military personnel.

Disaster management entails a continuous and integrated process of planning, organising, coordinating and implementing measures, which are necessary for prevention, mitigation and reduction of risk of any disaster or its severity or consequences. It also involves capacity building, preparedness to deal with any disaster, prompt response to any disaster, assessing the severity of effects, evacuation, rescue, relief, rehabilitation and reconstruction (Disaster Management Act 2005). The disaster management cycle has three stages: pre-disaster phase, emergency stage and post-disaster stage. The pre-disaster phase involves mitigation through risk assessment and prevention by doing hazard mapping, risk and vulnerability assessment and structural and nonstructural measures. In the emergency phase, rescue measure, immediate relief and loss assessment are required. Rescue measure involves provision for search and first aid; immediate relief by providing food, water, cloth, shelter and medical care; and assessment survey to assess the human and economic loss. The post-disaster stage requires rehabilitation by restoration of basic services and functions and reconstruction by complete resumption of services in addition to putting up preventive measures (NDMA 2009).

14.3 Literature Review

Disasters vulnerability affects urban and rural settlements differently. Rural settlements face unique challenges with respect to disaster vulnerability and resilience as compared to their urban counterparts. They have higher poverty rates, are more geographically isolated and typically have fewer resources available to their disposal. The rural communities are also at a particular disadvantage when it comes to planning and preparing for disasters (Kaiser and Bohl 1999). The large-scale movement of people from the countryside to large cities to earn a living and unhealthy living conditions throws in a challenge for planners at the time of disaster (World Disaster Report 2010).

Disasters are a mix of natural hazards and human action. The war increases the community vulnerability at the time of disasters such as famine and disease. The marginalised community suffers the most due to loss of human lives, livestock and livelihood. It affects economic and human development at the household level and destruction of facilities at the national level (Wisner et al. 2003). The occurrence of disasters has almost doubled and people affected have tripled (Homes 2008). This may be due to climatic variation, which is leading to sea level rise, melting of glaciers, flash floods and extreme temperature and erratic rainfalls (Cannon and Mueller-Mahn 2010; Mercer 2010). In order to reduce severity of impact of disasters and time taken in recovery, an effective response to natural disasters is required (Cohen and Bradley 2010). Earlier people used to migrate voluntarily but forced

migration also happens in conflict situations (Kalin 2005). In an early warning scenario, people are evacuated to safer places or they are forcefully moved out by disasters.

People staying in a disaster-prone area are well aware of their vulnerability to floods, draught, earthquake, volcano eruption and cyclones but still do not want to shift due to livelihood (World Disaster Report 2014). At times, the belief that disaster has struck due to God being annoyed with them or curse from a demon or the super natural or bad karma or black magic creates problem in providing relief and rehabilitation (Ballu et al. 2011). It is based more on beliefs and cultural practices than facts (Ariely 2009).

After the disaster, saving the lives of human and livestock and restoring essential infrastructure facilities get priority followed by rights enforcement. The large-size better planned and governed cities recover faster than their rural counterparts (Douglas et al. 2008). The effect also depends upon the severity of the disaster and its likely impact on livelihood (Potts 2009).

Political concerns are a significant factor in the preparation for, response to, recovery from and mitigation of disaster events (U.S FEMA 1997). There are three basic reasons why disasters are political in nature. First, disasters affect people. The impact of a disaster is measured with regard to how people are affected. Secondly, disasters involve public policy. Third, disasters always invite public interest (Selves n.d.). There are times when politicians refused to accept the disaster as an effect of climate change due to their cultural beliefs (Carrington 2014; McKie 2014).

People over-rely on government for both relief and rehabilitation (Michel-Kerjan and Volkman Wise 2011). Mitigation actions should be assumed long before a disaster befalls to reduce or prevent the loss of life and property damage (Godschalk 1991; Weichselgartner 2001). It involves preventing a disaster and reducing either chance of it happening or to reduce its damaging effects (Kafle and Murshed 2006).

14.4 Theoretical Framework

This chapter examines the effects of disaster in a border sensitive region and how it impacts the population. The border sensitive areas have different set of regulations and this has to be closely understood when thinking about planning for these areas. The relief work is also impacted due to this physical barrier over a composite region. The border divides the people living in the region but most of these people are related to the border one way or other, be it agriculture or any other activity. The Amritsar district shares a large percentage of its area with an international boundary as compared to the whole of the Punjab region, and the city of Amritsar is just located 22 kms away from the border opening at Wagah along the Grand Trunk Road. The international border makes it necessary to understand both natural and man-made disasters and marginalisation of border community at the time of such events.

14.5 Research Methodology

The literature review was undertaken to comprehend the concept of disaster, disaster management, issues relating to border sensitivity and how border-related issues impact the lives of the people caught in the crossfire. The secondary data related to population growth, number of blocks and general information about district was taken from Census of India 2001 and 2011. The disaster information was collected with the help of the disaster management plan of Amritsar. For collection of primary data, stakeholders' consultation was held in the various parts of the district. The stakeholders were farmers, officials and head of the households who are engaged in economic activity in the vicinity of the border and are most vulnerable during man-made or natural disasters in the region. Focus group interactions were also held with villagers and farmers to understand their concerns regarding natural disasters in the region and damage to the crops, livestock and lives of people due to the presence of military with a hostile neighbour.

14.6 Amritsar District: A Case Study

Punjab state is comprised of 22 districts over an area of 50,362 sq. kms. The state has a population of 2.77 crore in 2011 with predominant rural population of 63 %. It has a population density of 551 persons per sq km (Census of India 2011a). Amritsar district has a total of nine blocks. It is surrounded by Gurdaspur, Pathankot and Tarn Taran districts. Out of total district population of 2,490,891, 54 % stays in urban areas. The decadal population growth rate of 2001–2011 was 27 %. It has a population density of 928 persons per sq km. Its share in state's gross domestic product is 7.4 %, which is the third largest after Ludhiana (15 %) and Jalandhar (9 %). The district headquarters are in Amritsar city, which is the second largest city in the Punjab state with a population of 11 lakh only after Ludhiana with 16 lakh population. It is one of the oldest settlements and the only large city in the proximity of the international border with Pakistan and shares a 109.36 km stretch of international boundary with Pakistan. The city lies on the main Grand Trunk Road (GT Road) from Delhi to Amritsar, which further connects to Lahore in Pakistan. The Golden Temple is important, as it is a living symbol of the spiritual and historical traditions of the Sikh, which attracts almost one lakh tourists on weekdays and is the most popular destination for non-resident Indians (NRI). The number of tourists is even more than the Taj Mahal, another famous tourist destination and world heritage site.

Two rivers, namely, Ravi and Beas, emerging from the Himalayas surround the district. Out of these two, Ravi is a transboundary river that runs along the international border of India and Pakistan in the Amritsar district. Where Ravi forms the boundary between India and Pakistan, Beas demarcates the district from the other parts of Punjab. A tribunal has been signed over usage of Ravi river water

between India and Pakistan way back in the 1960s for the usage of water in a peaceful manner. This is the only international treaty that has been implemented with such sincerity that even the Indo–Pak war of 1971 did not revoked it.

14.7 Findings and Discussion

The Amritsar district and surrounding region is highly prone to both natural and man-made hazards such as earthquake, flood and war. The vulnerability is higher due to the high density of population with the number of tourists coming every year. Large-scale erosion by the rivers resulting in floods and collapsing of dilapidated building especially during the rainy season are examples of increased community vulnerability. In the Amritsar district records, no major disaster has been mentioned for the last 25 years, except the war of 1971 with Pakistan and flood which occurred due to overflow of river Ravi in 1988 leading to massive loss of property. The history of disasters in the district will further provide a clear picture of the vulnerability to which the region is prone.

14.7.1 Historical Assessment of Earthquake

Amritsar district falls in Zone IV on the seismic scale corresponding to the Modified Mercalli Intensity (MMI) VIII. It is prone to earthquakes which will lead to major damage in the region on the lines of damage to infrastructure, change of a river course resulting in floods and fire followed by forest fires. According to the District Disaster Management Plan of Amritsar (2012), the percentage of buildings likely to be damaged is 25–40 % depending upon the number of stories and the age of the buildings. Two to five thousand deaths are likely to occur and number of victims can be 25,000.

As far as earthquake history is concerned, the last earthquake to hit Punjab was in April 1905. Its epicentre was in Kangra in Himachal Pradesh state, and approximately 30,000 people were killed in the Kangra Valley and the adjoining parts of northern Indian and Pakistan. Its magnitude was Mw 7.8 on Richter scale. It was the deadliest earthquake to date in the Punjab Himalayas, westernmost section of the Himalayas. Shocks from the tremor were experienced as far as Puri, on the Mahanadi Delta in Orissa. Damage from the quake extended into many parts of the Punjab. It caused damage in large-size cities of Amritsar and Jalandhar as well as Tarn Taran. Many famous buildings suffered damages due to high-intensity earthquake. Tall structures in Amritsar such as minarets of the Sheikh Din Mosque and the Clock Tower were badly damaged.

In Chamoli earthquake of 1999, a large number of houses in northern Punjab had collapsed and two deaths were reported. Six buildings collapsed in Amritsar and cases of fire were also reported. The number of incidents of earthquakes has doubled

and tripled from 1981 to 2011. Till 1970s, only one major earthquake was recorded, but after that around five major earthquakes have been recorded with epicentres around the region and causing destruction in the region.

The buildings are very old and in dilapidated condition. The municipality has issued orders to their owners to either repair or they will be demolished, so as to minimise the impact of earthquake and fire in the inner city region. Outside the walled city, the structures are new and, hence, did not come under the purview of such orders.

14.7.2 Historical Assessment of Floods

The last major flood was due to overflowing of river Ravi in 1988. The occurrence of floods and their impact has reduced in the last two decades, i.e. 1991–2000 and 2001 and 2010 (Table 14.2). Nearly 80 % of rainfall in the State occurs within 3 months leading to the issue of water logging in residential areas clogging the city. The people with poor socio-economic condition have encroached upon the flood plains because of comparatively better livelihood opportunities. They are primarily dependent on the monsoon paddies grown in flood plains and stay in temporary (mud) houses. These along with the factor that there is a very little or no forest cover in the flood prone areas is an important contributor in increased vulnerability to floods.

The floods along the Ravi river affect villages located on the both sides of borders. During the focus group discussions (FGDs) with people of Amritsar region, affected villages in this side of border range more than 60 in number which accounts for about 8 % of the total villages (excerpt from FGD with villagers, August 2014). The similar estimation of number of people affected across the border cannot be calculated due to non-availability of similar data.

14.7.3 Historical Assessment of Fire

The major past incident of fire is of the Khanna paper mill fire in 2012 which went on for 1.5 months. The total property loss was estimated to be around 250 crores. Its

Table 14.2 Damage caused by floods in the last two decades

Decades	No. of people affected	Human lives lost	Damage of crops (in rupees)	Houses damaged (number)	Damage to public utilities (in rupees)	Cattle heads lost	Total damages (in rupees)
1991–2000	7,06,762	125	2,55,055	48,034	160,185	847	2,72,588
2001–2010	–	18	35,708	4,293	–	–	1,36,513

Source: District Disaster Development Plan Amritsar (Draft) (2012)

structure required special firefighting equipment for different parts of the city, and their inadequate availability further increased the damage.

Amritsar district has four fire stations, which falls short of one fire station as per the URDPFI (Urban and Regional Development Plans Formulation and Implementation) guidelines standards of one fire station for every two lakh population. There is no provision for a separate fire station or firefighting facilities in the surrounding district of Tarn Taran. Hence, the district is dependent on Amritsar for firefighting facilities in case of any disaster. This leads to loss of time and increase in cost of provision.

In the inner core of the walled city, fire incidents are reported quiet frequently. According to the fire superintendent of Amritsar and records of the Fire Department, the number of fires occurring in the city is over 90 incidents every month. This means that on an average, every day three incidents happen. These incidents include both minor and major incidents. The Fire Department is not fully equipped to fight with these incidents. Only having staff is not necessary, as it is difficult for fire fighting vehicles to reach the inner core parts of the city due to narrow lanes and streets.

14.7.4 Vulnerability of the Population in Amritsar

The vulnerable population and the area affected by different disasters have been analysed across different blocks in the district. All the blocks suffered from earthquakes so it has not been mentioned. Verka has the highest number of vulnerable population, but the area affected is more in Ajnala (Table 14.3). Out of the total population of 2,490,891, around 70 % (1,732,000) of the people fall under the category of a vulnerable population (Census of India 2011b). It forms two thirds of total people living under the constant threat of disaster, which is a huge portion.

Table 14.3 Vulnerable population across various blocks

Block name	Vulnerable population (in '000)[a]	Area (in sq.km)[b]	Issue
Verka	1,140	337	Fire, dilapidated buildings
Shri Hargobindpur	116	224	Floods
Ajnala	156	464	Floods
Rayya	185	274	Floods
Khadur Sahib	135	436	Floods
Total	1,732	1,735	

Source:
[a]Census of India (2011b)
[b]Calculated using GIS Database from Bhuvan image (Accessed from 'http://bhuvan.nrsc.gov.in/gis/thematic/index.php' on 5th Sept., 2014)

14.8 International Border Demarcation and Conflict

The India and Pakistan border runs round 2,900 km from Jammu and Kashmir to Gujarat, passing through Punjab and Rajasthan. This is the third largest border after the border between India–Bangladesh of 1,790 mile and the US–Mexico border (Carney et al. 2011). Distance wise, this may not be the longest but it is surely the one with the longest conflict.

The cross-border shelling by paramilitary or military forces is causing both human and economic loss. The issues related to border-related casualties at the International Boundary with Pakistan exist since the demarcation of Radcliffe line at the time of independence of India and Pakistan from the British Empire when India and Pakistan fought their first battle from 1947–1948. Later, it was renamed as Line of Control (LoC) after Shimla Agreement (BBC 2011). But continuous conflict on the LoC border and international border resulted in casualties on both sides of the border over the years (Indian Express 2013). Walker (2011) considers it among the world's most dangerous borders. Villagers migrate from their native place in the darkness to safe locations (Express News Service 2013). In a large country like India, these border sensitive areas fall between the cracks of development and stay behind years of technological and digital advancements.

In Punjab, most land is under agriculture on the both sides of border. The lush green landscapes look serene and calm. The settlements lie very close along the LoC on both sides. The Amritsar and adjoining districts lie very dangerously close to LoC. The distance between Amritsar and Lahore is around 50 km while the LoC starts round 18 km away from Lahore. The government of India has installed the fence with thermal imagers, night-vision devices and sensors to stop infiltration of militants and smuggling of arms and drugs from across the border (Calamur 2004).

14.9 Vulnerable Community Across International Border

In Amritsar district, there is a gate on Wagah border, which is the only road crossing between India and Pakistan since the 1960s. The gate is used for the movements of both people and goods. The flow of agricultural produce has been quite constant over the years. Punjab's economy is trade dependent, and many of the products traded in Amritsar cross the border between India and Pakistan through trade gate in Wagah. This gate works as an international economic node between two nations.

On the border of Amritsar and Gurdaspur districts, the Dera Baba Nanak town is located. The place becomes alive whenever a tension increases between India and Pakistan leading to movement of tanks, ammunitions and heavy deployment of the army (Bedi 2011). The last such deployment was during the attack of Indian Parliament by militants from Pakistan. During 1965 and 1971 war between two nations, the women and children were sent to safer locations and men folk helped the army to protect river over Ravi. It is a different case that they could not protect the bridge from heavy damages in 1965 and it is still not repaired.

At the distance of just 4 km from the town, famous shrine of Sikhism founder Shri Guru Nanak Dev Ji is located in the Pakistan territory and a gurdwara named Kartarpur Sahib is established. Guru Nanak himself had founded Kartarpur and Kartarpur Sahib is the historical place where Shri Guru Nanak Dev ji spent last 17 years, 5 months and 6 days of his life and outlined the basic principles of his philosophy. After partition, this place went to Pakistan side of the border located at a distance of only 2 miles from Indian Border in Dera Baba Nanak Block. The gurdwara is very important for the Sikh community as their first guru lived the last years of his life in Kartarpur. On Indian side, Dera Baba Nanak is located whereas Katarpur Sahib is located in Pakistan. Though actual distance is only 2 miles but pilgrims has to cover a distance of 237 kilometre via Wagah Border. To date, no passage is provided to Indians by Pakistan government to visit Kartarpur Sahib except by getting visa processed. Indian government has installed a telescope and established a viewing point just some hundred metres away from LoC so that anybody could watch the gurdwara through telescope. Sikhs can offer their prayers from this place on the Indian side.

Pankhon is a village situated along the Indo–Pak border in the Dera Baba Nanak block. The village shares the boundary with Pakistan in such way that some of the farmers have land beyond the fencing done by Indian army. The land within a distance of 200 m from LoC on the other side of the fencing is used for agriculture, and water for irrigation is being provided to these farmers. It is true for the farmers on Pakistan side. Their work is closely monitored by military personnel's using binoculars. The spaces at a gap of 1.5 kms are created to facilitate farmers' movement in such 'no man's land' on both sides of the LoC.

Farming labour in Pankhon is hard to find due to the border conflict. Usually labourers are not willing to come. And if some do, they charge exorbitantly higher amounts making it costlier to hire labourers. Even if they arrange the labour, they are not allowed to work during morning and evening hours. Farming is allowed only between 8 a.m. and 5 p.m. in the evening. Farming is not like an office job that can be carried out within a stipulated duration. Not even cattle are allowed in the field after evening hours. This forces them to take their livestock to the habitation area every evening and bring them back in morning. The farmers and labourers stay at a distance of 5 km and walk for work in the absence of their own vehicles. At the time of peace, farming is possible, but whenever tension increases between nations, the crops are destroyed due to the movement of soldiers. Shelling also causes loss of crops. The government does not compensate farmers for such losses. On one side, production is limited. On the other side, there are high transportation costs due to the absence of public transportation and the subsequent reliance on private transportation. The remoteness of *Mandis* also contributes to higher transportation costs. Generally, farmers in the area are under debt as understood by interviewing farmers in Pankhon village, Dera Baba Nanak block.

14.10 Conclusion

14.10.1 Summary of Key Points and Implications

Vulnerability of the district majorly falls under three categories, namely, floods, earthquakes and fire. Amritsar city is located in the Verka block of the district and is one of the oldest settlements due to the presence of Harmandir Sahib, commonly known as the Golden Temple. And like all old settlements, the city structure is closely knitted with narrow streets, tall buildings and surrounded by a boundary wall. Amritsar district falls in Zone IV of seismic scale increasing its vulnerability to earthquakes. Even, the earthquake with an epicentre in Pakistan impacts the local population. The Ravi river forming the border between two nations increases the vulnerability of population staying on both sides of the border. The floods of the Ravi river cause property loss on both sides of border. The communities living along the borders are most vulnerable to these kinds of damages.

The last major fire incident occurred in 2012 and continued for 1.5 months. However, minor fire incidents are norms of the day. Illegal storage and hazardous commercial activities in the inner city region particularly in the walled city have put thousands of lives at risk considering the number of tourists visiting the Golden Temple every day and high population density and built-up area density in inner city. Non-implementation of fire safety norms as stipulated by building by-laws and illegal and loose electric connections add to the vulnerability for fire hazards in the region (National Capital Region Planning Board 2010). The natural disasters along with the man-made disasters made life insecure and miserable for the residents. It has been observed that the disaster mitigation process was more or less insignificant in the region since the concerned people might feel that they have no alternative than to provide relief at the time of disaster as they want to benefit politically from their actions.

Some recommendations are discussed as follows. Firstly, fire norms should be revised and newly framed for the region. This is important because this place has a high density of population. For the border areas, a joint disaster mitigation plan should be prepared and accepted by both countries. The border sensitive areas have different regulations as in case of Amritsar and border security force takes care of day-to-day activities. They are the face of the law in those regions. The people staying in the frequent shelling regions should be resettled to some other regions. They should be counselled so that they do not live in the fear of death. The living in fear of death is against fundamental human rights. The union government should try to frame a policy to help the vulnerable population and to redeem them from the state of such insecurity. Secondly, signed peace agreements should be made mandatory between the two nations barring them from shelling in the populated areas so as to reduce the loss of tangible property and human lives. Thirdly, both the governments should also talk to each other so as to arrive at a mutual understanding

to assist each other in prevention and also to devise the methods of mitigation of both natural and man-made disasters in case of shared boundaries. The need is to engage in mutual talks and initiate reforms in such a way so that we have developed a strong framework of coordination and understanding before disaster strikes. The famers shall be allowed to stay in their farms with their livestock and do tilling for longer hours, which in turn will reduce a lot of hassle for them. In case of any violation being noted or any interference in the work of army is being found, stringent measures should be taken. The diplomatic talks should be held to ensure the stopping of shelling across borders. Thus, border patrolling shall be intensified so as to minimise the intrusion of militants in the region. Finally, public transportation to transport the farm produce should be readily available to farmers at a subsidised rate in these border sensitive regions so as to increase the profitability from farming for people staying in the region.

Regarding limitations, the case study is of a border sensitive region where most of the data pertaining to the study area is classified information by the Indian army. Hence, it became very difficult to study and analyse the social and economic impact of disasters in the region. Tarn Taran district came into existence in 2005 after being carved out from the Amritsar district. The census of India datum of 2011 considers it as a separate entity whereas it was part of Amritsar district in 2001. Thus, drawing a trend line between decadal data is difficult.

The disaster-related data was compiled and presented in disaster management plan of Amritsar, 2012. However, the Amritsar Municipal Corporation does not maintain the periodic data records of the disasters or update them.

In conclusion, there is scope for further research to assess the loss incurred by each family in the region. The loss should be spelt out in multidimensions such as financial and social. To understand the issue completely, the study of geographical areas on both sides of borders is required with the cooperation of armies of both the nations. This is to assess the damage caused in no man's land and other border areas.

References

Ariely D (2009) Predictably irrational: the hidden forces that shape our decisions. HarperCollins, New York

Ballu V, Bouin MN, Siméoni P, Crawford WC, Calmant S, Bore JM, Kanas T, Pelletie B (2011) Comparing the role of absolute sea-level rise and vertical tectonic motions in coastal flooding, Torres Islands (Vanuatu). Proc Natl Acad Sci U S A 108(32):13019–13022. Available at www.pnas.org/content/108/32/13019.full

BBC (2011) Future of Kashmir. Depth Kashmir Flashpoint, Thursday, 19 May 2011, 10, p 26. Available at http://news.bbc.co.uk/2/shared/spl/hi/south_asia/03/kashmir_future/html/

Bedi R (2011) Indo-Pak thaw resurrects sacred Sikh shrine, January 07, 2011 15:32 IST. Available at http://www.rediff.com/news/special/indo-pak-thaw-resurrects-sacred-sikh-shrine/20110107.htm

Calamur K (2004) India's Fence Sparks Little Debate, Washington (UPI) Mar 10, 2004. Available at http://www.spacedaily.com/news/nuclear-india-pakistan-04d.html

Cannon T, Mueller-Mahn D (2010) Vulnerability, resilience and development discourses in context of climate change. Nat Hazards 55:621–635

Carney S, Miklian J, Hoelscher K (2011) Fortress India: why is Delhi building a new Berlin Wall to keep out its Bangladeshi neighbours? Available at http://www.foreignpolicy.com/articles/2011/06/20/fortress_india

Carrington D (2014) Owen Paterson to give lecture to Nigel Lawson's climate-sceptic thinktank. The Guardian, 18 July 2014. Available at www.theguardian.com/environment/2014/jul/18/owen-paterson-lecture-nigel-lawsons-climate-sceptic-thinktank

Census of India (2011a) Provisional population totals, Census of India 2011; Urban Agglomerations/Cities having population 1 lakh and above (PDF). Office of the Registrar General & Census Commissioner, India. Available at http://www.censusindia.gov.in/2011-prov-results/paper2/data_files/India2/Table_3_PR_UA_Citiees_1Lakh_and_Above.pdf on 26 Mar 2012

Census of India (2011b) Village and town wise primary Census Abstract. 2011. Total population tables (including institutional and houseless population). Amritsar District Office of the Registrar General and Census Commissioner, India.

Cohen R, Bradley M (2010) Disasters and displacement: gaps in protection. J Int Humanitarian Leg Stud 1(1):95–142

District Disaster Management Plan Amritsar (Draft) (2012) Office of the Deputy Commissioner, Amritsar. Accessed from http://www.amritsar.nic.in/html/disaster/ddmp/DISASTER%20MANAGEMENT%20PLAN%20OF%20AMRITSAR.pdf. 20 Oct 2014

Douglas I, Alam K, Maghenda M, Mcdonnel L, Mclean L, Campell J (2008) Unjust waters: climate change, flooding and the urban poor in Africa. Environ Urban 20(1):187–206

Express News Service (2013) BSF Jawan killed, 3 injured in Pakistan shelling on border in Kashmir. Available at http://indianexpress.com/article/india/latest-news/bsf-jawan-killed-3-injured-in-pakistan-shelling-on-border-in-kashmir/

Godschalk DR (1991) Disaster mitigation and hazard management. In: Drabek TE, Hoetmer GJ (eds) Emergency management: principles and practice for local government. International City Management Association, Washington, DC

Goel SL (2009) Disaster administration: theory and practice. Deep and Deep Publications Pvt Ltd, New Delhi

Holmes J (2008) The need for collaboration. Forced Migr Rev 31:4

Indian Express (2013) Pakistan continues firing at Indian posts along LoC, JCO killed, posted on 28 Oct 2013. Available at http://indianexpress.com/article/india/india-others/pakistan-continues-firing-at-indian-posts-along-loc-jco-killed/

Kafle SK, Murshed Z (2006) Community-based disaster risk management for local authorities. Asian Disaster Preparedness Centre, Bangkok

Kaiser EJ, Bohl CC (1999) Tennessee after a series of floods and storms. Natural hazard mitigation: recasting disaster policy and planning. Island Press/D.R. Godschalk, Washington, DC

Kälin W (2005) Natural disasters and IDPs' rights. Forced Migr Rev 10(2005):11

McKie R (2014) Miami, the great world city, is drowning while the powers that be look away. The Observer, 11 July 2014. Available at www.theguardian.com/world/2014/jul/11/miami-drowning-climate-change-deniers-sea-levels-rising

Mercer J (2010) Disaster risk reduction or climate change adaptation: are we reinventing the wheel? J Int Dev 22:247–264

Michel-Kerjan E, Volkman Wise J (2011) The risk of ever-growing disaster relief expectations. Working paper 2011–09. Risk Management and Decision Processes Center, The Wharton School, University of Pennsylvania, USA. Available at http://opim.wharton.upenn.edu/risk/library/WP2011-09_ReliefExpectations.pdf. Accessed on 10 Nov 2014

National Capital Region Planning Board (2010) Disaster management in the national capital region. National Capital Region Planning Board, New Delhi, Available at http://ncrpb.nic.in/disaster.php. Accessed 18 Nov 2014

National Disaster Management Authority (NDMA) (2009) National policy on disaster management 2009. Ministry of Home Affairs, Government of India, New Delhi

Potts D (2009) The slowing of Sub-Saharan Africa's urbanisation: evidence and implications for urban livelihoods. Environ Urban 21(1):253–259

Selves MD (n.d.) The politics of disaster (principles for local emergency managers and elected officials). Available at training.fema.gov/emiweb/.\kern\fontdimen3\font.\kern\fontdimen3\font.\kern\fontdimen3\font/The%20Politics%20of%20Disaster.doc

The Disaster Management Act, 2005, No. 53 of 2005, The gazette of India extraordinary Part II, section 1, New Delhi Monday, 26 Dec 2005

U.S. FEMA (1997) The politics of disaster (Higher education project instructor guide). Federal Emergency Management Agency (FEMA). Emergency Management Institute, Emmitsburg

Walker P (2011) The world's most dangerous borders- thirteen places you don't want to be stuck at. Foreign Policy, 24 June 2011. Available at http://www.foreignpolicy.com/articles/2011/06/24/the_worlds_most_dangerous_borders?page=0,2

Weichselgartner J (2001) Disaster mitigation: the concept of vulnerability revisited. Disaster Prev Manag Int J 10(2):85–95

Wisner B, Blaikie P, Cannon T, Davis I (2003) At risk natural hazards, people's vulnerability and disasters, 2nd edn. Routledge, New York

World Disaster Report (2010) Focus on urban risk. International Federation of Red Cross and Red Crescent Societies (IFRCRCS), Geneva

World Disaster Report (2014) Focus on culture and risk. International Federation of Red Cross and Red Crescent Societies (IFRCRCS), Geneva

Chapter 15
Disaster Management in Asia: Lessons Learned and Policy Implications

Huong Ha, R. Lalitha S. Fernando, and Amir Mahmood

15.1 Introduction

This book (excluding the introduction and conclusion) consists of 13 chapters mainly based on case studies. The volume covers four main themes: (1) strategies to reduce disaster risk, (2) political and administrative challenges associated with disaster risk governance, (3) public education to enhance public awareness of disaster risk management, and (4) issues associated with disaster management, such as disability issues, peace, development, humanitarian logistics, corruption and the role of the Armed Forces.

The first chapter provided a summary of the rest of the chapters. Chapter 2, by Prof. Banu, provided an introduction to disaster management in Asia. Prof. Mahajan and Dr. Mahajan, in Chap. 3, discussed the government plans and programmes of Bangladesh and also examined the effectiveness of the government intervention in terms of the expenditure for risk reduction activities. This chapter also highlighted resilient investment areas to manage disaster risk management in Bangladesh. In Chap. 4, Dr. Hiranandani identified alternative sources of energy and utilisation of energy as a tool of development in the Himalayan Region. This chapter highlighted the importance of inclusion of disabled people in various phases of disaster management. With reference to the recent Uttarakhand disaster, Mr. Garge, Dr. Ha and Dr. Khoo examined the role of the Armed Forces in disaster relief, recovery and reconstruction in India in Chap. 5. Chapter 6, written by

H. Ha (✉) • A. Mahmood
UON Singapore, Singapore & University of Newcastle, Australia
e-mail: Huong.Ha@newcastle.edu.au

R.L.S. Fernando
Department of Public Administration, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura, Nugegoda, Sri Lanka
e-mail: lalithafernaando@gmail.com

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Prof. Fernando, Ms. Abeykoon and Ms. Premathilaka, and Chap. 7, written by Prof. Fernando and Ms. Muthulingam, are related to several issues pertaining to disaster management in Sri Lanka. By focusing on disaster education and training in Sri Lanka, Prof. Fernando, Ms. Abeykoon and Ms. Premathilaka, in Chap. 6, explored issues and difficulties in the implementation of education, training and public awareness programmes in reducing disaster risk and vulnerability in Sri Lanka. In Chap. 7, Prof. Fernando and Ms. Muthulingam examined the effectiveness of the administrative preparedness with references to a selected area which is highly vulnerable to flooding. Dr. Sharma, Mr. Joshi and Dr. Agrawal, the authors of Chap. 8, emphasised the fact that though the human beings are the most observant creature of this earth, their activities have been the main causes of unforeseen disasters. This chapter also outlined mitigating causes of futuristic actions. Chapter 9, authored by Prof. Bhattacharyya, examined the importance of a participatory approach to a post-disaster reconstruction by focusing on administrative planning and political response. With reference to the tsunami-affected Alappad Panchayat in Kerala, Prof. Joseph identified the issues and problems during the reconstruction and rehabilitation stages and analysed the livelihood security of the local community after disasters in Chap. 10. Dr. Andales-Escano, in Chap. 11, examined the appropriateness of ridge to reef approach for Mindanao (situated in the southern part of the Philippines) and explored new mechanisms to implement this approach to improve the development process and respond to disasters. Prof. Andharia, the author of Chap. 12, studied the importance of humanitarian logistics in disaster management and practice with relevance to the Asian context. This chapter explored the challenges of humanitarian logistics and recognised the significance of having a well-articulated supply chain management system during disaster and post-disaster stages. Chapter 13, contributed by Dr. Saharan, is related to disaster management and corruption. In this chapter, the author explained that humanitarian emergencies have generally created conditions for corruption to flourish. This, in turn, has produced many obstacles to the recovery process of the affected communities during post-disaster stage. Chapter 14, by Prof. Yadav and Mr. Sharma, explored how natural and man-made disasters increased the vulnerability of the communities residing in such border sensitive areas using Amritsar District, Punjab, as a case.

15.2 Lessons Learned, Policy Implications and Recommendations

Three lessons can be drawn from these chapters. Firstly, disaster risk management policies, plans and frameworks have been in place in the studied countries. However, they have been partially implemented or have not been implemented, and thus the success of such policies, plans and frameworks has been limited. Secondly, many authors have proposed that public engagement and participation as well as

stakeholder collaboration and partnerships are and will be critical success factors of any plans and strategies to mitigate disaster risk and one of the determinants of the outcome of pre- and post-disaster management. Therefore, promotion of stakeholder engagement and participation is essential in disaster risk management. Thirdly, although co-operation and involvement of different groups of stakeholders have been promoted in the studied countries, different interests, powers and agendas have affected the outcomes of disaster governance. Thus, taking into considerations all interests, all groups of stakeholders, all agendas and powers and responsibilities is really an extremely challenging task of disaster risk management to all sectors, i.e. the government, the public sector and the third sector.

In the development process, people depend on the environment; their needs and wants are unlimited, but the natural resources are finite (Engelman 2011). Frequent occurrences of natural disasters are visible not only in the contemporary Asia but also in the entire world due to the result of undesirable development activities by human beings (Ha 2014; Ha and Dhakal 2014). As Calvert and Calvert (1996) noted, there are combined pressures to the environment, i.e. "human beings are now faced two pronged crisis. On the one hand, in the future more and more resources that we now take for granted are going to start to run out. On the other hand, our environment is becoming increasingly contaminated by the waste we produced" (p. 250). As a result of these combined pressures, frequent natural disasters are being experienced, and this situation will be accelerated in the future. Thus, disaster risk management is a major policy area in the world, and Asia is no exception.

The developed nations have already responded to the rising incidence of natural disasters worldwide in the last four decades. In 1989, the United Nations General Assembly declared the *International Decade for Natural Disaster Reduction* (IDNR) (Burton et al. 2012). The IDNR emphasised the adoption of the *Yokohama Strategy and Plan of Action for a Safer World*. The Yokohama Strategy announced ten (10) principles to address issues of disaster risk management and emphasised the strategies and mechanisms to implement these principles. This included several activities, such as risk assessment, disaster preparedness and prevention, early warning of impeding disasters with the use of ICTs, participation of all stakeholders, appropriate education and training of the community, sharing necessary technology to prevent and mitigate disasters, environment protection and reducing poverty, adopting effective responses to disasters and accepting the assistance of the developed world and the international community (United Nations 1994).

Policy frameworks and organisational structures based on the best practices included in the Yokohama Strategy have been drafted, institutionalised and practised by many countries, including those in the South Asian region. However, the success of the implementation of these strategies, particularly in these countries, seems not up to the expected level. Various factors have been identified as barriers to South Asian nations' ability to respond effectively to major disasters (Ha and Dhakal 2014). Among them are (1) too much government intervention where the governments try to monopolised the intervention activities, (2) lack of transparency and the governments' interference in disaster recovery and relief efforts where some

governments over-rely on the Armed Forces for disaster relief activities which distract them from performing their main duty, and (3) inadequate capacity of disaster relief agencies (Day et al. 2012; Shivananda and Gautam 2012). Other key issues are (1) lack of coordination between all stakeholders involved in disaster management, (2) corruption in humanitarian assistance, (3) lack of political and administrative accountability, (4) poverty and poor communities' ignorance about the potential disasters, and (5) unlimited consumption by the wealthy communities (Akter 2009; Huppert and Sparks 2006). Policy measures are required to overcome these difficulties. In the disaster management process, the state has to play a major role, but strong collaborative efforts of all stakeholders including nongovernmental organisations and the community are equally important. Politicians and the other stakeholders' honest intentions and strong commitment are very crucial in this process. At the same time, countries should adhere to the concept of sustainable development even though the idea was somewhat old (OECD 2001). As the development cannot be sacrificed for the environment, the protection of the environment and poverty reduction should be the top priorities in the development process in the South and Southeast Asia.

15.3 Limitations

One of the limitations of this volume is that not all issues associated with disaster risk management are covered in this volume due to many constraints, such as space, time and resources. Although this volume cannot contain studies in all issues and in all countries in the Asian region, the selected chapters do cover a wide range of important subject matters related to disaster risk management in the Asian context. Also, the authors have approached the issues from a macrolevel. Therefore, future research studies should focus on issues and challenges associated with disaster risk management at the microlevel, i.e. sectorial, industry and corporate levels, since the recipients of any initiatives and programmes responding to disasters are mostly at this level.

15.4 Conclusion

This chapter summarises the central themes explored in the book and discussed lessons and policy implications and recommendations to address issues associated with disaster governance. The main focus of this book is to present disaster risk management strategies based on case studies pertaining to South and Southeast Asia. Today's development activities can lead to the destruction of the environment; and thus, unbalanced development is considered as one of the main causes of natural

disasters. Any government's decisions on development would certainly affect the country's environment. In this context, how to balance the socio-economic development and the environment is the main challenge faced by each and every government in the contemporary world. When designing public policies, each government has to identify how to allocate, utilise and share its limited natural resources to meet its people's needs and demands. In other words, when designing development programmes and projects with the infrastructure development, government and other groups of stakeholders cannot ignore the concern of the environment.

Similarly, in disaster risk management, the government's role is mandatory. In this process, identifying hazard-prone areas and introducing early warning systems in pre-disaster planning are very critical. In this context, there is potential for the use of geographical information systems and related technologies in disaster management. Activities such as (1) conducting natural hazard risk assessment and partnership to advance research, (2) well-designed administrative structures with the central and local levels, (3) effective inter-agency collaborations, (4) required funding for resources to the implementing agencies and (5) public and private partnerships in mitigation and response and recovery process and rehabilitation in disaster management are essential practices. If communities themselves take responsibilities by becoming aware of natural disasters, then the risk of their vulnerability could be reduced. In addition, (1) training and education programmes and (2) capacity building of different groups of stakeholders, especially volunteers and communities, are also proactive activities in this regard. Conducting training and educational programmes on climate change adaptation, safety and resilience preparedness should be adopted in all stages of a disaster risk management process.

In conclusion, there is no one-size-fit-all, magic recipe, method or approach to mitigate disaster risk and address issues associated with disaster risk governance across countries and across regions. Therefore, all stakeholders in all the three sectors (government, the private sector and civil society) should continue searching for novel and innovative governance approach to tackle disaster-related issues at the local, national and regional levels. Given the multifaceted, challenging and dynamic nature of disaster management, collaboration and coordination among different sectors, including industry and professional associations and civil society organisation, international and national nongovernmental organisations and community-based groups, are the prerequisite for good disaster risk governance.

Apart from time and resource constraints as one of the main limitations of this volume, all chapters in this book are based on qualitative research approaches with substantial descriptions. Thus, future research efforts could be undertaken, adopting quantitative deductive research methods to test hypotheses towards seeking valid theories on factors affecting disaster risk reduction and also to find best practices of disaster management. Another area of research could be undertaken to assess economic and social cost of disasters. Further, all the research papers focus on the natural disasters; and therefore, future research can complement the management of disaster risk by focusing on the management of man-made disaster risk.

References

Akter T (2009) Climate change and flow of environmental displacement in Bangladesh. Centre for Research and Action on Development, Dhaka

Burton I, Dube OB, Campbell-Lendrum D, Davis I, Klein RJT, Linnerooth-Bayer J, Sanghi A, Toth F (2012) Managing the risks: international level and integration across scales. In: Field CB, Barros V, Stocker TF, Qin D, Dokken DJ, Ebi KL, Mastrandrea MD, Mach KJ, Plattner G-K, Allen SK, Tignor M, Midgley PM (eds) Managing the risks of extreme events and disasters to advance climate change adaptation. A special report of working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC), Cambridge University Press, Cambridge, pp 393–435

Calvert S, Calvert P (1996) Politics and society in the third world: an introduction. Prentice Hall, Harvester Wheatsheaf, Great Britain

Day JM, Melnyk SA, Larson PD, Davis EW, Whybark DC (2012) Humanitarian and disaster relief supply chains: a matter of life and death. J Suppl Chain Manag 48(2):21–36

Engelman O (2011) The world at 7 billion: can we stop growing now? Available at http://e360.yale.edu/feature/the_world_at_7_billion_can_we_stop_growing_now/2426/. Accessed 4 Nov 2014

Ha H (2014) Land use and disaster governance in Asia: an introduction. In: Ha TTH (ed) Land and disaster management strategies in Asia. Springer, New Delhi, pp 1–14

Ha H, Dhakal TN (2014) Land use and disaster governance: implications and policy recommendations. In: Ha H (ed) Land and disaster management strategies in Asia. Springer, New Delhi, pp 259–264

Huppert HE, Sparks RSJ (2006) Extreme natural hazards: population growth, globalisation and environmental change. Philos Trans R Soc A 364(1845):1875–1888

OECD (2001) The DAC guidelines strategies for sustainable development. OECD, Paris

Shivananda H, Gautam PK (2012) Reassessing India's disaster management preparedness and the role of the Indian armed forces. J Def Stud 6(1):102–113

United Nations (1994) Yokohama strategy and plan of action for a safer world: guidelines for natural disaster prevention, preparedness and mitigation. World conference on natural disaster reduction, Yokohama, Japan, 23–27 May 1994. United Nations, New York. http://www.preventionweb.net/files/8241_doc6841contenido1.pdf. Accessed 3 Nov 2014