Seema Purushothaman
Rosa Abraham *Editors*

Livelihood Strategies in Southern India

Conservation and Poverty Reduction in Forest Fringes

Springer

Livelihood Strategies in Southern India

Seema Purushothaman • Rosa Abraham
Editors

Livelihood Strategies in Southern India

Conservation and Poverty Reduction in Forest Fringes

Springer

Editors
Seema Purushothaman
Azim Premji University, Bangalore, India

Ashoka Trust for Research in Ecology and the Environment
Bangalore, India

Rosa Abraham
Institute for Social and Economic Change
Bangalore, India

Ashoka Trust for Research in Ecology and the Environment
Bangalore, India

ISBN 978-81-322-1625-4 ISBN 978-81-322-1626-1 (eBook)
DOI 10.1007/978-81-322-1626-1
Springer New Delhi Heidelberg New York Dordrecht London

Library of Congress Control Number: 2013955021

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Foreword

This book on Livelihood Strategies in Southern India addresses the important issue of the impact of land-use change on the livelihoods of rural communities living in the margins of forests. The setting is the Western Ghats, one of the global biodiversity hotspots along the west coast of India, a landscape of immense importance for conservation of biodiversity and the economic well-being of a myriad of ethnic communities. Living on the margins of forests, often with uncertain land tenure, literally squeezed between natural, largely forested, habitats, and areas of extensive agriculture, these communities feel the brunt of protectionist conservation measures, without the benefits of agrarian polices, and subsidies that apply to revenue–generating agricultural lands with secure tenure, and access to markets.

The economic well-being of rural communities living at the margins of forests as well as the sustainable use of land and natural resources they utilize is critical for conserving biodiversity and sustaining ecosystem services the surrounding natural ecosystems provide. Thus, understanding the way these communities use natural resources and how these uses are impacted by forces extrinsic to the area is an important issue for the whole society. It is only through such an understanding we can bring about necessary changes in policies and governance affecting the use of land and natural resources.

The ten case studies presented in this volume from one, but very heterogeneous, landscape provide a wealth of information, but no generalizations. Land-use change is so rapid that most communities appear to be in transition. Typically, and traditionally, communities at the margin of forests used, and still use, a combination of ecosystem goods and services: small-scale agricultural lands for subsistence level agriculture, and adjoining forest ecosystems for fodder, fuelwood, fiber, construction and materials, and a wide variety of non-timber forest products for their own use, and for earning cash income.

However, the communities described in various chapters of the book, because of environmental and economic changes, seem to have their patterns of livelihoods changing fast. Some are into cash crops (Chap. 2), and others into ecotourism (Chap. 5). Still others are involved in new entrepreneurial activities, based on crafts from the Lantana weed (Chap. 4). In other cases, urbanization is opening up new possibilities and creating additional livelihood options (Chap. 3).

More important, the economic impact of rapid changes in landscape, driven largely by economic and land-use policies on local communities, is not clear. Although most authors seem to imply that changes have a negative impact—and this might very well be the case—it would have been nice to see some data on changes in people's incomes or some other measure of well-being, as a result of ecological or economic changes.

Thus, in the ever-changing landscape, which, to begin with, is very heterogeneous, one wonders to what extent the neat distinction of forest dependent communities into three types by Fisher et al. 1997, to which reference is made in the first chapter on page 1 of the Introduction, still holds. If the goal is to really understand the livelihood dynamics of communities that are partly dependent on forests and partly on agriculture, then we need data on contributions of these two sectors on rural incomes, and how these contributions are changing our time. More critically, we need to understand how both the forest as well as agricultural policies are affecting these contributions, the way the land is used, and how such usage is impacting forest resources, including ecosystem services.

Therefore the data on livelihoods presented by these chapters are important, and clearly point out huge gaps in our knowledge. The main issue is the small size of the land holding, and in many cases uncertain tenure over the holding, though few chapters in the volume make an explicit reference to these two parameters. The land holding in most cases is not large enough to provide even subsistence level outputs. Thus surrounding ecosystems, generally forests, are an important source of products and services for consumption and sale. Developmental challenge is how to generate a rich and diversified portfolio of services and goods from agriculture and local ecosystems, and how to sustain their flows.

Indeed, institutions and policies are needed, as also repeatedly mentioned in the last set of chapters in the volume. The targets of these polices must be the well-being of people living in and around forests—people that have been neglected for too long, along with the special landscapes they occupy. The policies cannot address land use, forest conservation, non-timber forest species extraction, agriculture, or ecotourism—to cite just a few examples—in isolation. It is the socio-ecological systems, with all their diverse uses of natural resources, that ought to be the center of attention.

Clearly the book addresses a set of critical and pressing needs, and makes an admirable effort to draw attention to the plight of small landholders living in forest landscapes. Policy makers should realize that millions of farmers with small holdings in biodiversity rich areas offer the potential to make gains in conservation, food security and poverty alleviation.

University of Massachusetts, Boston, USA Kamaljit S. Bawa

Ashoka Trust for Research in Ecology
and the Environment, Bangalore, India
www.kbawa.com
June 2013

Acknowledgements

The editors are grateful to Prof. Kamaljit S. Bawa for writing the foreword. We gratefully acknowledge Ms. Sheetal Patil, Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore, India, for her support and help in compiling and coordinating the chapters. We are also grateful to all authors for their valuable contribution, and also thank anonymous reviewers for their feedback. We thank ATREE for hosting the research that contributed to most of the chapters and Azim Premji University for its support and encouragement.

Contents

Chapter 1
Reconciling Conservation and Livelihoods in the Forest Fringes: An Introduction

Seema Purushothaman and Rosa Abraham

1.1 Introduction

Spanning an area of 75 million hectares, the forests of India cater to the livelihood needs of 200 million people residing in and around them. Of these, the Western Ghats in southern India encompass an area of 16 million hectares, stretching along 1,600 kms, cutting across the Equator and the Tropic of Cancer. Averaging a height of 2,000 mts above sea level, the highest peak, the Anamudi, scales a height of 2,695 mts above sea level. The Western Ghats-Sri Lanka ranges are globally recognised as a biodiversity hotspot, which has lost 75 % of the original forest cover while still being home to 4,500 species of flowering plants. Of these, nearly 35 % are endemic, 322 are among the globally threatened species, and 55 are critically threatened (Daniel 1997; Bawa et al. 2010). The area is also home to a viable population of most of the vertebrate species found in the peninsula (as many as 315).

This mega-diverse region also serves as an important livelihood base for millions of people including many ethnic native populations. Thus, the forests of the Western Ghats are a confluence of ethnic and biological endemism, traditionally a livelihood source and an important safety net for communities living in and adjacent to them, and impart an equalising effect on rural incomes (Vedeld et al. 2007; Mamo et al. 2007; Angelsen and Wunder 2003). However, the extent and nature of this dependence varies across regions and communities and is often difficult to estimate.

S. Purushothaman
Azim Premji University, Bangalore, India

Adjunct Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: seema.purushothaman@gmail.com

R. Abraham (✉)
Institute for Social and Economic Change, Bangalore, India

Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: rosa_abraham@hotmail.com

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_1,

The dependence of communities on forests and its manifestations, as a concept, has been articulated variedly. For instance, forest-dependent communities may be broadly defined as including anyone who makes an 'opportunistic use of forest resources' or as anyone 'who practices shifting cultivation' (Byron and Arnold 1999). Fisher et al. (1997) provide a broad division of three types of forest dependence. The first group comprise those living within forests and are dependent on forest resources for meeting their subsistence needs. The second group lives near forests and uses forest products for own subsistence as well as for income generation through marketing. This group is primarily engaged in agriculture, and in this activity too, they depend on forests for resources like biomass and nutrient supplements. The final group is engaged in forest-dependent labour and unlike the others has no reliance on forests for subsistence needs. However, most studies on 'forest-dependent' communities tend to clump together these varied groups of stakeholders, in the process overlooking the nature of these relationships and the diversity of situations (Byron and Arnold 1999). In the Western Ghats landscape, Lélé (1998) articulates a similar point in the context of discussing the appropriateness of joint forest management. The varied nature of dependence, divergence across households and existing traditional structures deem attribution of 'community' to these groups meaningless.

One of the associated drawbacks of this 'clumping' has been the disregard of the second group of stakeholders as identified by Fisher et al. (1997): communities living in the forest peripheries, depending on forests to some extent but not limiting their livelihoods to this resource base, thereby having no exclusive allegiance to either protected or production landscapes. Like their spatial location (in the peripheries) these groups have been pushed to the peripheries of discussion in the policy and academic arena. The livelihood options of these communities (primarily agriculture, but also forests) have been viewed as competitive sectors, often catering to mutually exclusive interests.

In the Western Ghats context, the communities living within these forests have received much attention in the literature – their livelihood strategies (Shaanker et al. 2003; Gokhale 2004; Gubbi and MacMillan 2008; Rai and Uhl 2004), the impact of forest policies (Lélé 1998; Martin and Lemon 2001; Menon et al. 2009) and demographic and cultural changes (Krishnan 2009; Garcia 2006; Malhotra et al. 2001; Karanth et al. 2006). In policy discussions too, there has been some extent of articulation of their needs in the form of support when faced with limited access to forests (e.g. special rates for forest products like *tendu* leaves or bamboo and rights under the SToFD[1] Act (2006)).

However, here too, communities living *around* forest peripheries, drawing livelihoods not just from forests but also from more typical agrarian activities, are often overlooked. Sandwiched between capital-intensive production landscapes and exclusive protected forests, these communities have witnessed the dwindling status of traditional modes of sustaining their livelihoods. They do not figure in

[1] Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

discussions on and in the framing of forest regimes or farm policies and agricultural extension services[2] that concentrate on exclusive conservation or commercial activities. There have only been very few studies that deal with the challenges faced by such communities albeit focusing on specific aspects, for example, studies in Ghana (Amisah et al. 2009), in Arunachal Pradesh (Sarmah and Arunachalam 2011) and in the Western Ghats (Bawa et al. 2007).

In this context, this book is an attempt to partially remedy this near vacuum in the literature on comprehensively approaching and analysing livelihoods in forest peripheries. Drawing from the experiences of different communities located along the fringes of the Western Ghats in southern India, the chapters in this book present an integrated approach to the multiple conflicts they face, their causes and consequences, and the role and impact of various policy interventions, thereby underlining the need for an integrated, targeted and cohesive policy formulation for these fringe communities. Although no one specific policy is addressed in detail, the chapters in the book touch upon various policy interventions that have stifled livelihood opportunities or have inadvertently promoted unsustainable ones. Locating these conflicts within the social-ecological-economic narratives of communities in the peripheries of forests, the book also provides a unique alternative perspective to the challenges faced by the people living in the forest peripheries.

1.2 Communities in the Peripheries of the Western Ghats

The peripheries of the Western Ghats form an ecotone between forests and agricultural lands. By and large previously forested regions, in the recent past, these have been cleared for farming and now comprise of degraded forests, marginal rainfed farms, commercial irrigated farms and village commons. These ecotone regions act as buffers between wild and managed landscapes and are vital for the functioning of both production and protected landscapes. Besides ecosystem functions, these peripheries are also important buffer zones for cultural attitudes and livelihood strategies, enabling a gradual transition between two very distinct socioecological systems. For example, among communities traditionally engaged in agricultural activities in the peripheral regions, interactions with the natural and the cultivated landscapes are better understood. They are exposed to frequent wanderings of wildlife into their fields and are often better informed on how to respond and strategise their adaptation to such encounters. An abrupt cessation of wilderness into intensively managed large production areas, in the absence of these sociocultural buffers, often leads to violent responses harmful to both wildlife and humans (Groom et al. 2009; Wells and Brandon 1993).

[2] Some articulation of the difficulties in broad-based extension services for poor farmers with multiple livelihoods is in Sulaiman and Holt (2004).

Over time, the communities in these peripheries have become fairly heterogeneous, comprising both natives and outsiders:

(a) Natives, who have been pushed out of their forest dwellings. For this category of fringe communities, two processes, according to Amruth and Rajan (2007), have been operational in deciding their fringe-area status:

  (i) Even while the boundary of forests shrunk, they remained in their original locations, thus excluding themselves from forests.
  (ii) The population inside the forests was resettled on forest fringes by the state. This was observed, for example, in places like Anaikatty near the Attappady hill ranges in the central Western Ghats where Irulas and Valaiyars were pushed to the exterior fringes due to conservation policies and Nelliyampathy hills where Malayans, Muthuvans and Mannans were evicted from their forest dwellings by the government's resettlement policy.

(b) Settlers, who have migrated here from elsewhere. These settler communities have emerged in response to the government's land distribution policies for landless labourers engaged in cultivation, encouraged by policies like the 'grow more food' campaign (Amruth and Rajan 2007). In Attappady-Anaikatty area (bordering Tamil Nadu and Kerala), for instance, non-natives, mostly farmers from the plains, possess the lion's share of fertile lands, while the local landless forest dwellers received the remaining less productive lands redistributed by the government.

In the Biligiri Rangaswamy Temple Wildlife Sanctuary, located at the confluence of the Western and Eastern Ghats, the community in the forest fringes (Shaanker 2003; Lélé 1998) comprises mainly of *Naiks*, distinct from the native forest dwellers, *Soligas*. In the Nagarhole Rajiv Gandhi National Park also, tribal communities – the primary inhabitants of the peripheries – have been relocated from the forests by the government, generally with the stated objectives of conservation and poverty reduction. These forest fringe communities were settled on the plains around the hills, practising agriculture and livestock rearing, their dependence on the forest being limited to fuel wood, timber (for household use) and grazing.

1.3 Caught in the Middle and Falling Through the Cracks: The Dilemma of Forest Fringe Communities

Located at the cusp, between exclusive protected forestlands and expanding commercial agricultural landscapes, these communities find their livelihoods being made increasingly vulnerable by conservation-oriented policies, on the one hand, and growing pressures on land and natural resources exerted by the forces of commercialisation and urbanisation, on the other. At the same time, their fringe-area status has found these communities being relegated to the backburner in policy and academic discussions or caught in the middle of conflicting discourses and policy

pressures that seek to promote either exclusive conservation or commercialisation (masquerading as 'development') agendas.

Reflecting to some extent the notions of 'pristine forestlands' and 'minimal human intervention' as ideal for sustenance of forests, forest policy in India viewed people as a threat to forests, implying the gradual and forced alienation of communities from their previous forest dwellings. The Wildlife Protection Act (1972) has systematically encompassed forestlands under a network of Protected Areas (PA). In the Western Ghats, this network covers 8.8 % of the area and includes two biosphere reserves (Nilgiris and Agasthyamalai), 13 national parks and 46 wildlife sanctuaries, where livelihood dependence is explicitly prohibited or restricted to varying extents.

The stakeholders most immediately impacted by such policies include the fringe communities along with forest dwellers. The most immediate consequence of such policies has been the expansion of and, in some cases, the *creation* of a fringe community, as communities get pushed to the geographic peripheries of their previous dwellings. As previously alluded to, many of the now 'fringe' communities used to be forest dwellers.

Until recently, forest-related policies have largely ignored the needs of these peripheral-dependent communities. Encouragingly, recent government publications including the Forests and People Annual Report (2010–2011) do mention the employment opportunities for forest fringe dwellers. Bamboo and timber harvesting, fire protection measures during dry season, NTFP collection during monsoon months and regeneration activities in forests; rainfed agriculture and silviculture in own lands; as well as road construction and maintenance have been listed as potential employment opportunities available to the 'forest fringe dwellers', though in real situations the actual role of these provisions on livelihoods is yet to be ascertained.

Besides restriction in access to forests and use of forest resources, fringe communities are also faced with a decline in the quality and abundance of this natural ecosystem. The southern stretch of the Western Ghats has experienced a loss of 2,729 km^2 of forests between 1973 and 1995. Specifically, dense forests shrunk by 19.5 % (at an annual rate of 0.8 %), open forests by 33.2 % (1.5 %), accompanied by an increase in degraded forests (26 %), grasslands (29 %), plantations (7 %) and agriculture (11 %) (Jha et al. 2000). Irresponsible land-use strategies are partly responsible for the declining quality of forests. Profit seeking, in the form of corporate mining interests and tourism ventures, have also damaged forest resources (Krishnaswamy et al. 2006; Swaminathan and Purushothaman 2000) impacting the extent of forestland available to communities in the peripheries. Their poverty has often been exploited for commercial and degrading uses of forests (Angelsen and Wunder 2003).

Many forest fringe regions of the southern Western Ghats are also located near growing urban centres – like Coimbatore, Bangalore, Mysore, Thiruvananthapuram and Tirunelveli (Fig. 1.1). The proximity of these centres creates increasing pressures on forest resources and impacts livelihoods. For example, Kerala, which had the highest population density, witnessed the most rapid decline in forest area in favour of plantation and agriculture between 1973 and 1995 (Jha et al. 2000).

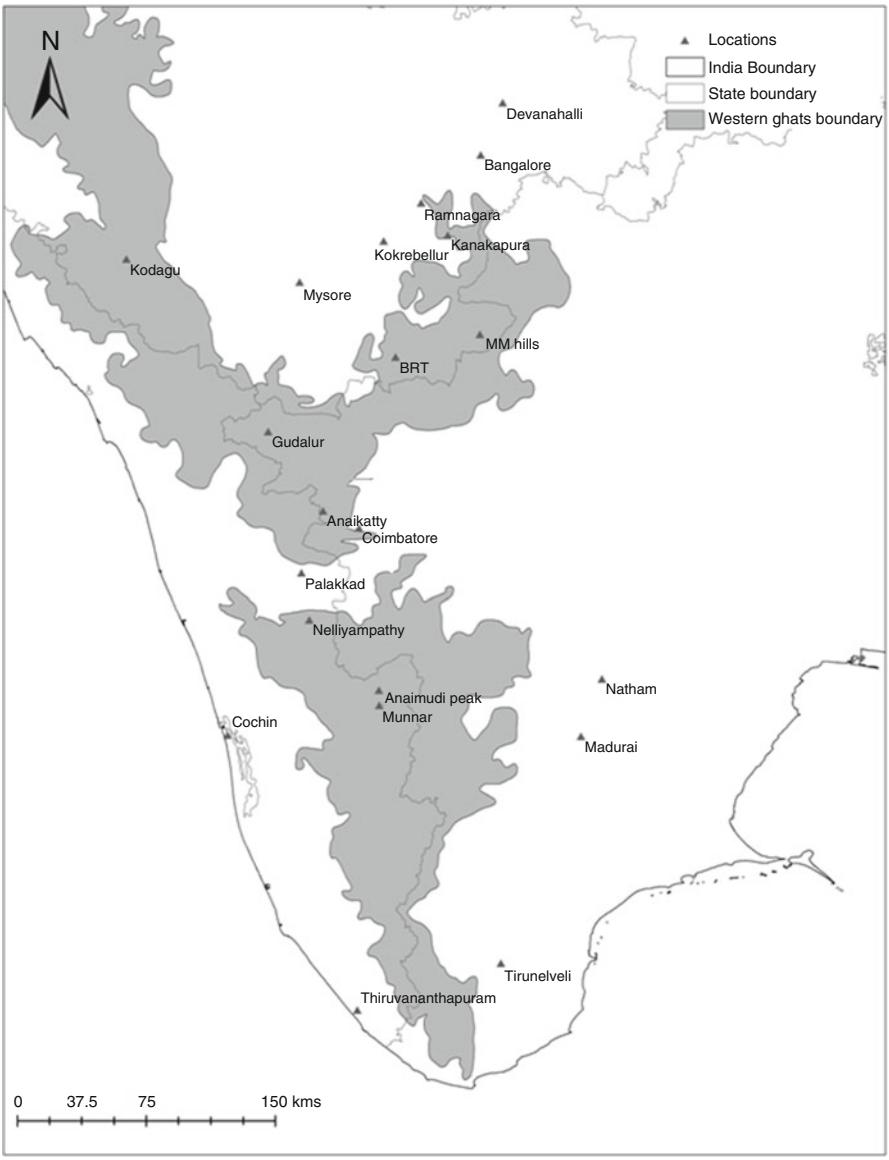

Fig. 1.1 Study sites and urban centres in the southern Western Ghats

1.4 Between Forests and Urbanising Rural Landscapes: Conflicts and Opportunities in the Peripheries

In general, households in forest fringes possess small landholdings (up to 2 ha) cultivated with a mix of cash and food crops. Land in their possession is hardly adequate to meet all consumption requirements of the families, and thus, they

depend on forest products to meet their subsistence needs as well as to supplement incomes. These farming communities are advantaged by their proximity to natural forest, for example, by the easy availability of biomass for livestock, green manure and soil mulching. However, policy and research being typically oriented towards market-based inputs fail to recognise this ecological opportunity, often coercing farmers towards alien crops and practices with considerable externalities. Lack of incentives for cultivating traditional crops and for ecologically suitable practices along with prevailing incentives to be market dependent for inputs was observed as an important factor motivating the shift away from food crops. The experience among farming communities in Karandhamalai, near Madurai (as described in Chap. 2), is a testimony to this.

Although a move away from food crops may not prima facie imply a breakdown of livelihoods given the potential opportunities offered by urbanisation, the reality is often different and harsh. The lack of suitable skill sets limits the potential of these communities to make use of these opportunities offered by their neighbouring urban centres. Evidence of such a dilemma emerges from the livelihood strategies of a peri-urban forest fringe community near the city of Bangalore, as described in Chap. 3. Although earnings from working locally or outside the village in nonagricultural activities as carpenters or drivers are highly lucrative, cultural characteristics and lack of skills and cultural features limit their access to non-farm, non-forest activities for the majority in the fringe areas. Thus, given the deskilling in traditional crafts, knowledge and livelihoods, along with lack of new skills oriented towards the emerging urban demand, many become livelihood impaired or join the bulging army of casual unskilled labour in nearby cities.

In such regions, migrating to nearby cities from the fringes is considered to be a temporary alternative and most resort to it only if in distress, rather than as a permanent solution. Nevertheless, this 'fringeness' or proximity to two distinct landscapes does provide opportunities for diversifying livelihood portfolios (like engaging in skilled and unskilled wage labour, crops and home gardens in their small landholdings, non-timber forest products (NTFPs), ecotourism operations). Such a basket of diverse and seasonal livelihood options, rather than specialising exclusively in any one livelihood option, is in fact preferred among the fringe communities as described in Chap. 4, in the context of the forest-dwelling communities near Nilgiris. This is an important pointer for strategising livelihood interventions in rural–urban interface. The prevalence of a bunch of livelihood options also provides scope for innovative, context-specific as well as community-specific enterprises at the grassroots, as presented in Chap. 5, in the case of peri-urban communities near Bangalore, and in Chap. 6, in the context of the plantation-forest ecotones of Kodagu. A basket of multiple livelihood options catering to different seasons and different shocks becomes crucial given the instability ingrained in most of the individual options linked to an increasingly globalised market and the limitations owing to the small scale of operations around each option.

While recognising the cruciality of multiple options, the challenges in the face of sustaining an appropriately diverse bunch of options cannot be overlooked. The forest fringe communities excluded from mainstream urban opportunities by their socio-economic status and absence of infrastructural facilities are characterised also

by inadequate coverage of basic public services like health and financial institutions. They face limitations in their social mobility exacerbated by the breakdown of their own social structures and loss of cohesiveness of their own groups/communities. The cultural and social space and activities are often monopolised by the resourceful (Amruth and Rajan 2007), while intra-community institutions have disappeared or weakened, with no discernible influence on individuals in the era of spreading communication technology and media. Instances of such institutional lacunae in harnessing synergies between (and within) the rural and urban opportunities are analysed in Chap. 7, among the self-help groups in Male Mahadeshwara Hills, and in Chap. 8, in the context of common property resources.

Besides the market-oriented focus of policy interventions and the institutional lacunae discussed above, the failure to recognise interlinkages and the inherent contradictions between different policies also encumber the livelihoods of these peripheral communities. Where there have been policy interventions, the untargeted nature or diffused forms of the policy have often had unintended but avoidable adverse consequences for the natural ecosystem and its directly dependent communities. Though fringe communities per se have not comprised focal groups for any policy interventions, they have *de facto* been recipients of welfare measures like the public distribution system (PDS) and subsidies for agricultural inputs. These interventions do offer short-term reliefs often with perverse incentives for degrading use of land, for changes in diet patterns unsuited to local production systems and for taking disproportionate financial risks, consequently locking peripheral families in a vicious circle of dependence and vulnerability. The lack of coherence is manifested, for example, in policies towards the use of forest resources. While access to renewable biomass near forests is denied for fear of overharvesting or smuggling (Shrinidhi and Lélé 2011), the generation of biomass-based local inputs from one's own land is disincentivised owing to the relatively easy and subsidised supply of synthetic inputs. Together, these two factors negatively impact soil fertility and crop productivity. In such a policy environment with mixed and ambiguous signals, the need for and scope of targeted, yet integrated policies and institutions that cognise the linkages between *and* within sectors is highlighted in Chap. 9, where the need for suitable land-use regulations is motivated through the experience of Anaikatty; Chap. 10, where the potential of fiscal instruments towards NTFPs is highlighted; and Chap. 11, advocating the need for integrated institutions towards forest-based goods and services.

1.5 Going Through the Book

The chapters in this book analyse various aspects of the issues highlighted above. At first glance, the chapters and the issues addressed therein may seem disparate and unconnected as the context and problems themselves are. Conscious about this inevitable complexity, the book addresses it in two ways. First, it adheres to the question of sustainability of peripheral livelihoods as the central theme. Second, it

does not disaggregate the question further to other important dimensions like caste (though one chapter deals with caste-wise distinction in strategies) and gender, which in fact is a limitation of the deliberations. Each chapter, using distinct methodologies, addresses the common thread of dilemmas related to conservation and/or livelihoods in selected contexts from the forest peripheries. In the following section, we make evident the interweaving themes and links across the remaining ten chapters of the book.

Through 10 studies with empirical focus on communities in different locations around the Western Ghats, the book outlines the challenges and deliberates options in livelihoods, policies (land use, agriculture and fiscal measures), institutions (localisation of policy process, collectives and commons) and peoples' initiatives (community-driven enterprises). The first five chapters, following this introduction, deal with location-specific case studies, examining livelihood portfolios and specific strategies for the forest fringes including a people-initiated livelihood model adaptive to a society in transition. The next set of five chapters cover various aspects of governance and institutions including collective action (self-help groups), governance of a crucial but shrinking socioecological space in rural India – the village commons – and mechanisms like fiscal instruments for reconciling livelihoods and conservation. The book concludes with a chapter that looks at how representative governance, the executive and the voluntary sector could integrate and adapt to such multifaceted challenges.

Chapters are organised in a similar manner beginning with an introduction to the concerned issue, which is explored further in a 'setting the scene' section which details the context, including the geographic setting, the relevant debates on the issue and the socio-economic details in which the problem or question is set. This leads into the analysis of the issue, followed by a discussion on the major findings, concluding with primary observations and recommendations.

For the benefit of the reader, we discuss here, in brief, the major issues dealt with in each chapter.

1.5.1 Peripheral Communities in Focus

Where activities based on own land or using traditional skills become decreasingly rewarding, fringe communities adapt in various ways. Chapter 2 is a curtain raiser to the life of communities in the peripheries, examining the change in land use amongst the Valaiyar communities, in Natham, adjacent to the Karandhai Malai mountain ranges in Tamil Nadu. Agricultural policy has exacerbated the vulnerability of fringe communities by encouraging practices or crops intrinsically unsuitable for the landscape (Farrington et al. 2006). These regions have experienced a huge change in cropping pattern with 200–300 % increase in cashew cultivation between 1990 and 2007, at the cost of either field crops or forests. In the two villages studied, farmers attributed the change in cropping patterns to erratic rainfall, although this did not match with the corresponding meteorological data. The change in cropping

pattern was also accompanied by farmers diversifying into other activities, like working as coolies or running a petty shop.

This chapter reveals how 'adaptation strategies' among communities may often involve a complete overhaul in the livelihood strategies rather than gradual responsive changes. Such drastic shifts may not be sustainable in the long run, whether ecologically or economically. In these regions, the lack of regulations and foresight in the use of land and the growing influence of urban pressures in consumption patterns have had inadvertent consequences on the long-term sustainability of the newly adopted livelihood strategies.

Chapter 3 illustrates another scenario in the fringes – the case of Kanakapura taluk, a classic example of a community caught in the crossfire of conservation policies and pressures of urbanisation. The authors explore the impacts of these forces on the livelihood strategies of peri-urban communities addressing questions including how dependence on forests and agriculture has evolved given the presence of urban opportunities and the consequent changes. The chapter enlightens readers on how different responses have emerged in the face of various changes, from grabbing the emerging opportunities to finding themselves sidelined and isolated from the mainstream.

As the scenario in Kanakapura evidences, the nature of response of fringe communities depends to a large extent on the ethnicity and background of the communities. The authors find an interesting relation between land ownership, cultural and ethnic backgrounds of households and the extent of diversification in their livelihood activities.

While the earlier chapter on the Valaiyar community used a social narrative approach to reveal the role of factors like employment opportunities, welfare measures and changing societal ethos in the changing livelihood strategies, this chapter describes the interplay of factors affecting livelihood portfolios using a simple socio-economic analysis based on primary data. The two chapters demonstrate the application of contrasting and distinct methodologies in order to analyse a similar issue, with both concluding on the need for greater foresight in regulations and policy in these landscapes.

1.5.2 The Limitations of Focusing on a Single Livelihood Option

While the two previous chapters provided a snapshot of two distinct fringe communities facing various challenges, Chap. 4 points towards the cultural peculiarities and other factors beyond the monetary, which shape and determine the basket of livelihood options of fringe communities. It shows that the sole attention to any one option is unlikely to be the best strategy. Analysing the reasons behind the lukewarm spread of a potential enterprise (making furniture out of a forest weed, lantana) among the Kattunayakars living near the Nilgiri ranges of the Western

Ghats, the chapter illuminates the role of supplementing the basket of livelihoods with sustainable options, without expecting wide-scale and exclusive adoption of any one activity.

1.5.3 Emerging Strategies from the Grassroots

Chapter 5 provides a glance into the potential of diversification for a fringe community in terms of new and adaptive options. Amongst the livelihood strategies that have emerged in these peripheral regions, ecotourism has been touted as a promising option that communities in peripheries can resort to. But ecotourism, as it is being practised now, has yielded only marginal benefits to these communities. As a result of the inherent conservation bias and corporate mode of most ecotourism initiatives, these communities fall through the cracks in terms of benefitting from this nascent industry. This chapter discusses the potential of community-driven ecotourism in three regions near the city of Bangalore, on the eastern fringes of the Western Ghats. The apparent apathy of local government officials, the need for capacity building amongst local communities and the inherent conservation bias (amongst policymakers and tourists) are revealed in the study. Examining the potential demand for ecotourism ventures, the chapter highlights how a self-organised group of peri-urban youth affected by fast-paced changes around Bangalore could strategise and evolve an enterprise given the existing travel demand from metros like Bangalore. The associated support for appropriate capacity building, legitimacy and basic infrastructure emerges crucial.

Following the prevalent livelihood diversification and its potential for securing small holder livelihoods discussed in the chapters so far, the remaining chapters look at mechanisms and policies to facilitate this diversification.

1.5.4 Scope for Incentive Mechanisms in the Forest-Plantation Ecotones

The coffee plantations of Kodagu provide a case where cultivation practices have often come in conflict with conservation. In this context, Chap. 6 examines the interface between conservation and development from the perspective of small-scale coffee farmers. Kodagu is renowned as much for its biodiversity as it is for its coffee. Coffee plantations have come to be an important source of livelihood in Kodagu. The adjoining forests provide valuable ecosystem services including pollination services, on which coffee yield depends. However, over the years, an archaic tenure system coupled with growing dissociation and commercial pressures has threatened the sustainability of these forests. A primary survey combined with a cost-benefit analysis of best practices reveals a mismatch between the prevailing

perception of ecosystem services from forests and the reality. In this context, this chapter discusses potential incentivising mechanisms that can reconcile conservation and development in the Kodagu landscape.

1.5.5 Expectations from Collective Action Among Forest Fringe Communities

Among the locally situated institutions, those like self-help groups (SHGs) have come to play an important role in articulating local concerns and organising local communities for improved livelihoods. Chapter 7 examines the role of these institutions in natural resource management.

Most SHGs are closely linked to and embedded in the surrounding social-ecological-economic system and are part of the multiple feedbacks and interlinkages between different components of the system. SHGs can thus facilitate natural resource management by linking ecological knowledge with a synergistic network. But often, the extent of linkage and level of information within SHGs regarding the interdependent multiple components of the social-ecological-economic system leave much to be desired. This has implications for their effectiveness in furthering poverty reduction in the long run.

With this in mind, the authors explore the functioning of SHGs in the Male Mahadeshwara Hills of Karnataka, looking at the effectiveness of these collectives to foster conservation and rural development, assessing the extent of social capital (how they catalyse mutual trust and collective action) created – their contribution to local livelihoods and the impact on natural resource stock. The performance evaluation undertaken in the chapter illuminates some fundamental shortcomings of SHGs in this landscape, particularly their failure in addressing existing issues of asymmetric distribution of power and resources as well as overlooking the threats to natural resources which form the base of livelihood activities. Chapter 7 portrays the case of SHGs operating in the Male Mahadeshwara Hills, where despite their noteworthy performance in supporting financial needs and production activities, these collectives seem to have failed to mobilise social capital for sustainable livelihoods in these forest peripheries.

1.5.6 Village Commons and Fringe Communities in Karnataka

It is well recorded in literature that village commons are important for rural livelihoods particularly for the rural poor (Jodha 1996; Chopra and Dasgupta 2008), and hence, better and communitarian protection and management of commons is pro-poor and pro-livelihoods. At the same time, it is also popularly felt that direct

land grants from common lands are more pro-poor especially when poor are landless and when dependence on and initiatives to manage rural commons are waning out. The opportunity cost to society in sustaining the commons also increases when alternative land uses are lucrative (e.g. mining, wind farms, industrial development).

In the context of vanishing rural commons (while urban commons like social networks on the Internet, neighbourhood parks, neighbourhood management committees flourish), it is timely to craft an institutional mechanism especially in the congenial context of related happenings in India – revived interest in land reforms, enacting SToFD Act and the constitutional thrust on decentralised governance.

The authors argue that while direct dependence on village commons may be declining, there are crucial roles that commons still play in the lives of the poor. Moreover, it might be that the nature of dependence is changing (indirect use of commons is increasingly recognised – fresh air, biodiversity, playgrounds, space for village fairs and cultural programmes, etc.), but not necessarily declining. Availability, access, quality and governance of common lands thus determine rural sustenance in general and benefits from village commons in particular. Chapter 8 concludes by advocating the need to refrain from using common lands as land banks and suggests a polycentric governance mechanism while also pointing to the much needed adaptive efficiency for policies and institutions in order to balance inclusive, decentralised management with equitable benefits and conservation (further argued in Chap. 11).

1.5.7 Land Use Regulations and Poverty in Forest Peripheries

Though land can be an important asset for these communities, as Chap. 9 reveals in the case of peripheral areas like Anaikatty, even those households with private lands face severe constraints in the revenue-generating capacity of their lands. Identifying existing practices among fringe communities consisting of natives like the Irulas, the authors explain the consequences of a policy lacuna on the natural and human resources of these landscapes. The absence of regulations on groundwater extraction, rent-seeking industries like brick kilns and the absence of balanced technical guidance on suitable cropping pattern adversely impact this socioecological system in the peripheries. Interventions may also be needed to ensure suitable cropping patterns in semi arid landscapes to ensure nutritional sufficiency for poor families. Given the growing pressures on land particularly in the transition regions between forests and urban centres, it is crucial to ensure efficient use of the limited land available. Moreover, the nature of land use in these buffer zones has implications on the vital ecosystem services from the forests (Bawa et al. 2007), necessitating regulations that ensure critical minimum of ecosystem functions. The chapter points towards progressive regulations and cropping patterns that could synergise the interactions between forests, marginal private lands and fringe communities.

1.5.8 Fiscal Measures as Assistance

Bamboo, in the present times, in a sense, is iconic of the two worlds that the communities in the peripheries straddle. It is generally harvested in the natural forestlands and is primarily consumed in the urban centres, in various forms. Though bamboo is gradually becoming popular as a cultivated species in the private lands, it still faces restrictions in harvest and transportation that were put in place when wild bamboo resources were being overexploited by the industrial sector. Therefore, it can be a powerful vehicle to clarify and characterise the link between the two worlds. With this perspective, Chap. 10 examines the scope for a bamboo-based fiscal instrument to reconcile the agendas of livelihoods in the peripheries and conservation of natural bamboo resources.

Regulatory measures for sustainable land uses are just one among the possible efforts to address the shrinking space of livelihood opportunities of fringe communities. Nevertheless, like any such interventions, regulatory measures could have regressive impacts particularly in equity outcomes across different and distinct stakeholders. Taking the case of bamboo, the authors explore the likely distributional impact of a targeted cess. In the context of the communities dependent on non-timber forest products (NTFPs) like bamboo, such a targeted cess can generate valuable revenue to be used on the one hand for resource regeneration and on the other for livelihood support through employment generation for dependent communities. However, any such fiscal measure needs an *ex ante* impact assessment, and the authors demonstrate the feasibility of such an assessment in the context of bamboo. However, as the authors caution, a targeted cess may not be successful in achieving the desired outcomes merely through revenue generation, as the channels for ploughing this revenue back into conservation and livelihoods need additional efforts to be instituted and functionalised.

1.5.9 Institutional Space for Integrating Regulatory and Other Measures

Where the previous chapter touches upon the need for institutions to ensure the functioning and monitoring of regulatory and fiscal measures, the last chapter (Chap. 11) explores how possibly diverse local institutions could fill this institutional void. Given the increasing trend towards devolution and community participation in natural resource management, the time is ripe to consider whether local institutions are indeed the best solutions. With the help of examples from ecotourism and NTFPs, the chapter also suggests that inclusiveness in policy and institutions is only one side of the coin and needs to be supplemented by official and legislative support to enhance legitimacy and viability, resonating the broader discussions on the need for polycentric and nested institutions (Ostrom 2010).

The authors call for the evolution of institutions that can incorporate multiple feedbacks and thereby ensure sustainable management of natural resource stock. Locally driven and government-facilitated institutions that include NGOs, community-based institutions and research organisations are found to be critical to ensure equitable and dynamic policy approach in tune with a rapidly changing society.

Figure 1.1 provides an overview of the study sites as well as major urban centres around the Western Ghats peripheries.

1.6 Purpose of the Book

Going beyond investigating the human-wildlife conflicts that are often encountered in such forest peripheries, the book offers insights into the diverse conflicts faced by communities living in forest peripheries and the potential means that have been/can be engaged so as to address these, *without* compromising on sustainability of livelihood options. Given the risks associated with increasing global links to local markets and given the small scale of operations, the chapters reiterate the role of diversity in the livelihood basket of fringe communities revealing the institutional and policy lacunae that inflict vulnerability on communities and their livelihoods.

As academic understanding on poverty and development conventionally holds that the interest of the poor will always be in short-term maximisation of cash income, ecologically damaging and at loggerheads with the global stakes, the book urges us to look beyond the blurred dichotomies of 'present vs. future' or 'local vs. global'. Conventional basis for this understanding is that high discount rates associated with poverty lead to decline of commons especially if the community does not self-organise. This often ignores the governance gaps and failures that are instrumental in hiking the discount rates of the poor and discourage self-organisation (see Scherr 2000).

While analysing the role and scope of policy and related institutions in improving the livelihoods of fringe communities, the imperative need for crafting context-specific institutional involvement emerges. As the livelihood options of forest peripheral communities erode in the face of policy oversights, institutional gaps and urbanisation pressures, this book assesses the role of bringing greater foresight in policy interventions to equip communities facing multiple challenges so as to overcome the advanced marginalisation that they currently live with.

In all of the cases examined in the book, a comprehensive analysis, integrating forward and backward linkages inherent in any activity in a socioecological system, is consistently brought forth. Moreover, the scope for multipronged interventions (following integrated policy formulation) tackling the coexisting problems of sustainable livelihoods and resource degradation is examined in the context of sensitive ecotones surrounding the Western Ghats. By doing so, the intricate linkages between forests, cultivated lands, village commons and peripheral communities are disentangled (with the exception of caste and gender perspectives) for the benefit of both policymakers and local actors apart from the academic community interested in the insights and methods.

References

Amisah, S., Gyampoh, A. B., Sarfo-mensah, P., & Quagrainie, K. K. (2009). Livelihood trends in response to climate change in forest fringe communities of the Offin Basin in Ghana. *Journal of Applied Sciences and Environmental Management*, *13*(2). doi:10.4314/jasem.v13i2.55294.

Amruth, M., & Rajan, G. (2007). Spatiality of subsistence and the human ecology of landscape: Towards self-regulatory forest communities. In B. R. Ramesh & G. Rajan (Eds.), *Forest landscapes of the Southern Western Ghats, India: Biodiversity, human ecology and management strategies* (pp. 97–140). Pondicherry: French Institute of Pondicherry.

Angelsen, A., & Wunder, S. (2003). Exploring the forest – Poverty link. *CIFOR Occasional Paper, 40*, 1–20.

Bawa, K. S., Joseph, G., & Setty, S. (2007). Poverty, biodiversity and institutions in forest-agriculture ecotones in the Western Ghats and Eastern Himalaya ranges of India. *Agriculture, Ecosystems & Environment, 121*(3), 287–295.

Bawa, K. S., Primack, R., & Ommeen, M. (2010). *Conservation biology: A primer for South Asia* (p. 471). Hyderabad: Universities Press.

Byron, N., & Arnold, M. (1999). What futures for the people of the tropical forests? *World Development, 27*(5), 789–805.

Chopra, K., & Dasgupta, P. (2008). Nature of household dependence on common pool resources: An empirical study. *Economic and Political Weekly, 43*, 58–66.

Cruz Garcia, G. S. (2006). The mother – child nexus. Knowledge and valuation of wild food plants in Wayanad, Western Ghats, India. *Journal of Ethnobiology and Ethnomedicine*, *2*(39). doi:10.1186/1746-4269-2-39.

Daniel, R. J. R. (1997). Taxonomic uncertainties and conservation assessment of the Western Ghats. *Current Science, 73*(2), 169–170.

Farrington, J., Deshingkar, P., Johnson, C., & Start, D. (2006). Agriculture and natural resource based livelihoods in an era of economic reform and globalization. In *Policy windows and livelihood futures: Prospects for poverty reduction in rural India*. Oxford University Press. Retrieved from http://library.wur.nl/WebQuery/clc/1941059

Fisher, R. J., Srimongkontip, S., & Veer, C. (1997). *People and forests in Asia and the Pacific: Situation and prospects. Asia-Pacific Forestry Towards 2010* (Asia-Pacific Forestry Sector Outlook Study Working Paper Series). Rome: Forestry Policy and Planning Division.

Gokhale, Y. (2004). Reviving traditional forest management in Western Ghats: Study in Karnataka. *Economic and Political Weekly, 39*, 3556–3559.

Gubbi, S., & MacMillan, D. C. (2008). Can non-timber forest products solve livelihood problems? A case study from Periyar Tiger Reserve, India. *Oryx, 42*(2), 222.

Jha, C. S., Dutt, C. B. S., & Bawa, K. S. (2000). Deforestation and land use changes in Western Ghats, India. *Current Science-Bangalore, 79*(2), 231–237.

Jodha, N. S. (1990). Rural common property resources: Contributions and crisis. *Economic and Political Weekly, 25*, A65–A78.

Karanth, K. K., Curran, L. M., & Reuning-Scherer, J. D. (2006). Village size and forest disturbance in Bhadra Wildlife Sanctuary, Western Ghats, India. *Biological Conservation, 128*(2), 147–157.

Krishnan, S. (2009). Of land, legislation and litigation: Forest leases, agrarian reform, legal ambiguity and landscape anomaly in the Nilgiris, 1969–2007. *Conservation and Society, 7*(4), 283.

Krishnaswamy, J., Bunyan, M., Mehta, V. K., Jain, N., & Karanth, K. U. (2006). Impact of iron ore mining on suspended sediment response in a tropical catchment in Kudremukh, Western Ghats, India. *Forest Ecology and Management, 224*(1), 187–198.

Lélé, S. (1998). Why, who, and how of jointness in joint forest management: Theoretical considerations and empirical insights from the Western Ghats of Karnataka. In *International Workshop on Shared Resource Management in South Asia," Organised by Institute of Rural Management Anand (IRMA) at Anand* (pp. 17–19).

Malhotra, K. C., Gokhale, Y., Chatterjee, S., & Srivastava, S. (2001). Cultural and ecological dimensions of sacred groves in India. *New Delhi and Bhopal, India: Indian National Science*

Academy and the Indira Gandhi RashtriyaManavSangrahalaya. Retrieved from http://www.ces.iisc.ernet.in/biodiversity/sahyadri_enews/newsletter/issue4/Yogesh_CEdimensions.pdf

Mamo, G., Sjaastad, E., & Vedeld, P. (2007). Economic dependence on forest resources: A case from Dendi District, Ethiopia. *Forest Policy and Economics, 9*(8), 916–927.

Martin, A., & Lemon, M. (2001). Challenges for participatory institutions: The case of village forest committees in Karnataka, South India. *Society & Natural Resources, 14*(7), 585–597.

Menon, A., Hinnewinkel, C., Garcia, C., Guillerme, S., Rai, N., & Krishnan, S. (2009). Competing visions: Domestic forests, politics and forest policy in the central Western Ghats of South India. *Small-Scale Forestry, 8*(4), 515–527.

Ostrom, E. (2010). Beyond markets and states: Polycentric governance of complex economic systems. *The American Economic Review, 100*(3), 641–672.

Rai, N. D., & Uhl, C. F. (2004). Forest product use, conservation and livelihoods: the case of Uppage fruit harvest in the Western Ghats, India. *Conservation and Society, 2*(2), 289.

Sarmah, R., & Arunachalam, A. (2011). *Contribution of non-timber forest products (NTFPS) to livelihood economy of the people living in forest fringes in Changlang district of Arunachal Pradesh, India*. Retrieved from http://www.cibtech.org/J%20LIFE%20SCIENCES/Vol%201%20No.%202/26%20-%2037%20Sarmah%20Non%20Timber%20Forest.pdf

Scherr, S. J. (2000). A downward spiral? Research evidence on the relationship between poverty and natural resource degradation. *Food Policy, 25*(4), 479–498.

Shaanker, R. U., Ganeshaiah, K. N., Krishnan, S., Ramya, R., Meera, C., Aravind, N. A., & Ramachandra, J. (2003). *Livelihood gains and ecological costs of NTFP dependence: Assessing the roles of dependence, ecological knowledge and market structure in three contrasting human and ecological settings in South India*. Retrieved from http://www.cifor.org/publications/corporate/cd-roms/bonn-proc/pdfs/papers/T2_FINAL_Shaanker.pdf

Shrinidhi, A. S., & Lélé, S. (2011). *Forest tenure regimes in the Karnataka Western Ghats: A compendium*. Retrieved from http://203.200.22.249:8080/jspui/handle/123456789/1898

SToFD Act. (2006). Government of India 2006. Scheduled tribes and other traditional forest dwellers (Recognition of Forest Rights) Act. New Delhi: Ministry of Law and Justice.

Sulaiman, R. V., & Holt, G. (2004). Extension, poverty and vulnerability in India. In I. Christoplos & J. Farrington (Eds.), *Poverty, vulnerability, and agricultural extension. Policy reform in a globalizing world* (pp. 44–89). Oxford/New York: Oxford University Press.

Swaminathan, L. P., & Purushothaman, S. (2000). Forest conservation, tourism and extraction: an economic perspective. *Indian Journal of Agricultural Economics, 55*(3), 398–411.

Vedeld, P., Angelsen, A., Bojö, J., Sjaastad, E., & Kobugabe Berg, G. (2007). Forest environmental incomes and the rural poor. *Forest Policy and Economics, 9*(7), 869–879.

Wells, M. P., & Brandon, K. E. (1993). The principles and practice of buffer zones and local participation in biodiversity conservation. Los principios y la práctica de laszonas de amortiguamiento y la participación local en la conservación de la biodiversidad. *Ambio, 22*(2/3), 157–162.

Wildlife Protection Act. (1972). Government of India 1972. The Indian Wildlife Protection Act. New Delhi: Ministry of Environment and Forests

Chapter 2
Changing Livelihood Strategies: The Experience of the *Valaiyars* of Karandhai Malai, Tamil Nadu

Kanmani Venkateswaran, Siddhartha Krishnan, Poosanavel Saravanan, M.C. Kiran, and S.C. Gladwin Joseph

2.1 Introduction

The National Rainfed Area Authority (NRAA) states in a draft paper 'Rainfed Livelihoods Progressive Paradigms' that 60 % of risky http://nraa.gov.in/pdf/RAINFEDLIVELIHOODSPROGRESSIVEPARADIGMS.pdf, unirrigated and underinvested areas of India support 40 % of the country's population and contribute 40 % of food grain, besides supporting a vast array of livelihoods. Climatic changes compound rainfed livelihood challenges, which require adaptation, coping and mitigation. Studies have stated that changes in rainfall and temperature patterns will adversely affect agricultural yields, especially in developing countries like India where there are insufficient funds for adaptation measures (Parry et al. 2001). Forest fringe communities are especially vulnerable to climate change due to their poverty, dependence on rainfed agriculture and their lack of access to modern

K. Venkateswaran
University of Colorado, Boulder, USA

Red Cross Climate Center, Lusaka, Zambia

S. Krishnan (✉)
Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: siddhartha.krishnan@atree.org

P. Saravanan
Community Conservation Centre, Ashoka Trust for Research in Ecology and the Environment, Natham, Tamil Nadu, India

M.C. Kiran
International Water Management Institute, Colombo, Sri Lanka

S.C.G. Joseph
Azim Premji University, Bangalore and Adjunct Faculty, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_2, © Springer India 2013

technology (Amisah et al. 2009). This study engages with one such geography and livelihood culture, namely, the forested Karandhai Malai mountain range that runs parallel to the semiarid Natham plains in South Tamil Nadu where Valaiyars engage in rainfed cultivation.

Our narrative of the Valaiyar case revolves around land use changes in two hill villages and farmers' exercise of plural livelihood options, with the intention of investigating the apparent motivations behind these changes and the long-term implications. Though the study began as an investigation of changes in farming patterns apparently motivated climate change, further investigation revealed a complex interplay of various other factors behind these changes, as the rest of this chapter describes.

2.2 Setting the Scene: The Karandhai Malai Foothills and the Valaiyars

The Valaiyar community, notified backward, inhabits and cultivates the Karandhai Malai (henceforth Karandhai) hills and foothills. The Karandhai mountain range runs parallel to the plains of Natham, a semiarid taluk of the Dindigul district of Tamil Nadu, and is spread over an area of 6,517 ha, 50 km north to Madurai (Fig. 2.2). This semiarid area experiences temperatures ranging from 19.7 °C to 37.5 °C in the plains and 7.7 °C to 20.6 °C in the hills. Heat becomes intense in April and May unless moderated by rains. About 46 % of the rainfall is contributed by the northeast monsoon. The full benefit of the southwest monsoon is not realised because of the Western Ghats forming a barrier. In Natham taluk, the mean annual rainfall is 859.8 mm.

The Valaiyars are said to have migrated to these hills around 300 years ago. Ongoing research indicates that the Valaiyar hill villages and surroundings are still rich in agro-biodiversity, despite noticeable change. The Valaiyars conserve and cultivate several traditional cultivars of millet and legumes through a traditional mixed cropping method. In the foothills, Valaiyars have substantially shifted from traditional crops to commercial crops such as gherkins, vegetables and flowers. Hill Valaiyars tend to practise rainfed agriculture, whereas foothill Valaiyars practise either canal-fed or irrigated agriculture or a combination of both. Nearly 60 % of the agricultural lands in the Karandhai constitute '*Manavari kadu*', or low lands with alluvial properties and medium to low water-holding capacity. Cash crops such as cashew (*Anacardium occidentale*) and tamarind *(Tamarindus indica)* are cultivated in '*Kothukadu*', or rocky terrain with gravely soil and with minimum water-holding capacity (Fig. 2.1).

Cereals such as *thinai (Setaria italica)* and *perunchamai (Panicum sumetrans)* and fruiting species such as *seetha (Annona squamosa)* are also grown on such land. There are also the *Mettu kadu* uplands with medium to low water-holding capacity and where the soil is sandy loamy or red in character. Crops are terrace cultivated here. All of their crop varieties are traditionally suited for rainfed cultivation.

Fig. 2.1 Small farms adjoining hilly landscapes in Natham

Generally, the agricultural season starts with the onset of rainfall during southwest monsoon in June–July.

Cashew nut plantations are prevalent, having been introduced by schools established by an NGO, Sarva Seva. They supplied seedlings to the community for their livelihood promotion and farmers planted them in Kothukadu. The trees fruit between the Tamil months of *Chithirai* and *Aani* (mid-April to mid-July). The Valaiyars harvest the cashew nuts, dry them and send them to local markets.

2.3 Collecting the Evidence

The data for this study were generated from questionnaires administered in Valasu and Chinnamalaiyur, two out of three Valaiyar hill villages, the third one being Periyamalaiyur. A structured interview scheduled with closed and open-ended questions on land use, cropping patterns and local climate change observations was used. Twelve Valaiyar families in each of the two villages were selected for in-depth interviews. While a total of 24 households could appear unrepresentative of an average of 80 households in each of the two villages, it needs to be noted that this number is part of a larger survey of six Valaiyar villages, wherein 72 households in all were selected using a purposive non-probability sampling frame. The criteria for selection were occupation, income, sex and landholding.

GIS images were generated for land use changes in Chinnamalaiyur and Valasu for the period 1990–2007. The images were presented to Valaiyars from Valasu and Chinnamalaiyur during a participatory community workshop held at ATREE's Community Conservation Centre, in the Natham plains. Twenty-four Valaiyars gathered for the participatory consultation. Valaiyar participants were selected on the basis of age, gender, land possession extents and occupational profile, whether cultivators or NTFP collectors. Recruitment for participatory discussions along such criteria was to ensure that the participating cohort remain representative of hill Valaiyar economy and society. Graphical representations of our analysis of meteorological data were presented as visual aids in the form of bar graphs on rainfall trends and GIS data on land use changes.

2.4 Ground Realities Near Karandhai Malai

In this section, the changes visited upon the forest fringe subsistence economy of the Valaiyar will be narrated using information generated from questionnaire surveys and analysis of GIS images on land use changes in the hilltop villages of Chinnamalaiyur and Valasu. Firstly, we provide some quantitative estimates for changes in cropping patterns and area in each of the two villages based on the land use change maps. Briefly considering climatic factors that are to have influenced changes in cultivation, we discuss in depth the reasons for an apparent shift from subsistence cultivation of cereals and millet to the cash crop cultivation of cashew. We then draw some social and economic implications.

2.4.1 Chinnamalaiyur

Cultivation in this hill village is rainfed. Figure 2.3 reveals the extent to which land use has changed in Chinnamalaiyur between 1990 and 2007. Around 41.45 ha of land that was originally used for field crop cultivation is now cultivated with cashew. Cashew has also made marginal forays into forest and fallow. About 0.90 ha of forest lands and 0.37 ha of fallow land have been converted for cashew cultivation. These shifts, post-1990, add 42.72 ha of cashew crop to the 13.21 ha of cashew that existed prior to 1990. In 17 years, Chinnamalaiyur experienced a 324 % increase in cashew cultivation.

There has also been a reduction in field crop cultivation between 2005 and 2011. In 2005, the farmers managed to cultivate a triple crop. However, farmers in each consecutive year after 2005 have only managed a double crop. The farmers initially attributed this reduction in cropping cycles and the shift to cashew cultivation to decreased rainfall, delayed and more erratic rainfall. We attempted to map their claims onto existing local meteorological data. Although we could not find a pattern showing a consistent decrease in amount of rainfall or more erratic rainfall since 1975,

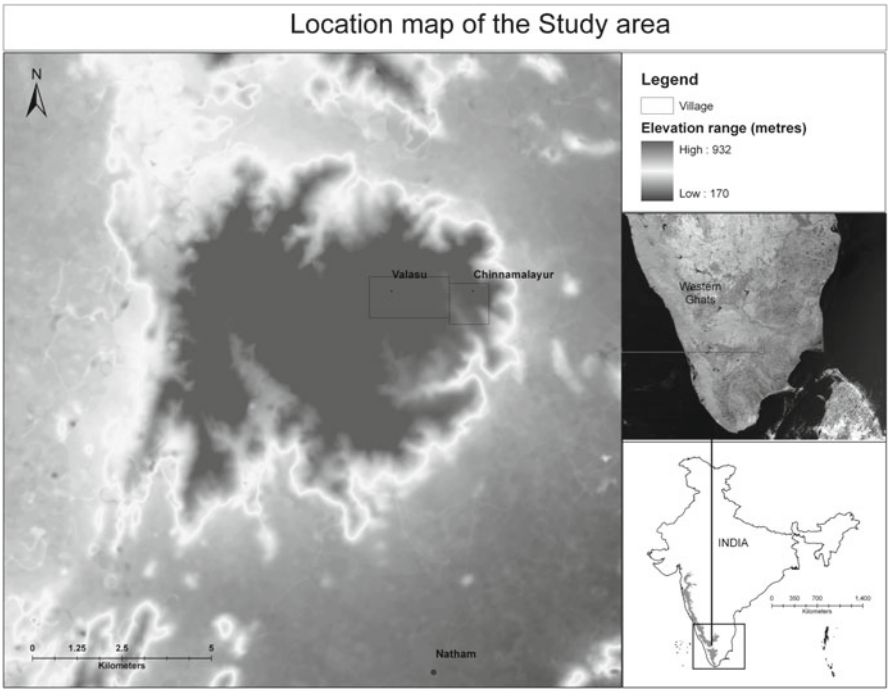

Fig. 2.2 Study area: Valasu and Chinnamalaiyur are villages located in the Karandhai Malai mountain range. Farmers in these two villages practise hilltop-rainfed agriculture

we did find that years from 2006 to 2011 were particularly bad for cropping during the June to August monsoonal season. The shift away from field crop cultivation has allowed the farmers to seek secondary employment. In Chinnamalaiyur, out of the 12 farmers who were interviewed, 11 were employed as coolies and one as a shopkeeper. The farmers earn an annual average of Rs. 20,400 ± 10,843 in their secondary jobs as opposed to Rs. 16,917 ± 11,943 by farming.

2.4.2 Valasu

Valasu, like Chinnamalaiyur, is a Valaiyar village located in close proximity to it (Fig. 2.2). It has the same physical, social and economic factors acting on it. This has resulted in similar changes to what was discussed in the Chinnamalaiyur section.

Figure 2.3 shows widespread shifts to cashew cultivation. In 1990, around 59.80 ha of land was cultivated with cashew. By 2007, it had risen to 181.11 ha, indicating a 202.86 % increase in cashew cultivation. Of this, approximately 117 ha of

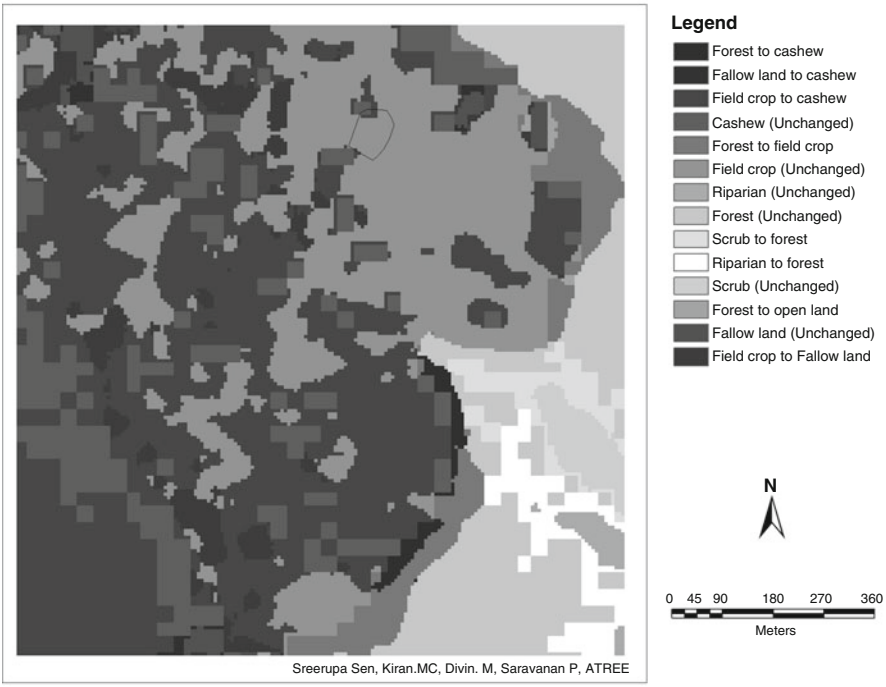

Fig. 2.3 Land use change in Chinnamalaiyur between 1990 and 2007

land was once cultivated with field crop but now bears cashew trees. The 18.97 % decrease in forest lands indicates cashew forays at the fringes. As in Chinnamalaiyur, the farmers in Valasu have only managed to produce a double crop since 2006. They too attributed their poor agricultural output to reduced, delayed and erratic rains. The poor field crop yields due to erratic climatic factors and the desire for a higher income have ostensibly encouraged farmers from Valasu to seek secondary employment, as was the case in Chinnamalaiyur. All of the farmers interviewed in Valasu work as coolies. They earn an average income of Rs. 15,917 (±10,149) annually from farming and Rs. 28,117 (±21,676) annually as coolies.

2.5 Reconciling Reality and Expectations

2.5.1 Moving Away from Traditional Agriculture

Land use change from field crop to tree crop between 1990 and 2007 is striking. There have been significant shifts from subsistence crops to cash crop cultivation of cashew cultivation in both Valasu (Fig. 2.4) and Chinnamalaiyur (Fig. 2.3).

Fig. 2.4 Land use change in Valasu between 1990 and 2007

Cashew is used to be cultivated on wastelands (sloped rocky and weedy areas) and forest/revenue lands, but is now cultivated on main agricultural lands replacing millet and pulses. In foothill villages that are also rainfed, traditional agricultural crops have largely been replaced by mango cultivation.

Figures 2.3 and 2.4 show a 202 % and 323 % change in land use to cashew cultivation in Valasu and Chinnamalaiyur, respectively. From the figures it is noticeable that cashew is being cultivated not only on lands that were used for cultivation of traditional crops such as millet and pulses but also on forest lands at the fringes. At this point in our narrative, a deeper discussion on choice of cashew is warranted.

2.5.1.1 Why Cashew?

But why cashew? Cashew, *Anacardium occidentale* L., is a part of the *Anacardiaceae* family. It is grown in semiarid and subtropical regions, which means that Natham taluk's climatic conditions are well suited to cashew cultivation (Harilal et al. 2006). Cashew is an especially popular tree crop amongst communities practising hilltop-rainfed agriculture. It is a drought-resistant, hardy and perennial tree crop which suggests that its productivity will not be affected by annual climate variability

(Ghana Export Promotion Council 2005; Harilal et al. 2006). The foothill Valaiyar villages, however, have largely shifted to mango cultivation, also a drought-resistant tree crop. The reasons for hill Valaiyars not growing mango were forthcoming from workshop discussions with them. They revealed that there were no roads from their villages to the foothills. This makes transportation of mango, a perishable fruit, to the markets particularly difficult. Tamarind, although a cash crop, has not been planted extensively due to the fact that it takes 15 years to yield fruit.

India has been one of the largest cashew-exporting nations since the 1920s, exporting a major quantity of its crop. But there is a substantial internal demand. Therefore, India has also been one of the largest importers of raw cashew nuts. In the 1960s, a Directorate of Cashewnut and Cocoa Development was established as a subgroup within the Ministry of Agriculture and its role was to help develop the Indian cashew nut economy and reduce India's dependence on imports. Although cashew nut imports into India reduced during the mid-1980s to 22,000 t as compared to 169,000 t in the early 1970s, they have significantly increased from the 1990s onwards – it was reported that 3,55,000 t were imported between 2001 and 2002 alone (Harilal et al. 2006). We can infer that this occurred due to the relatively high grade of Indian cashew as compared to globally produced cashew. The selling price for Indian cashew was between $1,012 and $1,188 per metric tonne FOB as compared to $330 and $315 per metric tonne FOB for Mozambique cashew and $700 per metric tonne FOB for Guinea Bissau Cashew, which suggests that India stood to profit more by exporting most of its cashew and importing cheaper cashew to satiate internal demands (Ghana Export Promotion Council 2005). The high selling price for Indian cashew coincides with the time during which hilltop-rainfed agricultural Valaiyar communities in Natham taluk began to cultivate cashew on their lands and when India increased its export of raw cashew kernel in the late 1980s and early 1990s (Harilal et al. 2006). In 1990, for example, Valasu and Chinnamalaiyur already had 59.80 and 13.21 ha of cashew planted, respectively. As revealed by Harilal et al. (2006), the price of cashew varied on a year-to-year basis. This brings into question the act of increasing cashew cultivation with the intention of enhancing livelihood security.

When questioned about the economic risks associated with cultivating and depending upon a single cash species, Valaiyar farmers from Valasu and Chinnamalaiyur stated that they would continue to prefer cashew cultivation even if the market prices fell. This maybe because processing the raw nut to produce the edible cashew kernel is a less labour-intensive process than processing millet, which only has subsistence value and no market demand. Although processing cashew requires seven to eight steps, grading, packaging and flavouring are performed by commercial outlets and not by farmers and their families (Harilal et al. 2006). Millet, however, is cultivated for subsistence rather than commercial purposes, and therefore, the process of dehusking millet grains – at least seven times – is done entirely by farmers and their families. Cashew is also relatively less labour intensive because there is no need to sow cashew on a yearly basis – the cashew tree starts bearing fruit after 3–4 years of being planted and remains productive for 30–40 years (Ghana Export Promotion Council 2005). The time that the farmers would

spend on sowing seeds every year can be spent on external employment opportunities, including those provided by the government such as through the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme.

2.5.2 *Economic Aspirations and Dietary Cultures*

The MGNREGA guarantees 100 days of wage labour per year for members of rural communities and pays Rs. 100 per day (at the time this chapter was written). It has provided farmers with jobs in projects such as rainwater harvesting and infrastructural improvement like fixing village roads. Others in Valasu and Chinnamalaiyur have sought employment outside of MGNREGA as labourers and shopkeepers. The farmers in these villages seem to be making more money from their secondary employment than they do by cultivating traditional crops. From our workshop with villagers from the foothill and canal-fed villages, we gathered that some also find seasonal employment in banana, coffee and cardamom estates. This migration typically takes place from February to April, but not during the sowing and harvesting seasons which extend from April to November. The farmers work for 10–15 days and return to their villages once they have earned around Rs. 2,000.

Finnis' (2007, p. 349) study conducted in Kolli Hills, Tamil Nadu, found a similar shift from millet cultivation to cassava cultivation. She attributed the shift to changing 'household economic aspirations'. Finnis argues that families want to be able to spend on commodities such as jewellery and electronics and want to send their children to private English or Tamil schools. Eating good food does not seem to be a priority any longer.

Millet and pulses were a major part of the traditional diet. This is not the case anymore given that rice is being sold at subsidised prices to families through the public distribution system (PDS). The dietary shift is to such an extent that families consume approximately 50 kg of rice per month. Unfortunately, the PDS only provides 16 kg of rice for a family of two and 20 kg for a family of four, requiring families to purchase the difference from markets in Natham at a rate of Rs.15–16 per kg. Therefore, the dietary shift to rice is also perpetuating a household need to grow cash crops in monocultures.

If rice is a significant cost for the families, why do they continue to buy it and forgo subsisting on millet and pulses? In Natham, villagers cited social pressures as a reason for the dietary shift. Consuming millet is looked down upon because it suggests poverty and backwardness, given that wealth is largely measured by the ability to buy market goods. In addition, growing and processing millet is labour intensive because agriculture in Valasu and Chinnamalaiyur is completely manual and because seven layers of the millet grain need to be manually dehusked before they can be cooked and consumed. Once the millet has been dehusked, the final yield is significantly smaller. As a result, both adults and children are not interested in consuming millet, thereby increasing the demand for rice in these communities (Fig. 2.5).

Fig. 2.5 Farmholdings in the foothills of Karandhai Malai forests

Farmers also suggested that the physical factors such as soil fertility were affecting their crop yields. Continuous sowing and harvesting are likely to have degraded the soil. We, however, do not have data pertaining to soil quality in the communities' agricultural fields. The farmers used to ensure soil fertility by spreading livestock manure over the fields. But livestock populations have decreased over the past 20 years as there is no fodder to feed the livestock. The fodder fed to livestock used to be crop residue. However, due to the shift to cashew cultivation, the amount of crop residue has drastically decreased. In addition, there is little social prestige attached to grazing which has created widespread disinterest in rearing and grazing livestock.

2.6 Livelihood Changes and Risk

During the participatory workshops conducted with the Valaiyar villages, all of the community members stated that the monsoon rains had reduced in quantity and become more erratic and that the overall seasons were getting delayed. They initially attributed their shift to cashew agriculture to supposed increased climate

variability and claimed that the shift ensured some degree of livelihood security. To some degree, the shift has allowed them to explore external employment opportunities and increase their annual incomes – a higher annual income, for instance, implies that they can enrol their children in better schools and thereby ensure the younger generations some amount of livelihood security (Finnis 2007; Dame and Nüsser 2011).

Nevertheless, the agricultural shift cannot be entirely attributed to climate change. In their review of adaptation, adaptive capacity and vulnerability, Smit and Wandel (2006) suggest that farmers should be able to survive in normal climatic conditions and cope in conditions that moderately deviate from the norm. Our analysis of the meteorological data from the area suggests that there have been no extreme shifts in Natham's climate. The Valaiyar farmers of Valasu and Chinnamalaiyur have not necessarily been trying to maintain their traditional agricultural practices. Instead, they have shifted to cultivation cash crop monocultures since the early 1990 in the process reducing their overall dependency on agriculture. This suggests that they are not attempting to 'cope' with slight to moderate shifts in climate, but have focused their livelihood strategies on non-climatic factors.

But current land use preferences pose some risks. The economic benefits of growing cashew seem to outweigh that of growing traditional subsistence crops, which suggests that the Valaiyars practising hilltop-rainfed agriculture in Natham taluk are in the process of converting all of their agricultural lands into monocultural cash cropping. The shift from traditional agriculture to cashew cultivation has several implications, environmental, social and health-wise.

A risk of monoculture cropping is the increased likelihood of crop failure from pests and disease. All households interviewed in Valasu and Chinnamalaiyur complained of increased disease occurrence. Therefore, to some degree, Valaiyar livelihood security is at greater risk now than it was when they had more diversified cropping systems. In Valasu and Chinnamalaiyur, all interviewed farmers have been spraying their cashew crop with the chemical fertiliser endosulfan to prevent pest-induced crop failure. They apply 4 l of endosulfan per acre once or twice a year, and the labour, application and technology cost approximately Rs. 2,000 per acre. endosulfan, once sprayed, persists in soil and water for many years as it easily adsorbs onto clay particles. Farmers from Natham taluk have noticed that endosulfan causes irritation on their hands, but have not yet seemed to have experienced its long-term health effects. They have also noticed that cashew trees sprayed with the pesticide have, on average, a 10-year shorter lifespan than an unsprayed cashew tree. It is likely that prolonged endosulfan use will cause health problems within the Valaiyar villages and surrounding faunal and floral communities. The increase in rice consumption and decrease in consumption of their traditional crops such as millet and pulses is also likely to adversely affect the health of the members of the Valaiyar communities in Natham. Millet and pulses are more mineral and fibre rich than polished white rice that is being distributed via the PDS. Moreover, the amount of rice given to the families is not sufficient suggesting food insecurity.

The farmers reported during the workshop that cashew trees also depleted supplies of groundwater and soil nutrients required by the other crops. The only other crop that is able to grow alongside cashew, according to them, is silk cotton, which is a non-native tree species. It is likely that the combination of long-term cashew cultivation and the threat of drought will drain out groundwater reserves, thereby altering the hydrological qualities of the land. Moreover, the farmers mentioned that they do not rear a significant amount of livestock due to both disinterest and a lack of fodder. As a result, there is no manure for the fields which indicates that soil nutrients are not being regenerated at necessary amounts. Overall, the lack of groundwater and soil nutrients may result in environmental degradation.

2.7 Conclusion

This case study of the Valaiyar alerts us to the fact that changes in livelihood strategies are due to a combination of physical, economic and social factors. Climate change is not, as is widely perceived today, a chief driver of agricultural shifts in this geography. As Fischer et al. (2005) and Gregory et al. (2005) state, climate change does not solely influence agricultural shifts; rather it is the interplay of social, economic and climate factors that influence such shifts. The latter (Gregory et al. 2005) also mention that since there are a multitude of factors that affect food systems, 'the capacity to adapt food systems to reduce their vulnerability to climate change is not uniform'. Adaptive capacity varies across countries, districts, communities, time and so on (Smit and Wandel 2006). Valaiyars are adapting to both socio-economic and climate change by making dietary and cropping switches. The gradual switch to cashew has meant that less time needs to be spent in agricultural activities and more time available to participate in the labour market, whether in paddy fields in the plains, tea estates in mountain ranges nearby or in construction labour. Rice, sold in subsidised rates, in PDS outlets, ensures food security. Cashew is also a hardy crop and can withstand climatic variability. More such case studies of how farmers in rainfed regions are coping every day and adapting long term to economic changes are as important as studies of farmers coping and adapting to climate change. In fact insights will be richer if climate change is located in a repertoire of changes visiting rural India, rather than being isolated, albeit in both reductionist and deterministic senses, as a sole independent variable.

Investigating adaptive strategies and their stated and actual motivations, this chapter provided an insight into how challenges of peripheral communities are often misunderstood and misinterpreted. In a similar vein, the following chapter provides looks at the changing livelihoods of a peripheral community that is also grappling with the onslaught of urbanisation. What may largely be perceived as an opportunity for these communities is in many cases a threat to certain groups within the communities, as the next chapter reveals, again highlighting the need for context-specific caution in strategising livelihood interventions.

Acknowledgements This chapter is based on a study of climate change and agriculture in Natham under an Indo-Norwegian research and education project, Conservation of Biodiversity and Sustainable Use of Natural Resources: Capacity Building for Interdisciplinary Research and Applications. The authors would like to thank the donors, The Royal Norwegian Embassy, New Delhi.

References

Amisah, S., Gyampoh, A. B., Sarfo-Mensah, P., et al. (2009). Livelihood trends in response to climate change in forest fringe communities of the Offin Basin in Ghana. *Journal of Applied Sciences and Environmental Management, 13*(2), 5–15.

Dame, J., & Nüsser, M. (2011). Food security in high mountain regions: Agricultural production and the impact of food subsidies in Ladakh, Northern India. *Food Security, 3*(2), 179–194.

Finnis, E. (2007). The political ecology of dietary transitions: Changing production and consumption patterns in the Kolli Hills, India. *Agriculture and Human Values, 24*, 343–353.

Fischer, G., Shah, M., Tubiello, F. N., et al. (2005). Socio-economic and climate change impacts on agriculture: An integrated assessment, 1990–2080. *Philosophical Transactions of the Royal Society: Biological Sciences, 360*(1463), 2067–2083.

Ghana Export Promotion Council. (2005). *Market brief: The market for cashew nuts in India*. http://www.gepcghana.com/assets/file/Market%20Brief-Cashews.pdf

Gregory, P. J., Ingram, J. S. I., & Brklacich, M. (2005). Climate change and food security. *Philosophical Transactions of the Royal Society: Biological Sciences, 360*, 2139–2148.

Harilal, K. N., Kanji, N., Jeyaranjan, J., et al. (2006). *Power in global value chains: Implications for employment and livelihoods in the cashew nut industry in India*. London: International Institute for Environment and Development.

Parry, M., Arnell, N., McMichael, T., et al. (2001). Millions at risk: Defining critical climate threats and targets. *Global Environmental Change, 11*(3), 181–183.

Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change, 16*, 282–292.

Chapter 3
Distinct Livelihood Patterns Among Communities: The Case of Kanakapura, Karnataka

A. Kavitha, S.C. Gladwin Joseph, Nitin D. Rai, and Rosa Abraham

3.1 Introduction

Ranging from biodiversity-rich mangroves along the coast, scrub jungles and dry deciduous forests in the plains and high-altitude grasslands and majestic evergreen forests of the Western Ghats in the east (covering 20 % of total geographical area, Karnataka State Action Plan on Climate Change 2011), the state of Karnataka is home to a tremendous variety of ecosystems. Despite its vast and verdant forest resources, Karnataka is more renowned for the exponential growth of its economic sector spurred largely by the information technology and biotechnology sectors. Though the state witnessed an 8.2 % growth in 2010–2011 and huge expansion of its urban centres particularly the capital city of Bangalore, more than 90 % of the approximately 60 million that comprise Karnataka's population still reside in the rural areas, earning a living from agriculture and related activities. Owing to the large forest area of the state, many of these farming communities are located at the interface of forests, farms or plantations. Due to their proximity to forests, forest-related activities are often a major source of income for the landless and marginal farmers that live in these regions. The reliance on forests is primarily for fuelwood, fodder, timber and poles for houses and agricultural implements. Among these, fuelwood is the most important often being the only source of energy for cooking and heating for most households.

A. Kavitha (✉) • N.D. Rai
Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: akavitha@atree.org

S.C.G. Joseph
Azim Premji University, Bangalore and Adjunct Faculty, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India

R. Abraham
Institute for Social and Economic Change, Bangalore, India

Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: rosa_abraham@hotmail.com

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_3, © Springer India 2013

In addition, they collect diverse non-timber forest products (NTFPs) for use in their own homes as well for cash income.

While facing pressures from exclusionary forest management policies, these communities are also confronted with the growing pressures from urban and commercial forces, a situation typical of these peripheral communities, as outlined in Chap. 1. In some ways, these forces are positive, primarily in the form of employment opportunities. But they also manifest in negative ways – primarily threatening small-scale farms, reducing their food security, exposing them to the vagaries of the market, land grabbing, growing speculation on land prices, loss of sociocultural values and increased overall vulnerability. Therefore, these communities on the peripheries walk a tightrope in balancing the multiple pressures from conservation and 'development' agendas.

3.2 Setting the Scene: The Taluk of Kanakapura

Urbanisation, involving rapid transformation of land uses accompanied by socio-economic changes, is sweeping many rural areas in various ways. We look at a forest and agriculture-based village economy to gauge the impacts of the changes from a socio-economic context. Studies have shown that new opportunities have differing impacts on the various classes and social groups within a village. For example, Lipton (2002) find that migration to urban centres reinforce interpersonal and intra-household inequalities, or Ghosh and Roy (1997) base the differential impacts of urbanisation on women on their socio-economic background. While landed people are able to sell land and thereby take advantage of the increased economic value of land due to urbanisation, the landless, unable to continue sustaining on forest incomes alone due to loss of access to forests, resort to casual urban employment. At the same time, there is also a group that suffers from both, i.e. restricted access to forests and to peri-urban opportunities.

The taluk of Kanakapura is caught amidst these forces and is home to a community living in the fringes of a large forest area *and* adjacent to a growing urban centre. Kanakapura taluk, in Ramanagara district, is around 50 km from Bangalore and covers approximately 1,590 km^2, stretching from the city of Bangalore in the north to the Cauvery river at the other end. It lies between 12°13′ and 12°48′ latitudes and 77°11′ and 77°36′ longitudes at an elevation of 800–900 m, with an annual rainfall of 800 mm. The mean temperature in the warmer months (April to May) is 27 °C and 20 °C in the coldest month (December to January). It has 258 villages spread over six *hoblie*s (groups of villages).

The forest ranges that encompass Kanakapura on the south and east are a remnant of the vast stretches of forests that once covered Bangalore. It is comprised of 12 state forests spanning an area of around 299.69 km^2, with the Bannerghatta National Park (BNP) towards the north and the Cauvery Wildlife Sanctuary (CWS) to its south (see Fig. 1.1). The Bilikal Reserve Forest (BRF) is the largest of the remaining forest tracts. The forest and its adjacent areas are largely intact in terms

Fig. 3.1 A mixed farm with an old open well in Kanakapura

of area despite the onslaught of unprecedented development spillovers from the city of Bangalore, although they are highly fragmented and interspersed with agricultural lands and settlements (see Fig. 3.1).

The agricultural lands and settlements are heavily skewed in terms of their ownership, and tribals and other marginalised communities like Dalits depend more on the forest than others for sustenance. They augment their income through fuelwood collection, livestock grazing and harvesting of NTFPs from the forest. As a result of the exclusionary management of forests adopted by the authorities, access to these forest lands is heavily constrained.[1]

Agriculture is rainfed and marginal, and since this is an elephant corridor, there is frequent crop depredation. Poor rainfall and undulating topography, combined with patchy and degraded vegetation, result in chronically high soil loss in this area.

Kanakapura's location close to the expanding city of Bangalore adds another dimension to the situation. Rapid urbanisation and extension of Bangalore's boundary led to the encroachment and fragmentation of forested landscapes, leading to

[1] The situation slightly improved with the introduction of the Joint Forest Planning and Management in 1993 (Anon 1999) and more changes are on the anvil with recent Recognition of Forest Rights Act 2006 (Bose 2010), although due to a number of reasons including poor implementation, their success in promoting inclusive conservation is questionable (Bhullar 2008).

increased human-wildlife conflicts. Changing climatic conditions and fluctuating rainfall resulting in reduced agricultural productivity as well as a volatile price environment for the crop produce prompt farmers to sell off their land and move to cities in search of better occupations. Eventually most of them resort to working as manual labourers in construction and other sectors. Owing to its proximity to Bangalore metropolitan city, villages are slowly being depopulated, farming becoming a casual activity with constant speculation on land prices.

Kanakapura, therefore, presents the case of a community and an area caught between natural landscapes that are increasingly being cordoned off, and an expanding city that offers opportunities as much as it threatens traditional livelihoods and resource bases. To understand the challenges faced in this context and the emerging patterns in livelihood among the beleaguered communities, a study was initiated in four villages of Kanakapura.

The objective of the study was to understand the livelihood patterns among villages and the extent of forest dependency, in the context of their location with respect to the city and also to the forest tracts. Using socio-economic survey of a sample of households in four villages, we sought to understand the difference in livelihood strategies across different castes, income classes and landholding groups.

3.3 The Study Villages of Kanakapura

Four villages, Bandedoddi, Budagayyanadoddi, Kumbaradoddi and Therubeedi (Fig. 3.2), in Maralwadi Hobli in the forest peripheries of Kanakapura taluk were selected.

The selected villages were located within 2 km from the forest. Ninety-one households were sampled in total from the four villages, and socio-economic data was primarily collected using a questionnaire survey, in which individual households were interviewed and responses were entered into the survey questionnaire. The survey was conducted in October 2005 in the local vernacular, Kannada.

Of the four villages, Bandedoddi and Budagayyanadoddi were homogeneous with predominantly Scheduled Caste (SC) and Scheduled Tribe (ST) presence, respectively, while Kumbaradoddi and Therubeedi were heterogeneous with STs, SCs and Other Backward Castes (OBCs) (Table 3.1).

All households in Bandedoddi and Budagayyanadoddi were included in the survey as there were fewer households and all belonged to the same caste. In the case of Kumbaradoddi and Therubeedi, only 65 % and 40 % of the households were sampled, respectively. These households were selected on the basis of caste and landholding size.

Of the 91 households surveyed, 26 belonged to STs, 28 to SCs and 37 to OBCs. These communities are distinguished largely by their occupational activities and religious beliefs.

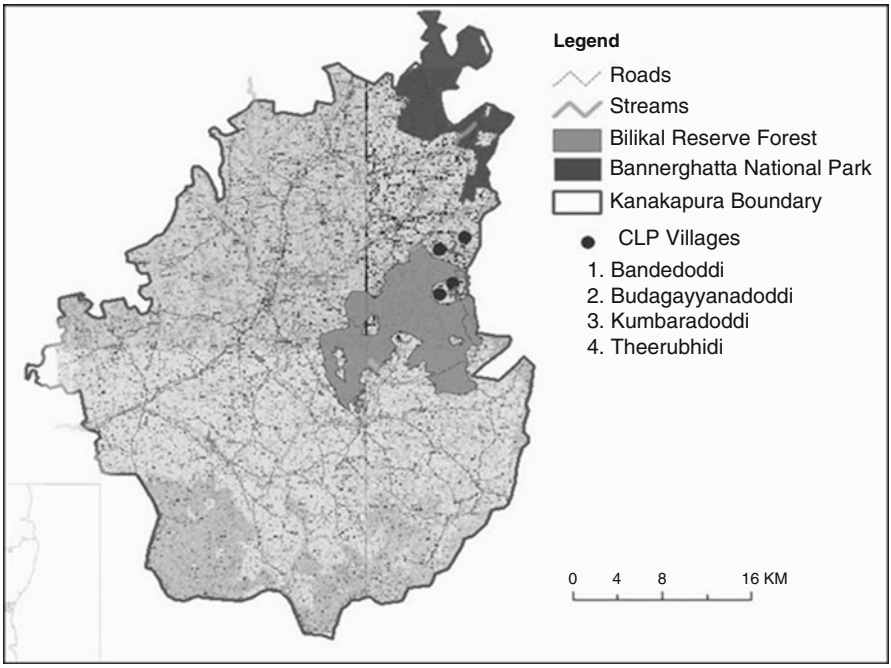

Fig. 3.2 Kanakapura taluk and selected villages

Table 3.1 Background information on the study villages

Villages	Caste	Total no. of households	Sample size	Location	Primary occupation (# of households engaged in)
Bandedoddi	SC	14	14	Adjacent to NP	13, agriculture; 1, labour
Budagayyanadoddi	ST	17	17	Adjacent to NP and RF	8, agriculture; 5, labour; 4, NTFP collection
Kumbaradoddi	SC, OBC	46	30	Adjacent to RF	15, agriculture; 10, labour; 3, NTFP collection; 2, livestock rearing
Therubeedi	SC, ST and OBC	73	30	Adjacent to RF	25, agriculture; 4, labours; 1, livestock rearing

SC scheduled caste, *ST* scheduled tribe, *OBC* other backward caste, *NP* national park, *RF* reserved forest

3.4 Comparing and Contrasting Livelihood Strategies at the Forest Margins

3.4.1 Communities in Selected Villages

As mentioned in the previous section, the selected villages consisted of SCs, STs and OBCs.

The OBCs comprise Gowdas (Vokkaligas), Lingayats, Acharis and Bestas with the former two being the most dominant groups in the community. They are spread all over the taluk, speak Kannada and have a vegetarian diet. Among the OBC respondents in the study, there were 18 Gowdas, Lingayats were 16, and there were two Acharis and one Besta.

Among the SCs, Dalits and Lambanis are the majority, followed by Edigas and Madivaalas. Dalits, also called Adi Karnatakas, are bilingual, speaking both Kannada and Telugu. They were leather workers in the past and have now taken to agriculture and related activities. Lambanis, also called Banjaras, live in settlements known as '*tandas*'. Agriculture is their primary occupation. Womenfolk were engaged in the sale of fuelwood, but in the recent years, due to strict regulation on fuelwood collection and opportunities elsewhere, many women have taken to wage labour in nearby estates. The SC respondents included 14 Dalits, 10 Lambanis, two Edigas and two Madivaalas.

The STs comprise mainly of Irulas and Bedas, with the Irulas being more prominent. They have settled in the area after migrating from Tamil Nadu. They are popularly known as *kadu pujari* and speak a dialect that is a mix of Kannada, Tamil and Telugu. Ragi (millet) is their staple food. They were jungle dwellers, now settled in colonies. Their initial occupation was making bamboo crafts (*bidiru kasuri* in local parlance) although in more recent times, they have taken to practising agriculture, livestock breeding and collecting NTFP (Fig. 3.3).

3.4.2 Income, Landholding and Caste Composition Across Villages

A preliminary analysis of major activities across villages suggests that all villages, to varying extents, are dependent on agriculture, labour and fuelwood and most villagers resort to migration as a livelihood strategy. Whereas most households in Bandedoddi and Kumbaradoddi were greatly dependent on income from labour, in Budagayyanadoddi and Therubeedi, livelihood activities were more diversified across various options.

The cultivable agricultural landholding across these villages ranges up to 18 acres, though the average farmholding size is approximately three acres, and there are only a handful of farmers who own anything more than eight acres. Of the mean household income of Rs. 19,000 per year, almost 16–37 % came from agriculture.

Fig. 3.3 A paddy field in Kanakapura

All villages were fully dependent on the forests for fuelwood for household use, and there were only a few landless farmers collecting fuelwood for sale in the local market.

The varying livelihood strategies are examined from three perspectives – caste, income classes and landholding groups. Figures 3.4, 3.5 and 3.6 provide a visual representation of the relationship between landholding, caste and household income.

Preliminary analysis revealed that OBCs had the highest landholding while STs owned the least area of land on average (Fig. 3.4).

However, the income status of these castes was in complete contrast to the landholding status, with the STs earning the highest annual average income (Rs. 27,000), followed by the SCs (Fig. 3.5).

A similar counter-intuitive pattern was observed between landholding and income classes. The relation between income and landholding was not as consistent as would be expected, and households having relatively large landholdings were not among the high-income earners (Fig. 3.6).

A closer look at these relations on the basis of the source of income can provide an insight into how livelihood strategies are affected by socio-economic profiles, revealing the factors affecting choice, availability and outcomes of different livelihood options.

In analysing livelihood strategies, labour income is categorised into three. Firstly, agriculture labour ('*agri labour*' as referred to in the figures below) refers

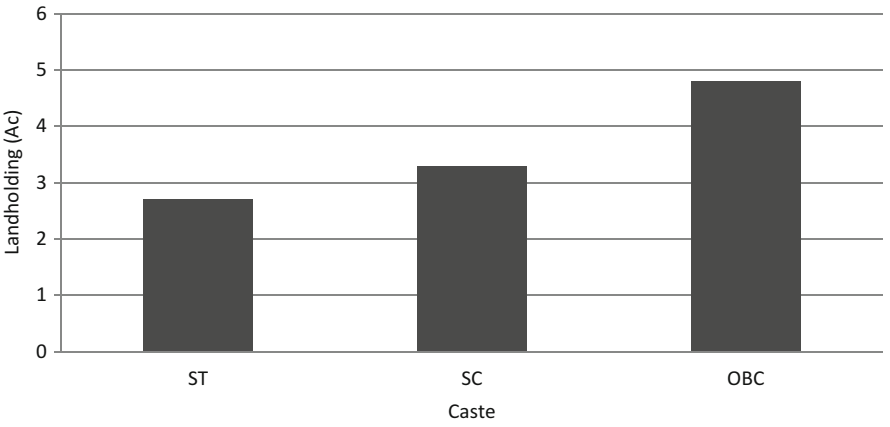

Fig. 3.4 Average landholding size (acres) among castes in the study villages

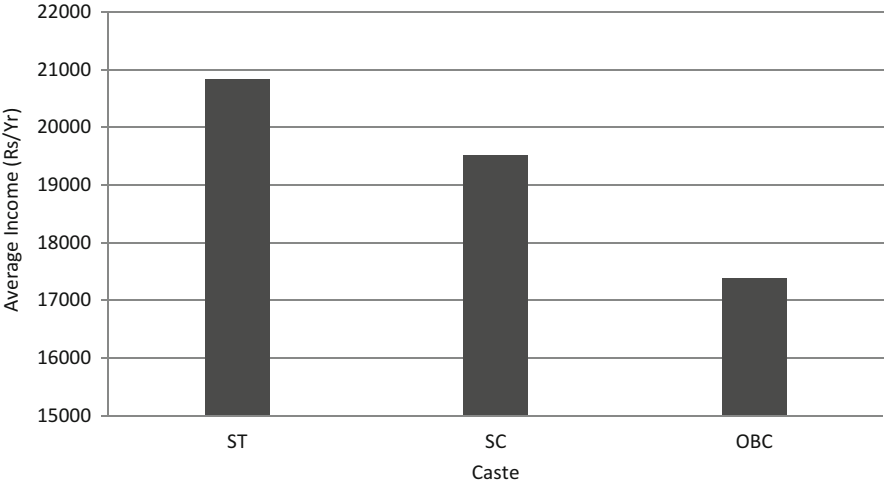

Fig. 3.5 Average income (Rs/year) among castes in the study villages

to work on other farms and estates. Nonagricultural labour is of two types. On the one hand, nonagricultural labour (referred to in the figures as '*non agri local*') includes construction work, carpentry, dealership in land and livestock, and small enterprises like grocery stores and tailoring shop, all of these options being located in and around the village. These may be owned by the individual or he/she may be employed in one such enterprise. On the other hand, nonagricultural labour also includes work outside the village and surroundings as construction workers or as

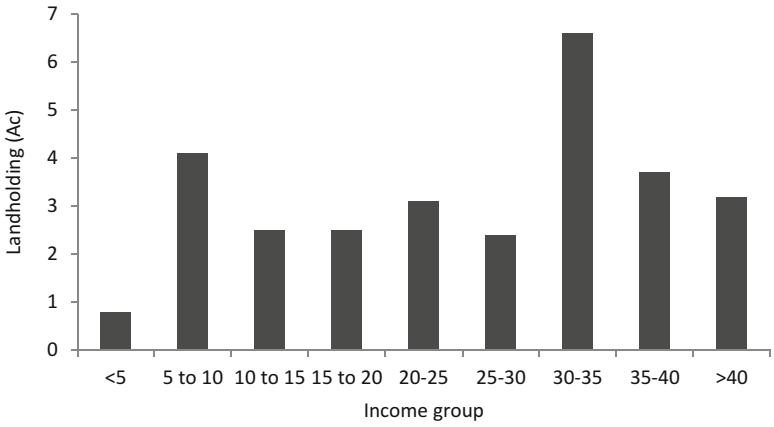

Fig. 3.6 Average landholding (in acres) across income classes (Rs '000/year)

daily wage labourers including painters, drainage workers, sand loaders, drivers and workers in garment manufacturing units and small factories. This category is referred to as nonagricultural outside labour (referred to as '*non agri outside*', in the figures).

3.4.3 Livelihood Strategies and Castes

Comparing the difference in strategies employed by different communities could indicate whether there is any perceivable pattern in the constraints or opportunities that households face as a consequence of their affiliation to a caste.

Looking at the differing dependency on various strategies across castes, it is evident that STs who had the highest average earnings sourced most of this from working in the nonagricultural sector, locally. Nonagricultural local labour emerges as an important source of income for both STs and OBCs, with average income from this source for those households having access to it being higher than the overall average income of their caste group. Interestingly, on further analysis, it was revealed that only two of the 26 households among the STs were accessing this. These individuals were working as carpenters and estate workers and earning high income per month. Similarly, among the OBCs who were also earning well from this activity (see Fig. 3.7), only one household had access to such a source.

Therefore, nonagricultural local labour, though a high-income earning activity, was not being equally accessed by everyone. In order to minimise the bias, these three households (two STs and OBCs) were removed from the analysis.

Once the three outlying households were removed, though STs still had the highest average income, now there were no households sourcing income from local nonagricultural work (Fig. 3.8). Instead, cash income from agriculture emerged as

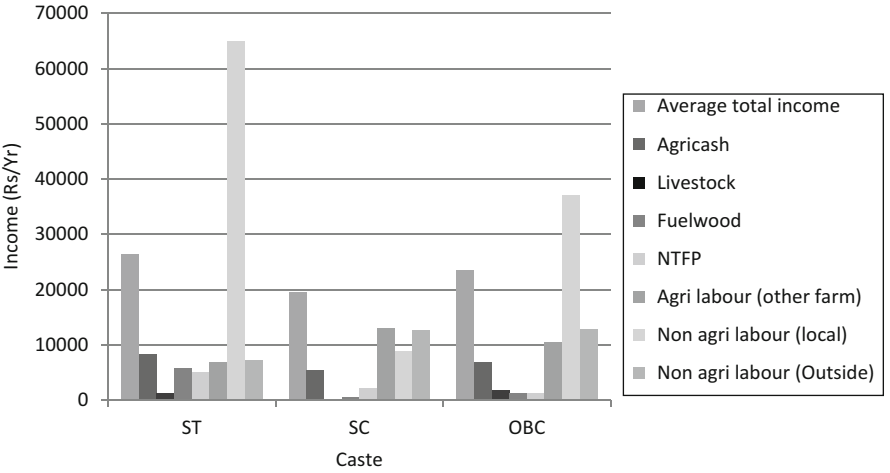

Fig. 3.7 Livelihood strategies across castes. Note: All variables in the figure are averages (mean) for dependent households

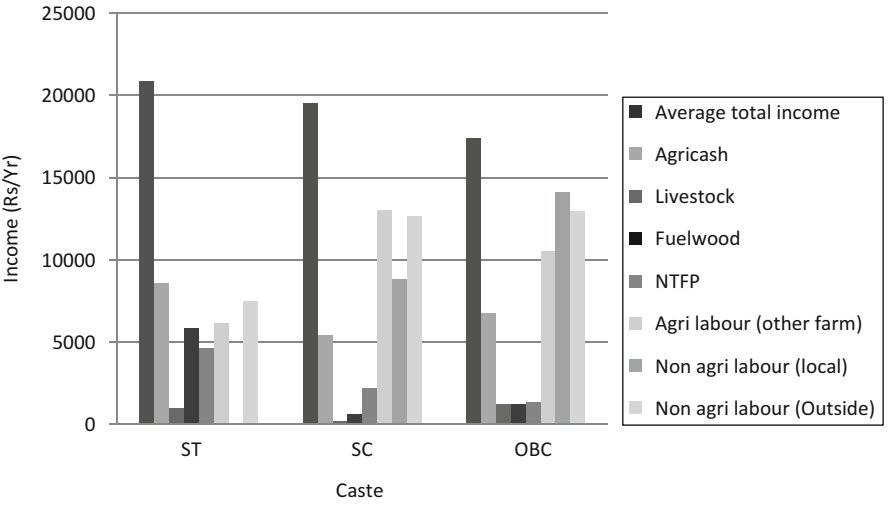

Fig. 3.8 Livelihood strategies across castes. Note: All variables in the figure are averages (mean) across dependent households

an important income source, yielding even more on an average than that in the OBC households despite the latter having larger landholdings. In fact, with the outlier removed from the OBC households, they were now the lowest income group, earning even less than the SCs. This is pertinent when seen in light of the larger landholdings that this group has. Nonagricultural labour (outside and local) was an important source of income as most of these household had members located

elsewhere, working in nonagricultural activities, either leaving their lands largely fallow or leasing it out to others.

Besides this, as Fig. 3.8 reveals, STs had a relatively high dependence on the forest for NTFP. In Budagayyanadoddi, a village dominated by STs, the households here have been given tree *patta*s, i.e. titles over tree harvest rights, for tamarind *(Tamarindus indica)* inside the National Park which provides them good income. *Lantana camara*, which is an invasive weed (used as fuelwood), is extensively spread grown in areas with human disturbance. Collectors from ST communities sell this to local quarry owners in large quantities. This explains the relatively high share of NTFP and fuelwood income among the STs. Therefore, the ST community in Kanakapura seems to have income from multiple sources, making efficient use of the resources at hand.

Among the SCs, there was a high dependence on income from agricultural labour, followed by income from nonagricultural activities outside the village. Examining the type of work these labourers were engaged in, it was found that their main occupation was as construction workers and as labourers in plantations, both of which are relatively lower-income activities. Clearly, being employed in a low-skilled activity (like construction, as against skilled work like carpentry as in the case of some ST households) compromises on the potential income from labour.

Among the OBC community, too, nonagricultural labour was important, particularly local labour. They worked as drivers, or in factories, and tended to earn better incomes compared to SCs, but less than the ST workers. Moreover, this community had the least dependence on forests, whether for fuelwood or for NTFP. However, they had greater dependence on livestock as their larger landholdings (Fig. 3.4) facilitated the rearing of livestock.

Among communities like the SCs and OBCs who have historically been agriculturalists, it is interesting to note that agriculture no longer forms the core source of income. Casual labour has emerged as the main source of income, displacing their traditional occupations and indicating adaptation in livelihood strategies among this community.

3.4.4 Livelihood Strategies Across Landholding Classes

The households in the sample were classified based on the area of landholding (Fig. 3.9). More than half the households were marginal landholders (0.1–4 acres).[2] There were also a significant number of landless households, accounting for almost 15 % of the sample.

[2] We refer to marginal landholdings as those with 0.1–4 acres, small landholdings with 4–8 acres and 8–12 acres constitute medium landholdings whilst anything more than 12 as large landholding.

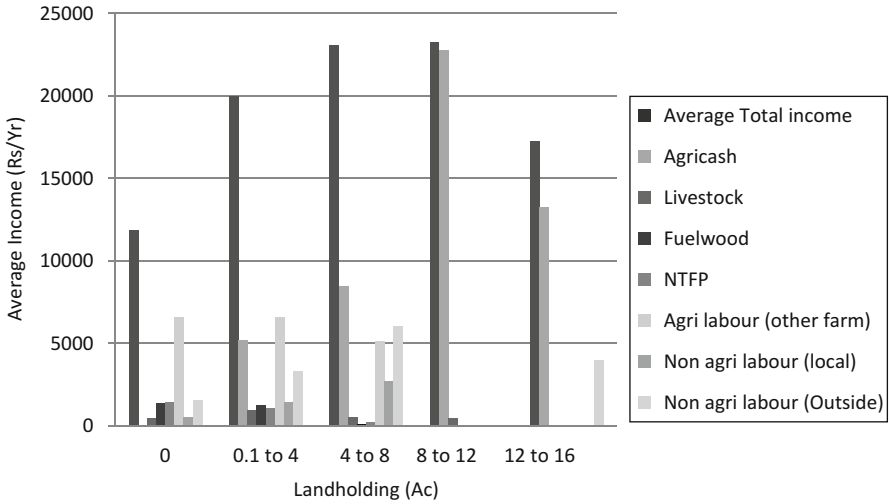

Fig. 3.9 Livelihood strategies across landholding classes (area in acres). Note: All variables in the figure are averaged across dependent households

Understanding the livelihood strategies employed by different landholding groups can indicate whether ownership of land has any implication on the type of livelihood strategy employed. As would be intuitively expected, it was clear that landless households and marginal landholders (<4 acres) depended more on forests for fuelwood and NTFP. This reiterates the findings in the literature in similar contexts on the crucial equalising role of forests particularly for peripheral landless or marginalised communities in supplementing livelihood options for the land deprived (Kamanga et al. 2009).

Another important finding that emerged was the difference in diversification across landholding groups. As can be seen in Fig. 3.9, as landholding size increased, the diversity in income sources reduced which, as will be discussed later on, is closely related to reduction in average household income. Amongst the marginal (0.1–4 acres) and small (4–8 acres) landholders, a number of income sources were present, including agricultural labour, nonagricultural labour, NTFP and livestock rearing. However, the medium (8–12 acres) and large landholders (12–16 acres) restricted their income options to agriculture, both for cash and for own consumption, relying solely on these for their earnings. Despite the larger landholdings, it is interesting to note that livestock rearing is not a source of income for these households. The large landholders did have some income from nonagricultural labour, which primarily involved working outside the village, since most of the family members had migrated to the city. The low diversity of livelihood options among large landholders could be attributed, at least partly, to the smaller family size of this group owing to the migration to the city, leaving fewer members in charge of the large holdings.

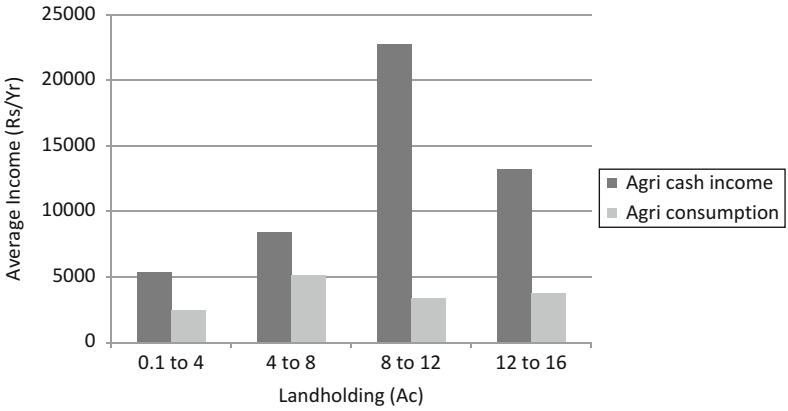

Fig. 3.10 Agricultural incomes and landholding size

The extent of dependence on land with respect to landholding size is an interesting relationship. Income from agriculture consists of two components – i.e. agricultural income from sale of crop and other farm produce, and imputed income from consumption of produce from one's own farm. Disaggregating agricultural income into these two components (Fig. 3.10) reveals an inverted U relationship between two components of agricultural income and average landholding size. This suggests that landless households and those with marginal holdings have very low income from agriculture and could not/did not depend on their lands for food for sale in the market, although marginal landholders utilised their land for growing food for own consumption to some extent. However, as the size of landholdings increases, amongst the small and medium landholders, there is a greater dependency on lands for food. As landholding size increased further, this dependency began to reduce. Therefore, though medium and large landholders had high dependency on agriculture, when compared to the small and marginal landholders, this dependency was relatively low despite their relatively larger landholding.

These results seem to indicate that as landholding size increases, farmers tend to grow more for commerce than for own consumption, possibly with more monocropping, encouraged by policies and market pressures. Moreover, even their dependence on land for income is also less. Combining this observation with the reduced livestock holding in larger landholdings (Fig. 3.10) suggests that as land size increases, dependence on land for agricultural income or for food becomes relatively low, as people depend on other sources of income through non-land-based activities.

It is also interesting to note that having larger lands did not imply higher average household income as in the case of the OBC community (Figs. 3.6, 3.7, and 3.8). In fact, in our sample, the medium- and small-scale landholder had the highest average income (probably as a result of greater diversification) followed by the marginal landholding groups.

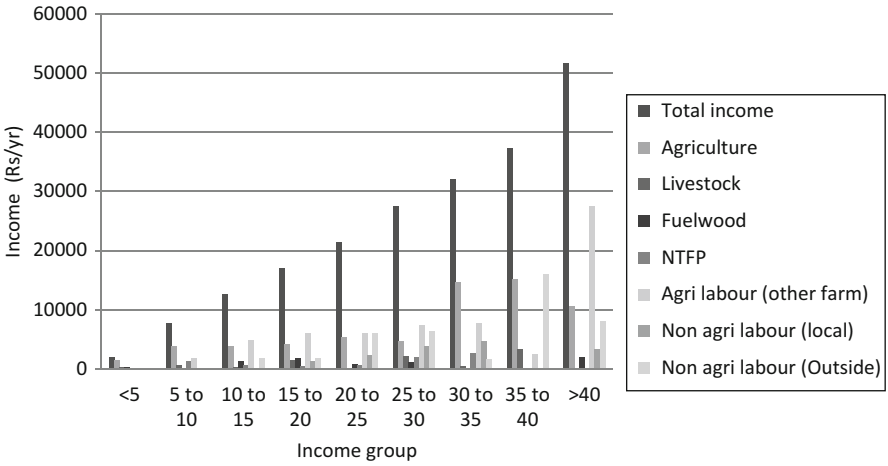

Fig. 3.11 Livelihood strategies across income groups. Note: All variables in the figure are averaged across dependent households

3.4.5 Livelihood Strategies Across Income Groups

Based on the distribution of annual income, the sample households were divided into nine groups (Fig. 3.11). The poorest group had an annual income of less than Rs. 5,000. The majority of the households (almost 50 %) had income between Rs. 5,000 and Rs. 20,000 per year. There were only a handful of households having more than Rs.40,000 per year.

The poorest income group sourced most of their income from the sale of agricultural produce. For them, agricultural labour on other farms was also an increasingly important source of income. Figure 3.11 reveals that as incomes increase, the dependence on income from agriculture and agricultural labour increases.

The high contribution of labour among the higher-income groups corroborates the observations in the earlier sections on the crucial role of labour (local and outside) as a source of income.

3.5 Conclusion

An analysis of the observations from the socio-economic survey conducted in this area throws light on the multiple strategies being employed by different strata of communities in Kanakapura and how these are influenced by landholding size.

In a rural taluk like Kanakapura where agriculture would be expected to be the primary mainstay, this traditional dependence is gradually reducing, perhaps as a consequence of the opportunities that have emerged driven by many factors including proximity to a growing metropolis. Though agricultural labour remained a

crucial source of income, nonagricultural labour was emerging as a lucrative source of income for many households. Most of the nonagricultural work accessed was located outside the village. However, despite the high returns, it was found that not all households were availing of this opportunity due to the lack of skills, reflecting similar findings elsewhere (Janvry and Sadoulet 2001). Such constraints and entry barriers can, over time, lead to increased inequalities across households (as observed in Africa by Reardon 1997). This suggests the need for building skills like carpentry and tailoring so as to enable households to diversify their basket of livelihood options.

Another interesting result that emerged was the curious relationship between landholding and livelihood strategies. For one, it was revealed that having larger landholdings did *not* imply higher incomes after a particular size class. Moreover, having larger landholdings did not suggest a greater dependence on land in terms of higher agricultural income (in cash or as food) from their lands. In fact, large landholders, mostly OBCs, had relatively lower dependence on their lands and depended primarily on income from nonagricultural work.

It was also found that the diversity of livelihood options declined as the land size increased. Therefore the marginal and small landholders had income accruing from a range of sources. As landholding size increase, the diversity declined. This result resonates with similar findings which show that the ability to diversify income sources is a characteristic of small and medium landholders (e.g. Reardon et al. 2000) and at the same time contradicting findings in other studies where larger landholdings were found to be inversely related to the extent of livelihood diversification (Abdulai and CroleRees 2002).

Dependence on forests for NTFP and fuelwood was apparent in the case of landless or marginal landholders, as a part of their highly diversified livelihood portfolio. Social grouping appeared to determine the extent of dependence on NTFPs as SCs despite living closer to forests did not engage much in collecting NTFPs compared to others in the landscape. It was interesting that the group with the highest income in the sample, the STs, was found to be sourcing a relatively high share of income from fuelwood and NTFP. Forests remain an important source of livelihood for households on the peripheries through their crucial income-equalising impact, reflecting similar findings in the literature in other countries (Kamanga et al. 2009; Vedeld et al. 2007).

Thus, this chapter reveals how the interplay of many factors determines the livelihood strategies in the periphery of forests in Kanakapura. These include households' proximity to forests, caste, skill sets and landholding size. Social groups with both low income and smaller land area as also those with lesser engagement in local nonagricultural employment emerge the most vulnerable in the forest fringes of Kanakapura.

As the scenario in Kanakapura evidences, the nature of response of fringe communities depends to a large extent on the ethnicity and background of the communities. Therefore, given the differing strategies and responses across different groups, advocating any single and exclusive livelihood strategy may not be successful. This aspect is brought out starkly in the Chap. 4, set in the Nilgiri ranges of the Western Ghats.

Acknowledgements The authors gratefully acknowledge financial support from the Sir Dorabji Tata Trust for conducting the survey and the support from the villagers of Bandedoddi, Budagayyanadoddi, Kumbaradoddi and Therubeedi for participating in the survey. We also thank Manjunath H. and Sudarshan H.C., project assistants who interacted with the community and helped in data gathering along with field assistants Shivram, Shivrudra and Kumar Naik.

References

Abdulai, A., & CroleRees, A. (2002). Determinants of income diversification amongst rural households in southern Mali. *Food Policy, 26*(4), 437–452.

Anon. (1999). Environment in Karnataka: A status report. *Economic and Political Weekly, 34*, 2735–2744.

Bhullar, L. (2008). The Indian Forest Rights Act 2006: A critical appraisal. *Law, Environment and Development Journal, 4/1*, 20. Available at http://www.lead-journal.org/content/08020.pdf. Accessed 20 Jan 2012.

Bose, I. (2010). *How did the Indian Forest Rights Act, 2006 emerge?* (Institutions for Pro-poor Growth Discussion Paper Series 39). Manchester: School of Environment and Development, University of Manchester.

Ghosh, R. N., & Roy, K. C. (1997). The changing status of women in India: Impact of urbanization and development. *International Journal of Social Economics, 24*(7/8/9), 902–917.

Janvry, A., & Sadoulet, E. (2001). Income strategies among rural households in Mexico: The role of off-farm activities. *World Development, 29*(3), 467–480.

Kamanga, P., Vedeld, P., & Sjaastad, E. (2009). Forest incomes and rural livelihoods in Chiradzulu District, Malawi. *Ecological Economics, 68*(3), 613–624.

Karnataka State Action Plan on Climate Change. (2011). *Draft Report for Government of Karnataka*. Available online: http://www.nicra-icar.in/nicrarevised/images/State%20Action%20Plan/Karnataka%20SAPCC%20draft%20-%20EMPRI,%20TERI%202011-09-17.pdf. Accessed 20 Feb 2012.

Lipton, M. (2002). Migration from rural areas of poor countries: The impact on rural productivity and income distribution. *World Development, 8*(1), 1–24.

Reardon, T. (1997). Using evidence of household income diversification to inform study of the rural nonfarm labour market in Africa. *World Development, 25*(5), 735–747.

Reardon, T., Taylor, J. E., Stamoulis, K., Lanjouw, P., & Balisacan, A. (2000). Effects of nonfarm employment on rural income inequality in developing countries: An investment perspective. *Journal of Agricultural Economics, 51*(2), 266–288.

Vedeld, P., Angelsen, A., Bojo, J., Sjaastad, E., & Berg, G. K. (2007). Forest environmental incomes and the rural poor. *Forest Policy and Economics, 9*(7), 869–879.

Chapter 4
Diversity as a Livelihood Strategy Near Mudumalai, Tamil Nadu: An Inquiry

Tarsh Thekaekara, Nishita Vasanth, and Thomas F. Thornton

4.1 Introduction

Chembakolli is a predominantly Kattunayakan (also called Kattu Naiken, Nayaka or Naiken) settlement in the Nilgiri Hills of Tamil Nadu that almost exactly fits the definition of a 'fringe village'. To its immediate north is the 'core zone' of the Mudumalai Tiger Reserve (MTR) and to the south is a large company-owned tea estate and other small family-owned estates. Like most peripheral communities, while the community is still dependent on the reserve for a significant part of its livelihood, it regularly partakes in wage labour in the neighbouring estates to augment its income. With increasingly limited access to the reserve and reluctance to fully embrace the estate work routine, the village seemed ideally situated for a 'conservation and livelihood' intervention.

Lantana camara (hereafter, Lantana) is an invasive weed that has a considerable negative impact on forest ecosystems across India (Love et al. 2009). The weed, however, has been found to be suitable to be crafted into furniture. Given the craft skills of the community, a 'Lantana furniture centre' seemed to be a positive intervention which would serve a twofold purpose: the removal of Lantana from the reserve and the restoration of forest habitat and a means of additional income to the community through production and sales of Lantana furniture.

T. Thekaekara (✉) • N. Vasanth
The Shola Trust, Gudalur, Nilgiris, Tamil Nadu, India
e-mail: tarsh@thesholatrust.org

T.F. Thornton
Oxford's School of Geography and the Environment and Environmental Change Institute, Oxford, UK

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_4, © Springer India 2013

As a part of a local nongovernment organisation (NGO), The Shola Trust, we started such an intervention in the village in 2009. Three years on we find it hard to call it a success within either the 'sustainable livelihoods', 'development' or 'conservation' frameworks.

Over the last 6 months, we have attempted to better understand the dynamics of this Lantana furniture unit and the local hunter-gatherer groups – the Kattunayakans and Bettakurumbas – that run it. We present some of the complexities of working with forest-based communities with alternative worldviews to the predominant capital economy model and highlight some problems in our simplistic understanding of 'livelihood' choices.

4.2 Setting the Scene

4.2.1 Chembakolli Village, in the Nilgiris

Mudumalai Tiger Reserve is a part of the wider Nilgiri Biosphere Reserve and adjoins four other protected areas – Bandipur, Nagarhole, Wayanad and Sathyamangalam. Together, these form about 8,000 km^2 of contiguous forest and hold one of the single largest populations of Asian elephants (*Elephas maximus*) and tigers (*Panthera tigris)* in India (Johnsingh et al. 2008). There is also a steep precipitation gradient across the reserve (600–1,800 mm) resulting in a significant range of vegetation types, from thorny scrub forest dominating the north-eastern region, and intergrading westwards into dry and moist deciduous forests and wet evergreen forests (Suresh et al. 2010).

Chembakolli is not typical of a village in the sense of a cluster of households together in one place, but consists of about 140 families spread across approximately 400 acres of land. There are two indigenous communities of hunter-gatherer origin – about 100 Kattunayakan families and 40 Bettakurumba (also sometimes referred to as Kurumba) families – in geographically distinct areas within the village, functioning otherwise as a more or less homogeneous group. They have learnt each other's language, for example, and even attend each other's cultural events. This is a rather unique instance of two tribes living in the same village, as there is very limited interaction between the groups traditionally. The Kattunayakans, especially, have largely been feared by the other groups. According to the communities' oral history, the small hamlet of about 15 families grew considerably in the 1980s when other families moved to Chembakolli, displaced by the Forest Department and more powerful immigrants into the Gudalur valley. As a result, it is now the largest Kattunayakan settlement in the region. The Bettakurumbas mostly moved to Chembakolli from Theppakadu, a village inside the reserve, which is also the centre of the government's tourism operations. The village elders cite the intense exposure to tourists and the oppressive ways of the Forest Department as reasons behind the move.

4.2.2 The People

A key to understanding this 'fringe community' better is perhaps provided in the literature on hunter-gatherer communities and their unique worldview. While some social scientists consider 'primitive' societies like the Kattunayakans to be 'at the mercy of' (and unable to dominate) nature (Manfredo and Dayer 2004), other anthropologists describe their relationship as one of trust, where there is no separation between humans and nature (Ingold 1994). Bird-David similarly points out that the Kattunayakan people 'look to the forest as they do on a mother or father. For them it is not something 'out there' that responds mechanically or passively, but like a parent, it provides food unconditionally to its children' (Bird-David 1990: 190). Similar views are held by other hunting-gathering peoples, such as the Batek Negritos of Malaysia (Endicott 1979) and Mbuti Pygmies of the Congo (Turnbull 1965). Fundamental to the hunter-gatherer's outlook is the concept of animism, where animals, plants, nonliving (in Western metaphysics) beings (stone, the sun, ancestors) and natural phenomena (thunder or wind) are all thought to be 'other than human persons', an 'ethnometaphysics' first described by Hallowell (1960). Bird-David also describes the Kattunayakan idea of '*Devaru*', whereby certain individual animals or even 'other than human persons' have personal relationships with Kattunayakans, which 'objectify sharing relationships between Nayaka and other beings' (Bird-David 1999). These relationships, and the ontology that supports them, are foundational to Kattunayakan worldviews and engagements with forests as homelands and communities of beings, rather than mere 'harvest areas' or 'resource sites'. The relationships and reciprocity between 'beings of place' (Thornton 2008) become the basis of sustainability rather than a so-called rational economic calculus of maximising or conserving resource supplies.

Providing a historically informed anthropological description of the evolution of these communities proves to be challenging. The Nilgiris have been highly researched starting from colonial ethnography in the early 1800s, but these early writings are highly subjective, even described as *'biased, amateurish and generally of poor quality'* (Hockings 2008). Touching on the literature and also drawing from our own experience of working among communities in the region, we provide a brief description of each of the groups.

4.2.2.1 The Bettakurumbas

The Bettakurumbas are spread out across three states – Kerala, Karnataka and Tamil Nadu. Thurston (1909) claimed that the community originated from a hill range in Karnataka, the Vollagamalai, and is an offshoot of the Pallava Dynasty, after its fall around the eighth century CE. He believed their long isolation in the forests made them 'wild and uncivilised'. In their own oral history, however, they prefer to think of themselves as always being forest people, though their exposure to the outside world began long ago. Maharajas employed them to trap and tame wild elephants in '*keddah*' operations, and this tradition was carried on by the British and the Indian

Forest Department. Even today, all the mahouts in Mudumalai are Bettakurumbas. They are often employed as guards and watchers with the Forest Department and as guides for tourists and researchers entering wildlife areas. The hunter-gatherer worldview and 'trust' relationship with nature as a community of beings that is described by Ingold (1994) are evident in their dealings with elephants. They believe that once the appropriate rituals or respect and cultivation are carried out before attempting to capture a wild elephant, they only have to approach a wild herd, and some elephants would voluntarily 'separate out from the herd and give themselves up to be caught' (Thekaekara 2010). This rich relational context of cultivation, trust and reciprocity between humans and animals, in turn, leads to mutual dependence and a cultural model of 'collaborative reciprocity' (Bird-David 1987) that informs not only everyday engagements with the forest but the extraordinary events such as wildlife conflicts.

4.2.2.2 The Kattunayakans

Kattunayakans are the most forest dependent of all the tribes in the region, as is described by their name, Kattu (forest) Nayakans (lords). They have had the least exposure to the outside world and have been the subject of various studies by Bird-David (e.g. 1990, 1992, 1994) in her search for 'near-pure' hunter-gatherers. They are feared by other communities as sorcerers and practitioners of black magic and have had very little interaction or interdependence with the other groups. Even today, more traditional individuals from the Paniya or Bettakurumba tribes believe they might 'die of chest pain' if they enter a Kattunayakan house.

Despite their relative isolation, they have had a long history of sporadically working as wage labourers in surrounding estates (Bird-David 1994). Given their intricate knowledge of forests, a few of them have also worked for the Forest Department. A passing linguist studying their language described them as *'possessing a certain amount of aloofness and dignity, pride and reticence'* not found in the other tribes (Zvelebil 1982). In the neighbouring state they are called jenu (honey) kurubas, as much of their lives revolve around honey collection, a tradition that has not changed over the years, and is still very central to their identity (Thekaekara 2009).

4.2.3 The Lantana Problem

Lantana is a shrub native to South America, but now a pan-global weed and is identified as one of the top ten invasive species in the world by the Global Invasive Species Information Network (Bhagwat et al. 2012). It is genetically highly adaptable, found in a wide variety of soil types and habitats, occurring from sea level to 1,800 mt above sea level. Most scientists consider its effect on native flora and fauna to be severely negative for a range of reasons:

- It exhibits allelopathic properties, which hinder seedling recruitment and growth of native plants in its vicinity (Achhireddy and Singh 1984).
- When mechanically cut, it coppices quickly, producing dense and impenetrable thickets (Sharma et al. 2005).
- It has a vibrant seed bank that is dispersed widely by birds, rodents and other animals and propagates very well vegetatively (Parsons and Cuthbertson 2001; Swarbrick et al. 1998).
- It benefits from soil disturbances associated with destructive foraging activity of mammals such as pigs, cattle, goats and deer, which enhance both germination and vegetative propagation (Thaman 1974).
- It possesses a strong root system and can regenerate from basal shoots even after moderately intense fires (Day et al. 2003).
- The leaves and young stems contain lantadene A and B, which are toxic (sometimes fatal) if/when browsed by herbivores (Sharma et al. 1981).
- It is also known to affect economic viability of 14 major crops around the world including coffee, tea, rice, cotton, oil palm, coconut and sugar cane (Sharma et al. 2005).

In view of this 'extreme invasiveness', the state Forest Department has been actively attempting to eradicate Lantana since the early 1900s (Tireman 1916), with all the early forest working plans prescribing management activities towards this end. In more recent times however, there appears to be a slight shift in these management plans by the Forest Department, abandoning earlier ideas of eradication and working towards more realistic goals of containment and adaptive management (Dorga 2007; Bhagwat et al. 2012).

4.2.4 The Intervention: A Lantana Furniture Unit

In this 'adaptive management' framework, various nongovernment organisation (NGO) interventions were initiated to provide local communities with an 'alternative livelihood' by using Lantana as a raw material for crafting furniture. The Ashoka Trust for Research in Ecology and the Environment (ATREE) is one such NGO that spearheaded a 'Lantana furniture centre' initiative in the Malè Mahadeshwara (MM) Hills of Karnataka for a number of years. The central conservation and livelihood aim was relatively straightforward: 'enhancing the livelihoods of poor forest dwellers, contributing to the control of an invasive, and restoration of native biological diversity' (ATREE 2012). The intervention in Chembakolli was based largely on this Lantana furniture centre model in which local peoples adversely affected by Lantana's impacts on traditional livelihood resources could diversify their portfolio of 'assets' by commodifying the invasive plant.

The Chembakolli village was chosen after a short consultation with representatives of an umbrella people's organisation in the area – the Adivasi Munnetra Sangam. This was primarily due to its proximity to the reserve and the availability

of Lantana but also due to the communities' disinterest in full-time employment options in the neighbouring tea estates. A series of meetings were held with the people of Chembakolli, and it was decided that the intervention should be through the Forest Department-initiated village 'eco-development committee' (EDC), so as to ensure full support from the department. Interestingly, the village also perceived Lantana as being a significant problem. In addition to some of the above-mentioned problems, locals reported that Lantana also decreased visibility for them, increasing the risk of surprise encounters with wild animals, particularly elephants. In addition to reduced visibility and displacement of traditional livelihood species and habitats, thick patches of Lantana were also said to have reduced mobility in the forest, thus further limiting access to critical pathways and projects associated with forest livelihoods. These livelihood impacts have also been observed in mixed agricultural-forest communities in the Malè Mahadeshwara Hills area of Karnataka and in some cases were severe enough to dissuade households from making significant use of the forest for gathering and grazing, as they had in the past (Thornton et al. n.d.). Here, too, a Lantana furniture centre had been introduced by ATREE (2012) to help provide a 'substitute' for non-timber forest resources displaced by Lantana's proliferation.

The Field Director of the Reserve (and Chief Conservator of Forests) was very receptive to the idea and even agreed to fund the initial part of the programme. Training was organised for 16 interested volunteers from the village for duration of 1 month. A trainer was recruited from the MM Hills Project. The volunteers were paid a small stipend (Rs. 50 per day) during the training, and all the raw materials (nails, varnish, cane binding, etc.) were purchased by The Shola Trust on a monthly basis and deposited at the unit, while the Lantana was collected from the forests on a weekly basis by the people engaged in the furniture making.

The process involved the following:

- Cutting/harvesting appropriate stems of Lantana based on the particular item to be made
- Boiling the stems for about 4 h, immediately followed by debarking
- Shaping/bending the sticks into the required shapes and assembling the basic structure of furniture
- Drying of finished product for a few days, followed by binding of all the edges and final varnishing

There was considerable enthusiasm during the training, with everyone staying beyond scheduled hours. They were very skilled in the use of a machete and worked almost exclusively with it, preferring not to use the hacksaw and secateurs as suggested by the trainer, but achieving the same results in similar time frames. The people of Chembakolli and the trainer, Kutty from the Soliga community, got along exceptionally well, and after a few days Kutty moved from a rented room into one of the people's houses as a guest. During the Lantana harvesting trips, long stories were exchanged about the forests in Mudumalai and those in MM Hills. The training was completed within 3 weeks, by the end of which Kutty and the trainees were satisfied and confident that they could continue the furniture making on their own (Fig. 4.1).

Fig. 4.1 A Bettakurumba man with a harvest of Lantana stems

With most interventions of The Shola Trust, an attempt is made to invest as little funding as possible to ensure the change is not dependent on or driven by external funding. So from the beginning the commitment to the village was only one of providing them with a continuous flow of furniture orders or marketing the furniture and supplying the unit with the one raw material (cane binding) that was not available locally. The intention was not to follow the more common NGO model where initial ownership and control is vested in the intervening body, which, in best case scenarios, is eventually handed over to the community. Nor did we intend it to be a factory-like, full-time wage-providing facility. It was our intention that the community should own it from day one, with The Shola Trust providing as little support as possible. The Forest Department had started a bank account for the village EDC and had deposited significant funds in it for the village to use collectively on any 'eco-development' work. So participants in the furniture unit used these funds to pay themselves weekly wages. This was reimbursed when payments for the furniture were made.

The Field Director inaugurated the training programme and visited the village again while the training was underway. He was the highest-ranking official to ever visit the village, and each visit was surrounded by considerable fanfare. The completion of the training coincided with the Chief Secretary of Tamil Nadu visiting Mudumalai, and so the highest-ranking officer of the Indian Administrative Service was their first customer, with the District Collector and numerous other officials waiting in line to buy some of their furniture. The Forest Department themselves placed an order for furniture worth over Rs. 40,000.

These were all significant political events for the community, who would otherwise never be able to gain an audience with the Chief Secretary of the State. Given this high-profile initiation, there was confidence all round that this project would be a runaway success.

4.2.5 The Turnout

Despite all the enthusiasm, after about 6 months the number of people working in the unit began to dwindle. After about a year there was no one left making furniture full time, but the village refused to officially close down the unit. In all the meetings we held during this period, they continued to insist it was a great initiative, and they would all shortly get back to working on it full time. This never happened.

There were of course a range of technical problems that cropped up along the way, each of which was cited as being the sole reason for the nonfunctioning of the unit. But as each one got resolved, a new one would crop up, and the unit never really took off in terms of the furniture output. The Shola Trust was never able to deliver any furniture orders on time, and completing an order was always troublesome and dependent upon mitigating a host of contingencies affecting the workforce.

Over the last 6 months or so, in addition to more closely examining the technical problems, we have also been trying to get a deeper understanding of the reason for this unit not being a 'success' and how this community understands this intervention as a livelihood option. Our attempts have been influenced by ethnographic methods, and we spent as much time as possible with the community, in situations where the Lantana furniture unit was not the focus, engaging in participant observation, limited interviews of 10 individuals from the unit and a focus group discussion and survey of livelihood activities. What emerged was an extremely diverse portfolio of livelihood options, driven by an alternative 'hunter-gatherer worldview', of Lantana manufacture being just one activity within a dynamic 'livelisystem' of activities and relations. We believe this has significant implications much beyond the Chembakolli village and that these preliminary findings could be useful for all such livelihood interventions with forest-based communities.

4.3 The Evolution of an Intervention and Lessons Learnt

4.3.1 Functional Challenges

Given the complete autonomy with which the unit functioned, it saw many changes in its style of working over the first year. Every second Sunday of the month, the whole group met, along with the local forester and occasionally with someone from The Shola Trust, to review and make plans for the functioning of the unit.

Fig. 4.2 Removing the thorny outer skin of the Lantana bark, a job most often performed by women

Location: The initial set-up was in a cottage provided by the Forest Department, inside the reserve, about 1 km from the edge of the village. Over time the people felt this was too far and decided to decentralise, with four different joint family units making furniture, each in their own homes. This worked for a while, but they then found it impossible to properly coordinate larger orders between them, or consistently maintain dimensions and quality. So they decided to move back into a single space and built a large shed inside the village for the purpose. All the labour for the shed construction was volunteered by the individuals from the furniture unit, and bamboo was harvested by them from the forest. Simple roofing material was provided by The Shola Trust, and the concrete floor was funded by the Forest Department through the EDC. By the time this was up and running, only about eight individuals remained who were trained to make furniture. The unavailability of water in the new shed was cited as another problem and was resolved by the Forest Department agreeing to supply them with water once a week in their jeep (Fig. 4.2).

Payment was another issue. The first large order of furniture was by the Forest Department themselves, and it took 8 months for the payment to finally come through. While we considered this a serious problem, it did not hamper the unit too much at the time. However, the use of EDC funds by the furniture making unit became an issue, since the majority of people in the village not involved in the furniture unit were unhappy about their common pool of money being used almost exclusively by the furniture unit. Though these were to be reimbursed, the payments were invariably delayed, since they were made only after the furniture reached the

Fig. 4.3 Making a three-seater sofa with Lantana

buyer, and shipping took a long time given the remoteness of Chembakolli. This was eventually sorted out by starting a new bank account exclusively for the unit, with The Shola Trust offering upfront payment as soon as an order was completed.

Quality was the next issue. None of these craftspeople in fact own any furniture themselves and thus possessed no cognitive prototype or particular vision of what a 'dining table and six chairs' should look like, much less an experiential or kinaesthetic perspective of how it should function. They did not consider a half-inch variation as a flaw in the making, though their customers thought otherwise. They seemed to have a natural tendency to diversify from the set pattern and were constantly improvising, in ways similar to improvisation in other domains like agriculture, wage labour and gathering wild foods and honey. As a result, different lots of furniture were rarely in keeping with the original prototype. The workmanship was invariably good, but the idea of 'standardisation' did not exist, and perhaps was even antithetical to their approach. Nothing within their built environments (the dimensions of their houses, structures of their roofs or designs of their mud-built firewood stoves, etc.) tended to be standardised, but rather varied according to the choices and capacities of the individuals producing them. Even when houses, roofs or stoves were rebuilt every few years, they were invariably different from what had been before. A complete set of furniture was finally left at the unit, to be used as a prototype, on the clear understanding that any variation meant that the furniture would not be bought (Fig. 4.3).

The long and increasingly erratic monsoons were a final constraint. The furniture was prone to getting covered in mould and fungus while left to dry. This

was partly worked around by mixing a dark wood stainer with the polish, masking the black from the mould and changing the colour of the furniture. It was not ideal in that most customers preferred the light coloured version, but it did work to an extent.

We at The Shola Trust could have possibly resolved many of these issues quickly by making some of these decisions ourselves, but we firmly believed in a hands-off approach, and left the producers to deal with the problems on their own terms. We did not try to 'build capacity' in the village, but rather let it evolve on its own in the hope that the unit on the whole would be much more resilient this way. We continue to debate the less versus more involvement approach.

In contrast to all these challenges, there was one key unforeseen positive relational impact that came up that could partly explain the reason behind the people not completely abandoning the unit. A new power dynamic was created in the communities' relationship with the Forest Department, particularly with the lower-level field staff. In the context of India's colonial and post-colonial oppressive history of forest management, this is particularly important. This programme had the full backing of the department, being almost a flagship for their programme for eco-development and community involvement in conservation. Senior officers were very keen on ensuring the programme functioned smoothly and had established some direct contact with the people in the village. The Field Director, in a break from the traditional strict hierarchy in the department, had even given the villagers his personal mobile phone number and told them to contact him if they had any trouble. This direct line of communication to the top gave the community a significant upper hand in all their dealings with the field staff. The uniformed forest watcher, for example, could not ever directly get in touch with the Reserve Director, eight ranks above him in the department, either on the phone or get an appointment directly. Even nominal participation in Lantana manufacture thus afforded workers a certain prestige and status with the Forest Department, along with potential access to power.

Nevertheless, despite the putative access to power and prestige afforded to participants in the furniture scheme, and our attempts to mitigate the various production issues as each arose, the unit continued to function poorly, with furniture being produced only sporadically. The Shola Trust no longer takes orders for furniture on behalf of the craft centre.

For us, the next step was to more closely examine existing livelihood options in these forest communities, to see if particular constraints posed by competing options or obligations could possibly explain the lack of greater and continuous participation in the unit.

4.3.2 Existing Livelihoods

Development projects are often criticised for their ethnocentric logic (Escobar 1995). The recipients of development aid, marginal communities, are conceptualised

as 'missing' something – education, skills, income, technology, market access and institutions – possessed by the donor society at the centre. The assumption is that by remedying these deficiencies, development can proceed. The ethnocentric emphasis on what is missing, however, can often obscure what is actually there. In the case of the hunting-gathering peoples of the Nilgiri Hills, what is there is not only a distinctive animistic view of the forest, as a community of beings, but also a flexible view of livelihoods as a broad portfolio of relational engagements. Lantana manufacture, in this light, is not something to be filling a void, but rather something which needs to be accommodated into existing livelihood systems.

What people do for their livelihood was always an unanswered question in any tribal village, perhaps owing to the communities' hesitance to declare allegiance to any one 'job' or set of activities. It became clear that unlike their nontribal counterparts, not everyone chose to partake in manual labour (the main employment option in the region) on a regular basis. Others would organise subsistence activities seemingly opportunistically or as constrained by the social and ecological conditions of the moment.

Bird-David's (1992) description from her fieldwork in the 1970s is telling:

> In general, Naikens do not plan their day in advance but take up any opportunity which presents itself during the course of that day. They idle around their fires, quite often until late morning, and then set out to the forest, to the tea shop, or to a nearby market village. On their way they may encounter a Moppala, for example, who may ask them to do some work for him, or they may come by a tradeable minor forest produce which they then collect. They respond to the circumstances presented to them to meet immediate needs.

While local NGOs use 'livelihood' almost exclusively to refer to activities which represent financial earnings, this idea is clearly inadequate in the context of hunter-gatherers. We use the term in a broader context along the lines of the definition by Chambers and Conway (1992): 'A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living'. Even more broadly important, however, considering the relational thought among Naikens and other local hunter-gatherer groups, is how the context of various introduced livelihood activities may not only create but also limit relations which the people value. We did not explore this dimension in depth, but it is apparent that a singular commitment to a cottage industry like Lantana furniture manufacture through individualised labour limits what Bird-David refers to as the 'individual' self, the Nayaka self that is constituted by the plethora of social-ecological relations in which it exists. As an invasive plant, Lantana as yet has only a limited part to play in this realisation of self, and hence minimal time is allocated to this activity.

We were aware that the introduction of the craft centre was not a straightforward answer to the problem of Lantana proliferation, but we never realised how complicated it actually was. We mapped the various livelihood activities over 1 year of two neighbouring households, where the two men, Kunjan and Selvan, were brothers, who pooled knowledge and assets, and often combined their activities. Their

Table 4.1 A family's annual livelihood activity calendar

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Own Agriculture	■	■	■	■	■	■	■	■	■	■	■	■
Forest Department labour		■	■	■	■							
Local wage labour	■	■	■	■	■	■	■	■	■	■	■	■
Migrant wage labour			■	■	■							
Wild foods/fuel for self	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
NTFP for sale	■			■	■	■				■	■	■
House, land maintenance					■	■					■	■
Tending to Cattle	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Accessing the PDS	■	■	■	■	■	■	■	■	■	■	■	■
Collecting water	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
									Full-day activity			■
									Part-day activity			▒

portfolio of activities captures only a part of the total diversity in the village, but it is perhaps representative of an average family. While interviewing the families we focussed on activities they undertake, but discussions were invariably generalised, representing the livelihood activities of the Kattunayakans in the village. We focussed primarily on the Kattunayakans, since they were the majority, both in the region and especially within the Lantana unit.

We learnt that the two families, and also the wider community, engaged in a wide range of livelihood activities throughout the year. With this large diversity of livelihood activities in household livelihood portfolios, we mapped a 'livelihood calendar' of how these activities are spread out across the year. We also attempted to assess the number of days spent on the various activities in the respective seasons. For part-day activities we have assumed one working day to be 8 h, so all the activities may be compared on the same scale. We finally asked about the approximate cash income derived from the various livelihood options to better understand their choices. All these figures are from just two families, though extracted in a focus group setting with neighbours also participating, speaking more on behalf of the whole village. They are more indicative of an idealised budget rather than an exact mapping of the distribution of livelihood activities among community households (Table 4.1).

4.3.3 Interpreting the Activity Calendar

1. Agriculture on their own lands: They owned about three acres between them, most of which were planted with coffee and pepper. A significant portion of their time was spent in tending these crops. Some years they even grew seasonal crops like ginger and bananas on a commercial basis and a few other wild tubers for their consumption.
2. Forest Department: Being a significant employment provider in the region, the Kattunayakans also engaged with this employment opportunity on a semi-permanent basis, either as 'antipoaching watchers' through the year or as 'fire watchers' during the summer. The department also offered daily wage employment for 'habitat improvement activities' – clearing Lantana, deepening water holes, clearing the forest understory to create 'fire lines' to control forest fires, civil works inside the reserve, etc. The interesting aspect of this form of employment was that the remuneration, at Rs. 110 per day, was considerably lower than that in the private tea and coffee estates, but most families in the village spent at least a week or 2 every year working for the Forest Department. Our understanding is that this gives them the opportunity to interact and establish personal links with the staff of the Forest Department, possibly increasing their social capital. This is particularly relevant in helping them 'get away' with grazing their cattle or collecting wild food, honey, fuel wood, etc. inside the reserve, activities which were considered illegal prior to the enactment of The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. This type of work was almost expedition-like, involving groups of people working collectively, which is recognised as a preferred style of working among many indigenous communities. Women also took part in this work at times, though were paid less – Rs. 90 per day. Selvan had worked as an antipoaching watcher some years ago, but now only worked on and off as a casual labourer.
3. Local wage labour: Given the considerable number of tea and coffee estates around, there is a labour shortage at most times of the year. Wage labour on these estates is the most remunerative form of employment. Kattunayakan men in particular specialise in 'lopping work', undertaken just before the monsoon (May–June), where the branches of shade trees are cut back. It involves considerable skill and dexterity, in being able to climb and balance in large trees and branches with no safety equipment. During this season, men were paid up to Rs. 300 per day. Tea picking, fertilising and weeding work was available through the year, where women were paid Rs. 150–200 and men about Rs. 200–250 per day. In peak season local labour contractors often came to the village in jeeps and went from house to house asking people to come for work, offering transport up and down, along with higher wages. Again Bird-David's (1992: 27) description from the 1970s still holds true: 'The plantation officers depended on the Nayaka labour more than the Nayaka – who could turn to the forest – depended on them'. Men tended to work mostly in the lopping season, but women worked intermittently through the year.

4. Migrant wage labour: This occurred mostly in neighbouring districts of Kodagu in Karnataka and Wayanad in Kerala, around coffee harvesting and ginger planting seasons. The wages were perhaps a little more than local wage at about Rs. 300 per person, and only men went for this work. Again, more than the remuneration, its attraction was perhaps the group activity, the age and gender sociality and solidarity building among young men, etc. All the young men treated it almost like an annual outing, a period of 'liminality', separate from the community, where they could enjoy a kind of 'communitas' (Turner 1969) among a male age set.
5. Gathering wild foods and fuel wood for self-consumption: Despite being very much a part of the mainstream cash economy system, the people of Chembakolli claimed they could not 'resist' some forest things – honey, tubers, mushrooms and wild fruits. With access to the reserve being restricted, these were becoming increasingly harder to get. Yet they continued to invest a significant proportion of their time and energy in gathering wild foods. Fuel wood demand was a continuous constraint in their lives; every family in the village spent a significant part of their time collecting fuel wood. It was usually a weekly activity, with both husband and wife working together to collect the wood and in the daily activity of chopping the wood into more usable sizes.
6. Fuel wood and non-timber forest produce (NTFP) for sale: NTFP collection has come down significantly over the last decade, possibly driven by a combination of the availability of alternate sources of income, restrictions on entering the reserve and the proliferation of Lantana. Nevertheless, honey gathering was still a key livelihood activity, despite numerous arrests and considerable conflict with the Forest Department. This activity was undertaken towards the end of summer and into the start of the monsoon (from April to June), where groups of young men went on week-long expeditions into the forest, returning with as much honey as they could carry. There was considerable demand for wild honey, and each individual could earn between Rs. 3,000 and Rs. 20,000 over the season. While the list of NTFPs traditionally harvested is long, Nellikai (*Phyllanthus emblica*) and Kurunthotti roots (*Sida rhombifolia*) were the only two still widely collected and sold. This was undertaken towards the end of the year (October–January). Neither of the families we interviewed routinely collected and sold fuel wood, but took part in it opportunistically. If there was a fallen tree close to them combined with an urgent requirement for money, about 3-h work of collecting one head-load would get them about Rs. 100–150.
7. House and land maintenance: Though not considered an important part of their livelihood, a significant part of their time was spent in this activity. Houses were made with bamboo plastered with mud, with either thatched or plastic/tin sheet roofs. They required maintenance every year before the monsoon and were completely rebuilt every 7 years or so. These were almost social events, with neighbouring households all coming together to help each other. Maintaining their lands was a significant part of their livelihood activity. Most of the work was in repairing and trimming the hedges that act as fences and digging conduits to channel the flow of water in the monsoons.

8. Tending to cattle: Though not a mainstream activity, many families in the village had taken to keeping one or two milch cows, distributed through various government and NGO schemes. Despite the programme being designed to supplement family incomes, in practice the cows acted more as a convertible asset for the family, where the calves, or sometimes the cow itself, would be sold in times of need. Families who had adapted to keeping cows sometimes even bought young cows themselves at the end of the coffee or pepper harvest when they had surplus income. While not a full-time activity, each day the cows were tethered in different places to graze, sometimes moved around during the day and finally taken back to be secured in a shed adjoining their houses at night.
9. Collecting rations through the public distribution system: Two days a month were spent in a trip to the government 'ration shop' in the nearby village. All the families with a 'ration card' were entitled to 30 kg of rice, along with some wheat, sugar and kerosene. The journey to the shop and back should have taken only a few hours, but with the long queues and other social activities like sitting around the local tea shop, the better part of the day was exhausted.
10. Collecting water: Though not considered a livelihood activity, it constituted a significant part of their routine. The time spent varied greatly among families depending on how close they were to the water source. For the families we interviewed, the whole family made two 'water trips' every day, each lasting about 30 min, while the women sometimes made an additional trip during the day.

In addition to the calendar showing how various activities are distributed through the year, how families divide their time between activities is also significant (Table 4.2).

The striking element in Fig. 4.4 is the lack of correlation between the time spent on the various activities and average daily income. Over all the activities there is a negative correlation of 0.06, and considering only the remunerative activities, there is still a negative correlation of 0.32.[1] So it appears, in choosing how to split their time between all the livelihood options, they do not spend too much time on any single activity regardless of the income potential. In fact, the Kattunayakans actually choose to spend less time on activities that give them higher remuneration. This was of course immediately evident from their choice of working for the Forest Department, but comes across much more clearly when compared across all their activities. The complex reasoning behind their livelihood choices is something that cannot be completely unravelled without a full-fledged ethnographic study, yet it is clearly evident that their choices are not based on income maximisation alone but a mix of factors. Indeed, a flexible mix of diverse activities engaging a range of social-ecological relations seems to be central to the Kattunayakans' cultural model of

[1] The livelihood activities, time spent, daily income and annual income, as shown in Fig. 4.4, were tabulated in LibreOffice 3.3.4. The Pearson correlation coefficient was calculated between time spent and daily income.

Table 4.2 Time spent and income earned from livelihood activities

Sr. no.	Activity	Time (days/ year)	Total income (Rs/year)	Daily income (Rs/day)	Notes
1	Accessing the PDS	24	0	0	Both husband and wife, together 2 days a month
2	Land/house maintenance	40	0	0	Both spend a week a year on maintaining the house, with a day a month on the land
3	Water collection	91	0	0	Both people, 2 h every day, translating into a little less than 2 days a week
4	Wild foods/fuel	145	0	0	Both people, 1 day a week for fuel wood, plus 45 days for wild foods, spread across the year
5	Tending to cattle	91	6,000	66	Either person, 2 h per day. One cow is normally sold every 2 years for Rs. 12,000
6	Forest Dept labour	30	3,180	106	Mostly men (3 weeks, paid Rs. 110/day), women, at times (1 week, paid Rs. 90/day)
7	Own agriculture	170	26,000	153	Both people, 7 days a month. Income is Rs. 9,000 from 150 kg of coffee and Rs. 17,000 from 50 kg of pepper
8	Local labour	150	25,000	167	Men about 50 days, paid Rs. 250/ day. Women about 100 days, paid Rs. 150/day
9	NTFP for sale	60	15,000	214	Men collecting honey accounts for 30 days and Rs. 10,000. Other NTFP and fuel collection is a joint effort of about 30 days, earning Rs. 5,000
10	Migrant labour	25	7,500	300	Only men, about 1 month a year, paid Rs. 300 per day

livelihoods and may have been critical to their success and resilience within the forest social-ecological system.

4.4 Conclusion

With this prevailing diversity of livelihood options, the seemingly straightforward idea of ‘providing an alternate livelihood’ or ‘enhancing the livelihood of poor forest dwellers’ to capitalise on the proliferation of Lantana was at best simplistic, possibly even ludicrous. Yet, numerous NGOs, including ourselves, launch these programmes with great conviction and expectations. The basis of

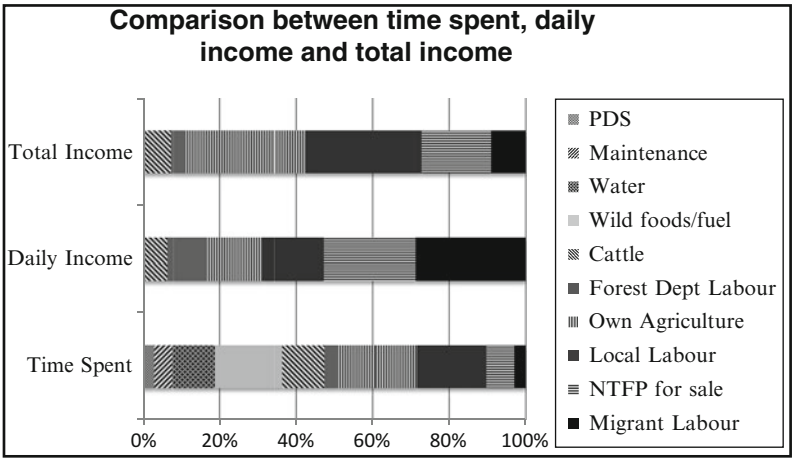

Fig. 4.4 Time and income allocation

our Lantana furniture intervention, and perhaps the basis of most other conservation and livelihoods programmes, is that if a community was offered a 'better' livelihood, usually narrowly interpreted to mean 'more remunerative', they would embrace it as 'the' livelihood option or occupation. This may not be the case for forest communities, especially if they are of hunter-gatherer origin as is evident with the Kattunayakans.

The more reasonable question we now pose to ourselves is 'will this community want to add another livelihood option to their existing ones' and if so how will they fit it into their portfolio of activities within an annual or even daily cycle. And here the answer is not straightforward. Despite the apparent failure of the Lantana furniture business, the unit never seemed to fully die. When we visited the village after a gap of a few months, assuming the unit was not functional, we were surprised to find a husband and wife walking back from the forest with a large stack of Lantana stems. On inquiring, we found all the necessary equipment set-up in their house, where they appeared to be continuing to manufacture furniture. A labour contractor from the neighbouring state of Kerala had visited the region some time before, trying to recruit workers for a large plantation, and was very interested in their furniture, particularly as a cheap alternative to cane, which was in high demand in Kerala. So despite not having any reliable communication facilities, the family had established a link with a furniture trader in Kerala through the labour contractor. If they were in urgent need of money, they would make about five chairs and either carry them to the Kerala border through the forest (about 10 km) and have the trader pick them up, or even organise a vehicle and have them transported across the state to the trader in Kerala (about 60 km by road) and return with about Rs. 5,000–8,000 in hand. They would then abandon this work for a few months and resume again for a few weeks if they needed more money. Of the 16 people who initially got trained, it appears a subset of them have continued to engage with the Lantana furniture in this flexible, opportunistic way.

In short, they have expanded their livelihood portfolio to include Lantana furniture making. However, rather than adapt their relational selves and diverse portfolio of livelihood activities to fit the singular Lantana craft industry, they have instead adapted the skill to fit into their own cultural model of subsistence. Bird-David (1992: 30) noted the same phenomena with their engagement with the cash economy:

> … the particular way in which they integrated themselves into the World of plantation, money, commodities and shops … suggested that although they had been working in the plantation for over thirty years, they did not settle for good into a new mode of subsistence, but instead incorporated wage work into their own.

The addition of the Lantana furniture livelihood skill to the locals' livelihood repertoires is possibly a good way to increase the communities' resilience and ability to cope with the rapid social-ecological change and its contingencies. And this may be an acceptable outcome for an eco-development, or adaptation initiative. However, it does not quite fit into the conservation framework, as Lantana is barely being removed at a rate that can account for any significant invasive mitigation or biodiversity conservation outcome. This case suggests we need to understand the full range of incentives and constraints that operate on individual and household decision-making in forest-dependent communities, including not only financial constraints but cultural appetites for certain activities and foods, and the social and relational entailments that come with ontologies of animism and other than human personhood in particular social-ecological systems. Kattunayakans balance these constraints by remaining diverse and flexible, relying on a full range of adaptation pathways (Thornton and Manasfi 2010) within their complex webs of relations, rather than a simple conservation or development solution.

Therefore, while these marginal communities are faced with a variety of options as a consequence of their location at the ecotones, it is important that this variety must be retained, as evidenced by the success of selected groups in Kanakapura (in Chap. 3) and the lessons from the Lantana intervention in Mudumalai (this chapter). An exclusive focus on any one strategy, as has been the experience of the Valaiyars (Chap. 2), makes the intervention unsustainable, an important lesson for development action in such landscapes.

Acknowledgements We thank Ramesh Kannan and others at ATREE for helping launch the Lantana furniture project in Gudalur; Rajeev K. Srivastava, the Chief Conservator of Forests and Field Director of Mudumalai, for all his support and help in funding the Chembakolli EDC through the Mudumalai Tiger Foundation; Ramesh Madan, Jobi Thomas, H. Madhusudanan and others at The Shola Trust who have been involved in the Lantana Project and Shonil Bhagwat and Kathy Willis for various discussions around invasive species and helping in shaping some of the ideas in this chapter. We also thank the Rufford Small Grants Foundation for supporting a part of the Lantana project. Thornton's work was funded in part by the framework project NE/I004149/ on human adaptation to biodiversity change, with support from the Ecosystem Services for Poverty Alleviation (ESPA) programme. The ESPA programme is funded by the Department for International Development (DFID), the Economic and Social Research Council (ESRC) and the Natural Environment Research Council (NERC).

References

Achhireddy, N. R., & Singh, M. (1984). Allelopathic effects of Lantana (*Lantana camara*) on Milkweedvine (*Morrenia odorata*). *Weed Science, 32*, 757–761.

Bhagwat, S. A., Breman, E., Thekaekara, T., Thornton, T. F., & Willis, K. J. (2012). A battle lost? Report on two centuries of invasion and management of *Lantana camara* L. in Australia, India and South Africa. *PLoS One, 7*(3), e32407. doi:10.1371/journal.pone.0032407.

Bird-David, N. (1987). The Kurumbas of the Nilgiris: An ethnographic myth? *Modern Asian Studies, 21*(01), 173–189.

Bird-David, N. (1990). The giving environment: Another perspective on the economic system of gatherer-hunters. *Current Anthropology, 31*(2), 189.

Bird-David, N. (1992). Beyond 'the hunting and gathering mode of subsistence': Culture-sensitive observations on the Nayaka and other modern hunter-gatherers. *Man, 27*(1), 19.

Bird-David, N. (1994). The Nilgiri tribal systems: A view from below. *Modern Asian Studies, 28*(2), 339–355.

Bird-David, N. (1999). 'Animism' revisited: Personhood, environment, and relational epistemology. *Current Anthropology, 40*(Supplement), 67–92.

Chambers, R., & Conway, G. (1992). *Sustainable rural livelihoods: Practical concepts for the 21st century* (IDS Discussion Paper 296). Brighton: IDS.

Day, M. D., Wiley, C. J., Playford, J., & Zalucki, M. P. (2003). *Lantana: Current management, status and future prospects* (ACIAR Monograph 102). Canberra: Australian Centre for International Agricultural Research.

Dorga, R. K. (2007). *Management plan for the Mudumalai Sanctuary and National Park, 2007–2012*. Madras: Government Press.

Endicott, K. (1979). *Batek Negrito religion: The world-view and rituals of a hunting and gathering people of Peninsular Malaysia*. Oxford/New York: Clarendon Press/Oxford University Press.

Escobar, A. (1995). *Encountering development: The making and unmaking of the third world*. Princeton: Princeton University Press.

Hallowell, A. I. (1960). *Ojibwa ontology, behavior, and worldview*. Indianapolis: Bobbs-Merrill.

Hockings, P. (2008). All Aboard the Nilgiri Express! – Sustained Links between Anthropology and a Single Indian District. *History and Anthropology, 19*(1), 1–16.

Ingold, T. (1994). From trust to domination – An alternative history of human-animal relations. In T. Ingold (Ed.), *The perception of the environment: Essays on livelihood, dwelling and skill* (pp. 61–76). New York: Routledge.

Johnsingh, A. J. T., Raghunath, R., & Madhusudhan, M. D. (2008). *Suggested extension for the Mudumalai Tiger Reserve, a unique tiger landscape in India*. Mysore: Nature Conservation Foundation.

Love, A., Babu, S., & Babu, C. R. (2009). Management of Lantana, an invasive alien weed, in forest ecosystems of India. *Current Science, 97*(10), 1421–1429.

Manfredo, M. J., & Dayer, A. A. (2004). Concepts for exploring the social aspects of human–wildlife conflict in a global context. *Human Dimensions of Wildlife: An International Journal, 9*(4), 1–20.

Parsons, W. T., & Cuthbertson, E. G. (2001). *Noxious weeds of Australia* (2nd ed.). Collingwood/Melbourne: CSIRO Publishing.

Scoones, I. (1998). *Sustainable rural livelihoods: A framework for analysis* (IDS Working Paper 72). Brighton: Institute of Development Studies.

Sharma, O. P., Makkar, H. P. S., Dawra, R. K., & Negi, S. S. (1981). A review of the toxicity of *Lantana camara* (Linn) in animals. *Clinical Toxicology, 18*, 1077–1094.

Sharma, G. R., Raghubanshi, A. S., & Singh, J. S. (2005). Lantana invasion: An overview. *Weed Biology and Management, 5*, 157–165.

Suresh, H. S., Dattaraja, H. S., & Sukumar, R. (2010). Relationship between annual rainfall and tree mortality in a tropical dry forest: Results of a 19-year study at Mudumalai, Southern India. In *Adaptation of forests and forest management to changing climate selected papers from the*

conference on 'Adaptation of forests and forest management to changing climate with emphasis on forest health: A review of science, policies and practices', Umeå, 25–28 Aug 2008. *259*(4) (February 5), 762–769. doi:10.1016/j.foreco.2009.09.025.

Swarbrick, J. T., Willson, B. W., & Hannan-Jones, M. A. (1998). *Lantana camara* L. In F. D. Panetta, R. H. Groves, & R. C. H. Shepherd (Eds.), *The biology of Australian weeds* (pp. 119–136). Melbourne: R.G. & F.J. Richardson.

Thaman, R. R. (1974). *Lantana camara*: Its introduction, dispersal and impact on islands of the tropical Pacific Ocean. *Journal of the University of Guam, 10*, 17–39.

Thekaekara, M. (2009). Honey is life. *The New Internationalist*. http://www.newint.org/features/2009/09/01/tribal-peoples. Accessed 1 Oct 2012.

Thekaekara, T. (2010). Dissecting the 'human' in human-wildlife conflict. M.Sc. thesis, University of Oxford.

Thornton, T. F. (2008). *Being and place among the Tlingit*. Seattle: University of Washington Press.

Thornton, T. F., et al. (n.d.). *Human adaptation to biodiversity change: Rethinking pathways, synergies, and solutions. Manuscript in the author's possession*. Oxford: Environmental Change Institute, University of Oxford.

Thornton, T. F., & Manasfi, N. (2010). Adaptation, genuine and spurious: Demystifying adaptation processes in relation to climate change. *Environment and Society Advances in Research, 1*, 132–155.

Thurston, E. (1909). *Castes and tribes of Southern India*. Madras: Government Press.

Tireman, H. (1916). Lantana in the forests of Coorg. *Indian Forester, XLII*, 387–392.

Turnbull, C. M. (1965). *The Mbuti Pygmies: An ethnographic survey* (Anthropological papers of the American Museum of Natural History, Vol. 50). New York: American Museum of Natural History.

Turner, V. W. (1969). *The ritual process: Structure and anti-structure*. Chicago: Aldine Pub.

Zvelebil, K. V. (1982). Jēnu Ku umba: Brief report on a 'Tribal' language of the Nilgiri Area. *Journal of the American Oriental Society, 108*(2), 297–301.

Chapter 5
Community-Driven Ecotourism Near Bangalore: Adapting to Change

Priya Gupta, Seema Purushothaman, Benson Issac, and Akai Mao

5.1 Introduction

Ecotourism (ET) emerged as a response to the adverse consequences of conventional tourism practices. The consequences ranged from major environmental problems including pollution, deforestation, loss of habitat, local resource shortages to socio-economic problems of overcrowding and economic and cultural dislocation, eventually undermining tourism potential itself. Ecotourism, unlike conventional tourism, attempts to reconcile leisure travel with multiple objectives of local livelihoods, sociocultural values and sustainability, employing measures to reduce negative impacts on the natural and cultural environment while ensuring that benefits are realised by local communities. Thus conceptualised, ecotourism is meant to be characterised by its focus on eco-cultural sustainability and conservation education, with significant involvement of and benefits (both social and economic) to local communities (Purushothaman et al. 2007).

Thus, ET seeks to accommodate and host visitors in a way that is minimally intrusive or destructive to the natural and cultural environment of the destination. At the same time, it builds awareness and respect for the socioecological system among all stakeholders involved. Unlike conventional tourism, it retains a significant

P. Gupta
National Institute for Advanced Studies, Bangalore, India

S. Purushothaman
Azim Premji University, Bangalore, India

Adjunct Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: seema.purushothaman@gmail.com

B. Issac (✉)
Azim Premji University, Bangalore, India
e-mail: benson.issac@gmail.com

A. Mao
Ashoka Trust for Research in Ecology and the Environment, Darjeeling, India

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_5, © Springer India 2013

proportion of revenue with the host community by using locally owned facilities and services, minimising leakage of resources, including natural, human and financial. ET also increasingly relies on infrastructure blending with the natural environment (Epler 1996) and minimises carbon emissions. More importantly, it emphasises the need for planning and monitoring for avoiding unsustainable growth of the tourism industry.

In the peripheries of the Western Ghats, one would expect such ET enterprises to be a naturally emerging response given the tremendous potential from both the demand side (the vast market of domestic tourists growing with the economy) and supply side (the natural and sociocultural uniqueness). Given the growing urbanisation pressures faced by these regions, ET can be seen as a mechanism that can potentially transform these pressures into opportunities.

In this context, this chapter assesses the viability of community-driven ET enterprises in three selected sites located in the peripheries of Bangalore, with the objectives of analysing the potential for community-identified tourism packages in terms of local benefits. Following exploratory visits and interactions with local youth, a stratified sample of travellers was interviewed to gather information on their motivations for travel and willingness to diversify their experience. Based on this information collected, we explore the feasibility of community-driven tourism ventures in three sites.[1]

5.2 Ecotourism: For, Of and By the Community?

Viability of ecotourism ventures depends on the synergy between collective actions and private initiatives. Usually a small group of interested individuals acquire skills and develop such enterprises while balancing this with other occupations they pursue. The inherent challenges include conflicts within the collective as also between the collective and other locals as well as financial viability.

Collectively evolved mechanisms for monitoring impacts and for deciding the carrying capacity of the enterprise and of the locality are crucial to adhere to the environmental objectives of ecotourism. This needs to be accompanied by a shared understanding and mechanism for dispute resolution so as to ensure the social feasibility of such collective enterprises. With these challenges in mind and recognising the relevance of initiatives originating from community stakeholders, it is referred to henceforth as community-driven ecotourism (CDET).

'Community-driven ecotourism' (CDET) takes the social aspect in ecotourism a stage further. With substantial stake for local community in the development, management and outcomes of the venture and a major proportion of the benefits remaining within the community (WWF 2001), CDET is seen as a development tool, bringing wider benefits to the community and their environment while fostering empowerment.

However, the de facto scenario that stares us in the face today (in the Indian context) is one where local communities, owning and/or inhabiting a natural attraction,

[1] From where local youth approached us for an assessment.

are simply viewed as sources of cheap labour or as colourful objects of interest in travel packages. They receive insignificant economic benefits and have little or no role in the planning or management of operations inspite of being major part of the system. Thus, ecotourism, as it is in practice today, provides few incentives for local communities to conserve their natural and cultural resources or stops at token service to these. The end result is that tourism is planned and managed in ways that are delinked from the development needs and aspirations of the local community. In order to retain the focus of ET on the local benefits in terms of livelihoods and conservation, the role of communities in ecotourism needs to be strengthened.

5.2.1 The Debate on and Experience of Ecotourism

Previous experiences in community-based ecotourism (CBET) (Beavers 1995; Herrera 2006; Odero and Huchu 1998; Doria et al. 2003) throw light on how to face multiple challenges impending, how to inculcate cultural peculiarities without commodifying them to address the constantly emerging capacity needs, to identify and monitor indicators of impact, to develop cross-cultural communication skills, to evolve strategic and fair business tie ups, to avoid and resolve conflicts and finally to share benefits. The presence and participation of strong nongovernmental organisations (NGOs) and decentralised governance mechanisms always emerge as crucial factors in any successful CBET enterprise model. Diverging from the external origin and anchorage of CBET, the community can decide the kind and extent of tourism that should occur in the area and also, importantly, how they would like to be involved, giving rise to location-specific models, driven by contextual strengths.

In the case studies written up by the World Tourism Organization (WTO 2000: 11), four major factors were identified for sustainability of such projects. Local community involvement in the planning, development and management of the projects was seen as the most critical factor, with 40 % of case studies citing it as specifically relevant in determining success (Edwards 2004). In fact, the degree of control the local population has over tourism in their locality is generally perceived as being a significant element of ensuring sustainability of a tourism venture (Mowforth and Munt 1998).

Despite the overwhelming evidence in favour of community-driven ecotourism, a review of ET policies (Purushothaman et al. 2007) revealed the lacunae in the concept, practice, policies and institutions in the sunrise industry of ET in India.[2] Consultations and reviews undertaken for the study reveal an apparent conservation bias at the cost of local stakes. Due to the conceptual ambiguity in defining ET, proactive practices were found to be rare except for isolated cases that too in a limited manner,

[2] Purushothaman et al. (2007) discuss policies and institutions to monitor social and ecological sustainability of ecotourism enterprises in India. It reviews prominent ecotourism models in Kerala, Karnataka, Sikkim and Darjeeling and elicits a set of user-friendly criteria for assessing impacts in terms of eco-cultural footprint, community involvement and equity.

mostly confined to employment of a few locals as guides and cooks, whilst other forms of benefit sharing were found to be virtually absent. In fact, the employment benefits could have been higher if synergies in needs and availability of capacities had been considered as a prerequisite.

The reality is that many of the ecotourism initiatives today are conceived as top-down initiatives with little community ownership and active involvement. The need is not only to ensure that local stakeholders become the beneficiaries of tourism but also, more importantly, to make them drivers of needed planning and management processes.

In fact, CDET offers scope to encourage sustainable land use that can potentially synergise forest resources with agriculture and open spaces in rural areas. By upgrading local infrastructure to meet the needs of tourists, the living standards of local communities will also benefit, especially in the areas of public health, sanitation, energy and waste management. If CDET functions this way, both as a conservation and rural development strategy, it would not compromise natural and cultural resources, while meeting local development aspirations.

Henceforth in this chapter, we use the terms ET and CDET synonymously, given the imperative need for ET to be community driven so as to meet its objectives.

5.2.2 Geographical and Socioeconomic Context: Assessing Market Potential for CDET Around Bangalore

Feasibility study is a step towards addressing the gaps in the ecotourism sector in India and to turn the focus to the less engaged aspects – that of local benefits of the sector in terms of livelihoods and conservation. This study was driven by local youth from peri-urban Bangalore who approached us for a critical look at an enterprise that they identified. Excited by the livelihood opportunities offered by ET, in the backdrop of exclusion from the economic opportunities in and around Bangalore, they identified local possibilities. From these, three sites around the city of Bangalore were identified as having potential for such enterprises, namely, Kokrebellur, Ramanagaram and Panchagiri (see Fig. 5.1). While the former two are relatively well-known sites particularly among avid bird watchers and rock climbers, respectively, Panchagiri is practically unexplored by tourists. All the three sites are located within 100 kms from Bangalore City. Kokrebellur and Ramanagaram are located along the eastern peripheries of the Western Ghats, whereas Panchagiri is surrounded by forested lands and hilly regions (see Fig. 1.1) towards north of Bangalore. For these sites, potential packages were drawn up in close consultation with local communities. The objective was to analyse the potential of the identified packages in meeting the objectives of CDET and to get an idea of potential benefits from such packages to local communities.

We do not adhere here to the conventional valuation methods followed in similar studies on ET like contingent valuation or travel cost (e.g. Hadker et al. 1997; Lee and Mjelde 2007; Lindsey et al. 2005). Instead, the intention was to understand

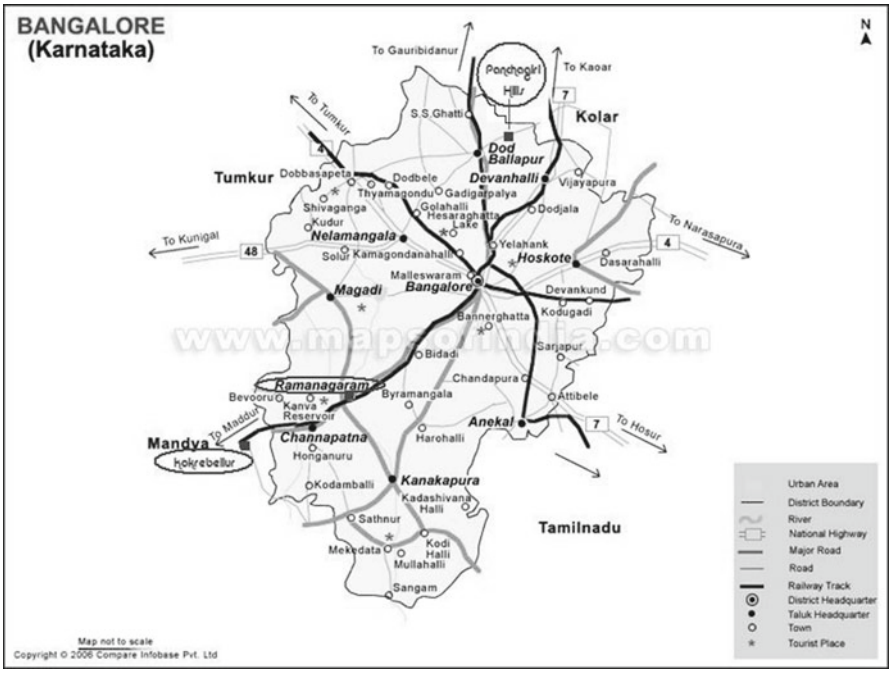

Fig. 5.1 Potential sites for CDET near Bangalore

the feasibility of ET initiatives in this setting, starting from socioeconomic profiling of potential visitors, their willingness to pay for different amenities and their expectations from such travel experience.

The following is a summary of site details, compiled from the observations and discussions of the authors and locals as well as information available in the public domain.

5.2.2.1 Kokrebellur

Kokrebellur is a village situated in Mandya district around 120 kms south-west of Bangalore, on the eastern outpost of the Western Ghats. One of the well-known sites in Karnataka for community-initiated conservation efforts, Kokrebellur is a historic nesting site for endangered migratory birds like spot-billed pelicans (*Pelecanus philippensis*) and painted storks (*Ibis leucocephalus*). Tourism in this village is however limited to individuals arriving on their own, mostly avid birdwatchers.

There are around 430 households in the village with a total population of approximately 3,000, primarily engaged in agriculture, pottery and sericulture. Agriculture is the primary source of livelihood for the locals, even with marginal size of holdings (about an acre), with sugarcane, paddy and ragi being the

Fig. 5.2 Painted storks roosting on trees in Kokrebellur

main crops cultivated. Women in their spare time also engage in tending mulberry fields, sericulture and selling the cocoons in local markets.

Cultural attractions around the village include a hilltop temple within a kilometre from the village where grey hornbills (*Ocyceros birostris*) can be sighted during the migratory season and *Shravana Gudda,* a hillock, about 4 km from the village which has an 18 ft monolithic statue of Sri Bhagawan Bahubali, atop the hill. The region hosts *Jatri puja*, held during the second week of April for 3 days, which attracts more than 3,000 people to the village. Besides this, there is a large lake in the area frequented by diverse species of birds. Community ventures here could offer coracle rides, birding trips, trekking or bullock cart trails to interested tourists (Fig. 5.2).

No concerted conservation measures have been taken up by government for the welfare of the birds. Efforts have been limited to a census of the trees in the village wherein compensation is made to the locals for preserving the constant number of trees. An environmental enthusiast group, Mysore Amateur Naturalist, has been involved along with villagers in preserving nesting sites of the endangered bird species. There were no visible conflicts among the villagers, and there is consensus that the birds should be protected at any cost. Their relations with the government department of tourism, on the other hand, appear to be strained due to the apparent apathy exhibited by the latter in trying to spread conventional tourism.

The villagers have an aversion for conventional tourism as it has negatively impacted the local environment and proved to be particularly detrimental to the welfare of the birds. Besides the litter and waste disposal problems, the consumption

of alcohol and disruptive behaviour by tourists have had negative cultural impacts, particularly on children. The locals, however, welcome researchers and student groups who are allowed to stay in the village. Though a minimal fee is paid to the locals for homestays, the rates for other services provided have however not been standardised. The fee collected goes mostly towards conservation of the birds.

The villagers are willing to participate in tourism provided the negative impacts generated by it are minimised and also importantly if they are involved in the planning and management of the enterprise. There is clearly an opportunity for community ecotourism to revive the economic and social infrastructure of the village of Kokrebellur.

5.2.2.2 Ramanagaram

Ramanagaram is situated on the banks of the Arkavati River, south-west of Bangalore. Well known for the rocky hillocks surrounding the region, Ramanagaram is also known as the land of seven hills having innumerable granite monoliths spread over a wide flatland. Only recently declared as a district, it is about 48 km away from Bangalore on the Bangalore-Mysore highway. Though the tribal population here is dependent on forest resources for their livelihood, agriculture is the primary occupation with ragi being the dominant crop raised in the area.

Ramanagaram is famous for its silk market, one of the biggest in India, and therefore is popularly known as 'Silk Town'. The place is also noted for the manufacture of highly artistic terracotta artefacts and pottery and its many short rock climbs (Fig. 5.3).

The region is covered by scrub forest and is home to threatened bird species such as the yellow-throated bulbul (*Pycnonotus xantholaemus*) and long-billed vulture (*Gyps indicus*). In fact, these hills are today one of the few locations in south India where the long-billed vultures nest. The region is also home to numerous sloth bears (*Ursus ursinus*). However, the picturesque hills have been threatened by quarrying. Rock climbing, temple visits, guided tours of sericulture units, bird watching and coracle rides are amongst the potential tourism activities here.

The fallow season (March to June) during which the locals are relatively free from agricultural responsibilities can be utilised productively to operate ecotourism activities. This would bring in much needed income for the predominantly agrarian community. Ramanagaram has a good number of educated rural youth for whom finding employment presents a challenge given the lack of nonfarm opportunities to capitalise on. The local youth themselves have many ideas for tourism activities around this region and wish to acquire new capacities to diversify livelihood options including planning and management of ecotourism operations. The local youth find themselves available for a minimum of 10 days in a month for ecotourism activities. There are active self-help groups to provide some of the required services for the ecotourism enterprise, such as preparing food, supplying local handicrafts and vegetables, among other things.

Fig. 5.3 Craft works in Ramanagaram: a tourist attraction

5.2.2.3 Panchagiri

Located about 55 kms from the city of Bangalore towards its north, the Panchagiri Hills derives its name from the five hills that dot the area. These are Nandi giri, Chandra giri, Skanda giri, Brahma giri and Hema giri.

Nandi Betta (Nandi Hill) is the only hill among the five with access by road. The hill was strategically important for Tipu Sultan's defences and hence was made accessible by road. Consequently, over the years, while Nandi Hill developed into a weekend tourist hotspot, the other four hills that dot the area have practically remained unexplored. Being the origin of many rivers (including the Arkavati, which goes on to join the Cauvery), the region is lush green with many waterfalls and attractive spots for tourists.

The cohesive village community here has collectively ensured the prevention of environmentally degrading activities in the landscape. A strong protest from local inhabitants against stone mining in this area to protect the catchment has resulted in complete stoppage of mining around these hills. Three villages in the area also came together (as Chandra giri Jalanayana Abhiridhi Samaja) for conservation of the local irrigation tank. This and other institutions in the community are active and have helped preserve the pristine natural beauty of the area.

The understanding about the sociopolitical scenario, from our conversations with the Panchayat leaders, points towards a relatively politically conscious community. One of the challenges here, as in Ramanagaram, has been the absence of nonfarm

Fig. 5.4 Chandra giri, one of the five hills that form the Panchagiri Hills, has been identified as a potential camping site by the community

alternative income opportunities. Consequently, we find rampant migration to Bangalore in search of employment. Few educational institutions are in the near vicinity, and though some locals possess graduate and postgraduate degrees, they still lack professional skills.

This apart, the picturesque environs and the presence of strong social organisational structures and apparent cohesiveness within the community bode well for an ecotourism enterprise in the area. In fact, an ecotourism enterprise can absorb many of the unemployed educated youth who leave the villages looking for greener pastures in the city. Having witnessed mass tourism in the neighbouring Nandi Hills, they have been cautious of hordes of tourists visiting and negatively impacting their natural and cultural environment. In fact to this end, they have consciously avoided building a road access to the hills and have instead raised natural barriers by way of farming the area. Ecotourism will provide an impetus to the village economy while preserving or revitalising natural and cultural integrity of the locality. They are enthusiastic about receiving training that would help them participate effectively in ecotourism enterprise planned and managed by them (Fig. 5.4).

In the following sections, we examine the scope for and potential of ecotourism ventures in the three sites described previously. This is done through a survey of potential tourists to understand their preferences and inclinations, as well as by estimating the cost of ecotourism ventures in these sites. Overlaying these results, we draw conclusions on the net potential of ecotourism initiatives in these sites.

5.3 Asking the Tourists

Following a stratified sampling approach, a sampling frame consisting of residents of Bangalore belonging to different occupational strata was prepared. The sample profile for the study was arrived at after consultation with the travel fraternity in Bangalore. Our discussions revealed that IT professionals make up as high as 75 % of the visitors to Jungle Lodges and Resorts, a premier public sector ecotourism company having nearly a monopoly in the ecotourism sector in Karnataka. Thus, for this study, the IT community comprises the major segment (of the respondents) that we targeted for the final survey.

After a preliminary survey of visitors to Nandi Hills to get an understanding of the general tourist's perception towards ecotourism, a semi-structured questionnaire was prepared for the three selected sites to gauge the local perception towards CDET and also to assess the local community infrastructure (human resource, accommodation, tourist attractions, transportation, access, etc.). This was tested through discussions with the local communities including the Panchayat heads and other contacts in the three selected sites.

The findings from the preliminary survey and the site visits were used in designing the packages and for framing the questionnaire for the final survey. The questionnaire was essentially with multiple choices and divided into three sections. The first section addressed the socioeconomic profile of the respondents, the second part covered their general travel preferences, while the last section dealt with their willingness to pay (WTP) for the packages and their expectations from CDET. The questionnaire was administered through face-to-face interviews as well as through email. Of the total 66 responses, 48 were from face-to-face interviews and 18 were received via email.

5.4 The Tourists: Who They Are and Their Expectations

5.4.1 Socioeconomic Profile

Male respondents constituted 61 % (40) of the sample, and 62 % (41) out of the total were single. The age profile showed that 54 % (36) were in the age group of '26 to 36 years' followed by '25 years and below'. The occupational profile of the respondents was with high (68 % [45]) representation from the 'private sector', primarily working in the IT industry. Government servants, those having their own business and students, comprised the rest of the sample. Nearly half the respondents drew an income of more than Rs. 40,000[3] per month, and amongst the remaining, almost a quarter earned more than Rs. 20,000 per month, auguring a potential clientele for CDET.

[3] All monetary figures in the chapter are for the year 2007.

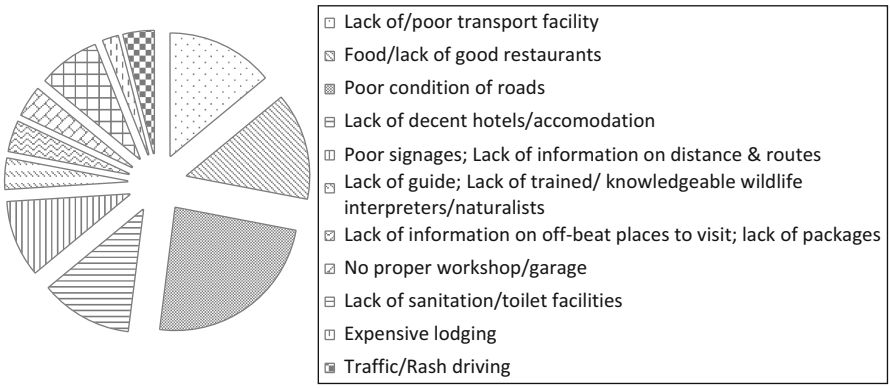

Fig. 5.5 Problems experienced by tourist respondents

But expectations are high and hence quality and minimum standards have to be assured in CDET enterprises. Interactions with the respondents revealed that 'ecotourism' was a new concept for majority of them. Nevertheless, for many of them, CDET was an interesting and noble concept that they would like to know more about and experience.

5.4.2 Travel Preferences

Following the questions on socioeconomic status, respondents were asked about their travel preferences. This provided useful insights into the tastes and motivations of travellers shaping their decisions on destinations. The survey findings clearly reflect that the interest of visitors varies significantly and hence ecotourism packages need to be diversified.

Half of the trips undertaken were weekend trips with respondents spending on an average Rs. 1,096 per day per person. The day trips and longer trips undertaken by the respondents are of equal number, with expenditures amounting to Rs. 438 and Rs. 1,088 per person per day, respectively. Sightseeing is the most popular activity in all these trips with natural attractions being most popular, followed by historical/ architectural attractions.

Among the problems faced during the leisure trips, poor facilities and roads en route to destinations were the most important problems cited by (see Fig. 5.5) most respondents.

With regard to the type of accommodation that travellers preferred, we found that lodges and homestays were among the most preferred options (Fig. 5.6).

We find that families place more emphasis on comfortable accommodation, and therefore a majority (72 %) of married respondents opted for lodges and hotels.

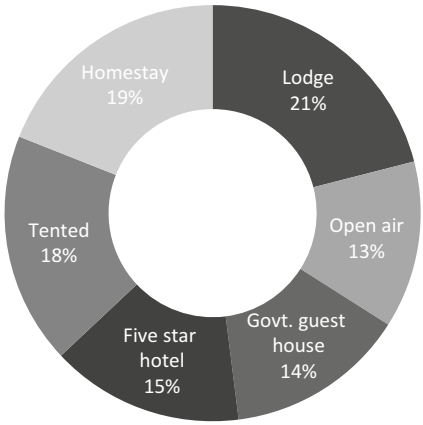

Fig. 5.6 Accommodation preferences among tourists (%)

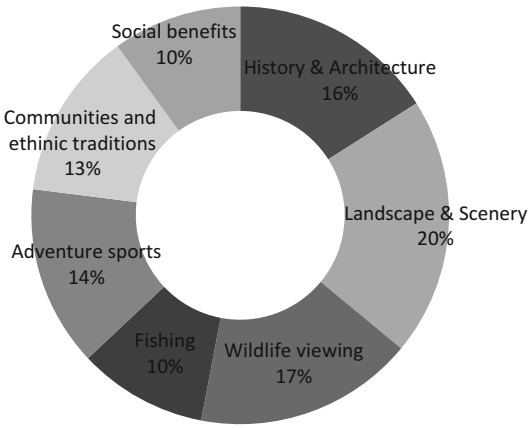

Fig. 5.7 Travel priorities (%)

The choice for 'open air' as a part of eco-tourist destinations was only from young single individuals.

Among the criteria to select any destination, landscape and scenery (20 %) were the top priority for tourists followed by wildlife, history and architecture. Adventure sports, communities and ethnic traditions received nearly equal ratings. Social benefits and sport fishing or angling turned out to be of least (10 % each) importance for respondents. Social benefits to locals being a new concept for practically all respondents, the rating was understandably low. As for the sport fishing, being a specialised sport in the river Cauvery and an expensive one at that, it is mainly indulged by a privileged few. Consequently, the low rankings for both the social benefits and sport fishing are by no means indicative of a lack of preference for the same (Fig. 5.7).

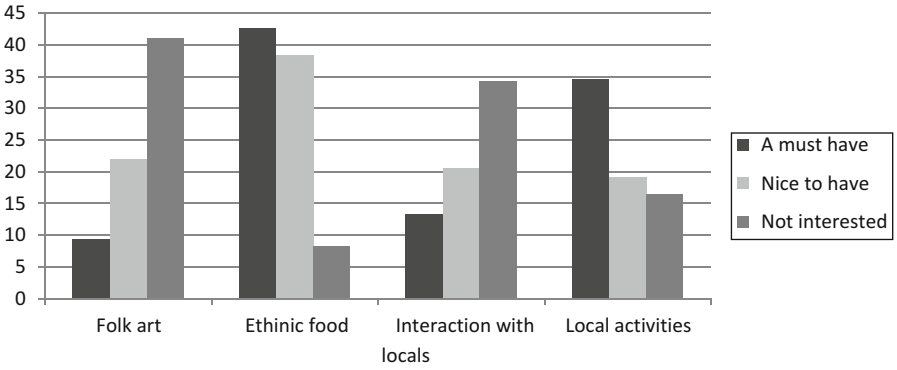

Fig. 5.8 Expectations from CDET activity

5.4.3 Perceptions and Preferences in CDET

In the final section, the respondents were asked about their expectations from travel experiences and perceptions on CDET.

An analysis of the respondent's expectations from CDET (Fig. 5.8) indicates that 'eating local cuisine' is the most favoured activity (92 %), with as high as 40 % opting it as a must-have activity. This is followed by 'witnessing traditional folk art/local festivals' with 83 % of the respondents in favour of the activity. This is a must-have activity for 32 % of the respondents. Interacting with local people and experiencing local activities are also equally favoured by 82 % of the respondents, though the former has a higher percentage of respondents opting for must-have at 26 %. Overall, we find that majority of the respondents feel that all the four activities are 'nice to have' and would add value to the CDET experience, especially local cuisine.

To the question of whether environmental conservation and local benefits are integral to tourism activities, 79 % of the respondents answered in the affirmative for both. Seventeen per cent felt that only conservation was integral to tourism activities. The rest opted equally for 'only local benefits' and 'neither'. Though conservation bias was absent among the respondents, some antagonism was expressed towards local benefits by those who felt that the 'conservation' was being compromised in favour of the 'livelihoods'. Nevertheless overall, the results indicate a positive perception towards responsible tourism.

5.4.4 Tourist's Willingness to Pay for CDET

The average WTP (per person per day) for a secure tented accommodation was Rs. 768, for clean local food Rs. 319 and for a local escort, guide and first aid

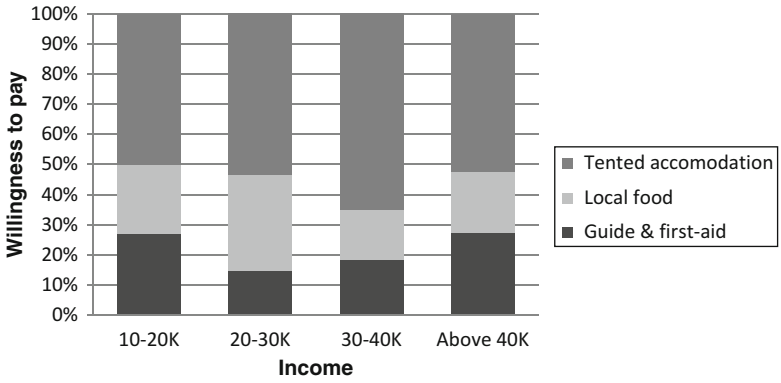

Fig. 5.9 Willingness to pay among different income groups

Table 5.1 Estimated cost of services and corresponding willingness to pay for ET services (Rs./person)

Service	Estimated cost	WTP
Clean local food	100	319
Local guide and first aid	300	352
Accommodation	250	768
Total	650	1,439

Rs. 352. We find that as high as 53 % of the total expenditure has been allocated for tented accommodation, while almost equal share between 22 and 24 % is allocated for food and an escort. More importantly, we find that the WTP does not necessarily increase with increase in incomes (see Fig. 5.9).

How much an individual is willing to pay is primarily affected by the awareness about ET and whether a place/package meets their preferences. From the interactions with the respondents during the survey, we also found that the cost of a package was not an issue for a majority of the respondents, provided authentic and quality products and services were assured.

A cost[4] estimate (per person per day) for providing services to guests was worked out with the locals during the field visits. Table 5.1 shows the details of the same.

With the profit margins shown as in Table 5.1, and assuming that 10 guests are hosted (for a two-day package) in a month, the total profit generated could be about Rs. 15,780. If this profit could be shared between locals, this forms useful supplementary income.

[4] All monetary values are for the financial year 2007–2008, when the survey was conducted.

5.4.5 Learning on ET for Livelihoods in the Fringes

In the long run, with enhanced skills, capacities and social networks of the local people, CDET will morph into individual livelihood option as a small enterprise as private initiatives and mechanisms will be streamlined in tandem with natural and cultural heritage. Thus by the time collective efforts in CDET gain maturity as an enterprise, it would have set the basic fabric necessary for a stable locally grounded livelihood option.

Despite potential attractions, one other challenge faced by CDET enterprises is the lack of linkage with potential ecotourists. Though NGOs may provide some assistance in the short run, organised and well-connected tour operators among the locals will provide better assistance with marketing. Creating websites and collaborating with the bigger players in the tourism industry to provide necessary exposure in the long run is a specific role for NGOs. Once established, these enterprises can reach target market segments through promotions, appropriate marketing channels, pricing and product differentiation. Existing markets in the cities need to be tapped first till the community's confidence and skills in management of the enterprise improve in the due course. The importance of building and strengthening institutional linkages (NGOs, GOs, private sectors, tour operators, etc.) is an indispensable component if ecotourism is to deliver the desired goods. This chapter also points out that local cuisine and natural landscapes are important features to be considered in setting up a viable CDET.

It is pertinent to point out that many ecotourism projects languish in socioecological objectives due to lack of monitoring and evaluation. A well-established monitoring system for the CDET enterprise needs to be in place. Tools and indicators need to be developed right at the beginning by the enterprise to constantly watch the positive and negative impacts of the enterprise. Monitoring provides a means of measuring social and ecological impacts over time and being proactive in mitigating negative consequences.

5.5 Conclusion

Linking informed choices in leisure travel and rural livelihoods though appears feasible emerges as a challenge despite the existing demand, presence of suitable natural and cultural attractions and enthusiastic rural youth. Our case studies also reveal that social benefits of tourism being a new perspective for the conventional tourists, this needs to be mainstreamed carefully with the focus pitched on sustainability of tourism itself. Contrary to the elitist nature resorts, the natural and cultural attractions in the case studies here appear to attract travellers irrespective of individual levels of income.

The results reveal the potential for CDET as a means to synergise sustainability and livelihood and therefore of particular relevance to communities living close to both natural and urban landscapes, caught between conservation and urbanisation.

However, CDET must be necessarily with the active involvement of locals to identify potential attractions and historical narratives. Active community initiative is the missing link which needs to be addressed if ecotourism is to positively benefit local livelihoods along with their natural and cultural environment.

There was generally a positive response to developing CDET enterprises in the three study sites, particularly given the gradual erosion of other traditional livelihood options like farming. However, in all study sites, a lack of synergy with local government institutions, infrastructure and the inadequate skills amongst villagers pre-empted such opportunities. For local communities to assume roles as CDET entrepreneurs, it is imperative to build capacities in guiding tourists, language skills, combining local cuisine and infrastructure with standards of hygiene, accountancy and administration. Strengthening capacities of the social networks could be an important focus area besides instilling confidence in seeking better livelihoods in one's neighbourhood. Capacity building will be an ongoing investment throughout the life of the enterprise, and in this regard relevant local agencies (both government, voluntary and academic) could play facilitating roles. Thus established, CDET can lay the base from where individual but networked livelihood enterprises can emerge in the peri-urban villages.

References

Beavers, J. (1995). *Community based ecotourism in the Maya Forest: Six case studies from communities in Mexico, Guatemala/Belize*. Unpublished Report, The Nature Conservancy-USAID/MAYAFOR Project.

Doria, C. R., Rosendo, C., & Sergio, F. D. (2003). Community-based ecotourism in the Pedras Negras and Curralinho extractive reserves, Guapore River Valley. *Lyonia, 4*(1), 35–42.

Edwards, V. M. (2004). *The commons in an age of global transition: Challenges, risks and opportunities*. The 10th Biennial Meeting of the IASCP Oaxaca, Mexico, p. 30.

Epler, W. (1996, May 18–23). *The evolution of ecotourism as a sustainable development tool*. Paper presented at the sixth international symposium on society and natural resource management, Pennsylvania State University, University Park.

Hadker, N., Sharma, S., David, A., & Muraleedharan, T. R. (1997). Willingness to pay for Borivali National Park: Evidence from a contingent valuation. *Ecological Economics, 21*, 105–122.

Herrera, J. (2006). *Lessons from the Equator Initiative: The Casa Matsiguenka community-based ecotourism lodge enterprise in Manu National Park*. Peru: University of Manitoba.

Lee, C.-K., & Mjelde, J. W. (2007). Valuation of ecotourism resources using a contingent valuation method: The Case of the Korean DMZ. *Ecological Economics, 63*, 511–520.

Lindsey, P. A., Alexander, R. R., du Toit, J. T., & Mills, M. G. L. (2005). The potential contribution to ecotourism to African wild dog *Lycaon pictus* conservation in South Africa. *Biological Conservation, 123*, 339–348.

Mowforth, M., & Munt, I. (1998). *Tourism and sustainability: New tourism in the third world*. London/New York: Routledge.

Odero, K. K., & Huchu, P. (1998). *Community-based ecotourism venture: The case of Sununguka Camp, Zimbabwe*. Washington DC: The World Bank/WBI's CBNRM Initiative.

Purushothaman, S., Jojo, T. D., & Patil, S. (2007). Ecotourism policy: A framework for India. In G. Radha Krishna (Ed.), *Tourism: Perspectives and issues* (pp. 51–78). Hyderabad: ICFAI Press.

World Tourism Organisation. (2000). *Sustainable development of tourism: A compilation of good practices*. Madrid: WTO.
WWF-International. (2001). *Guidelines for community based ecotourism development*. Gland: WWF-International.

Chapter 6
Conservation and Coffee Production: Creating Synergies in Kodagu, Karnataka

Rosa Abraham, Seema Purushothaman, and Soubadra Devy

6.1 Introduction

The district of Coorg, or Kodagu, in south-western Karnataka, is known for its natural beauty and biodiversity. Located in the eastern slope of the Western Ghats, Kodagu is blessed with verdant valleys and lush forests. Since as early as the sixteenth century, coffee has been a popular and successful cash crop grown in this region.

However, over the recent years, the vegetation and forest cover of Kodagu have been fast declining, a consequence of colonial forestry practices, removal of forests for large-scale coffee plantations and other anthropogenic influences. The loss of forest resources and the consequent decline in biodiversity has tremendous and far reaching implications for the predominantly agriculture-dependent economy, as coffee plantations rely heavily on the forest for its role in pollination, hydrological balance and climate control. This chapter examines the role of ecosystem services in the context of the Kodagu landscape as well as the local perceptions about these services amongst the local coffee planters. In particular, in light of a revealed divergence between the local understanding of pollination services and the actual services realised, this chapter critically examines the potential for an incentive-based mechanism for conservation of forest services.

R. Abraham (✉)
Institute for Social and Economic Change, Bangalore, India

Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: rosa_abraham@hotmail.com

S. Purushothaman
Azim Premji University, Bangalore, India

Adjunct Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: seema.purushothaman@gmail.com

S. Devy
Ashoka Trust for Research in Ecology and the Environment, Bangalore, India

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_6,

6.2 Setting the Scene: The District of Kodagu

Kodagu is a hilly district situated at an altitude of 4,000 ft above sea level; the highest peak, Tadiandamol, rises to 5,740 m. The district receives abundant rainfall on an average of 2,800 mm annually. The temperature ranges from 11 to 28 °C (52–82 °F). The landscape is characterised by three types of vegetation – evergreen in the higher reaches, semi-evergreen in the middle and moist deciduous in the lower elevation. With more than a third of its total 4,102 km^2 being officially designated as forest area, Kodagu is a hotspot of biodiversity.

6.2.1 Coffee Plantations in Kodagu

In what is perhaps one of the earliest accounts of coffee plantations in India, Hull (1865) conjectures that coffee might have been introduced into India from Arabia by way of 'Mussulman craft' at a very early period. Legend has it that Baba Booden, a pilgrim, smuggled seven coffee berries from Mecca and planted these on a hill (now named after him), literally sowing the seeds for the most successful plantation crop of the peninsula. As early as 1856, Coorg was reported as having 'promising and well-conducted estates' (Hull 1865) with more land being continually converted for coffee plantations.

Currently, 57 % of cultivated land is dedicated to coffee, followed by rice (19 %) whilst the remaining 24 % is distributed among various commercial crops like pepper, cardamom, ginger, cashew, rubber, areca nut and orange. Kodagu accounts for more than a quarter of the total coffee produced in India and almost half of the coffee production of Karnataka. *Coffea canephora*, popularly known as 'robusta' coffee, is the major coffee grown in 73 % of the area under coffee, while *Coffea arabica* is grown in 27 % of the area under coffee in some parts of southern Kodagu.

Coffee is grown in all the three taluks of Kodagu among which Somwarpet has the maximum area under coffee plantation. In all the taluks, small holdings constitute more than 80 % of the total area under coffee plantation (Table 6.1).

6.2.2 Coffee Cultivation, the Land Tenure System and Deforestation

With the commercial success of coffee, more and more forest lands have come to be gradually occupied for plantations. The practice of clearing forests can be traced back to the British colonisation. Timber, especially teak and rosewood, was in high demand and forests were systematically depleted of several of its tree species. Soon the cleared forests began to be replaced by coffee plantations, and by the end of the century, more than 11,000 ha of forest area had been cleared (Nanjundaiah 2008).

Table 6.1 Taluk-wise distribution of coffee growers in Kodagu district by size of holding

Area under coffee (hectare)	Madikeri	Somwarpet	Virajpet	Total (%)
Less than 1	5,533	14,940	6,615	27,088 (40.57)
1–2	4,676	6,290	4,966	15,932 (23.86)
2–4	4,446	3,440	5,328	13,214 (19.79)
4–10	2,740	1,722	3,868	8,330 (12.48)
Above 10	625	555	1,021	2,201 (3.30)
Total	18,020 (26.99)	26,947 (40.36)	21,798 (32.65)	66,765 (100.00)

Source: Revenue Offices and The Coffee Board, Kodagu
Note: Figures in *parentheses* indicate percentages to total

However, as coffee plants need some shade, a complete de-pauperisation of the forest resources has not occurred and many coffee plantations in Kodagu are nestled within the original forest environment. Areas with the shade loving arabica coffee retain more shade trees than robusta plantations. Despite this, a perverse and archaic land tenure system has contributed adversely to the management of natural resources and the disappearance of native tree species.

Currently there are 37 different land tenure systems in the district (Sathish 2005) which may be classified into two primary categories: tenures conferred through land grants and tenures conferred on lease (Nanjundaiah 2008). Originally, land grants were conferred by the royalty or the British in return for services to the state as soldiers or guards. Amongst the various land grants, the *jamma* land tenure is the most privileged. Under the jamma tenure, the landholder had complete and absolute occupancy rights over his/her land and faced lower assessments. However, he/she was not permitted to mortgage or sell the property without the prior sanction of the government.

Baane lands, another form of tenure, came attached with the jamma lands. Forests on slope of the terrain (called baane) were granted for the purpose of protecting wetlands. The baane lands were intended primarily for supplying the jamma landholder with grazing area, timber, firewood and manure (Nanjundaiah 2008). With the introduction of coffee in 1850s, baane land started being used increasingly for coffee cultivation.

Amongst the land tenure conferred on a lease basis, several forms existed. These included *jamma malais, geni malais, coffee saguvali malais, devarakadus and uruduves*. Jamma malais and geni malais were primarily forest lands, with the latter being used for cardamom cultivation. Devarakadus constituted sacred groves and there are often strict unwritten laws and taboos against the felling of trees in these groves (Neilson 2008). Uruduves were village forests which were used by local communities for grazing, timber and collection of firewood (Nanjundaiah 2008). Often when there was no baane land available, uruduve was assigned for cultivation (Shrinidhi et al. 2001).

Though these farmers had user rights to baane, the state had ownership rights over the timber value of tree species in both baane and jamma tenure holdings. The differential rights over native trees was carried forward from the colonial

days into the post-independence era as well and remains an important determinant of land-use practices in the region (Neilson 2008). Under the Coorg Land and Revenue Regulation 1899, the government provided an option to landowners to redeem the rights over their lands. If the landowner paid the timber value of trees, he/she could acquire ownership of those trees. However, sandalwood, rosewood and 26 other 'reserved trees' still required permission from the government before being exploited. The owners of unredeemed lands had limited rights over the trees in their holding, and any felling of these trees was possible only with the permission of the forest department. These restrictions were upheld by the post-independence authorities, most recently under the Karnataka Land Revenue Act, 1964 and under the Karnataka Forest Act, 1963 (Uthappa 2004). These restrictions have been a cause for continuing source of tension in the community and, rather counter-productively, have had an adverse impact on biodiversity within coffee plantations (Neilson 2008).

Redemption of land along with restrictions on ownership over certain native species led the coffee cultivators to replace these native trees with others like *Ficus* sp. and *Artocarpus* sp. The increased popularity of *Coffea canephora,* the 'sun coffee', has also adversely impacted the forest cover in the district. In its favour, *Coffea canephora* is resistant to diseases and stem and berry borers, involves less maintenance and labour, and needs simple processing. In the process of shifting from *C. arabica* to *C. canephora*, the *native* trees were replaced with silver oak (*Grevillea robusta*) trees which are fast growing and income generating with good timber value and which provide just enough shade to the requirement of *C. canephora* (Ambinakudige and Choi 2009). Though silver oak trees are fast growing with high timber value and serve as an alternative income source during the time of coffee price fluctuation, cultivators identify disadvantages associated with them. Falling leaves and branches of silver oak on coffee plants remain undecomposed for months and those falling on the coffee branches affect the bud emergence. As compared to leaves of native trees, silver oak leaves take longer time to decompose. But as Olschewski et al. (2006) mentions, it is common for small landholders, especially in the developing countries, to adopt various agroforestry techniques in order to diversify their income sources.

During the early 2000s, fall in coffee prices (Valkila 2009) was also a reason that forced coffee growers to clear off more forest land to harvest the native shade trees in their coffee plantations and to plant fast growing silver oak trees thus triggering a change in vegetation cover (Sathish 2005; Ambinakudige and Choi 2009). Therefore, a government intervention aimed at preservation of the forest and the native tree species has had a perverse effect of creating disincentives for conserving local biodiversity. The new shade management along with higher coffee yields and better disease-resistance has spurred a shift to *C. canephora* from *C. arabica*. Fewer native trees in coffee plantations coupled with other reasons like the Thai sac brood disease, chemical use in the plantation and climate change could adversely impact the number of pollinator visits to coffee plantation, leading to a reduction in coffee yield and income (Fig. 6.1).

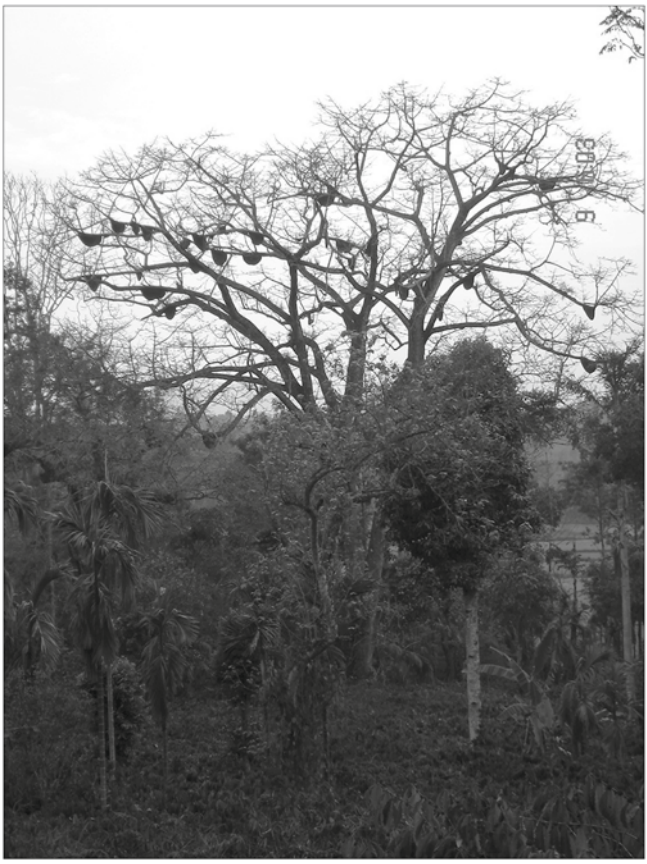

Fig. 6.1 A single native tree provides home for several hives, a common scene in the plantations of Kodagu

6.3 Management Practices and Shade Regimes in Kodagu

In order to examine the influence of shade regimes and management practices on coffee output, keeping other factors uniform, we tried to differentiate the coffee yield and net benefits from plantations under a gradient of management practices. Management practices in coffee agroforestry, particularly in the South American context, are generally classified into five types based on the extent of environmental impact, vegetational and structural complexity and management (Moguel and Toledo 1999). These management practices include the following: *traditional rustic or 'mountain'* system where only the lower strata of the forest are removed for planting coffee and the native trees are maintained; *commercial polyculture*, where native trees are replaced by introduced shade trees which are economically attractive and indirectly beneficial to coffee; *traditional polyculture*, where all native trees are

removed and coffee is grown alongside numerous other commercially viable crops; *shaded monoculture*, where leguminous trees (generally belonging to the family Fabaceae) are planted exclusively for providing shade and soil nitrification for coffee, combined with extensive use of chemical products; and finally, *unshaded monoculture*, or sun coffee, characterised by specialised plantations where the original forest cover is entirely removed and involves high inputs of labour, fertilisers, pesticides and machinery (Moguel and Toledo 1999; Vergara and Badano 2009).

Unlike its South American counterparts, where there is a distinct border between the plantations and forests, coffee plantations in Kodagu coalesce with their natural surroundings, with one invading into the other and forests and plantations occurring conjointly. Because of this seamless merging of forests and the plantation, it is difficult to classify the management practices based on different shade regimes as has been done in Mexico and other South American plantations. However, a basic classification of different management practices involved in coffee cultivation can be made, based on the presence of native trees, introduced species such as silver oak and the extent of use of pesticides and fertilisers.

In the study context, management practices are classified based on shade regime and whether conventional or best-practice farming techniques are adopted. The following criteria were applied to find best practitioners for the above assessment. Planters adopting limited or need-based application of chemical pesticides and fertilisers as also applying high quantity of farmyard manure were identified as 'best practice' or 'organic' farmers. Conventional practices, on the contrary, involved intensive pesticide and fertiliser use.

Many factors determine the final yield of coffee beans from each plant – irrigation, nutrition, shade and pollination. However, it has been found that in a regional context, the diversity of pollinators, and hence the final yield, in coffee agroforestry systems is influenced by the distance to the natural forest margin and by local management practices (Klein et al. 2007; Ricketts 2004; Olschewski et al. 2006). In the Indian context, various studies in Himalayan region (Partap 2003) show that increase in honeybee population (*A. cerana*) increased the fruit set by 36 % and fruit weight by 40 % on an average. Similar observation was made for vegetables too (Partap 2003), revealing the importance of pollinators for crop productivity.

Besides the differential yields (expressed in terms of berry weights) from differing management practices, we also examined the variations in net benefits across differing practices. Finally, we also undertook a primary survey of coffee planters to understand the ground-level perceptions of ecosystem services and whether the farmers acknowledge any linkages between management practices, ecosystem services and yield. The next section discusses the difference in yield and net benefits across management practices and the results of the primary survey.

6.4 Results and Analysis

Three types of management practices, based on shade regime and farming technique, are identified – organic cultivation (native shade regimes with best practices), native shade regime with conventional practices and silver oak shade regime with

Table 6.2 Fruit weight (wet and dry in grams) under different management practices and vegetation

Vegetation and shade management	Moist deciduous		Semi-evergreen		Evergreen		Average	
	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
Organic	1.06	0.75	1.30	0.86	1.14	0.72	1.17	0.78
Native	1.21	0.76	1.32	0.89	1.18	0.80	1.23	0.82
Silver oak	1.07	0.75	1.24	0.80	1.08	0.69	1.13	0.75
Average	1.11	0.75	1.29	0.85	1.13	0.74		

Source: Primary survey and Coffee Board

conventional practices. There could have been another category of silver oak shade regimes with best practices, which we did not come across in our sample of 106 plantations. In terms of landholding size, 62 % of the farms sampled were small holdings (<4 ha), 22 % were medium holdings (4–10 ha), while the rest were large holdings, reflecting the overall landholding pattern in the district.

6.4.1 Berry Weights and Management Practices

Coffee yield is measured in terms of the weight of wet and dry coffee berries. Fresh berries are oven-dried to arrive at the dry weight of berries. In comparing berry weights across management regimes, it was found to be highest in native shade management (Table 6.2).

Native shade regimes show a positive influence on berry weight, irrespective of the vegetation type and farming practice. Farms operating under conventional management with no native trees performed the worst in terms of berry weight.

The higher berry weights under the native shade regime can potentially be explained by the presence of greater pollinator activity and microclimatic factors in these forest fringes. Several studies (as mentioned in Sect. 6.3) have linked enhanced pollinator activity – both in terms of diversity, species richness and abundance – to the proximity of forests and native landscapes (Ricketts 2004; Olschewski et al. 2006; Moguel and Toledo 1999; Vergara and Badano 2009). This relation between vegetation type and pollinators has also been verified in the Kodagu context (Krishnan et al. 2012), establishing the fact that this process could function as a self-reinforcing vicious cycle, manifested in increased deforestation and gradual disappearance of native trees and pollinators.

6.4.2 Comparing Benefits and Costs of Differing Management Practices

To compare net benefits under best practice with that of conventional practice, dry weight of fruits from one acre was taken as a proxy for yield. Data on the cost involved in input application was collected from the Coffee Board of Kodagu

Table 6.3 Annual cash flow (in Rs./acre of mature robusta at 2007 prices) in coffee plantations with conventional and best practices

Components	Conventional practice	Best practice
Total benefits (Rs)	77,320	74,755
Net annual benefits (Rs)	56,158	56,759

Note: For further details about the computation of these figures, refer to the Appendix Table 6.4 at the end of this chapter

district. Quantities of inputs and labour came from the primary survey. Annual benefit from and cost of cultivation are analysed to arrive at the per acre annual net benefit from cultivation for both the practices.

There are very few best practitioners among the small holders cultivating coffee in a purely organic manner (referred to as best practice henceforth), with limited use of chemicals and more farmyard manure and with a high density of native trees in their plantation. More common was the conventional practice wherein cultivators use more chemical fertilisers and pesticides and very little or no farmyard manure and maintain silver oak trees in high density. The comparison of benefit and cost components of these two cultivation practices is given in Table 6.3 and in detail in the appendix to this chapter.

The cost-benefit comparisons (see Appendix Table 6.4) show that best practices yield a higher net benefit even in the short run. Therefore, on comparing yields (in terms of berry weights) and net benefits, it can be concluded that though conventional practices (under native shade regimes) produce a higher yield, the net benefits are higher under organic/best practices. The lower input costs associated with the latter explains this. Therefore, organic practices combined with native shade regimes have the highest potential to maximise yield and net benefits.

6.4.3 Primary Survey: Perceptions About Pollination and Other Ecosystem Services

Besides the pollination experiments, we also conducted primary surveys amongst the sample of farming households. We pretested and finalised a semi-structured questionnaire for the primary survey to assess management practices, awareness about pollination and on the role of natural forests as well as willingness to contribute towards protecting natural vegetation in Coorg and surroundings. The sampling frame for the survey based on the frequency distribution of various sizes of plantations is discussed in Sect. 6.4.

The primary survey revealed a clear apathy and lack of recognition amongst local farmers on the role of the honeybees in the coffee crop as well as on conservation of their forests. Only 50 % of the farmers identified either bees, insects or wind as contributing to the pollination of the coffee plant. Interestingly, only 12 % of the farmers explicitly identified bees as being responsible for pollination, one

respondent mentioning that beehives must be placed within the plantation to enhance yield and fruit set. Another 41 (38 %) farmers attributed pollination to a combination of bees, winds and other insects. Most of the remaining farmers attributed successful fruit set to favourable weather or pollination via water. Eighteen farmers identified water to be the primary factor influencing berry formation. Almost all these farmers felt that pollinators did not contribute to yield and almost 70 % of them stated that a disruption in pollination, keeping nutrient and water supply fixed, would in no way affect the coffee yield. Many farmers observed that despite ongoing deforestation and potential loss of pollinator habitats, their yield had not declined. Hence, they felt justified in not cognising the role of honeybees in coffee output.

Even amongst those farmers who acknowledged the role of honeybees in pollination, only a minority recognised the fact that forest could provide habitats for honeybees and that the presence of forests affected the density of bees. Most respondents identified forests as being a 'nuisance', a disservice, because of the frequent attacks of elephants, wild boars and monkeys, though the climate regulatory functions of forests were recognised by all.

It was therefore not surprising that only 32 % of the farmers were ready to participate in forest conservation. Most of these respondents stated that they would prefer to work through the Karnataka Forest Department (KFD), the next preferred response being the Panchayat authorities. These were mostly medium- to large-scale farmers, while the smaller farmers were reluctant to work towards forest conservation. However when prompted on how they would prefer to contribute, almost 40 % stated that they would not make any contribution per se, some amongst these justified this saying they had already paid their share by contributing towards fencing off their plantations. Only 20 % were willing to contribute money, between Rs. 50 and Rs. 500, averaging approximately Rs. 200 per year. Less than 10 % preferred to dedicate their time rather than money.

There was unanimity amongst the farmers on the reasons for maintaining the native trees within their landholdings. The primary reason cited was to provide shade for the coffee plants, followed by provision of mulch, soil nutrition, timber and firewood. Though three farmers mentioned that they valued these trees for themselves, i.e. their recreational and ecological value, no one thought that they could provide a habitat for most important pollinator of their crop, i.e. the giant Asian honeybee – *Apis dorsata*. Furthermore, they predictably expressed reluctance to planting more native species for the purpose of enhancing pollinator activity, citing space constraints primarily. Though half of the respondents wanted to have the rights to cut shade trees, they were ready to consider planting and retention of native trees if there could be adequate compensation payments.

Though more than 90 % of the farmers interviewed were aware of organic farming and acknowledged that it would be beneficial in terms of healthier plants and for maintaining soil fertility, they remained hesitant to adopt it and only less than 10 % were willing to adopt it. One of the primary justifications given by the respondents for not adopting organic farming was the lower yields expected under this practice, as well as the longer gestational lag, lack of availability of farmyard manure and

labour supply constraints. They also mentioned the lack of market for organic products as well as problems with obtaining the required certification. Other potential reasons for avoiding organic farming are the lack of appropriate and continuous extension services, lack of incentives for best practices (premium price for organic coffee is elusive for small growers as certification is costly) and the inherent hesitation amongst farmers to change practices that have been followed for several years.

6.5 Compensation for Ecosystem Services: Reconciling Reality and Perceptions

Given the incongruence between the perceptions and actual experience of 'best practice' and 'conventional' management practices (in terms of net benefits and berry weights), a natural question that emerged was whether and how to reconcile these two.

As was observed by Olschewski et al. (2006), though there was significant impact of distance to forest on pollination through fruit set and berry weight, the value of alternate land uses of forests were higher than the value of pollination service. Similarly, in Kodagu, the opportunity cost of maintaining the forest may be very high, especially if the forest land is alternatively used for further agriculture purposes. Ninan and Sathayapalan (2005) found that the opportunity cost of coffee output foregone for a village in Kodagu district is quite high implying is a strong incentive to deforest.

In this context, an incentive-based system based on the 'payments for ecosystem services' (PES) mechanism that can promote conservation-oriented plantations has the potential to reconcile the agendas of conservation, and development is under discussion in the landscape among planters, researchers and NGOs. The rest of this chapter takes a critical look at such mechanisms for Kodagu.

Payments for ecosystem services (PES) have been defined as 'voluntary transactions, where a well-defined ecosystem service (ES) (or a land-use likely to serve that service) is being bought by an (minimum one) ES buyer from an (minimum one) ES provider if and only if the ES provider secures ES provision (conditionality)' (Wunder 2005: 3). Though it captures the essential aspects of a PES, this definition has been criticised by many as limiting (e.g. Kosoy and Corbera 2010; Muradian et al. 2010; Sommerville et al. 2009). According to Muradian et al. (2010), 'PES' in reality captures a variety of incentive mechanisms. Rather than a strict definitional structure, PES lends itself more to a continuous classification (ranging from a purely market-based exchange of resources to institutional arrangements involving community action with a resource transfer of some kind, in cash or kind). For instance, a PES (including payments for avoided disservices) may be organised by governments, communities or voluntary agencies. It may be transacted through markets – created through government regulations, as in the case of the emissions trading market – or it may be naturally emerging in response to consumers' willingness to pay for an ES, like the markets for eco-labelled or certified products (Ribaudo et al. 2010).

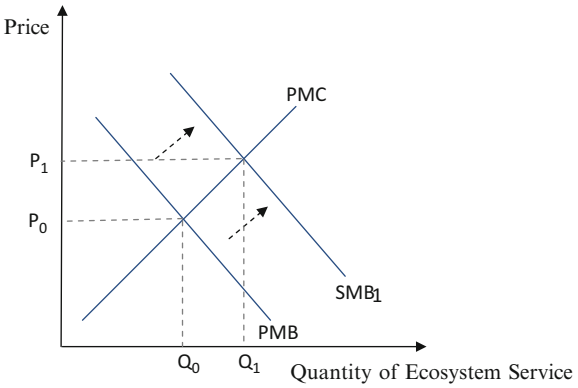

Fig. 6.2 Inducing social optimum (Q_1) by incentivising the incremental social benefits generated (*PMC* private marginal costs, *SMB* social marginal benefits, *PMB* private marginal benefits. Under normal circumstances, Q_0 of the ecosystem service would be used, at the price of P_0 where private costs and benefits are equalised. Compensation for ES raises the private benefits such that social optimum is reached)

Alternatively, PES may be channelled via taxes or cesses imposed on appropriators which are then redistributed to the providers (who in this case are the farmers from whose lands these services emerge).

Many existing 'PES' schemes do not involve an explicit 'payment', i.e. a cash transfer, but are instead an in-kind exchange of resources (e.g. transfer of beehives in return for watershed management, (Wunder 2005) or extension of user rights over a particular resource (e.g. water rights in return for reduced grazing in upstream catchment). Though some in-kind transfers may be criticised as being unequal exchanges, given the complexities involved in designing a cash payments mechanism,[1] they may be more efficient and easier to implement. In this context, cash 'payments' not being the only means of exchange envisaged, we henceforth refer to such transactions as 'compensation' for ES (CES).

Thus, CES is an 'umbrella term' (Sommerville et al. 2009) that broadly defines any mechanism that invokes a positive change in the supply of ES through the provision of a compensatory incentive. Several 'non-provisioning' ES (to use the Millennium Ecosystem Assessment [2003] categorisation) are also 'positive externalities' since they yield benefits to society over and above the private benefits to the provider. Since these social benefits are not taken into consideration in production decisions, they remain underprovided. CES seeks to internalise these positive externalities by incorporating them within production decisions. This is achieved through incentivising the social optimum (a) by incorporating the social benefits generated from the positive externality (Fig. 6.2) where the social optimum is induced by

[1] Estimating 'payments' involves, among other things, evaluating ecological production functions, monetising these biophysical quantities to arrive at marginal monetary value, determining the appropriate price and choosing between opportunity cost and willingness to pay. For a discussion on valuation, see Purushothaman et al. (2013).

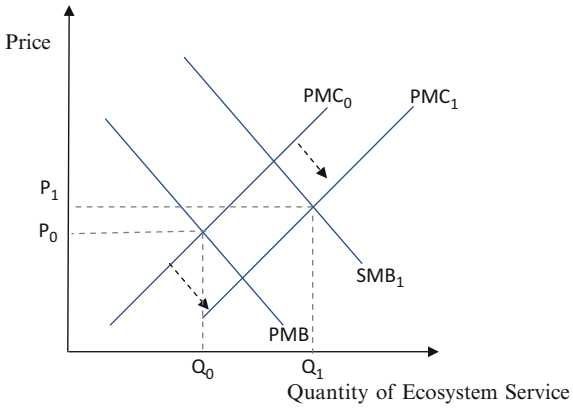

Fig. 6.3 Inducing social optimum (Q_1) by compensating for the incremental costs generated (*PMC* private marginal costs, *SMB* social marginal benefits, *PMB* private marginal benefits. Under normal circumstances, Q_0 of the ecosystem service would be produced, at the price of P_0 where private costs and benefits are equalised. Compensation for ES compensates the private costs (PMC_1) of generating the ecosystem service and thus encourages social optimum)

providing compensation to the extent by which private benefits deviate from social benefit, or (b) by subsidising the private costs of generating the positive externality (Fig. 6.3), or finally (c) by mainstreaming the externality by *creating* an explicit market for it (as in carbon trading or ecotourism).

6.5.1 Scope for CES in Kodagu

In the coffee-forest ecotones, in the biophysical gradient, there are a number of ES that are provided locally as well as further downstream to consumers and farmers located at a distance from the forest fringes. Coffee, a provisioning service (MEA 2003), is the most visible of these, being globally recognised and consumed. Timber is also an important provisioning service although its sale is limited to the local market. Being located on the eastern slopes of the Western Ghats with mountainous topography and steep gradient, this landscape offers important hydrological services (both water availability as a provisioning service as well as its quality as a regulating service) to users in farms and cities downstream (Vijayalakshmi 2004) of Kodagu. Other non-provisioning services from this landscape include carbon sequestration, biodiversity and aesthetics. Other than the provisioning services of coffee and timber, most of the ecosystem services that emanate from this landscape are undervalued and are not produced/conserved to their social optimum (Fig. 6.4).

The stakeholders in this landscape include the coffee planters, the Forest Department, farmers located downstream who benefit from the hydrological services, and final consumers and appropriators (of coffee, water and other provisioning services) located locally and downstream. Among the planters, despite the multiple ES that adjoining forests provided, there is a prevailing apathy among coffee planters

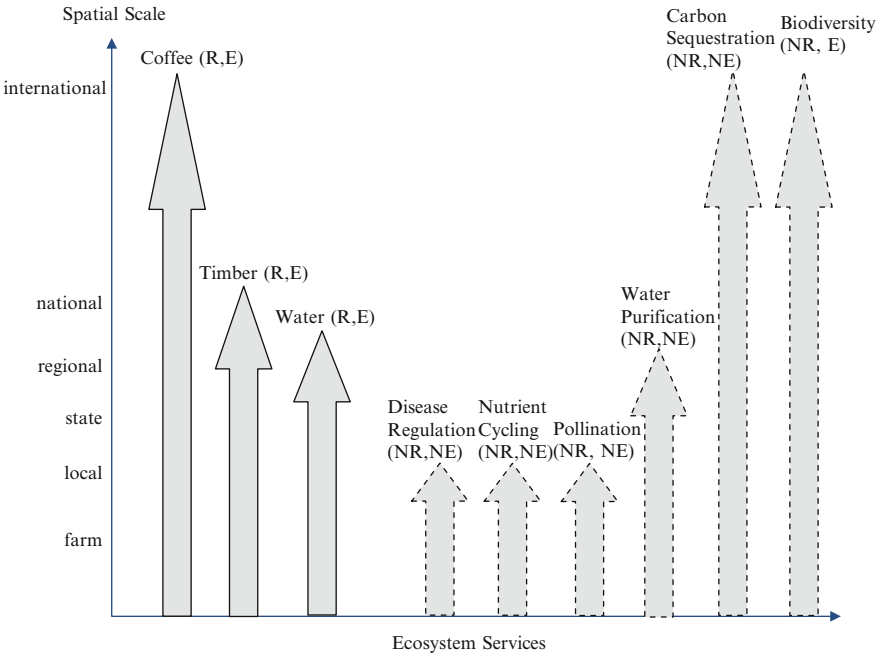

Fig. 6.4 Ecosystem services from the private coffee plantations of Kodagu (Purushothaman et al. 2013) (*Arrows with bold lines* indicate provisioning services. These are private goods, being rival (R) and excludable (E) in their consumption. *Arrows with dashed lines* indicate non-provisioning services. These display features of being non-rivalled (NR) or non-excludable (NE) or both. The reach of the arrow represents the spatial scale at which the ecosystem service is provided)

towards the surrounding forests as discussed in Sect. 6.4.3. While climate regulatory and hydrological functions of surrounding forests are acknowledged, pollination services are under-recognised, whereas disservices in the form of frequent crop raids by wild animals are of prime concern. The ambiguity in property rights and the mistrust towards state forest department contribute to the apathy towards conservation of private and state-managed natural. Though many planters were keen on planting native shade trees in their plantations, the limited rights in harvest and transport prevent them from doing so.

The other appropriators in this landscape differ in the extent of their recognition of their dependence on this upstream ecosystem. For the downstream appropriators of water resources, the increased dissociation between the location of service appropriation and the source ecosystem is exacerbated by the presence of irrigation networks particularly the extensive network of canals in downstream farming regions. These irrigation systems that ensure a perennial supply of water lead to a distancing of farmers from the upstream catchment, blurring the extent of their dependence on the ecosystem (for a similar case, see Purushothaman et al. 2009).

Unlike the locally appropriated non-provisioning services, like hydrological services, discussed above, for certain ES like carbon sequestration and biodiversity, despite the apparent geographical distancing, there is better recognition of these ES

due to the global spotlight on them. The unique aesthetics of the landscape is also nationally renowned and recognised in tourist circles.

Any CES mechanism, as discussed in the previous section, also needs a source of income, from which the payments can be sources. In the Kodagu context, there are several high-income consumers among the domestic and global appropriators of the ecosystem services. Therefore, the stakeholders as well as the ecosystem services of the landscape point towards the scope for an incentivising mechanism.

However, the coffee-forest system is a mosaic of tenurial regimes where state-managed forests of the Western Ghats coalesce with privately owned coffee plantations with different use and ownership rights (Uthappa 2004), as discussed in Sect. 6.2.2. Clearly defined property rights and well-functioning institutions that uphold these rights are crucial for identifying the providers of an ES (Adhikari 2009) and for ensuring the equity of a CES mechanism (Garcia-Amado et al. 2011). Property rights allow providers to enforce excludability on the positive externalities, i.e. the non-provisioning services, originating from their private lands. In particular, under certain tenurial systems in this landscape, planters have limited rights over native trees. The ambiguity in property rights in this regard and the lack of ownership result in a prisoner's dilemma in the conservation of these ES, particularly the native shade trees within plantations.

Moreover, in the case of coffee-forest ecotones, livelihoods are closely intertwined with the production of coffee for commercial reasons. Most planters do not have a direct and immediate relation (for food, fodder, etc.) with their agricultural land. Therefore, consumption of non-provisioning services within coffee-forest landscape is less recognised among the planters. These aspects will need to be considered in devising appropriate CES mechanisms for the Kodagu landscape.

6.5.2 Potential CES Mechanisms for Kodagu

The wide variety of ecosystem services and of appropriators offers scope for a similar variety in compensation mechanisms. For the privately owned coffee plantations, given the existing lack of trust in local government agencies and multiplicity of tenurial arrangements (Sect. 6.2), market-mediated compensation mechanisms that are privately transacted and do not need institutional involvement would be suited. These 'retail trade-based' (Landell-Mills and Porras 2002) instruments bundle provisioning services with non-provisioning services, for example, 'bird friendly certified coffee' or 'shade-grown coffee' bundles biodiversity with coffee. Owing to high-income consumers for coffee from this unique landscape, such instruments can target niche markets. Efforts to include small holders in such certification schemes are critical in this mechanism.

Besides bundling of services as in retail trade-based instruments, the unique Kodagu landscape can also leverage the global recognition of the ES they mediate. Currently, the planters in Kodagu landscape have begun considering schemes such as the clean development mechanism (CDM) and reducing emissions from deforestation and forest degradation (REDD) that compensate for the carbon sequestration services provided by retaining native shade trees within their farms (CAFNET 2010). Lack of intimate links between ES and its providers in the landscape (owing to their

mercenary engagement with ES) and with some appropriators could be overcome by the presence of a niche international market that acknowledges these services.

Voluntary arrangements like 'watershed protection contracts' that mandate watershed management activities to be undertaken in return for a fixed payment (Landell-Mills and Porras 2002) could target the untapped market of urban consumers downstream. However, owing to the limited recognition among downstream appropriators such arrangements may not always emerge. Therefore, compensation may also be sourced from this high-income consumer base through state government-mediated payments in the form of targeted cess, the revenue from which could be distributed to planters upstream based on pre-specified conditions like maintaining biodiversity and reducing the usage of mineral fertilisers and chemicals. The challenge here is to put in place institutional systems to mutually engage users and stakeholders for specific ES and to monitor the conditions and transactions.

6.6 Conclusion

The agrarian sector and the environmental degradation that India and the rest of the developing world witness today have often been viewed as two separate behemoths, and consequently, efforts to resolve either have been launched independent of the other. In forest fringes, where pressures of commercialisation and conservation are present, the crisis is exacerbated.

In this scenario, compensation mechanisms offer a reconciliatory alternative for the forest-fringe farming communities. In private production lands, where excludability is enforced through property rights as in the coffee plantations of Kodagu, 'piggybacking' non-provisioning services on the provisioning services (as in the case of certifications) may be an effective strategy. Where this is not possible, other appropriate incentive mechanisms (input subsidies, voluntary agreements or cesses) are being be considered. In the Kodagu context, where ground-level perceptions are incongruent with real outcomes, CES could also be a means to reconcile the two. As the discussion in this chapter reveals, these instruments must be developed in keeping with the local context including the perceptions on ES among the stakeholders, the nature of tenurial arrangements and the physical gradient of concerned ecosystem service flows. However, CES provides a means to mobilise the inherent synergies between the agendas of rural development and agricultural sustainability.

Though issues like equity and efficiency aspects of CES remain, as an instrument to reconcile agricultural and rural development with environmental sustainability in forest fringes, as this chapter highlighted, CES can not to be completely written off. While a diversity of livelihood options exist for these marginal communities as discussed thus far in the book, access to many of these is hindered due to institutional lacunae and limited social mobility. It is in this context that community-based collectives emerge as an important player to synergise the various opportunities and conservation needs. The following chapters, therefore, examine how self-help groups and common property resources, as institutions, have a crucial role to play amongst these communities.

Appendix

Table 6.4 Annual cash flow (in rupees for an acre of mature robusta at 2007 prices) in coffee plantations with conventional and best practices

	Conventional practice					Best practice				
	Labour		Others		Total	Labour		Others		Total
Components	Days	Cost (Rs.)	Item	Cost (Rs.)	cost (Rs.)	Days	Cost (Rs.)	Item	Cost (Rs.)	cost (Rs.)
Costs										
Weeding	21	1,680	NA	0	1,680	24	1,920	NA	0	1,920
Irrigation	10	800	Diesel (Rs. 35/ltr)	5,040	5,840	8	640	Diesel (Rs. 35/ltr)	4,200	4,840
Farmyard Manure	NA	0	NA	0	0	6	480	10 kg/plant	3900	4380
Fertiliser application	9	720	1.75 t/acre	2,820	3,540	NA	0	NA	0	0
Pest management	2	160	600 ml/acre	3,350	3,510	6	480	Traps (10 traps/ acre)	100	580
Pruning	10	800	NA	0	800	6	480	NA	0	480
Mulching	10	800	NA	0	800	10	800	NA	0	800
Other management (fence, shade, suckers)	15	1,200	NA	0	1,200	15	1,200	NA	0	1,200
Picking	40	3,200	NA	0	3,200	40	3,200	NA	0	3,200
Drying and packing	5	400	NA	0	400	5	400	NA	0	400
Transport	NA	0	Rs 800/200 bags	128	128	NA	0	Rs 800/200 bags		128
Loading/unloading	Rs 2/ bag	64	NA	0	64	Rs 2/bag	68	NA		68
Total costs (Rs)	9,824 (46 %)		11,338 (54 %)		21,162 (100 %)	9,668 (54 %)		8,328 (46 %)		17,996 (100 %)

Benefits				
Saleable beans	1,600 kgs	56,320	1,650 kgs	58,080
Fuelwood	0	0	0.6 t	275[a]
Timber	4 logs	21,000[a]	8 logs	16,000[a]
Others	0	0	4 l	400
Total benefits (Rs.)	77,320		74,755	
Net annual benefits (Rs.)	56,158		56,759	
Net annual incremental benefits of best practice over conventional practice (Rs) 601				

Source: Primary survey and Coffee Board

Note: Fixed costs (planting and land preparation) and number of plants per acre (450 plants per acre) remain the same under the two practices; labour cost for weeding and pest management as well as yield of saleable beans, timber and fuelwood are higher for the best practice

Coffee yield: 32 and 33 bags of 50 kg each per acre and @ price Rs. 1,760 per bag

Daily wage rate in 2007: For men Rs. 100; for women Rs. 70

NA not applicable

[a]Net benefit after deducting the cost

References

Adhikari, B. (2009). *Market-based approaches to environmental management: A review of lessons from payment for environmental services in Asia* (ADBI Working Paper No. 134). Tokyo: Asian Development Bank Institute. http://www.adbi.org/files/2009.03.26.wp134.market.based.approaches.environmental.mngt.pdf. Accessed 12 Nov 2011.

Ambinakudige, S., & Choi, J. (2009). Global coffee market influence on land-use and land-cover change in the Western Ghats of India. *Land Degradation and Development, 20*(3), 327–335.

CAFNET. (2010). *Carbon sequestration in coffee agroforestry systems of Kodagu, Western Ghats of India*. CAFNET Carbon Handout. http://www.ifpindia.org/ecrire/upload/eco_projects/CAFNET%20Carbon%20Handout.pdf. Accessed 11 Nov 2011.

Garcia-Amado, L. R., Perez, M. R., Escutia, F. R., Garcia, S. B., & Mejia, E. C. (2011). Efficiency of payments for environmental services: Equity and additionality in a case study from a Biosphere Reserve in Chiapas, Mexico. *Ecological Economics, 70*(12), 2361–2368.

Hull, E. C. P. (1865). *Coffee: Its physiology, history and cultivation: Adapted as a work of reference for Ceylon, Wynaad, Coorg and the Neilgherries*. Madras: Gantz Brothers, Adelphi Press. http://books.google.co.in/books?id=fYJIAAAAYAAJ&ots=keGhIJW6Z-&dq=coffee%20coorg&lr&pg=PP7#v=onepage&q&f=false. Accessed 20 Feb 2012.

Klein, A. M., Vaissière, B. E., Cane, J. H., Steffan-Dewanter, I., Cunningham, S., Kremen, C., et al. (2007). Importance of pollinators in changing landscapes for world crops. *Proceedings of the Royal Society, 274*, 303–313.

Kosoy, N., & Corbera, E. (2010). Payments for ecosystem services as commodity fetishism. *Ecological Economics, 69*, 1228–1236.

Krishnan, S., Cheppudira, G. K., Shaanker, R. U., & Ghazoul, J. (2012). Status of Pollinators and their efficiency in fruit set in a fragmented landscape mosaic in South India. *Basic and Applied Ecology, 13*, 277–285.

Landell-Mills, N., & Porras, I. T. (2002). *Silver bullet or fools' gold? A global review of the markets for forest environmental services and their impact on the poor. Instruments for sustainable private sector forestry series*. London: International Institute for Environment and Development. http://www.cbd.int/doc/external/iied/iied-silver-report-2002-en.pdf. Accessed 10 Nov 2011.

MEA. (2003). Millennium Ecosystem Assessment. United Nations Environment Program. Retrieved from http://www.unep.org/maweb/en/index.aspx

Moguel, P., & Toledo, V. M. (1999). Biodiversity conservation in traditional coffee systems of Mexico. *Conservation Biology, 13*(1), 11–21.

Muradian, R., Corbera, E., Pascual, U., Kosoy, N., & May, P. H. (2010). Reconciling theory and practice: An alternative conceptual framework for understanding payments for environmental services. *Ecological Economics, 69*(6), 1202–1208.

Nanjundaiah, C. (2008). Do property rights really influence forest conservation and management in Western Ghats of India? In *The 12th Biennial Conference of the International Association for the Study of Commons*, held on 14–18 July 2008, University of Gloucestershire, Cheltenham. http://iasc2008.glos.ac.uk/conference%20papers/papers/N/Nanjundaiah_218501.pdf

Neilson, J. (2008). Environmental Governance in the Coffee Forests of Kodagu, South India. *Transforming Cultures eJournal*, *3*(1). http://epress.lib.uts.edu.au/journals/index.php/TfC/article/view/680/611. Accessed 20 Mar 2012.

Ninan, K. N., & Sathayapalan, J. (2005). The economics of biodiversity conservation: A study of a coffee growing region in the Western Ghats of India. *Ecological Economics, 55*(1), 66–72.

Olschewski, R., Tscharntke, T., Benítez, P. C., Schwarze, S., & Klein, A. (2006). Economic evaluation of pollination services comparing coffee landscapes in Ecuador and Indonesia. *Ecology and Society, 11*(1), 7.

Partap, U. (2003). Cash crop farming in the Himalayas: The importance of pollinator management and managed pollination. In *Biodiversity and the ecosystem approach in agriculture, forestry and fisheries proceedings* (pp. 224–246). Rome, 12–13 Oct 2002. http://www.fao.org/docrep/005/y4586e/y4586e00.htm. Accessed 20 Nov 2011.

Purushothaman, S., Abraham, R., & Patil, S. (2013). Tropical farms as social-ecological systems: tools for assessment. In A. Christinck & M. Padmanabhan (Eds.), *Cultivate diversity! A handbook on transdisciplinary approaches to agrobiodiversity research*. Weikersheim: Margraf Publishers.

Purushothaman, S., Hegde, S., Patil, S., & Kashyap, S. (2009). People's perception on benefits from a protected catchment: A case study of Gundal command in Karnataka. *Indian Journal of Agricultural Economics, 64*(4), 573–584.

Purushothaman, S., Thomas, B. K., Abraham, R., & Dhar, U. (2013). Beyond money metrics: Alternative approaches to conceptualising and assessing ecosystem services. *Conservation & Society 11*(4) (Forthcoming).

Ribaudo, M., Greene, C., Hansen, L., et al. (2010). Ecosystem services from agriculture: Steps for expanding markets. *Ecological Economics, 69*(11), 2085–2092.

Ricketts, T. H. (2004). Tropical forest fragments enhance pollinator activity in nearby coffee crops. *Conservation Biology, 18*, 1262–1271.

Sathish, B. N. (2005). Assessment of tree diversity in coffee plantations under different land tenure systems in Virajpet taluk, Kodagu. Master's thesis, University of Agricultural Sciences, Bangalore.

Shrinidhi, A. S., Ambinakudige, S., & Lele, S. (2001). *Forest tenure regimes in Karnataka Western Ghats: A compendium*. Bangalore: ISEC, Institute for Social and Economic Change.

Sommerville, M., Jones, J. P. G., & Milner-Gulland, E. J. (2009). A revised conceptual framework for payments for environmental services. *Ecology and Society, 14*(2), 34.

Uthappa, K. G. (2004). *Land tenure, land holding, tree rights of Kodagu* (1st ed.). Kodagu: Kodagu Model Forest Trust.

Valkila, J. (2009). Fair trade organic coffee production in Nicaragua – Sustainable development or a poverty trap? *Ecological Economics, 68*(12), 3018–3025.

Vergara, C. H., & Badano, E. I. (2009). Pollinator diversity increases fruit production in Mexican coffee plantations: The importance of rustic management systems. *Agriculture, Ecosystems & Environment, 129*, 117–123.

Vijayalakshmi, E. (2004). Timber tussle. *Down to Earth*. http://www.downtoearth.org.in/node/11037. Accessed 24 Mar 2011.

Wunder, S. (2005). *Payments for environmental services: some nuts and bolts* (CIFOR Occasional Paper No. 42). Bogor: Center for International Forestry Research. Available online: http://www.cifor.cgiar.org/publications/pdf_files/OccPapers/OP-42.pdf. Accessed 24 Mar 2011.

Chapter 7
Rural Collectives for Livelihoods and Conservation: Lessons from Malè Mahadeswara Hills, Karnataka

B. Dhanya, Seema Purushothaman, and Sheetal Patil

7.1 Introduction

Rural collectives and self-help groups (SHGs) have emerged as an important social engineering tool for the process of transforming and improving the livelihoods of the underprivileged. Originally conceived as organisations to promote financial sustainability, these have evolved over the years to cater to a number of objectives including social organisation, rural welfare and natural resource management. Though the latter has only recently been viewed as an objective of SHGs, it is equally important, as unsustainable use of natural resources can threaten the long-term viability of those livelihoods that SHGs seek to support.

In this context, this chapter discusses multiple roles of rural self-help group institutions in social transformation, with the following specific objectives: (1) review the potential roles of SHGs in rural well-being, (2) evolve a protocol for systematic assessment of the performance of SHGs and (3) identify factors responsible for the performance of SHGs.

B. Dhanya (✉)
University of Agricultural Sciences, Lingsugur Road, Raichur, Karnataka, India

School of Environmental Science, Mahatma Gandhi University,
Kottayam, Kerala, India
e-mail: krupaias@gmail.com

S. Purushothaman
Azim Premji University, Bangalore, India

Adjunct Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: seema.purushothaman@gmail.com

S. Patil
Ashoka Trust for Research in Ecology and the Environment, Bangalore, currently
Azim Premji University, Bangalore, India
e-mail: ssheetalpatil@rediffmail.com

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_7, © Springer India 2013

This chapter first overviews the multiple roles of rural SHGs through the perspective of a social-ecological-economic system[1] (SEES) and then evaluates SHGs in the light of the first objective. Using an empirical study of SHGs, we then move to the second and third objectives, through sections on evaluation methods discussed in literature, description of the study area and a process of evaluation followed by results and discussion.

7.2 An Overview of the Multiple Roles of Rural SHGs

The multiple roles of SHGs could be classified as follows: (1) as microfinance institutions for household, (2) as part of marketing chains, (3) as collectives for natural resource management (NRM) and (4) as networks for overall rural well-being. The functioning of SHGs in each of these roles has a feedback effect on the other roles as well, which may or may not be planned or intended. Broadly, the first two roles impact financial, human and social capitals, the third impacts natural capital stock, while the last stands for synergising the four functions. However, the nature and course of action taken to pursue the first two objectives can have implications on the quantity and quality of social and natural components in the SEES. While desisting from listing success or failure stories in each of these categories, the sections below try and evaluate these specific roles.

7.2.1 SHGs as Microfinance Institutions

Microfinance, a buzzword in the development sector, is often hailed as panacea for welfare at the grass roots. Microfinance commonly works through group systems like the Grameen Bank of Bangladesh, solidarity groups of Latin America and self-help groups of India. Self-help groups in India are 'small voluntary associations of people from the same socio-economic background who come together for the purpose of solving their common problems through self-help and mutual help' (Kumar 2006, p. 2061). They are mostly autonomous financial institutions, which help members keep safe their occasional small surpluses in the form of thrift and grant loans to people in exigencies at reasonable interest rates without cumbersome procedures. More than 16 million rural households have gained access to bank credit, making the SHG movement the largest social movement in India, targeting nearly one-third of India's poor. The impressive credit recovery rate of 90 %, low overhead costs and the enormous goodwill earned in the process of social transformation enthuse the banking community to nurture more groups to serve the twin purposes of banking and social development.

[1] The dynamic coexistence of natural, manmade, human and social capital is referred to as the social-ecological-economic system here.

SHGs impart dimensions of democratic participation to credit management and display their sustainability even in the absence of any subsidy from the state (Vatta 2003). Microfinance can contribute to development through its impact on nutrition, health and education, which in turn could increase productivity in rural livelihood activities. But it is opined that SHGs have relatively more pronounced social, rather than economic, impacts (Puhazhendi and Satyasai 2001). As women's groups exclusively dominate SHGs, correcting gender inequalities in economic and social fronts becomes one of the greatest opportunities. Mayoux's typology of the three contrasting paradigms in microfinance and gender, namely, financial self-sustainability, poverty reduction and feminist empowerment is useful in this context (Thakur and Tiwari 2005). It highlights the varied rationale in targeting women – at one end of the spectrum is the efficiency-oriented argument that women record high repayment rates, while the other, social and political empowerment of women. However, majority of SHGs could not address gender concerns of members and could not empower them socially and politically. This unfortunate gap often leads to withdrawal of members, stagnating the activities of the SHGs (Thakur and Tiwari 2005). The economic benefits of microfinance programme in turn have been region specific (Rajashekhar and Madheswaran 2005).

7.2.2 SHGs as Links in Marketing Chains

Corporate profit seekers are increasingly linking with rural communities through SHGs. Prahalad and Hammond (2002) and Prahalad (2005) are illustrations of such trends. Using innovative marketing strategies like low-margin high-volume units and employing locals to organise group activities, SHGs have become launching pads to approach the vast consumer base among the rural poor. Apart from acting as a gateway for consumption, at times they also act as supply channels for rural products.

Intuitively, it appears that dependence on nature for subsistence generates a lasting relationship with nature, while dependence for commercial motives results in overharvests. When there is overexploitation of local resources for profit, there is a potentially adverse trade-off in terms of continued subsistence. Thus, increasing efforts to link corporate profits to rural SHGs can affect the resilience of SEES through overharvest, degradation of natural capital and eventual deprivation of the biomass base needed for subsistence modes like cultivation, dairying, livestock keeping and grazing.

SHGs can be linked to markets in many ways (Prahalad 2005). Two scenarios linking corporate profits to SHGs and the implications for natural resources are simplified as below:

1. Business houses entering rural areas employ enterprising women from villages as trading agents and extend credit at mild terms through SHGs. Profits to the business here come in the form of interest along with high credit recovery rate and profit from product sales. Developmental impact on the poor is probably confined

to an inculcated saving habit and increased levels of consumption of certain goods. Impact of these changes can neither be considerable nor long-standing, since real income levels, human capabilities and livelihood securities do not improve.

SHGs, unlike the corporate business houses, are functional components of the local SEES, having important backward linkages. For instance, a group of people within a community endowed with social assets and capacities may not take up enterprises that collectively damage their environmental or social values. Hence, infinite pursuit of financial capital at the expense of other components of a SEES is unlikely to happen through well-informed and democratic social institutions like SHGs. But then, how informed are SHGs about the interlinkages between different components of their SEES?

2. Industries in the processing sector enter the rural market directly through SHGs to procure raw materials from a range of timber and non-timber products. Middlemen can be eliminated, value addition skills can be built and rural products can obtain reasonable prices. Conservation and regeneration could also happen if there are incentives to produce more biomass. In that context, SHGs can be instrumental in collection, processing, sales and microcredit. Improved incomes, improved savings and increased consumption could occur in the long term.

7.2.3 SHGs as Institutions for Natural Resource Management

The effectiveness and sustainability of community-initiated collective action along with awareness creation in natural resources management have been proved by many studies (e.g. Thomas 2002; Cronwell 2003; D'Silva and Pai 2003; Ghate 2003; Husain and Bhattacharya 2004; Datar and Prakash 2004). The success of collective action depends on levels of social capital emerging from a sense of mutual reliance and cohesion among people, presence of a committed local administration and local leadership.

Watershed management has been a major intervention in rural development, and many agencies have initiated micro-watershed projects in different parts of the country, using SHGs (e.g. water user groups, catchment protection collectives). Nevertheless, the strategy accepted by many research and government institutions that each watershed should have one SHG was found unviable (Fernandez 1998), mainly because of a mismatch between the social configuration of the SHG with the geographical unit of a watershed. Large associations have different groups as well as socially distinct configurations like caste, family, occupation, lifestyle or origin. In Gujarat, SHGs with watershed management mandate form committees independent of the non-functional 'pani-Panchayats', and they have been involved in constructing water-harvesting structures and check dams in the village. Nurseries and plantations of forest trees are another conservation activity of these SHGs that also act as a source of income generation (Cronwell 2003). While community institutions in watershed management have been working for equitable distribution of irrigation water, SHGs formed in regenerated scrublands (e.g. Papagni basin in Andhra Pradesh) work to generate livelihoods from biomass.

7.2.4 SHGs as Networks for Overall Rural Well-Being

Poverty reduction is an essential but not exclusive process of improving social well-being. Poverty reduction is perceived as increasing the freedom of choice and capabilities (Sen 2000) or increasing access to resources one needs to function (Dasgupta 2001). If poverty reduction as commonly understood involves enhancing human-made (MC) capital, 'well-being' extends beyond this and is determined not merely by higher consumption levels but also by aspects like literacy, skills, civil and political liberties and quality of environment. Well-being thus depends also on availability of other assets like natural capital (NC) and social capital (SC). While NC is the stock and flow of environmental goods and services, MC represents the stock and flow of manufactured resources, SC is the aggregate of interpersonal networks beneficial to the society (Coleman 1988) and HC is considered as aggregate of education, skill and experience.

Expectation about the role of SHGs in bringing rural well-being seems to originate in (a) the role of social capital in reducing poverty, (b) the debt-resource hypothesis and (c) the poverty-environment nexus theory. In reality, these are context-specific and have varying strength, depending on diverse factors (Dasgupta et al. 2005). Nevertheless, the broad implications of these concepts are discussed below.

(i) SHGs and social capital for poverty reduction: According to Elaine and Barton (1998), social intermediation is financial intermediation with a capacity-building component. It can be understood by transformation of beneficiaries into clients or customers and creation of local institutions that bridge the gap between the formal financial institutions and marginalised groups. SHGs are institutions to uncover latent shared values, for sanctioning antisocial behaviour and for channelling individual actions in collectively desirable directions (World Development Report 2000). SHG institutions are geared to supplement social capital endowment of a community through fostering mutual trust, cooperation and cohesiveness among people.

Lin's (2000, p. 786) network-based definition of social capital is 'an investment and use of embedded resources in social relations for expected returns'. There are arguments that the benefits of social capital in reducing poverty have been oversimplified in literature and that it is a weak policy tool to fight poverty (Schuurman 2003; Cleaver 2005). There are also studies showing that benefits of group formation may not lead to lowering of poverty itself (Thorp et al. 2005). While Vatta and Singh (2001), Tankha (2002) and Galab and Rao (2003) report that SHG activities have improved the income of women, Panda (2003) and Mahajan (2004) opine that the income through SHGs has limitations in meeting the financial requirements of members and does not provide any income security. But the relevance of SHGs as powerful instruments of social, political and economic empowerment of women has been unanimously brought forth in the studies of Antia and Kadekodi (2002), Sinha and Sinha (2002) and Kelkar et al. (2004).

(ii) SHGs and the debt-resource hypothesis: The debt-resource hypothesis (DRH) implies that if resource degradation increases with indebtedness and if SHGs can reduce the indebtedness of nature-dependent poor, they probably can help conserve natural resources and thereby improve rural well-being. Forming credit and savings groups can not only lead to the economic betterment of the community but can also reduce their forest dependence through providing new livelihood options. Nevertheless, DRH itself is not proven (Neumayer 2005) as of now.

(iii) SHGs and the poverty-environment nexus: Erosion of local resource base can make certain categories of people destitute even while the economy's gross national product increases (Dasgupta 2001). At a microscale, this would mean that poverty reduction is invariably dependant on natural regeneration and biomass. When livelihoods depend directly on natural resources, the sustainability of livelihoods depends on the sustained flow of natural resources. Thus, poverty reduction strategies should be making community sustainable suppliers of natural capital (NC) first, and consumers of human-made capital (MC) next. Retaining a productive and healthy landscape in spite of changed consumption pattern comes through ecological knowledge (HC) and synergistic networks (SC) built through institutions like SHGs. Hence, management of human and social capital through institutions like SHGs is crucial if poverty reduction strategies are to stimulate complementary changes in the ecological component of SEES.

Are self-help group (SHG) institutions capable of enhancing the aggregate of components discussed above, eventually enhancing rural well-being? SHGs can be catalysts in building human and social capital, in order to move towards sustainable natural capital management so that livelihood options are available and long-standing. Then, livelihood security can lead to freedom of choice and access to resources, eventually leading to improved rural well-being. Now the question is that of evaluating the success of the SHGs in achieving these multiple objectives of access to credit, provision of livelihoods and rural well-being.

7.2.5 Performance Assessment of SHGs

Several factors can reveal the nature of functioning of SHGs, including norms of operation and execution, periodicity of and attendance at meetings, maintenance of records, democratic functioning, participation and awareness of group members, regular repayment of loans, credit allotment process and self-reliance of the group (NABARD 2000; Arvind 2002; Anand 2002). The World Bank appraises financial performance of microfinance institutions using criteria like portfolio quality, productivity, efficiency, profitability and financial viability, which are applicable to financially well-developed groups (Ledgerwood 1999). Most studies in this regard identify similar factors as reasons for good or bad performance of SHGs,

which include quality and stability of leadership, homogeneity, democracy and transparency of the group, as well as understanding and cohesiveness within the group (Anand 2002; Arvind 2002). Challenges include non-observance of regulations by the group, exclusion of the poorest from the group and bureaucratisation of the groups in due course of time (Harper 2002a; Arvind 2002; Anand 2002; Kadiyala 2004).

However, integration of the economic and institutional criteria of evaluation with appropriate ecological criteria and ways to judge SHGs as vehicles of rural well-being are scarce in literature. We try to evaluate SHGs from the perspective of SEES, using available criteria in previous studies as well as those evolved for the current study.

From the very few examples of SHGs targeting wholesome rural development, we selected a set of self-help groups from Karnataka, facilitated by the Ashoka Trust for Research in Ecology and the Environment (ATREE). ATREE facilitates these SHGs among the forest-dependent people of Malè Mahadeswara Hills (MM Hills) of Karnataka, with the purpose of fostering economic incentives to increase people's stake in conservation. Next section details the empirical study before describing different approaches to assess performance of SHGs. Our empirical example for the purpose of demonstrating the methodology for evaluation of SHGs, we confine to selected SHGs of the MM hills.

7.3 The Soligas and Lingayats of Malè Mahadeswara Hills: Socio-economic Context

The study area of the Malè Mahadeswara Hills (MM Hills) Reserve Forest is located in the Kollegal Taluk of Chamarajanagar district in Karnataka. The total area of the reserve forest is about 435 km^2. MM Hills lies very close to the border between Karnataka and Tamil Nadu, marked by river Palar, and is characterised by a chain of undulating hills. The highest point (*Ponnachi boli*) reaches an altitude of 1,514 m and the highest inhabited village, Kokkubarai, is at an altitude of 1,430 m. The major forest types in MM Hills include scrubs, dry deciduous and moist deciduous forests. The area receives rainfall mainly from the northeast monsoon (September to November) and the driest period of the year is from January to May. People of MM Hills belong to two communities: the Soligas, the indigenous tribal people, and the Lingayats. The eight tribal settlements in MM Hills where the study was conducted had a total population of 1,909 comprising 1,506 Soligas and 403 Lingayats.

Soligas live in settlements called '*podus'* scattered in the forest and its fringes (see Fig. 7.1). Traditionally, the major occupation of Soliga*s* was making bamboo baskets. In fact, the name Soliga itself has originated from '*sola'* meaning bamboo thicket in Tamil (Kibe and Somasundaram 1990). But overexploitation led to depletion of bamboo in the MM Hills forests, and hence the forest department imposed restrictions on collection of bamboo. Traditionally, Soligas have also engaged in shifting agriculture, hunting and collecting a wide range of non-timber forest

Fig. 7.1 A Soliga *podu* in MM Hills

products (NTFPs) for their subsistence. When the area was designated as a reserve forest (around 1914, as per the working plan for Kollegal forest division for 1974–2004), the state government banned shifting agriculture and hunting. Soligas were allocated small pieces of land for settled agriculture.

Soligas practise rainfed subsistence agriculture and collect forest products. Both the activities are seasonal and uncertain. Hence, during lean periods, Soligas resort to migration in search of alternate sources of income. In this context, SHGs formed among the women of MM Hills in 2002 with the following objective: to increase the stake of local communities in conservation by implementing innovative models of conservation, based on strong participation, institutions and human resources. While men got trained to take up handicrafts using an invasive weed *Lantana camara*, as an alternate livelihood option, women formed SHGs, with the objective of initiating conservation-linked livelihood sources. The activities of SHGs span from savings and microfinance to getting involved in Lantana collection as well as making artefacts and furniture.

Out of existing 30 SHGs (known locally as *jyothi)*, we focused on 12 SHGs that started functioning in 2002. Each SHG has 8–12 members and has an elected or nominated president and secretary. Each group meets once a month and each member pays a fixed amount (usually Rs. 10–30) as monthly saving. Savings are mobilised as loans to members at an interest rate of three for Rs.100 per month (36 %). Beneficiaries of loans are usually selected by the SHG on the basis of urgency of the purpose. The president and secretary of each group operate the accounts. Records that are maintained at the group level include balance sheet, process document (minutes of meetings), member-wise cashbook and passbook for bank accounts. Most of the members being illiterate, the accounts at the time of the

Fig. 7.2 A group meeting of one of the SHGs in MM Hills

survey were managed by field staff of the facilitating organisation. Groups that have a considerable amount of savings have opened bank accounts. Several SHGs form a 'cluster' and about 12 clusters will form a federation. Each SHG holds weekly meeting (Fig. 7.2) while office bearers of all SHGs assemble at MM Hills for monthly 'cluster meetings' to discuss the problems they face and strategies to solve them.

7.4 Analysing the Self-Help Groups

We undertook a detailed survey of SHG members and non-members using semi-structured questionnaires in MM Hills during 2005. Separate questionnaires were pretested, revised and finalised for individual interviews and group-level interactions.

We interviewed 30 % of members in each of the twelve SHGs formed in eight villages of MM Hills taking care to include the following categories of members: those who have availed maximum credit and minimum credit and those without loans from SHG. In total, 41 members were interviewed (Table 7.7 in Appendix). In order to bring out the role of SHGs, non-members were also interviewed for comparing the pattern of resource dependence of members and non-members. For this, 23 non-members were interviewed. Village-level discussions involving a group of 10–15 people of each *podu* provided general information about the lifestyle of the people and their practices as a group. Secondary data collected from the village office in MM Hills, Kollegal Taluk census report, Kollegal forest division working plan and markets in MM Hills, were also used in the study to supplement primary data.

The process of SHG evaluation included (a) evaluation of the SHG as a social organisation, i.e. evaluating the social capital created in mutual trust and collective action (Sect. 7.4.1), (b) assessing human resource improvements achieved through SHGs (Sect. 7.4.2), (c) evaluating the monetary and livelihood benefits (Sect. 7.4.3) and (d) assessing the impact of SHGs on natural resource management (Sect. 7.4.4).

7.4.1 Evaluating the Role of SHGs as Social Organisations

Performance evaluation of SHG as a social organisation involved selecting criteria for evaluation and then identifying and computing indices for these criteria. Both quantitative and qualitative parameters could be used for evaluation of organisational performance of SHGs. The following criteria were selected based on existing guidelines and studies (Ledgerwood 1999; NABARD 2000; Arvind 2002; Rajasekhar 2002; Bhose 2003): (a) participation of members in group activities and (b) awareness of members about the purpose and activities of the group.

Indices for the above criteria were calculated by first identifying the factors contributing to each criterion and framing questions aimed at eliciting relevant responses from the members surveyed. The responses were then scored and the scores were weighted and ranked to calculate the index for each criterion.

(a) Index of participation: The extent of participation of members in various activities, assessed from individual interviews, was used to calculate an index of participation. Seven parameters were used to adjudge the index. These include the following: (i) naming the SHG, (ii) fixing the membership fees, (iii) payment of the membership fee, (iv) resolutions taken by the group, (v) discussions in the group meeting, (vi) sanctioning loans and (vii) fixing the amount, interest rate and time period of loans.

Scores ranging from 1 to 3 were assigned for individual responses with 1 for ignorance about the process to 3 for active participation in the process. In addition to these, performance of groups as a whole was also scored based on selected parameters and these scores were added to the average score for individuals' responses. Group-level performance was adjudged using the indicators below:

(a) (i) Percentage of dropouts, an indicator of how far the groups have been successful in keeping the members together, and (ii) percentage of meetings with 100 % attendance, indicating the extent of participation of members in group activities. According to Bhose (2003), attendance in all meetings in which there were resolutions taken should be 100 % to indicate effectiveness in functioning of the group as a democratic body (see Dhanya 2004 for details of the scoring process). The cumulative score of the mean individual scores and group-level parameters formed the index of participation, and higher values of this index indicated democratically functioning SHG.

(b) Index of awareness: Awareness of members (about formation of the group, naming of the group, fixing the membership fees, resolutions taken by the group, activities of the group, aspirations of the group, expenditure plan of the corpus fund, credit facilities from the bank availed, comparative advantages of the group, challenges faced and ways to improve the functioning of the group) was judged from the survey and scored as in the case of index of participation, and the mean score of individual respondents from each group formed the index of awareness of that group. This was supplemented with information on the incidence of conflicts within and outside SHG, for judging the realised benefits of collective action. Results of organisational evaluation of SHGs based on (a) and (b) above are presented in Sect. 7.5.

7.4.2 Evaluating the Role of SHGs in Enhancing Human-Made Capital

SHGs can impact the financial resources of its members either through improved access to credit or through greater incomes from new livelihood opportunities. Efficiency of the group as a financial institution meeting the crucial liquidity needs is judged by an index of savings and credit calculated from the individual responses as follows: (i) regularity in the payment of savings, (ii) availability of credit on demand, (iii) purpose of loans advanced, (iv) dependence of members on external sources of credit, (v) repayment of credit and (vi) mode of fixing the amount, interest rate and time period of loans.

Certain group-level parameters calculated from SHG records were also made use of for calculating this index. These include the following:

(a) Per capita per month savings: This parameter gives an idea of how much each member pays to the group in a month in the form of savings, management fund and interest on loans.
(b) Percentage of average annual household income of members mobilised as savings: This is a measure of the saving propensity (thrift) of the members.
(c) Amount of loans advanced per capita per month: This parameter shows how efficiently the savings of the group are rotated among its members as loans. A group is considered active only if its common fund revolves briskly (Bhose 2003).
(d) Percentage of savings advanced as loans: This indicates the credit allotment capacity of the group. Hence, higher percentage of savings mobilised as loans indicates effective functioning of the group.
(e) Percentage of members having loans from the group: This again indicates the credit allotment efficiency of the group and the credit absorption capacity of the members or the extent to which members use the group as a source of accessible and affordable credit. Higher percentage of members with loans from the group is a positive indication in this regard.

(f) Percentage of members who have taken loans from non-SHG sources after the formation of the group: This criterion gives an idea of whether the group could cater to the financial needs of its members. Dependence of members on outside sources of credit is an indication of the insufficiency of the group as a savings and credit institution.
(g) Amount overdue as a percentage of total loan amounts: This reflects the credit repayment capacity of members and credit recovery rate of the group. According to Bhose (2003), overdues should not exceed 5 % of the total loan amount.
(h) Frequency distribution of loans: This can give a picture of the range of amounts in which loans are allotted to the members. A trend of large number of small loans is considered a positive sign for an SHG in its growing phase (Natarajan 2004, personal communication).

Both individual responses and group-level parameters were scored as in the case of participation index (see Dhanya 2004 for further details), and a cumulative score was worked out as the index of savings and credit.

Apart from the changes in income and credit worthiness attributable to membership in SHG, indications of change in livelihood options, derived from enhancing the human capital endowment, can be taken as indicators of potential impact of SHGs on income generation. At present, the SHGs under evaluation have not been responsible for income generation, and hence, the evaluation confines to their role as microfinance institutions.

Thus, social and institutional impacts of SHG were evaluated using indices of participation, awareness and savings and credit as per methods discussed in Sects. 7.4.1 and 7.4.2. Section 7.5.1 describes the combined results of these indicators.

7.4.3 Evaluating the Role of SHGs in Enhancing Human Capital

With prevailing illiteracy and absence of adult education programmes as indicated by the survey, enhancement of human resource of the community through SHGs will be reflected in the skill upgradation attained through various training programmes. Training received in various cottage skills could be compared for the comparative advantage in being part of SHG. Primary surveys are used to glean this information and Sect. 7.5.2 discusses the results of this analysis.

7.4.4 Evaluating the Role of SHGs in Natural Resource Management

This can be assessed (a) by judging what incremental capacities have been generated for sustainable management of natural resources like NTFPs. This could be

learning about sustainable harvest methods or techniques to assess the sustainable quantity of harvests or setting up participatory monitoring of quantities harvested (b) by assessing the changes in biodiversity, water use efficiency and soil fertility for the area.

Since any conspicuous improvement in natural capital stock (forest regeneration, improved biodiversity or soil and water conservation) due to group activities can be reasonably expected only after several years of functioning of the groups, in the present study potential avenues to foster livelihoods that are less dependent on extractions from forests or to promote resource conservation were explored as an indicator of groups' ability to enhance natural capital. Section 7.5.3 discusses the potential of this parameter in evaluating SHGs.

7.5 Self-Help Groups and Their Interaction with the Social-ecological-Economic System

Indices of the selected criteria for focal SHGs were formulated in order to rank the groups in a general assessment of performance under each index. Groups were also sorted according to their achievements and failures under each selected criteria (Table 7.1).

Table 7.1 Profile of all SHGs studied

SHG no.	Name of SHG	Mean annual income of member households (Rs.)	Mean annual forest dependence[a] of member households (Rs.)	Per capita savings as on May 2004 (Rs.)	Per capita loan amount from SHG (Rs.)
1	Paramatma	59,280	16,950	330	43
2	Thousarappa	54,484	19,865	99	41
3	Jadeswamy	31,543	12,757	491	200
4	Vanadevathai	47,516	19,722	652	294
5	Kichukuthumaramma	36,949	13,922	844	257
6	Manjulamma	52,678	28,733	650	250
7	Sangamma	44,123	23,643	224	69
8	Padaramadeswara	60,891	20,378	218	100
9	Madeswara	79,903	31,335	478	50
10	Samundeswari	56,587	22,052	793	215
11	Mankamma	73,583	25,504	531	183
12	Aathisakthi	67,049	16,874	1,117	293
Average for all the groups		55,382	20,227	536	166

[a]Value of all products derived from forests for own consumption and sales

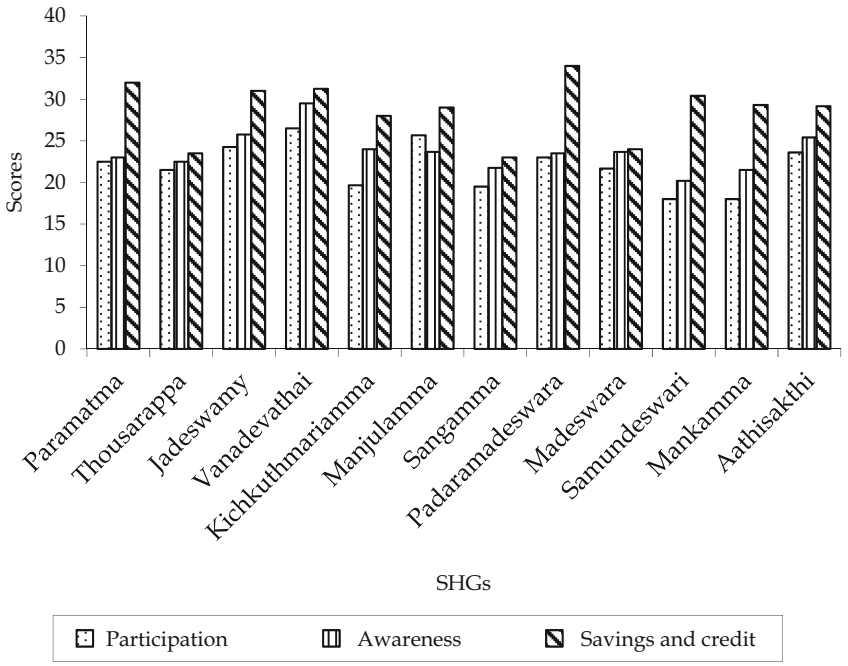

Fig. 7.3 Performance of SHGs in selected indicators

7.5.1 Performance of SHGs as Social Organisations and in Enhancing Human-Made Capital

Comparison of the performance of the SHGs under study on the three indices of participation, awareness and credit institution shows that while group 4 tops in participation and awareness indices, group 8 tops in the savings and credit index. Groups 2, 7 and 9 perform badly on all three indices (Fig. 7.3).

Better performance of group 4 in participation and awareness indices indicates better social cohesion in this group, while the higher ranking of group 8 in the savings and credit index can be attributed to greater entrepreneurship and comparatively high household income of members belonging to higher classes in social hierarchy. Many parameters considered in the savings and credit index, like the amount of per capita per month savings, are significantly correlated with the household income of members (Pearson's coefficient of correlation = 0.57, $p < 0.01$). On the other hand, criteria like proportion of members with loans from the group and the proportion of savings of SHG mobilised as loans are related to the entrepreneurship of the people and their ability to use available credit sources efficiently. Poor performance in all three indices in some groups could be linked to the low annual household cash income of members compared to other groups,

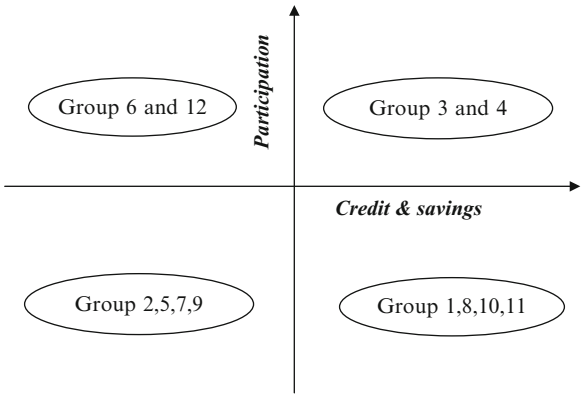

Fig. 7.4 Scenario matrix among the study groups

their lack of familiarity with the participatory process of SHG management and remoteness of hamlets limiting their interaction with the outside world.

Out of the 12 focal groups, 9 reported conflicts and 4 of them were reflected in the meetings we participated. Incidence of conflicts within SHGs and between members and others in the village indicates a lack of social cohesion attributable to SHGs. Our survey finds inadequate social capacities in interactions and community initiatives as common occurrence both within and outside SHGs. It is not yet clear how SHGs will be able to nurture social capital in the groups studied.

In light of the above discussion, four scenarios could be identified to characterise the overall performance of SHG with respect to the social and institutional indicators as depicted in Fig. 7.4.

The four scenarios that the paper identified among the SHGs under study have the following implications:

- Groups with high index under participation, savings and credit index imply good potential to be incorporated into sustainable social institutions.
- Groups with high participation index sometimes possess low savings and credit index due to reasons like dearth of financial resources and lack of gender equity in financial resources of the family. Such instances envisage external credit support and awareness creation, especially among the menfolk, paving the way for financial empowerment of women through entrepreneurial ventures.
- Members of groups with high savings and credit index view SHGs only as a means of accessible credit and they lack awareness about the larger role of SHG in rural well-being. These groups have to be helped with capacities for ensuring cognitive interactions and active participation of members.
- Groups with low participation index and low savings and credit index are relatively unsustainable in the long run, unless they get adequate financial and institutional monitoring. These groups have to be monitored to identify the socio-economic factors that prevent SHGs from acting as catalysts in rural well-being.

Table 7.2 Skills imparted to respondents through SHGs

Skills acquired	Members (%)	Non-members (%)
Basket making	13	0
Pickle making	26	0
Pappad making	8	0
Incense making	33	12
Honey processing	0	4
Shampoo making using *seega* (*Acacia concinna*)	8	0
Tamarind processing	3	0

7.5.2 Performance of SHG in Enhancing Human Capital

If we compare the added human capital through SHGs, it appears that nearly 90 % of total members received training at least once in new skills, half of which are concerned with value additions to forest products like fruits, tubers and cane. The rest of the trainings did not have any direct relevance to locally available resources (Table 7.2).

It seems to be a clear advantage to be a member of SHG as far as improving one's skills is concerned. Acquired skills in the long term can expand livelihood opportunities. This would have had equitable developmental impacts if the poorest were involved as members in SHGs. Other appropriate human resource investments have been in imparting sustainable techniques of harvesting and monitoring forest products. SHGs appear as potential platform for further improvements in human and natural capital through education programmes and exposure visits to SHG activities in other places.

7.5.3 Performance of SHGs in Natural Resource Management

The role of SHGs in NRM in the study area depends on the extent of forest dependence of members and the added involvement and capacities in NRM. On an average, members derive 38 % of their household income from forests and possess 1.12 ha of agricultural land per household (Table 7.4). Currently, it appears that there has been no added skill in either sustainable management of agricultural lands, in monitoring harvest rates of forest products or in assessing sustainable offtakes from local plant resources. The survey elicited possible enterprises linked to conservation, like medicinal plant cultivation and lantana collection for furniture making which could be pursued by SHGs.

The results are reflective of the fact that human and social capital channelised through SHG have not yet targeted natural resource management. Involving SHGs in conservation-linked enterprises requires members to synergise their activities

Table 7.3 Comparative profile of SHG members and non-members (in 2004)

Parameters	Members	Non-members	Percentage difference
Age (mean)	35 (12)	33 (12)	–6.74
Family size (mean)	5 (3)	4 (2)	–24.18
Household (HH) total income (mean)	55,198 (35,064)	30,603 (29,525)	–44.56
Cash income (mean)	37,056 (34,309)	16,098 (13,322)	–56.56
Noncash income (mean)	18,142 (13,123)	14,505 (27,078)	–20.05
Per capita income of the HH (mean)	10,240	7,488	–26.88
Total agricultural income (mean)	7,571 (8,161)	1,703 (2,536)	–77.51
Agricultural income as percentage of total income	74	23	–51
Cash income from agriculture (mean)	5,798 (6,594)	904 (2,210)	–84.40
Noncash income from agriculture (mean)	1,773 (3,122)	799 (1,245)	–54.95
Forest dependence (mean)	20,227 (12,336)	17792 (27,865)	–14.93
Per capita forest dependence	3,880	4,353	12.20
Forest dependence as percentage of total income	38	58	33.50
Noncash income as percentage of total income	33	47	–21.58
Loan availed from moneylenders (mean)	3,913 (4,552)	304 (863)	–92.22
Total cash liability (mean)	3,869 (6,181)	304 (863)	–92.13
Per capita debt (mean)	718	74	–89.62
Landholding (mean) (ha)	1.12 (0.77)	1.09 (1.14)	–2.78

All monetary values are on an annual basis; standard deviation within parenthesis

with improved natural resource management, including monitoring the regeneration rates of raw materials, adopting ecologically safer methods of cultivation and forest product extraction and providing tools to monitor the stock of resources remaining in the SEES. Such awareness, social synergies and skills generated and disseminated through SHGs can build up sufficient human capital to manage the natural resources of the SEES without major conflicts. A collective learning process organised through groups of poor people brought together primarily for better access to credit and entrepreneurship can be a balanced movement, fostering both livelihoods and conservation.

7.5.4 Comparing SHG Members and the Rest of the Community

This comparison is accomplished in recognition of the need to look at the value added by the SHGs to the community. A number of differences are discernible in the economic conditions of SHG members and non-members (Table 7.3), even though they form a homogeneous group in terms of caste, culture, beliefs and practices.

Age and family size do not appear to be barriers for participation in SHG activities, as revealed by the survey. Household income of non-members (Rs. 30,603/annum) is about 44 % lesser than that of SHG members. Annual average household cash income is higher for SHG members, while noncash income is slightly higher for non-members. Villagers who were not members of SHGs were more dependent on forest resources in terms of proportion of total income derived from the forests (38 % and 58 %, respectively, for members and non-members). This could partly explain the higher contribution of noncash income among the non-members. While 89 % of SHG members received training in new skills, only 16 % of non-members had that privilege.

Since the focal SHGs have not been generating incomes so far, the relatively higher income of members is irrespective of SHG membership. If this is the case, then SHGs in the study area represent relatively better-off people and have excluded the poorest in the community. Also in terms of credit taken, non-members are totally dependent on moneylenders even though their outstanding liability is lesser than that of members. As a microfinance institution in providing the much-needed liquidity, SHGs are in fact helping the relatively richer fraction within the community. Higher noncash income of non-members might be due to their greater dependence on forest-related activities (NTFP collection, fuel wood and fodder collection and grazing). They also work for more number of days per year, since forest-dependent activities are less remunerative. Members possess greater extent of cultivated land-holdings and hence lower proportion of fallow land which gives rise to higher cash and noncash income from agriculture. According to Galab and Rao (2003), the landless are underrepresented in SHGs due to the pressure of daily work and likely loss of wages for days spent in meetings. Our analysis in terms of income and land possession also shows that non-members are poorer than members and are more dependent on the local forest resources. One of the major arguments against microcredit worldwide is its failure to reach the poorest of the poor (Vatta 2003). If forest dependence is higher for non-members, then the objective of sustainable use of forest resources through SHG involvement – either by substituting forest dependence through potential SHG-based enterprises or through sustainable harvest of resources – cannot be meaningfully addressed. In terms of future options for improved livelihood too, non-members are at a disadvantage, being relatively unskilled.

Examining the reasons for exclusion of non-members from the group, it is apparent that conflicts within and outside the household are equally important. Table 7.4 analyses the underlying reasons for not joining SHGs. Lack of resources for paying the membership fees and conflicts emerge as major reasons. Many a time, the initial mobilisers may exclude the poorest due to their bias and underestimation of the capacities of the poor to save. Sometimes the poor are indifferent to such programmes and thus never join the groups (APMAS 2002). Nevertheless, our analysis reveals that the SHGs under study have not penetrated to the weakest and poorest strata of target community. MYRADA (a pioneer in the field of SHG movement), through its studies, has found that over half of the poorest families enter SHGs only after 2 or 3 years of formation (Harper 2002b).

Table 7.4 Reasons for exclusion in SHGs

Reason	Non-members stating the reason (%)
Not aware of SHG	12
Cannot afford membership fees	24
Conflict with SHG members	20
Discouraged by family members	16
SHG stopped functioning	8
Member of other voluntary groups in the village	4
Other reasons	16

Table 7.5 Logit analysis of SHG membership

Parameter	Estimate	S.E.	t-ratio	p-value
Constant	−1.926	0.834	−2.308	0.021
Cash income	0.00008	0.00003	2.767	0.006
Total liability	0.001	0.001	1.981	0.048
Noncash income	0.00001	0.00002	0.846	0.398
Extent of land	−0.375	0.428	−0.877	0.380

McFadden's rho-squared = 0.343

Logit analysis on membership (Table 7.5) indicates that membership in SHGs is significantly related to higher income levels and high levels of credit availed (credit availed includes liabilities accrued from different sources including SHGs, banks, moneylenders). This reiterates the observation that SHGs under study have not been pro-poorest and they have been mostly a source of microcredit for the members.

7.5.5 Factors Determining Performance of SHG Institutions

Analysis of the SHGs under study and their potential role in SEES point towards the following factors to improve the present performance.

(a) Reliable sources of livelihood: The absence of perennial livelihood opportunities is one of the biggest obstacles before sustainable self-help group activities. Major occupations of SHG members are subsistence farming, NTFP collection, fuel wood collection, raising livestock and seasonal migration. All these activities are seasonal and none of them are capable of serving as a reliable income source for people. This leads to irregularity in payment of subscription fees and repayment of credit. Thus, stable income and sustainable SHGs are mutually reinforcing.

(b) Accounting and organisational skills: Illiterate members do not maintain records and accounts. This makes them dependent on the facilitating organisation for managing the accounts. Rules and regulations that are to be observed by a democratic social organisation are difficult to be observed under such circumstance, for instance, insisting for quorum specification in meetings, imposition of fines for defaulters and absentees and follow-up of resolutions. This indicates the need to impart skills to a community with little formal education and making them real self-help organisations. Our survey showed little involvement of members in group formation, discussions and decisions. The only discussion pursued was regarding credit allotment and repayments over which members spend inordinate time amidst heated arguments. As a result, time for constructive discussions or follow-up of decisions taken during previous meetings was rather inadequate.
(c) Constant interactions: Interactive discussions between members and facilitators on the potential and needs of SHGs (assuming that the facilitators themselves are well trained in organisational skills and the vision of SHGs) and skill upgradation can open up pathways that SHGs can adopt in the due course. Co-evolution of SHGs and social assets can go a long way in benefiting the SEES. Logically, social assets should be collective benefits of open access regimes consisting of social interactions and exchanges, when free-riding this open access resource may not lead to 'tragedy of commons'. Table 7.6 summarises the discussion on SHGs so far clarifying their accomplishments as well as unfinished agenda.

7.6 Conclusion

Self-help groups and village collectives are potential institutional vehicles of rural well-being, based on the role social capital can play in poverty reduction as put forth by the poverty-environment nexus theory and the debt-resource hypothesis. Women SHGs in India generally focus on activities providing access to credit, consumption goods, enterprises or for skill upgradation.

For some, like moneylending companies and consumer goods manufacturers, SHGs are a way to reduce cost and enhance outreach. For others interested in poverty reduction, it constitutes part of a mandated poverty reduction strategy or an entry point for the broader goal of empowerment and transformation of power relations within society. Although the microfinance activities promoted by women's SHGs have shown considerable potential in the beginning, the analysis shows that they are unable to absorb the range of benefits from social crafting at the grass roots.

Though reconciling livelihood generation and natural resource management is a potential goal for rural SHGs, they leave much to be desired in reality. The relatively young SHGs studied in MM Hills acted as platforms for skill upgradation and microcredit institutions, despite excluding the poorest. Unless rural SHGs are not perceived, constituted and monitored as integral parts of social-ecological systems, civil society could miss this opportunity to realise long-standing socio-economic empowerment of rural poor.

Table 7.6 Self-help groups and the social-ecological-economic system: myths and realities

1. SHGs and economic capital	
1a. Microcredit institutions/microfinance	
Myth	*Reality*
Panacea for the credit needs of poor	Impart dimensions of democratic participation to credit management even in the absence of incentive. Nine out of 12 groups performed well in savings and credit mechanism
	Region specific (Rajashekhar and Madheswaran 2005). Credit access is still an unmet need for rural India
	SHGs are beneficial to the lender, considering the large volume low-risk (high credit recovery) business
	As long as the effort is only to improve savings rate and not stabilising income levels, the saving trend will not be sustained
1b. Links in marketing chain	
Corporate links with rural poor through SHGs increase the consumption levels helping poverty reduction	Efforts to link corporate profits to rural SHGs can affect SES through over harvest, pollution and eventual deprivation of biomass needed for subsistence
	Ad hoc attempts at increased consumption levels cannot remove persistent poverty as these efforts lack provisions to improve production (supply)
	Two issues in marketing: (a) the marketability of the product or service provided or produced by the group and (b) market access (Adolph 2003)
1c. Enterprise	
SHGs through microfinance provide a platform for potential rural entrepreneurs to develop skills and evolve long-term livelihood options	Ten out of 12 groups fared well in improving entrepreneurship through skill upgradation
2. SHGs and social capital	
Enhancing social capital	
SHGs are mechanisms to uncover latent shared values, for sanctioning antisocial behaviour and for channelling individual action in collectively desirable direction	Microfinancing is a form of social intermediation
	Groups successful only as MF institutions without inclusive process do not directly enhance social assets
	Only five out of 12 fared well in participatory processes

(continued)

Table 7.6 (continued)

3. SHGs and natural capital	
Collective management of natural resources can be facilitated through SHGs	Enterprises established through SHGs have been trying to substitute exploitative and degrading livelihood options in certain contexts (e.g. MM Hills, Karnataka and Anantapur, Andhra Pradesh)
	SHGs can achieve this goal only if equipped with capacity to monitor and regulate natural resource extraction
	Exclusion of poorest communities among its members undermine the potential for NRM
4. SHGs and human capital	
4a. Skill upgradation	
Capacity building of members on needed skills in utilising local resources and managing enterprises would empower the community with more livelihood options	This again points to the need for an external agency for constant efforts in quality upgradation of skills
	Study showed improved capacities in all groups with respect to cottage skills
	Skills appropriate to the SEES and the market and linking the product/service need facilitation at both ends
4b. Women's empowerment	
SHGs act as catalysts in women's empowerment	As women's groups exclusively dominate SHGs, correcting gender inequalities in economic and social fronts becomes one of the greatest opportunity
	With initial facilitation, gender concerns can be ploughed into the groups

Another important institutional structure in the social-ecological-economic systems of these communities are the common property land resources and its governance mechanisms. Like the experience of the SHGs in MM Hills suggest, the potential of these institutions remain underutilised and continues to be gradually undermined, as the next chapter will demonstrate.

Acknowledgements The authors wish to thank respondents in MM Hills for their cooperation in the survey. Mr. Ramesh Kannan, Senior Research Associate, ATREE, and Mr. Narayana, Field Assistant, MM Hills field station, ATREE, are gratefully acknowledged for facilitating the survey.

Appendix

Table 7.7 SHGs interviewed: total membership and sample size

Sl. no.	SHG name	No. of members	No. of members interviewed
1	Paramatma	15	2
2	Thousarappa	11	2
3	Jadeswamy	12	4
4	Vanadevathai	8	4
5	Kichukuthumaramma	7	3
6	Manjulamma	10	3
7	Sangamma	13	4
8	Padaramadeswara	11	2
9	Madeswara	8	3
10	Samundeswari	13	5
11	Mankamma	12	4
12	Aathisakthi	14	5
	Total	134	41

References

Adolph, B. (2003). *The role of self help groups in rural non-farm employment* (Discussion Paper). UK: Natural Resource Institute.

Anand, J. S. (2002). *Self-help groups in empowering women: Case study of selected SHGs and NHGs* (Discussion Paper 38). Thiruvananathapuram: Centre for Development Studies.

Antia, N. H., & Kadekodi, G. K. (2002). *Dynamics of rural development: Lessons from Ralegan Siddhi*. Report of a joint study by the Foundation for Research in Community Health, Pune and Centre for Multi-disciplinary Development Research, Dharwad.

APMAS. (2002). *Evaluation of self-help groups in Adilabad, Cudappah and Visakhapatnam districts*. Hyderabad: Draft Report Prepared for the Government of Andhra Pradesh.

Arvind, R. K. (2002). *Analysis of micro credit groups in Ramnad plains: Options as vehicles for community-based development activities*. Unpublished Post Graduate Diploma dissertation, Indian Institute of Forest Management, Bhopal.

Bhose, J. S. G. R. (2003). *NGOs and rural development: Theory and practice*. New Delhi: Concept Publishing House.
Cleaver, F. (2005). The inequality of social capital and the reproduction of chronic poverty. *World Development, 33*(6), 893–906.
Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, S95–S120.
Cronwell, D. W. (2003). *The SEWA movement and rural development: The Banaskantha and Kutch experience*. New Delhi: Sage.
D'Silva, E., & Pai, S. (2003). Social capital and collective action: Development outcomes in forest protection and watershed development. *Economic and Political Weekly, 38*(14), 1401–1415.
Dasgupta, P. (2001). *Human well-being and the natural environment*. New Delhi: Oxford University Press.
Dasgupta, S., Deichmann, U., Meisner, C., et al. (2005). Where is the poverty-environment nexus? Evidence from Cambodia, Lao PDR and Vietnam. *World Development, 33*(4), 617–638.
Datar, C., & Prakash, A. (2004). Engendering community rights: Women's access to water and wasteland in Gujarat, Maharashtra, Andhra Pradesh and Karnataka'. In K. Sumi (Ed.), *Livelihood and gender – Equity in community resource management* (pp. 137–170). New Delhi: Sage.
Dhanya, B. (2004). *Assessing the role of self help groups in ensuring conservation linked livelihoods in MM Hills, Karnataka*. Unpublished M.Sc. dissertation, Mahatma Gandhi University, Kerala.
Elaine, E., & Barton, L. (1998). *Social intermediation and microfinance programmes: A literature review*. Washington, DC: Micro-Enterprises Best Practices. The SEEP Network.
Fernandez, A. P. (1998, July). Self-help groups in watershed management. *ILEIA Newsletter*, pp. 12–13.
Galab, S., & Rao, C. N. (2003). Women's self-help groups, poverty alleviation and empowerment. *Economic and Political Weekly, 38*(12 &13), 1274–1282.
Ghate, R. (2003). *Ensuring collective action in participatory forest management* (Working Paper No. 303). Nepal: SANDEE.
Harper, M. (2002a). *Promotion of self- help groups under the SHG-bank linkage programme in India*. Paper presented at Seminar on SHG-Bank Linkage Programme at Micro Credit Innovations Department, NABARD, New Delhi.
Harper, M. (2002b). Self-help groups and Grameen Bank groups: What are the differences? In T. Fisher & M. S. Sriram (Eds.), *Beyond micro credit: Putting development back into microfinance* (pp. 170–196). New Delhi: Vistar Publishers.
Husain, Z., & Bhattacharya, R. N. (2004). Attitudes and institutions: Contrasting experiences of joint forest management in India. *Environment and Development Economics, 9*(4), 40–50.
Kadiyala, S. (2004). *Scaling up Kudumbasree – Collective action for poverty alleviation and women's empowerment* (Discussion Paper 180). Washington, DC: International Food Policy Research Institute.
Kelkar, G., Nathan, D., & Jahan, R. (2004). Redefining women's samman: Micro credit and gender relations in rural Bangladesh. *Economic and Political Weekly, 39*(32), 3627–3640.
Kibe, R. V., & Somasundaram, H. N. (1990). *Soliga, the tribe and its stride*. B.R Hills/Mysore: Vivekananda Girijana Kalyana Kendra.
Kumar, A. (2006). Self-help groups, women's health and empowerment: Global thinking and contextual issues. *Jharkhand Journal of Development and Management Studies, 4*(3), 2061–2079. Ranchi: XISS.
Ledgerwood, J. (1999). *Sustainable banking with poor. Microfinance handbook – An institutional and financial perspective* (pp. 205–232). Washington, DC: The World Bank.
Lin, N. (2000). Inequality in social capital. *Contemporary Sociology, 29*, 785–795.
Mahajan, V. (2004). De regulating rural credit. In *New priorities: A symposium on a social agenda for India.* http://www.india-seminar.com/2004/541.htm. Accessed 15 Sept 2004.
NABARD. (2000). *Circular, national bank for agriculture and rural development*. New Delhi: NABARD.

Neumayer, E. (2005). Does high indebtedness increase natural resource exploitation? *Environment and Development Economics, 10*(2), 127–146.
Panda, S. K. (2003). Micro-finance in economic empowerment of weaker sections. *Yojana, 47*(3), 21–25.
Prahalad, C. K. (2005). *The fortune at the bottom of the pyramid*. Upper Saddle River: Wharton School Publishing.
Prahalad, C. K., & Hammond, A. (2002). Serving the world's poor, profitably. *The Harvard Business Review, 80*(9), 48–58.
Puhazhendi, V., & Satyasai, K. J. S. (2001). Economic and social empowerment of rural poor through self-help groups. *Indian Journal of Agricultural Economics, 56*(3), 459.
Rajasekhar, D. (2002). Economic programmes and poverty reduction: NGO experiences from Tamil Nadu. *Economic and Political Weekly, 37*(29), 3063–3068.
Rajashekhar, D., & Madheswaran, S. (2005). Economic and social benefits of micro-finance programmes: An econometric analysis. In B. B. Bhattacharya & A. Mitra (Eds.), *Studies in microeconomics and welfare* (pp. 383–404). New Delhi: Academic Foundation.
Schuurman, F. J. (2003). The politico emancipatory potential of a disputed concept. *Third World Quarterly, 34*(6), 991–1010.
Sen, A. K. (2000). *Development as freedom* (pp. 87–92). New York: Knopf.
Sinha, F., & Sinha, S. (2002). Sustainability and development: Evaluating the performance of Indian micro-finance. In T. Fisher & M. S. Sriram (Eds.), *Beyond micro credit: Putting development back into microfinance* (pp. 264–298). New Delhi: Vistar Publishers.
Tankha, A. (2002). *Self help groups as financial intermediaries in India: Cost of promotion, sustainability and impact*. Netherlands: Report for ICCO and Cord Aid.
Thakur, S., & Tiwari, A. (2005). *Whether SHG-based micro credit programs can remove poverty? A case study of SHG-based programmes in Patan district of Gujarat* (Working Papers from eSocialSciences). http://econpapers.repec.org/paper/esswpaper/id_3a20.htm. Accessed 16 Dec 2005.
Thomas, J. (2002). *An evaluatory study of the activities of Peermade Development Society and its research institute in the environmental perspective*. Unpublished M.Sc. dissertation, Mahatma Gandhi University, Kerala.
Thorp, R., Stewart, F., & Heyer, A. (2005). When and how far is group formation a route out of chronic poverty? *World Development, 33*(6), 907–920.
Vatta, K. (2003). Micro finance and poverty alleviation. *Economic and Political Weekly, 38*(5), 432–433.
Vatta, K., & Singh, P. (2001). The performance of self-help groups in Punjab: A study of Hoshiarpur district. *Indian Journal of Agricultural Economics, 56*(3), 452.
World Development Report. (2000). *World Bank, 2000/1*. New York: Oxford University Press.

Chapter 8
Village Commons, Livelihoods and Governance: An Assessment of Karnataka's Experience

Sharachchandra Lele, Seema Purushothaman, and Sham Kashyap

8.1 Introduction

Over the past several decades, researchers have argued that common property land resources (CPLRs) are important because of the high dependence of rural households on them, the particularly high dependence of the poor among them. CPLRs act as sources of fuelwood and fodder and other products that are critical to rural livelihoods and as safety nets during times of agricultural stress. Moreover, they also are sources of other environmental services to the local and global economy. Some of the pioneering studies on CPLR dependence and effects of CPLR loss have come from Jodha's work across several states in India (Jodha 1990, 1987, 1986). These have been followed by more studies at state or regional scales (Iyengar 1989; Nadkarni 1990; Beck and Nesmith 2001; Beck and Ghosh 2000) and more recently again at the national scale using data from the National Sample Survey Organisation (NSSO) (Chopra and Dasgupta 2008; Menon and Vadivelu 2006). Most of these studies focus on the question of economic dependence, within the framework of poverty alleviation, arguing that if CPLRs turn out to be economically important for the poor, then they should be maintained as such.

There was perhaps some receptivity to this perspective at the national policy level in the 1990s, as seen in the joint forest management programme for forested areas and

S. Lele (✉)
Centre for Environment and Development, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: slele@atree.org

S. Purushothaman
Azim Premji University, Bangalore, India

Adjunct Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: seema.purushothaman@gmail.com

S. Kashyap
Grassroots Research and Advocacy Movement, Mysore, India

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_8, © Springer India 2013

in the watershed development programmes for semiarid areas that included significant support for 'treating' and regenerating CPLRs. At the same time, state-level policies have generally been quite divorced from this perspective. While central intervention by the Forest Conservation Act 1980 stopped the trend of wholesale handing out of forestlands for cultivation, CPLRs are still thought of as land banks by the state governments, sometimes for the poor but increasingly for mining, wind farms, garbage landfills or real estate and industrial development. With the introduction of the concept of paying net present value for conversion of forests, there is a possibility that forest conversion will also be dictated by economic calculations. And it is hard to argue against the economic logic of converting uncultivated CPLRs to development projects, as the 'net' economic benefits to society of conversion may often be higher, although the distributional impacts may be quite regressive. There is also the concern, voiced occasionally in some studies, that dependence on CPLRs (even of the rural poor) may in fact be diminishing (Menon and Lobo 2008; Kiran Kumar et al. 2008; Baviskar 2012). It appears therefore that there is a need for clarity on at least three points. Firstly, what is the normative frame through which one views the question of CPLRs and their conversion—is the concern about aggregate economic welfare, environmental benefits only or social equity, or about the process of decision-making? Second, how appropriate is it to use economic analysis and the calculus of opportunity costs to even estimate benefits and costs when the institutional context is not conducive to standard valuation? And are there ways forward to better governance?

To answer these questions, we use the case of CPLRs in Karnataka. We begin by clarifying the normative frame(s) through which CPLRs may be looked at (Sect. 8.2). We then provide an overview of the types of CPLRs in Karnataka, their spatio-temporal distribution and current condition (Sect. 8.3). We then summarise the empirical evidence as to the trends in CPLR dependence, particularly the arguments about declining dependence that undermine a role for local governance and lead to a liberal conversion policy. We conclude with observations on alternative approaches to CPLR governance.

8.2 Conceptual Framework: Potential Stakes (and Stakeholders) in CPLRs

We use the term CPLR to mean all land resources to which the public or part of the public have legitimate stakes or have de facto access, regardless of the legal status. Thus resources that are managed by the community itself as well as resources owned either by the state or by private persons with de facto open access to multiple groups are considered to be CPLRs. These would then include forest and grazing lands, mineral resources, privately owned but openly accessed fallows, irrigation tanks, rivers, tank and river beds, and urban public lands. However, in the context of land resources and for the purposes of this chapter, we confine ourselves to *rural uncultivated lands owned by the state*.[1] These lands may be exclusively managed by

[1] We do not include 'commonly held or managed' agricultural lands, as there are almost no examples of this left in Karnataka state today. We also do not include seasonally open access

the state (as in the case of reserve forests), might be de facto open access (as in the case of protected forests and many other lands) and may occasionally be under (mostly informal) community management. In effect, we are saying that the 'CP' in 'CPLR' may refer to common access,[2] not common property.

The reason for such an inclusive (or permissive) definition is as follows. Admittedly, if one follows the hierarchical classification of regimes as 'authorised users', 'authorised claimants', 'proprietors' and 'owners' (Schlager and Ostrom 1992; Agrawal and Ostrom 2001),[3] then including all situations where there are authorised users, regardless of their management and exclusion rights, would be tantamount to equating CPLRs with simple easements. But one must recognise that the present property rights regime in India is an artefact of the colonial period, in which the higher level rights (of management and exclusion) that rested earlier with local communities were by and large obliterated and that this trend continued in the post-independence era. Therefore, it is better to include all commonly accessed resources, keeping in mind the possibility that communities may actually lay managerial claims to them, given a chance.[4]

Having clarified our definition, it is useful to begin by asking whether there should be any public policy on CPLRs and, if so, why. Motivations that historically drove public policy on CPLRs (such as appropriation of the forests by the British in order to control timber and generate revenue) may no longer be valid. Unless the motivation for management (and hence for state policy-making) is clearly identified, most debates would be infructuous.

To begin with, it is important to identify what is at stake and who are the stakeholders when talking about managing CPLRs. For ease of exposition, one may categorise the benefits/beneficiaries of CPLRs into local and nonlocal benefits/beneficiaries. At one level, CPLRs have the potential to provide both product and service benefits to local users, particularly those households living in forest fringes, in several ways:

(a) Resources complementing household production and reproduction activities

1. The provision of organic material like leaf manure and new soil for agriculture
2. Fodder and grazing material for livestock held by farmers
3. Fuelwood for domestic purposes and cottage/small-scale industries

(b) Resources directly providing income-generating livelihoods

4. NTFPs and other minor forest produces
5. Grazing for livestock held by pastoralists
6. Timber

---

resources, such as post-harvest agricultural lands, which may be important in some states and for some communities (Beck and Ghosh 2000), but seem still a smaller part of the issue of CPLR management and conversion. Finally, we do not focus on urban parks or other urban commons, and also do not include underground mineral resources in any direct discussions.

[2] Or common pool, which makes exclusion difficult and de facto access easy.

[3] Which corresponds to whether the user has only 'rights of withdrawal' or also 'of management', 'of exclusion' and of 'alienation'.

[4] As is now beginning to happen under the Forest Rights Act 2006.

(c) Local social-ecological services

7. Places of cultural and religious significance and recreation
8. Soil conservation and hydrological services
9. Habitat for wildlife and biodiversity that are locally valued

At another level, CPLRs are also vital in meeting regional and global ecological and economic needs. These include the following:

1. Wildlife/biodiversity habitat
2. Watershed services (including hydrological regulation and soil conservation)
3. Carbon sequestration

Under the current dispensation, CPLRs are also often a source of meeting the mineral, timber and pulpwood demands of the regional government and private industries.

Thus, CPLRs have the *potential* to provide substantial product and service benefits to a range of local and nonlocal stakeholders. In terms of public policy, one major concern then is to maximise these product and service benefits. But in doing so, the state must also look at the opportunity cost of leaving the CPLR in its current state vis-à-vis converting it into a non-CPLR, which means (given our terminology) either cultivation or non-vegetative uses (mining, quarrying, dams, roads, real estate).

Besides the opportunity costs involved, there may be at least two other public concerns: sustainability and equity. Since the actual stakeholders include both the current generation of users and the future generations of users and given the nature of the ecosystem functioning (e.g. slow regrowth of forests), sustainability over time becomes an important concern, including adaptability to future environmental shocks such as climate change.

The question of equity in the distribution of benefits, both *within* what we have loosely defined as 'local stakeholders' and between local and global stakeholders, is equally important. If landless and marginal landowning households depend more heavily on CPLRs for subsistence needs, then social justice norms require that their needs be given priority. Similarly, the rights of nomadic pastoralists are often unrecorded but strongly supported by custom and tradition. In decisions about management and/or conversion of CPLRs, rights of these communities who are often not part of the resident (and voting) population need special treatment. At the same time, since CPLRs also generate regional-/global-scale environmental benefits, fairness also requires that CPLR management not be entirely dominated by local needs and priorities.

We believe all these concerns are relevant to the formulation of public policy on CPLRs. In practice, the policy on CPLRs has tilted towards regional/global stakeholders since the colonial period. The colonial state took control of most CPLRs to meet its own narrow interests of resource control and revenue generation, although it left some lands earmarked for local uses, especially in princely states where the colonial power exercised only indirect control. Subsequently, in

the case of forests, although local needs have been recognised, the idea of the 'environmental role' of CPLRs (especially forests) continues to have an overbearing influence on policy. In practice, the forest bureaucracies do not want to give up control, especially over valuable timber resources, even if they cannot limit access fully. On the other hand, the revenue department that controls non-forestlands exercises its power in the form of permission for conversion to private/developmental uses. Thus, in one case the global stake is emphasised and full state control is recommended, and in the other case the absence of any significant stakes is emphasised, and state-controlled conversion is recommended. In either case, then local interests seem to become irrelevant. Indeed, the argument is increasingly being made that locally used CPLRs are a vestige of the past. We now consider these arguments in the context of Karnataka state.

8.3 CPLRs in Karnataka

8.3.1 Legal Categories of CPLRs in Karnataka

In Karnataka, CPLRs are spread across diverse administrative categories, with diverse local nomenclatures and forms, and controlled by various arms of the state, including the Forest Department (FD), Revenue Department (RD) and, to some extent, the local Gram Panchayats (village councils created under the 1992 constitutional amendment). This diversity in nomenclature and administration of various categories of lands probably exists in most other states of India but is perhaps extreme in Karnataka because the state was formed by aggregating regions from five different pre-independence administrations (British provinces and princely states). Although unified legislations were passed after the formation of Karnataka state (in particular, the Karnataka Land Revenue Act and the Karnataka Forest Act), no real attempt was made to rationalise these categories. For example, within the Western Ghats forested region, where most public lands are or were covered by forests, there is a wide range of individually controlled regimes with different names in each district (*soppina betta*s in Uttara Kannada (UK); Shimoga (SHM) and parts of Chickmagalur (CHM); *sagu* and *jamma baane*s in Kodagu; *haadi*s*, kumki*s and *kaane-baane*s in Dakshina Kannada (DK)/Udupi districts) with different rights, allocation rules and administrative responsibilities (see Srinidhi and Lele 2001 for details). Other common lands are again under different categories, with minor forests dominating in Uttara Kannada, *gomaal*s in Shimoga, assessed wastelands in Dakshina Kannada and *paisaris* in Kodagu. Different categories dominate in the eastern plains (Maidan) region, particularly gomaals, *amruth mahal kaval*s and reserve forests in the southern Maidan and *hullu-banni* and reserve forests in the northern Maidan regions.

Along with this diversity of regimes, there is enormous diversity in the physical condition of the CPLRs ranging from dense seminatural forests to managed tree savannas to pure grassland to barren hillocks. Today, many CPLRs are covered with monoculture plantations taken up under social forestry programmes or subsequent joint forest management. The use of CPLRs also ranges from firewood collection, leaf collection, grazing and fodder collection to NTFP collection, timber harvesting and water harvesting.

Nevertheless, one may broadly group the rural CPLRs into three categories:

(a) Forest-related CPLRs: The different legal forest categories which local communities typically have access to and would therefore be characterised as CPLRs in our definition, including reserve forests, minor forests, protected forests, village forests, individual or group access forestlands like *soppinabetta*s, kumkis and baanes and (in cases where there is villager access) even parts of wildlife sanctuaries and national parks.
(b) Major non-forest CPLRs: The legal categories of revenue lands coming under CPLRs, including gomaal (grazing lands), amruth mahal kavals (grazing lands reserved for state use), hullu-banni, paisaris and assessed wastelands ('waste' because they do not generate revenue).
(c) 'Minor' non-forest CPLRs: These include *parambog* (permanently open for public use—rivers and roads), *gundu-thopu* (small plantations) and smaller and functionally specific common lands like *gramthaan*s (settlement areas), *kere-angala* (lake foreshore), *smashaana* (crematoriums/graveyards) and *daari* (road) that are typically under the control of the Gram Panchayat (see Nadkarni 1990; Krishna Murthy 1989; Srinidhi and Lélé 2001 for details).

The first two categories hold the major amount of land and shall be the main focus of our discussion hereafter.

It might appear that there would be a high correlation between a CPLR being 'forest related' (some form of forest vegetation) and being managed by the forest department or being legally declared as forestland and others being declared as revenue lands and managed by the revenue department. But there are significant deviations and complexities. Firstly, departmental control may vary quite a bit—with some legal forestlands managed by the revenue department and the forest departments managing revenue lands. Secondly, the physical status also varies significantly within each category: legal forestlands may be grasslands or in various stages of degradation or modified vegetation and some revenue lands may actually be physically forested. It is difficult to provide rigorous estimates of resource condition disaggregated by legal type, because the condition of land records is enormously confusing and spatially referenced ownership boundaries (even for the broad category of 'state-owned lands') are not available. Individual studies have managed to provide information at the village level or multi-village level (Lélé et al. 1998; Lélé 2001; Nagendra and Gokhale 2008), using which we present some broad observations on tenurial category, location, the categorisation in government statistics, the manner of state control and local rights and the physical condition for the forest-related CPLR categories in Table 8.1.

Table 8.1 Different tenure regimes of CPLRs in the Western Ghats districts (Based on Srinidhi and Lélé 2001)

Tenure and location	Land use type (DES ninefold)	Access	Controlling department	Rights	De facto situation
Minor forests (UK district)	Forests (RF)	Largely open	FD	Fuelwood, fodder for self. cons. MFP, timber, etc. (FD/ contractors)	Physical status is mixed; rights curtailed some times; government allots housing sites
Assessed wastelands of DK and Udupi districts	Misc. trees and groves, pastures, barren?	Largely open	RD	Fuelwood, fodder for self. cons. MFP (RD)	Significant fractions encroached for cultivation, otherwise degraded
Soppina Bettas of UK district	Forests (PF)	Private or groups of households	FD + RD	Fuelwood, fodder for self. cons. MFP (FD) Pepper cultivation allowed	Varies from dense trees to tree savanna to pure grassland
Soppina Bettas of CM, SHM districts	Pastures, forests, Misc. trees and groves	Private or groups of households	RD	Fuelwood, fodder for self. cons. MFP (FD), but sold privately too Pepper cultivation allowed	Vegetation varies. Some joint patches have been divided
Haadis of DK, Udupi district	Misc. trees and groves, forests	Private or groups of households	RD + FD	Fuelwood, fodder, leaves, timber, MFP	Significant tree cover, but some are cashew plantations
Gomaals (most districts)	Pastures, barren? Misc. trees and groves	Largely open	RD	Fuelwood, fodder	Barren except if brought under social forestry; often allotted for developmental projects, housing or land distribution

Note: Acronyms refer to different districts and departments of Karnataka: see text
self. cons. self-consuption

Table 8.2 Percentage of various land use/land tenure categories in different regions of Karnataka

Particulars	Year	Regions: Coastal and Ghats	Mixed/ transitional	Northern Maidan	Southern Maidan	State total
TGA	2004	2.15	19.32	36.83	23.69	100
Permanent pastures	1986	9.39	4.38	1.79	11.1	5.94
	1996	8.58	3.49	1.72	9.66	5.27
	2004	8.53	3.79	1.7	7.96	5.00
Forests	1986	42.16	15.09	5.49	7.56	16.09
	1996	42.14	15.08	5.54	7.56	16.08
	2004	43.09	16.92	5.77	8.61	16.12
Permanent fallows and cultivable wastes	1986	5.44	3.4	3.31	7.09	4.56
	1996	5.46	3.79	3.35	5.98	4.39
	2004	5.03	4.73	3.02	6.29	4.7
Cultivated area and current fallows	1986	28.08	67.07	80.88	57.93	60.94
	1996	28.36	67.19	80.54	59.76	62.26
	2004	27.34	62.99	80.93	59.81	61.17

Source: Based on land utilisation data from Department of Economics and Statistics, Government of Karnataka. Table design based on Nadkarni (1990). Ghat refers to mountainous region, and Maidan refers to plains region

8.3.2 Spatio-temporal Distribution of CPLRs in Karnataka

The CPLRs and their categories described in the previous section vary in their location and extent across Karnataka. Exact data on the village-wise, taluka-wise or even district-wise extent of each of the above-mentioned legal categories are absent.[5] We have to make do with the ninefold land use data compiled by the Directorate of Economics and Statistics and end up with two categories of public lands (forests and pastures) and one category of mixed public and private land (fallow/cultivated waste). The spatio-temporal trends in these statistics are given in Table 8.2. We have used the four major agroclimatic zones of Karnataka: the coastal and mountainous high-rainfall zone, the transitional zone of medium rainfall (900–1,500 mm) and the northern and southern dry (<900 mm) plains (*maidan*).

We see that CPLR endowment varies significantly across different eco-historical regions of Karnataka. For example, the southern Maidan regions have traditionally had more permanent pastures as well as permanent fallows and cultivable wastes than other regions. The northern Maidan region has had the least amount of CPLR endowment. Note that these official figures do not correct for lands which have actually been encroached for cultivation or other private activities. Thus, the actual extent of CPLRs, especially in the pasture and cultivable waste category, is smaller than that reported here (Nadkarni 1990; Damodaran 1987).

[5] Some data have been compiled for just the Western Ghats districts by researchers (Srinidhi and Lélé 2001; ISEC and NST 1998). Unfortunately, the recent award-winning programme for Land Record computerisation (called Bhoomi) failed to record these diverse categories.

In understanding the interregional variation in the extent of CPLRs, two factors, namely, physiography and history, emerge as important. The local physiography often decides whether agriculture is able to spread into inaccessible or steep areas which earlier constituted CPLRs. This kind of terrain is a natural deterrent for cultivation, except in the case of crops like coffee or tea which require sloping lands. On the other hand, even between ecoclimatically similar regions such as the northern and southern Maidans, there is a big difference, which has to be largely explained by history. The southern Maidan has had a long history of princely state policies that have fostered the existence of gomaals and amruth mahal kavals.[6] On the other hand, the Nizam's regime that previously held much of the northern Maidan region appears to have favoured the expansion of cultivation so as to increase land revenues. This variation comes out sharply when village-level data are used to depict average CPLR endowment as a fraction of the total area of the village (Fig. 8.3).

One can see from Fig. 8.1 that even within the same region, there is significant variation in the endowment of CPLRs across villages. This reflects micro-level differences in physiography but also that the use of village-wise statistics masks the fact of shared use of the commons by multiple villages. This has important implications when one discusses the question of assigning use or management rights across communities.

In spite of the limitations of the data, it is indisputable that, all over Karnataka, the CPLR area has gradually declined. This 'officially recorded' decline in CPLRs is mostly due to implementation of land grant programmes (Nadkarni 1990) as well as conversion of Common Property Resources (CPR) lands for purposes like mining, dams, wind farming and other industrial activities (Nadkarni et al. 1989). Permanent pastures, which are administratively the easiest to 'give away' because they do not come under central regulations such as the Forest Conservation Act 1980, show a rapid decrease in area in all the four regions of Karnataka.

Similarly, all studies and discussions with officials indicate that the extent of encroachment of CPLRs is quite significant. Encroachment for cultivation, illustrated in Fig. 8.2, is possibly the single biggest cause for declining extent of CPLRs, although the beneficiaries in most cases (excepting big encroachments for coffee cultivation in the forested Western Ghats) are equally likely to be large or small farmers or landless (Robinson 2008). A more recent trend has been the legal conversion or encroachment of CPLRs for illegal mining and quarrying (Anonymous 2010), as illustrated in Fig. 8.3.

Encroachment has been so widespread and persistent, and driven partly by poverty, that some government officials suggest that other than periodic regularisation and legalisation of such encroachments, there is no other effective way to actually prevent encroachments. Pessimistic estimates often mention that all

[6] Whether the kavals ever served as commons in the true sense is debatable given that they were set up to meet the needs of the king's special livestock (Nadkarni 1990). It has been argued, however, that the specially bred livestock served as a public resource (for breeding) and that some grazing was permitted in these lands (Krishna Murthy 1989; Bandyopadhyay et al. 1988).

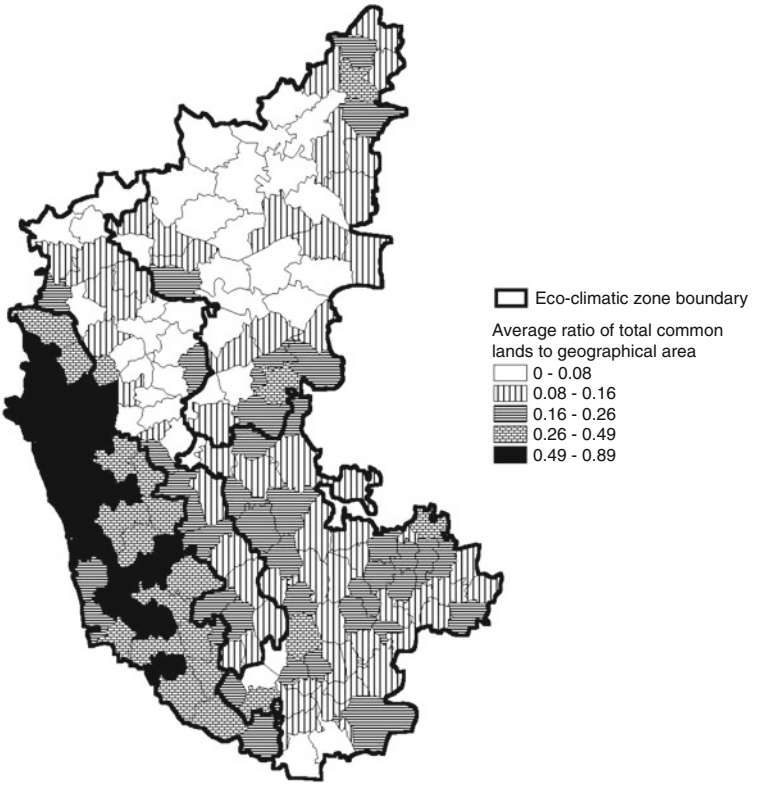

Fig. 8.1 Fraction of total common lands to total geographical area (Source: Lélé et al. 2005)

Fig. 8.2 Farming in erstwhile gomaal land in Davangere

Fig. 8.3 Quarrying on sloping gomaal lands

useful CPLRs have already been fully encroached. While we could not gather extensive data ourselves, our field experience in each of the regions is that this is true only if (a) one treats 'useful' as equivalent to 'cultivable', (b) one excludes forested areas from CPLRs and (c) one assumes that all encroachments are being productively used. In other words, although encroachment is a major issue, we believe there are still tens of thousands of villages in the 30,000 odd villages in Karnataka where de facto CPLRs are significant in extent.

8.3.3 Current Condition of CPLRs

If data on the extent itself are inaccurate, the data on condition are even fuzzier mainly due to a lack of benchmarks or reference points. But more importantly, before one gets into any assessment, one has to recognise that the assessment of 'condition' is closely tied to the use or benefit that one has in mind and the potential benefit possible in a particular ecological context (Lélé 1994). For example, a *gomaal* (grazing land) with zero canopy cover will look 'degraded' in the eyes of the forester and will register low on most measures of forest cover in satellite images (such as NDVI), but in fact this *gomaal* may be fully meeting local grazing/fodder needs through good grass growth. Not surprisingly, grasslands and tree savannas routinely get misclassified with 'degraded scrub' in official maps (Lélé et al. 1998). Similarly, the scrub thorn 'forests' of the dry regions may look 'poor' compared to the lush evergreen forests of the Western Ghats. Thus, we cannot use unidimensional 'forest cover

assessments' of the type put out by the Forest Survey of India (FSI 2007) to arrive at a simplistic ranking of CPLR status.

If one uses field-level data and takes 'meeting local needs' as the primary objective, one may still conclude that many of the CPLRs are in various stages of degradation, i.e. they are unable to provide the material needs (e.g. fuel and fodder) of the local community at the level that they potentially could (Bhagavan and Giriappa 1987). In the forested regions, the main reason for this is de facto open access, leading to unregulated extraction and consequent decline in the productivity of the vegetation.

Degradation may also take other forms. Many of the drier regions in Karnataka are witnessing widespread invasion of *Prosopsis*, an invasive tree species. This serves as a temporary relief in at least meeting fuelwood needs of rural households, but its long-term implications are not clear. Similar effects are being felt due to lantana invasion in the forested areas (e.g. Murali and Setty 2001).

Another form of 'degradation' that has taken place is where land use has been forcibly changed to better suit nonlocal needs. The implementation of Social Forestry programmes in the 1980s on non-forest CPLRs significantly curtailed access to area available for grazing either by converting such lands to softwood plantations or by preventing livestock access to grazing lands that lay further off from such plantations (Damodaran 1987; Nadkarni and Pasha 1993; ODA 1992). Under the Japanese Bank for International Cooperation-supported Joint Forest Planning and Management (JFPM) programme implemented in the eastern plains starting late 1990s, significant grazing areas were again brought under plantations (Lélé et al. 2005). The same thing happened with afforestation programmes in the Western Ghats, which targeted the meagre open-canopy areas (Saxena et al. 1997). Proposed policies to support the cultivation of biofuels such as *Jatropha* or *Pongamia* on common lands again run the risk of reducing access for other uses.

Interestingly, in many cases, neither regional, global nor local needs are met sufficiently, and even if particular stakeholder needs are met, there is no guarantee of these being met sustainably in the future. In very few cases where state control is total, as is the case of National Parks and Wildlife Sanctuaries, the resource has ceased to be CPLRs, and local needs of fuel and fodder are not met, while wildlife conservation needs are favoured (assuming there is no poaching). Finally, as mentioned earlier, illegal 'encroachment', which means conversion of CPLRs to other uses (usually agriculture, but increasingly also housing, quarrying and mining), is also a significant trend in the condition of CPLRs.

8.4 The Degradation of CPLRs: Administrative, Institutional and Social Reasons

The reason why CPLRs are being converted into private agricultural lands is relatively straightforward: the benefits that individuals (especially landless ones) can obtain from degraded and open-access lands are much lower than they may individually and

temporarily obtain from cultivating such lands, even though the costs imposed on (at least some members of) the larger community may be significant.

The more complicated question, however, is why the community permits such encroachment and equally or more importantly why the hitherto publicly held CPLRs are in a degraded condition or degrading (implying mis- or nonmanagement). Again, it is important to be sensitive to the definition of degradation before trying to explain it. We can relate the definitions to the categories of benefits described in Sect. 8.2, viz., local and nonlocal.

What then explains the current inability of CPLRs to meet *local needs* at the level that they could? Several explanations appear to hold simultaneously or for different regions/situations for this mis- or nonmanagement from a local perspective. We outline three possible arguments, which all assume that there is a local interest in CPLR management, but it is not properly articulated. In the next section, we consider alternative arguments that trace the role of economic development.

8.4.1 Administrative Explanation: Fuzzy and Oversimplified Nature of Land Records

The status of land records regarding public lands is extremely fuzzy and non-transparent in Karnataka. We have already described the complexity of tenurial regimes that it has inherited and the refusal to rationalise them so far. This complexity, coupled with the lack of maintenance and updating of these records, means that the exact status of many lands is under question. For instance, in the undivided district of Dakshina Kannada, a joint ISEC and NST study (ISEC and NST 1998) showed that the estimate of legal forest area in the district varied from 32 % (of total district area) as per Revenue Department records to 44 % as per Forest Department records. Many other instances of fuzziness of records have been noted by the Forest Department itself (Dilip Kumar et al. 2005). Moreover, cadastral maps which are essential spatial records of land ownership are out of date and inaccurate especially when it comes to boundaries of public lands. And unfortunately, the state government's otherwise innovative effort to computerise land records and make them publicly available has failed to pay due attention to public lands—they have not recorded any of the complex categories nor made these records accessible to the public, let alone trying to resolve contradictions in the records (Srinidhi and Lélé 2001).

Fuzzy and non-transparent land records have hampered proper governance of CPLRs in many locations or situations. Perhaps the biggest problem is the non-recognition of local rights. Often, this has enabled the Forest Department to claim lands that were legally reserved for grazing or local use (e.g. the transfer of common lands to pulp mills described in Hiremath 1997).[7] In many other cases, it has

[7] The Forest Rights Act 2006 has the potential to rectify some of these missing rights, but it is not making any headway on this issue in Karnataka.

enabled the Revenue Department to hand out lands to well-connected or powerful encroachers (Someshwar 1995).

Clearly, the refusal to recognise pre-existing rights, to reconcile land records, to resurvey boundaries, to make records publicly available or to rationalise tenurial categories cannot be put down only to lack of knowledge or 'mistakes' in the *bhoomi* programme. The issue is perhaps not in the interests of the politically powerful classes, in which the land mafia plays a prominent role.[8]

8.4.2 Institutional Explanation: Historically Open-Access Situations and Poorly Designed Institutional Arrangements for CPLR Governance

The most important and widely applicable explanation is that in the British colonial state, CPLRs became state property and local institutions for their management disappeared and these institutions were not restored (in fact were further suppressed)[9] by post-independence governments (Gadgil and Subash Chandran 1989; Nadkarni and Pasha 1993). The description of the current tenure regimes given in Srinidhi and Lélé (2001) bears out the fact that local users have access rights but not management rights,[10] which vest with the Forest or Revenue Departments. This explanation holds good particularly for forestlands that are used by local communities but over which they have no control. This being the situation in most nonindividually controlled forestlands it explains the bulk of the degradation in the forested regions or pockets. It also explains the degradation of many gomaals, because the Revenue Department could not manage grazing practices but at the same time did not empower local institutions to manage them either.

Whenever attempts have been made to transfer management to local institutions, whether Gram Panchayats (under Social Forestry) or Village Forest Committees (under JFPM), the multiple institutional conditions for enabling successful local management have not been met. In the case of Social Forestry, the Gram Panchayats are too large and remote from the resource and do not have statutory powers to manage the resource, apart from the fact that the mandate given to them is restrictive.

In JFPM, the FD retains too much control, thereby imposing its own objectives (Saxena et al. 1997; Lélé et al. 2005). Moreover, it does not have statutory backing and does not bring all CPLRs under management, thus preventing communities from investing seriously in their management (Lélé 2001). Alternatively, the JFPM structures are such that they enable elite capture in collusion with the Forest

[8] For instance, the case of encroachment of forests by large coffee planters in Chickmagalur district involved powerful political figures and hence could not be pursued vigorously by the Forest Department, in spite of Supreme Court pressure to do so.

[9] For instance, even the Panchayat Forests that had been set up under Madras Presidency in parts of Bellary district and the Village Forests set up in Shimoga and Uttara Kannada were all dismantled after the passage of the Karnataka Forest Act in the mid-1960s (see Shetty 1988; Lélé et al. 2005).

[10] As Nadkarni et al. (1989) put it, communities were alienated from management, not from use.

Department, leading to generation of cash income for the elite at the cost of other livelihood needs of the marginal and poor households (see Lélé et al. 2005).

The same failure of institutional arrangements results in excessive conversion to mining or quarrying or other nonagricultural activities (highways), because these decisions do not involve any consultation with, let alone primary role for, local communities. It also means that local communities that have an interest in managing for biomass resources may not take up this task because they know that at any moment the state government can step in and reassign this land for a highway or some other 'developmental' activity which has only marginal benefits for them (Foundation for Ecological Security, statement in Bangalore consultation with subgroup VI of the group set up by the parliamentary subcommittee to look at the unfinished agenda of land reforms to submit report on the status of land reforms in Karnataka).

Even when nonlocal needs are prioritised, it is true empirically that the state often cannot exert adequate long-term control over the resource in the face of hostility generated from exclusion of local communities, because such control comes at a high cost. Policing of National Parks and Sanctuaries is a case in point. Social Forestry plantations which were protected by the state for the initial few years are a better example: as soon as state-controlled relaxed, local communities have often cut down these plantations (observations by the first author during a study of social forestry plantations in southern Karnataka in 1995–96).

8.4.3 Sociological Explanation: Social Conflicts Act as Barriers for Collective Action Among Local Communities

As discussed above, interest in CPLRs even at the local level is not homogeneous. Different communities or classes may have different interests in the CPLRs. In addition to, or independently of this material heterogeneity, there are many situations of socially generated conflicts, even though the community is dependent on them. Alternatively, the reduced dependence of the elite in a village setting where power is still differentially wielded means that the poorer groups cannot organise on their own to take over the CPLR that they may continue to depend upon. Further, Manor (2007) notes that in Karnataka, while caste hierarchies have been broken down, the divisions within villages based on case identities have increased. This has made collective management difficult for CPLRs. What is not clear, however, is how much these difficulties are the product of the history of state bureaucratic control that has alienated communities from their management role.

8.5 Are CPLRs Still Locally Important?

All the previous explanations rest on the assumption of local dependence and seek to explain CPLR degradation that happens *despite* this dependence. Is it, however, possible that the dependence on CPLRs was a historical phenomenon,

with development leading to declining dependence? If so, CPLRs may be *accessible*, but are not being *accessed* very much and that too only because other land uses are not permitted. There are two strands to this argument: decline of historical dependence modes and increase in the value of alternative land uses due to development.

8.5.1 Declining Dependence on CPLRs Reduces Incentive to Manage Locally

In an early study, Kanbargi and Kanbargi (1991) argued that as a village becomes more prosperous, its Common Property Resources (CPRs) decline, and that this does not produce any adverse impact, but is in fact part of a 'natural' process of development. Dependence on CPLRs has also declined sharply in those forested regions where forests have been extensively converted to coffee, tea or rubber plantations (Lélé 2001, 2006). Similarly, studies in the dry region show that when agriculture undergoes a transformation from traditional to modern, with the spread of irrigation, use of chemical fertilisers and cross-breed animal husbandry, the dependence on CPLRs declines (Kiran Kumar et al. 2008; Purushothaman et al. 2009). This happens due to the fact that irrigation results in higher cropping intensities, and thus the quantity of agricultural waste generated increases providing more than enough fodder thereby reducing dependence for grazing. Similarly, adoption of modern animal husbandry techniques reduces grazing dependence since more and more fodder needs to be sourced from the market. Finally, demand for wage labour in irrigated agriculture increases, creating alternative sources of livelihood.

There is also some state-level evidence of declining importance of livestock-based livelihoods. The 17th Indian Livestock Census indicates that livestock population in Karnataka (other than cross-breed cattle and poultry) showed an overall decline of 10.18 % between 1997 and 2003. Adoption of external input intensive agricultural systems (like heavy use of chemical fertilisers and irrigation) lessens the consumption of leaf manure as well as farmyard manure effectively reducing the dependence on CPLRs. Increased income and better distribution systems allow a shift from fuelwood to kerosene and especially to LPG.

8.5.2 Alternative Uses of the CPLRs Acquire Much Higher Value

In recent years, certain CPLRs especially in the plains region have acquired enormous value for their granite or iron ore deposits or for special economic zones or urban residential expansion. This has put enormous pressure for their conversion. It is quite possible that even if the local community was fully in command of the CPLR, they might decide to convert it to mining or quarrying.

However, the key point to be noted is that the evidence in support of declining dependence uses a measure of dependence (=current economic benefits) that has major limitations. First, it refers to actual benefits derived, not potential benefits if the CPLR is regenerated. Given that the CPLRs are in a degraded condition in many places or have been shifted to other uses (as described in Sect. 9.5), what looks like lower level of benefits may simply be a result of non-availability of the desired benefits from CPLRs (Pasha 1991; Damodaran 1987). Conclusions about potential benefits and significance of CPLRs based on current benefits derived under conditions of open access would be erroneous.

Second, the low level of current return to local users is the result of restricted property rights. Specifically, local users do not have timber rights (except in some cases for limited domestic use). The same land, when converted to private land, would become available for farm forestry. So one is comparing apples and oranges—CPLRs with no timber rights versus private lands with timber rights—and concluding that CPLRs do not generate benefits comparable to private lands. At another level, rights of harvest may be given, but marketing may be heavily regulated, resulting again in lower benefits to local harvesters. The classic example is the marketing for non-timber forest products, which the state has tried to control through state-supported cooperatives. Improvements in the functioning of these cooperatives can lead to doubling of incomes for collectors (Lélé and Rao 1996; Lélé et al. 2004); estimates based on current functioning would then be gross underestimates of the 'value of NTFP benefits from forests'.

Third, information on the importance of local ecological services is scarce to non-existent, so it is difficult to assess whether the reduction in direct product dependence means there is no remaining incentive for local management. Studies on ecosystem services such as pollination services provided by forests to agriculture have begun to show that these CPLRs are still important for local communities (Rehel et al. 2009). Moreover, in many regions, forested or dry, the dependence of marginal and landless households is acute (Shaanker et al. 2004; Hegde et al. 1996). On the whole, we would argue that there are significant variations in terms of local dependence on CPLRs, both across and within regions and within villages. The dependence is still quite high in many parts of the forested region, in the transition belt, and in pockets of the dry regions where CPLRs are still available (Lélé 2001), although dependence may be highly stratified (Lélé et al. 2005).

Finally, the changing face of rural communities and economies may lead to a changing dependence, rather than nondependence. Agriculture may become less dependent for direct input of (say) leaf manure, but more dependent on hydrological services (as water becomes scarcer) or pollination services (as pollinator communities within agricultural lands get depleted). Recreation is a value typically attributed only to urban consumers, but there is no reason why, as rural communities prosper, they may not assign increasing importance to this benefit from their local CPLRs.

In short, while some trends in declining dependence are visible, the lack of local 'interest' in CPLRs as commonly managed resources is more a reflection of the institutional context rather than of a homogeneous, secular and inexorable decline in the importance of CPLRs for local communities (Lélé 2012). Local

dependence, especially of the poor, continues, and the reconciliation of local interests (and intra-local differences) with global stakes will have to be the focus of policy regarding CPLRs.

8.6 Conclusion: Towards Better CPLR Policy

We began by framing the question around CPLR governance in terms of the variety of potential stakeholders and concerns that might underpin policy on CPLRs. We then reviewed the empirical situation in Karnataka, pointing out the enormous diversity regarding the types of CPLRs, their spatial distribution and changes over time, their condition as seen from different vantage points and the possible reasons for this condition. Two clear threads emerge: one of physical degradation and conversion of CPLRs and one of persistent non-recognition of a local voice in managerial and conversion decisions about CPLRs. Since at least the 1990s, academics and activists have repeatedly linked the first to the second, i.e. the degradation of CPLRs is a result of local communities not being given rights to manage and govern them. Various state programmes and policies have sought to respond to these critiques with (relatively feeble) attempts to increase local control on CPLRs.

Recently, a third thread, the possibility of declining local interest in CPLRs, has emerged. Some of this literature may simply be pointing out heterogeneities in dependence and reverse causality (degradation of CPLRs leading to declining returns). Some of the development-induced trends in CPLR use may nevertheless be true. After all, the current trajectory of development is one of households moving away from forest-based livelihoods, pastoralism and even agriculture and therefore seeing a declining *direct* dependence on the uncultivated landscape.

The conventional interpretation of the evidence of 'declining direct dependence' has been to argue for a combination of state control over the 'globally useful' CPLRs (high-biodiversity forests), the conversion of low-biodiversity areas into commercial plantations[11] and the conversion of other low-value areas to either land for the landless or (more likely) lands for industrial development, mining, airports and special economic zones. These approaches to governance of CPLRs existed even when the evidence of high dependence was incontrovertible; it is just that signs of declining dependence are used to bolster the push for exclusive state control and/or conversion. We have, however, argued that the evidence for declining dependence is limited, and these declines are happening in certain institutional contexts, where communities exert no control on the direction of CPLR management or its quality and where local elite continue to capture any significant opportunity for decentralised control (e.g. Lélé et al. 2005).

At another level, there may be arguments for decentralisation that transcend the presence or absence of tangible local interest. They relate not to the *outcome* of

[11] Witness the repeated efforts by industries to gain 'leases' in common lands for commercial plantations.

CPLR management but the *process* of CPLR governance. In both global and Indian discourses on development and governance, there has been a strong emerging concern regarding the need for 'democratisation'. The 1992 constitutional amendment that created three-tiered governance below the level of the states was the first official recognition of this concern in India. One may therefore argue that community-accessed land resources should become community-managed land resources regardless of the nature of the community's dependence.

If the state's normative concerns include not just the immediate land needs of the local poor but the overall and long-term benefits generated by CPLRs and a commitment to democratisation of governance, the implication may not be a simplistic proposal for common land management at the community level. Rather, a sophisticated, multilayered and regionally calibrated proposal is needed, that comprises of democratic governance of public lands (integrating forest and non-forest public lands), open recognition of multiple and partially conflicting stakes and particular sensitivity to the pressures of poverty on the poorest sections. Some elements of such a proposal might include the following:

1. A two-stage CPLR rights reform that accommodates the needs of the landless and pastoral nomads by preferentially giving them individual and secure usufruct rights—such as a 'tree patta' and 'grazing patta'—in specific portions of CPLRs, nested within hamlet-level community management of the larger CPLR on the lines of the Forest Rights Act 2006
2. The devolution of regulatory power to district-level governments (not bureaucrats) regarding the conversion of CPLRs to other land use, but with the strict requirement of hamlet-level consent for such conversions
3. Implementation of the proposal through state-level legislation that bolsters the Forest Rights Act 2006 but is cognisant of state-specific variations in conditions and historical regimes

Such a proposal, which includes a subaltern perspective favouring an increase in the stakes of local communities in the governance of their immediate environment, will give a voice to these communities whose participation has been suppressed for the last two centuries.

References

Agrawal, A., & Ostrom, E. (2001). Collective action, property rights, and decentralization in resource use in India and Nepal. *Politics & Society, 29*(4), 485–514.

Anonymous. (2010). Unscrupulous mining lobby. *Economic and Political Weekly, XIV*(29), 9.

Bandyopadhyay, J., Reddy, S. T. S., & Shiva, V. (1988). *Amruth Mahal Kavals: An approach to conservation and development*. Dehra Dun: mimeo, Research Foundation for Science and Ecology.

Baviskar, A. (2012). India's changing political economy and its implications. In Anonymous (Ed.), *Deeper roots of historical injustice* (pp. 33–45). Washington, DC: Rights and Resources Initiative.

Beck, T., & Ghosh, M. G. (2000). Common property resources and the poor: Findings from West Bengal. *Economic and Political Weekly, 35*, 147–153.

Beck, T., & Nesmith, C. (2001). Building on poor people's capacities: The case of common property resources in India and West Africa. *World Development, 29*(1), 119–133.

Bhagavan, M. R., & Giriappa, S. (1987). Class character of rural energy crisis: Case of Karnataka. *Economic and Political Weekly, 22*(26), A-57–A-69.

Chopra, K., & Dasgupta, P. (2008). Nature of household dependence on common pool resources: An empirical study. *Economic and Political Weekly, 43*(8), 58–66.

Damodaran, A. (1987). Structural dimensions of fodder crisis: A village study in Karnataka. *Economic and Political Weekly, 22*(13), A-16–A-22.

Dilip Kumar, P. J., Nagaraj, S., Lélé, S., & Shashidhar, K. S. (2005). *Induction, development and impact of GIS/RS facility and applications in Karnataka Forest Department: Assessment of past and ongoing programmes and strategic planning for the future* (Evaluation Project Report No. PCCF(EWPRT)/EVAL.PROJ/001/2005-06). Bangalore: Karnataka Forest Department.

FSI. (2007). *State of forest report 2007*. Dehra Dun: Forest Survey of India, Ministry of Environment and Forests, Government of India.

Gadgil, M., & Subash Chandran, M. D. (1989). On the history of Uttara Kannada Forests. In J. Dargavel, K. Dixon, & N. Semple (Eds.), *Changing tropical forests: Historical perspectives on today's challenges in Asia, Australia and Oceania* (pp. 47–58). Canberra: Centre for Resources and Environmental Studies, Australian National University.

Hegde, R., Prakash, S., Achot, L., & Bawa, K. S. (1996). Extraction of non-timber forest products in forests of Biligiri Rangan Hills. India. 1. Contribution to rural income. *Economic Botany, 50*(3), 243–251.

Hiremath, S. R. (Ed.). (1997). *Forest lands and forest produce – As if people mattered* (1st ed.). Dharwad: NCPNR, SPS, JVS, JVA, FEVORD-K.

ISEC and NST. (1998). *People's database on land tenure, land-use, and land cover for land resource management: Results of a pilot study in Dakshina Kannada district*. Guruvayanakere, D. K. District: Institute for Social and Economic Change, Bangalore and Nagarika Seva Trust.

Iyengar, S. (1989). Common property land resources in Gujarat: Some findings about their size, status and use. *Economic and Political Weekly, 24*(25), A67–A77.

Jodha, N. S. (1986). Common property resources and rural poor in dry regions of India. *Economic and Political Weekly, 21*(27), 1169–1181.

Jodha, N. S. (1987). A case study of the decline of common property resources in India. In P. Blaikie & H. Brookfield (Eds.), *Land degradation and society* (pp. 196–207). New York: Methuen.

Jodha, N. S. (1990). Rural common property resources: Contributions and crisis. *Economic and Political Weekly, 25*(26), A65–A78.

Kanbargi, S., & Kanbargi, R. (1991). *Emerging development and declining CPRs: Is it necessarily an evil*. Bangalore: Seminar on Towards Greening India's Wastelands, ISEC.

Kiran Kumar, A. K., Lele, S., & Shivashankar, P. (2008). Impact of irrigation-led agricultural development on use of common lands in dry regions of Karnataka, India. In Anonymous (Ed.), *Insights from the field: Studies in participatory forest management in India* (pp. 110–134). New Delhi: RUPFOR, Winrock International India.

Krishna Murthy, T. S. (1989). History of Amruth Mahal Kaval Lands in Karnataka. In *Proceedings of the Workshop on Rangelands Revegetation Project*. Bangalore.

Lélé, S. (1994). Sustainable use of biomass resources: A note on definitions, criteria, and practical applications. *Energy for Sustainable Development, 1*(4), 42–46.

Lélé, S. (2001). *Linking ecology, economics, and institutions of village-level forest use in the Karnataka Western Ghats*. Project Report. Bangalore: Institute for Social and Economic Change and Pacific Institute for Studies in Development, Environment and Security.

Lélé, S. (2006, July 21). Linking ecology, economics, and institutions of village-level forest use in the Karnataka Western Ghats. *Sahyadri E-News*.

Lele, S. (2012). Economic incentives for forest management. In Anonymous (Ed.), *Deeper roots of historical injustice* (pp. 101–124). Washington, DC: Rights and Resources Initiative.

Lélé, S., Bawa, K. S., & Gowda, C. M. (2004). *Ex-post evaluation of the impact of an enterprise-based conservation project in BRT Wildlife Sanctuary, India*. The Commons in an Age of Global Transition: Challenges, Risks and Opportunities, 8th Biennial Conference of the International Association for the Study of Common Property, Oaxaca.

Lélé, S., Kiran Kumar, A. K., & Shivashankar, P. (2005). *Joint forest planning and management in the eastern plains region of Karnataka: A rapid assessment*. CISED Technical Report. Bangalore: Centre for Interdisciplinary Studies in Environment and Development.

Lélé, S., Rajashekhar, G., Hegde, V. R., Kumar, G. P., & Saravanakumar, P. (1998). Meso-scale analysis of forest condition and its determinants: A case study from the Western Ghats region, India. *Current Science, 75*(3), 256–263.

Lélé, S., & Rao, R. J. (1996). Whose cooperatives and whose produce? The case of LAMPS in Karnataka. In R. Rajagopalan (Ed.), *Rediscovering cooperation* (Vol. II, pp. 53–91). Anand: Institute of Rural Management Anand.

Manor, J. (2007). Change in Karnataka over the last generation: Villages and the wider context. *Economic and Political Weekly, 42*(8), 653–660.

Menon, A., & Lobo, V. (2008). *The changing face of the commons, national workshop on 'Beyond JFM: Rethinking the forest question in India'*. New Delhi: Centre for Interdisciplinary Studies in Environment and Development and Winrock International India.

Menon, A., & Vadivelu, A. (2006). Common property resources in different agro-climatic landscapes in India. *Conservation and Society, 4*(1), 132–154.

Murali, K. S., & Setty, S. (2001). Effect of weeds *Lantana camara* and *Chromelina odorata* growth on the species diversity, regeneration and stem density of tree and shrub layer in BRT sanctuary. *Current Science, 80*(5), 675–678.

Nadkarni, M. V. (1990). Use and management of common lands: Towards an environmentally sound strategy. In C. J. Saldanha (Ed.), *Karnataka state of environment report IV* (pp. 31–53). Bangalore: Centre for Taxonomic Studies, St.Joseph's College.

Nadkarni, M. V., & Pasha, S. A. (1993). Social forestry in Karnataka. In C. J. Saldanha (Ed.), *Karnataka: State of environment report – VI* (pp. 41–53). Bangalore: Centre for Taxonomic Studies, St.Joseph's College.

Nadkarni, M. V., Pasha, S. A., & Prabhakar, L. S. (1989). *The political economy of forest use and management*. New Delhi: Sage.

Nagendra, H., & Gokhale, Y. (2008). Management regimes, property rights, and forest biodiversity in Nepal and India. *Environmental Management, 41*, 719–733.

ODA. (1992). *Evaluation of the Karnataka social forestry programme*. Evaluation Report. New Delhi: Overseas Development Agency (now Department for International Development).

Pasha, S. (1991). Sustainability and viability of small and marginal farmers: Animal husbandry and common property resources. *Economic and Political Weekly, 26*(13), 27–30.

Purushothaman, S., Hegde, S. S., Patil, S., & Kashyap, S. (2009). People's perception of benefits from a protected catchment: A case study of Gundal Command in Karnataka. *Indian Journal of Agricultural Economics, 64*(4), 573.

Rehel, S., Varghese, A., Bradbear, N., Davidar, P., Roberts, S., Roy, P., & Potts, S. (2009). Benefits of biotic pollination for non-timber forest products and cultivated plants. *Conservation and Society, 7*(3), 213.

Robinson, E. J. Z. (2008). India's disappearing common lands: Fuzzy boundaries, encroachment, and evolving property rights. *Land Economics, 84*(3), 409–422.

Saxena, N. C., Sarin, M., Singh R. V., & Shah T. (1997). *Independent study of implementation experience in Kanara Circle*. Review Committee Report. Bangalore: Karnataka Forest Department.

Schlager, E., & Ostrom, E. (1992). Property-rights regimes and natural resources: A conceptual analysis. *Land Economics, 68*(3), 249–262.

Shaanker, R. U., Ganeshaiah, K. N., Krishnan, S., et al. (2004). Livelihood gains and ecological costs of non-timber forest product dependence: Assessing the roles of dependence, ecological

knowledge and market structure in three contrasting human and ecological settings in south India. *Environmental Conservation, 31*(03), 242–253.

Shetty, H. R. (1988). *Study on working of Forest Panchayats: Uttara Kannada district – Karnataka State*. Report submitted to Karnataka Forest Department, SWED Forest, Bangalore?

Someshwar, S. (1995). *Macro policies, local politics: The official and the clandestine processes of deforestation in the Western Ghats of South Kanara, India*. Ph.D. thesis, University of California, Los Angeles.

Srinidhi, A. S., & Lélé S. (2001). *Forest tenure regimes in the Karnataka Western Ghats: A compendium* (Working Paper No. 90). Bangalore: Institute for Social and Economic Change.

Chapter 9
Land-Use Practices and Regulations to Reduce Poverty: Lessons from Anaikatty, Tamil Nadu

Seema Purushothaman and Sheetal Patil

9.1 Introduction

Poverty reduction measures targeted at rural communities include social welfare schemes, safety nets (public distribution systems, reservation in jobs and education, primary health, etc.) and disaster relief packages (e.g. tsunami and drought relief and Vidarbha package for farmers in distress). Several authors have also discussed the role of better education, health, employment and price structure in poverty reduction (e.g. Ravallion 1998; George 2004; Sen 2005; Swaminathan and Medrano 2004). However, along with temporary employment programmes or subsidised distribution of food and free health care, beneficiaries also need natural resources like agricultural land, village commons and forests for the sake of sustained affordable nutritional security and sovereignty. Addressing persistent poverty among rural communities is known to involve enhancing and improving their endowments in natural and human resources (Sen 2000). Rightful capacities to own, access, use or manage any natural resource thus become crucial in the rural context for maintaining an array of options for sustenance.

The natural resource base of tribal communities has been shrinking with decreasing access to depleting forest areas previously occupied by them and subsequently taken over by the state. Their resource base now confines to shrinking common lands and marginal agricultural lands. In rural areas near forest peripheries where migration and nonagricultural employment are uncommon, natural resources are the basis of sustenance. Flow of benefits from these resources is an important

S. Purushothaman
Azim Premji University, Bangalore, India

Adjunct Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: seema.purushothaman@gmail.com

S. Patil (✉)
Ashoka Trust for Research in Ecology and the Environment, Bangalore, currently
Azim Premji University, Bangalore, India
e-mail: ssheetalpatil@rediffmail.com

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_9, © Springer India 2013

determinant of well-being among the fringe community. The hypothesis under scrutiny is that land regulations can enable poor communities in meeting subsistence needs and thus help reduce poverty and improve well-being in forest fringes. This recognises the fact that access to areas other than owned or operated land in the rural landscape is increasingly difficult. At the same time, benefit flows are diminishing from all types of available land resources.

This chapter looks at the issues involved in achieving socially desirable land and water management in forest peripheries, so as to strengthen discussions on policies for poverty reduction. It looks at the regulatory gaps in addressing natural resource management in these ecotones. Based on the experience of the Irula community in Anaikatty area of Western Ghats, this chapter highlights the direct and indirect factors affecting benefit flows from marginal lands, thus addressing the potential of land resources to meet subsistence needs in the long run. The analysis here confines to marginal land holders in the forest peripheries thus excluding the landless from discussion in this chapter.

9.2 A Brief Review of Literature and Policies

Rural sustenance derived from natural resources generally involves four different land resources. These are marginal land holdings owned or operated by native communities, other private lands with commercial land uses, village common lands, if any, and forest areas. The benefits that flow from each of these different land uses depend on multiple factors including per capita size of land holding, soil fertility and labour flows (in the case of own lands and private lands); size of dependent population, total (de facto) land area and social cohesion (in the case of common lands); and access, usufruct rights as well as the threat of conflicts with wildlife (in the case of forest lands). Regulations on land use has implications on several of these factors including productivity of lands, intensity of agriculture in privately owned lands, conversion of land use and rights and access to forests. Land-use regulations, through well-designed incentives could encourage adoption of appropriate land management measures. Land-use regulations could also influence other drivers of degradation of marginal lands such as resource extraction in the vicinity, impact of drought and wild animal intrusion.

However, efforts towards enhancing the natural endowments of the rural poor, particularly those in forest fringes, are scarce and are usually confined to subsidised inputs in agriculture. These include subsidised but unplanned irrigation and subsidised intensive but imbalanced use of inputs in rain-fed areas (Purushothaman 2012). Subsidised inputs do not necessarily help to improve or preserve the source and means of production, i.e. land. Such measures often act as perverse incentives triggering degradation. For instance, irrigation from a low erratic base may not make any major dent in land use or labour employment in arid regions (Singh 1981) or could cause salinity by prolonged flooding. Findings of a comprehensive assessment of water sector by Consultative Group on International Agricultural Research indicate that small investments in the irrigation sector and rain-fed farming are the

answers to address the burgeoning water needs (Wani et al. 2009). Large irrigation schemes often leave a third of population facing water scarcity and half of agricultural production untouched. These agricultural investments are despite the fact that more than half of world's food come from rain-fed farms. Optimal land-use pattern has been recognised as one in tune with the soil and water requirements of the area (Mamoria 1985), although policy measures ignore the contextual needs and requirements of the socioecological ecotones and extend perverse incentives for degrading practices. The sustainability fallout of intensification of external inputs or unidimensional scaling up in small holdings is discussed in Purushothaman and Abraham (2011).

Whereas the institutional determinants of poverty and their neglect by policymakers have been highlighted by many in the context of 'landlessness' (Lipton 1985; Ghonemy El 1990), similar attention has not been cast in the context of 'land use'. Suitable land uses, according to Nadkarni (2000), can turn the vicious cycle in which poverty is said to operate into a 'virtuous circle'. Conceptual recognition of an intrinsic connection between inequitable access and poverty can be found in Gadgil and Guha (1995), while the empirical connection between natural resource use and rural poverty has been identified in Singh (1990), Mehta (1993) and Sainath (1996), in the case of agrarian relations across communities and regions. The economic rationale for investing in land-use changes of the poor under appropriate institutional mechanisms has been put forward by Darwish et al. (2001).

Besides overlooking the linkages between land use and poverty reduction, policy interventions tend to be concentrated in irrigated or high rainfall areas. Intuitively, the poor in the dry regions would be worse off, considering inadequate land-use capabilities with relatively low volume of biomass and fewer opportunities for other livelihood. Reliable income, more than increasing income, is the need of these small and marginal farmers who can improve their drought resilience through simple measures like water harvesting and soil conservation. Cost-benefit analysis of various rain-fed land-use options from a community perspective reveals the potential of suitable cropping pattern and simple soil and water conserving measures for supporting household food security.

Addressing the regulatory issues concerning land uses is thus vital to materialise an effective poverty reduction among the landless and the landed rural poor. Hence, this chapter highlights the social impact of regulatory lacunae in land uses. It discusses the importance of improving productivity of own marginal lands for reducing poverty and the need for land-use regulation to achieve this objective in the context of negative social externalities of extensive resource extraction by commercial enterprises. Focus is on the need for enacting and facilitating regulations in the use of natural resources in dry regions to make poverty reduction policies effective. It traces the origins of land degradation issues in dry lands analysing how this affects marginal farms. It moves on to a case study in Anaikatty region discussing pointed issues followed by a focused discussion on the direct impact of brick-kilns. This chapter then makes a case for rain-fed systems in forest peripheries and how they can be facilitated by land-use regulation before presenting some policy implications.

9.3 Historical Context: The Evolution of Land Productivity Issues in Dry Areas

Emergence of land-based poverty issues in any region is best understood from the historical backdrop of land uses and ownership. This study was inspired by the land-based issues faced by tribal communities in dry forest peripheries of Western Ghats near Anaikatty, bordering the southern states of Kerala and Tamil Nadu (Fig. 9.1).

The intertwined history of land uses and ownership as seen in this study area is similar to that in many forest fringes in peninsular India. Most of the dry forest peripheries in Peninsular India (Tamil Nadu, Kerala, Andhra Pradesh and Karnataka) share a common evolutionary path, condensed in Fig. 9.3. Though nature-dependent communities occupied these areas for several centuries, the relationship between their settlements and forests were more or less symbiotic as evidenced by the concept of the *Tinai* ecologies mentioned in Tamil Sangam literature (Kulke and Rothermund 1986). But, from the middle of the first millennium A.D. onwards, the state increasingly sponsored conversion of forest lands to cultivation mainly benefiting the nontribal farming community. In the first half of twentieth century, both before and after India attaining independence, there was a period of rapid exploitation in terms of clear felling of forests. This deforestation was either for timber to be exported to England or for expanding network of Indian railways for building sleepers or making charcoal. By the time railway engines began to run on diesel, many of these areas were denuded.

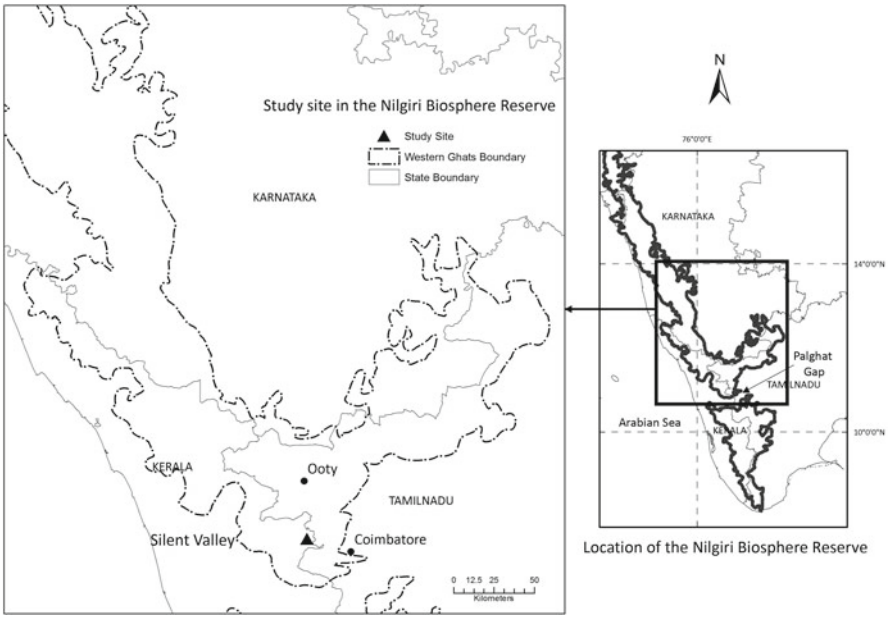

Fig. 9.1 Location of study area

Fig. 9.2 A settler farm in Anaikatty

Towards the end of such a phase of rapid exploitation of forests spanning almost a century, there arose an increasing demand for food and other resources from a burgeoning population. Population and food security provided enough excuses for a state-sponsored invasion of remaining wilderness by farming communities from the plains, as in the case of 'Grow More Food' campaign during the 1940s. This resettlement of farmers to forest peripheries caused alienation of tribal lands, aggravating their loss of rights over land and other resources (Fig. 9.2).

Rural landscapes began to be demographically diverse with non-native populations marginalising native communities both in their geographical and socio-economic presence. All these caused extensive conversion of forest lands for commercial and subsistence agriculture, cattle grazing, mining, etc. In the wake of conservation policies in areas near the forest, the marginal communities also had to cope with a decline in accessibility and availability of forest products as also increasing incidence of attacks by wild animals. A discernible pattern of unreliable rainfall and decline in agricultural productivity further aggravated the issue. Unfamiliar with settled agriculture, but responding to the urban process, the hitherto shifting cultivators struggled to manage their lands for sustenance. Low productivity of marginal lands could also be attributed to the poor quality of land initially distributed to the landless as part of land reforms.

Figure 9.3 illustrates how the rapid pace of land and biomass degradation and transformation of customary rights aggravated socio-economic vulnerability among the rural poor. Vulnerability in turn started triggering more processes of degradation

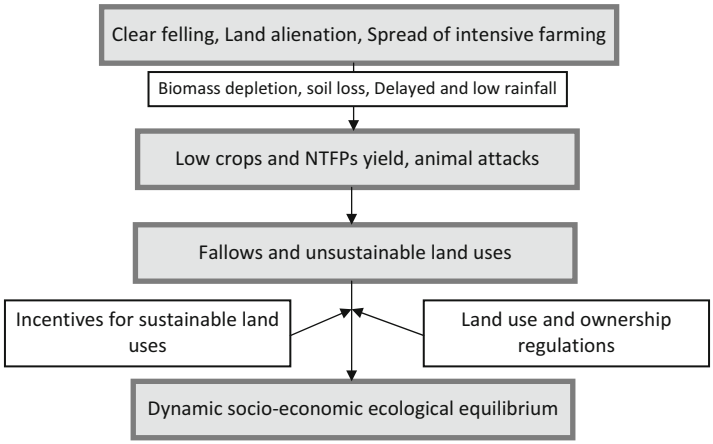

Fig. 9.3 Evolution of land productivity issues near dry forests

leading eventually to further poverty. This degradation was not only to meet consumptive demand of the locals but also due to commercial exploitation to meet market demand. While it is said that subsistence needs motivate commercial exploitation, the latter undermines the resource base for continued subsistence. Though native fringe communities were employed in commercial exploitation of resources, their involvement was temporary and unstable, leaving them vulnerable in the long run. Thus dynamic processes consisting of land-use practices, demography, markets and policies had direct impact on land-use capabilities and sustenance of communities in dry forest peripheries.

9.4 Socio-economic Context

9.4.1 Native Farmers and Social Transformation

As indicated in the previous discussion on evolution of land-use problems, forest peripheries have been occupied by indigenous (Adivasis) people who first got rehabilitated from inside the forest areas after nationalisation of forests and later got marginalised owing to invasion of settler communities from the plains, to these ecotone areas (Sect. 9.3 mentions the role of 'state' in this).

Notable differences between a native farmer and a settler include intensity of farming, size of holding and clarity of rights over natural resources. The natives usually live in adjacent huts in hamlets with their fields located in clusters surrounding the hamlets. Settler farms, on the other hand, are located around individual farmhouses. Land use in native hamlets used to be more of a community decision wherein the time of sowing and crops sown were more or less uniform across farm

holdings. But settler farms are individualistic, market-driven and input intensive. Weakening social cohesion and deeper penetration of the market encouraged the native farmers to emulate the cropping pattern in neighbouring settler farms. This along with concessional supply of food grains by the public distribution system spearheaded a shift in dietary habits and consequent land uses without much change in the input scenario. Consequently, the number of tribal farms growing commercial crops increased, despite poor irrigation facilities, owing to resource constraints. Irrigation constraint in tribal farms is being addressed by heavy subsidies for intensive use of ground water.

The social osmosis from a relatively cohesive and closed society to a market economy resulted in changes in the lifestyle, social behaviour and natural environment of these communities. Weakening ethnicity and social cohesion should be viewed in the background of voluntary as well as induced changes experienced by the fringe communities in a relatively short span of time. While loss of community rights aided erosion of social cohesiveness, absence of a strong private property regime and other resources failed to encourage entrepreneurship. This resulted in an uneasy midway where neither traditional social systems nor a complete merger with the mainstream economy was facilitated. Ineffective land laws and political munificence added to the mosaic of sociological problems associated with a previously self-sustaining forest-dwelling community.

9.4.2 Land Distribution to the Landless, Declining Access and Opportunities

As part of the government policy to distribute land to the landless, many tribal households received titles for lands. In Anaikatty, beneficiaries received rights for lands lying at a distance of 6–7 kms away from their hamlet, most of which were often barren or unproductive. Not surprisingly, there was a distinct lack of interest in managing these lands owing to its inaccessibility and high degradation. These ‘beneficiaries’ of land distribution, therefore, resorted to leasing in productive land for cultivation.

Leasing of lands was prevalent among Adivasi farmers and also between Adivasis and settlers. Most of the leases were among tribals themselves. Most often it was landless people who leased in some land from the people of the same hamlet who may be preoccupied with other employment or from households where enough family labour was not available to cultivate the whole land with the family. In the case of settlers, leasing out parts of their large unirrigated land was common. Tribal lands with access to irrigation were generally leased out of the community. Instead of finding resources for intensive farming by themselves, leasing out productive lands was more feasible to many tribal households, confining their operations to relatively unproductive areas.

With declining access to forests and low agricultural productivity, the traditional sources of subsistence for these Irula communities in Anaikatty became redundant.

It appears that the probable sources of income near the forests in terms of non-timber forest products (NTFP) or firewood cannot contribute much to the annual household income, compared to other sources like wages received for casual labour.[1] But labour opportunities near these forests confine to seasonal planting activities undertaken by the forest department. For those who do not migrate to nearby cities, labour employment in the neighbouring settler farms or in forestry activities becomes the major source of sustenance. At the same time, declining productivity, lack of capacities for better land management and susceptibility to wild animals encourage fallowing of remaining cultivable land. The following subsections elaborate on these.

9.4.3 Recurring Drought and Land-Use Changes

An important wedge in the land degradation-poverty-degradation cycle is drought. Recurrence of drought is a phenomenon affecting all land uses, occupation and local economy as a whole. In an interesting analysis of water scarcity in the Kutch region of Western India, Mehta (2000) argued that water scarcity is a product of social and historical processes; the severity of drought being viewed as a manifestation of decades of dry land blindness of planners. The origins of what is experienced in most dry regions of India seem very similar to that traced by her as a scenario characterised by many development schemes, poor drought proofing and worsening resource stock; resulting in a downward spiral of rural poverty.

Once the surrounding hills of Anaikatty became degraded in the latter half of the last century, soil erosion and reduced surface water run-off started adversely affecting dry land agriculture. The situation was aggravated by cultivation of water intensive crops using deep bore wells in settler farms.[2] This was compounded by lack of soil conservation measures in both marginal and large farms. Biomass depletion in the hills and declining production in the fields resulted in inefficient manual and draught power in the Adivasi hamlets. As the frequency and extent of fallows increased, casual labour employment became important to meet immediate basic needs, which again discouraged soil conservation or tree planting measures. New dietary patterns and crop raiding by wildlife resulted in changing cropping patterns. Indebtedness due to crop failure often led to losing land rights or promoting further degrading activities like soil excavation. Rearing goats and firewood extraction remain as available options for some remote hamlets worsening the already slow regeneration of dry deciduous forests. Many native farmers incurred crop loss due to drought, and most of them abandoned cultivation, seasonally or permanently. Extensive area under irrigation in settler farms on the other hand provided some employment opportunities. But a declining trend was observed in the scale of

[1] A similar situation is observed in Chap. 3 where the importance (though varied across communities) of wage labour in Kanakapura region near the fringes of the Western Ghats is highlighted.

[2] Janakarajan and Moench (2006) argue that rural poverty increases with overextraction of ground water.

operation in these farms over time. This again is an offshoot of recurring drought conditions and frequent pachyderm intrusions resulting in outmigration and absentee landlordism in most parts of the study area.

Declining number of rainy days and rain received (source: rainfall data for 1990–2001 from Horticultural farm, Anaikatty), removal of vegetative cover from the hills, excessive withdrawal of ground water in settler farms, widespread construction activities and brick-kilns in the area could have, as Mehta (2000) pointed out, spearheaded a social process leading to soil moisture deficit in dry farming areas of Anaikatty. It is interesting to note that drought is often quoted as the reason behind every problem in such areas, whether as a reason for natives leaving their land fallow or settlers deepening their wells or wild animals raiding crop fields. It is also the stated driver for poor yields, dearth of draught power, biomass depletion and/or illicit distillation. The implication is that, whether enforced by monsoon failure or man-made or both, once recurrent, drought becomes an all-pervasive phenomenon. The cause and effect aspects of drought have significant implications on land use and livelihood strategies.

9.4.4 Role of Livestock

Analysis of income sources among forest-dependent Irulas of Anaikatty shows that compared to the contribution of wages (67 %), NTFPs (10 %) and agriculture (20 %); livestock (3 %) contributed the least to annual household income. Generally the number of livestock units in a household was directly related to the extent of agricultural operations. Draught power and manure from livestock are used in crop cultivation, and crop residue is used as fodder. Manuring the crop fields was accomplished by keeping the animals in pens at random locations in the field before ploughing.

Unlike the native farmers, for the settlers, income from livestock was mainly in the form of sale proceeds of dairy products and cattle manure. Even if marginal holders possessed a few large ruminants, they easily succumbed to fodder and water scarcity in times of drought, depriving farmers of crucial draught power for the next cropping season. This led to a vicious cycle where ecological degradation leads to poor biomass production (both on and off farm), creating fodder scarcity and then a paucity of draught power and other resources for cultivation. This in turn makes the farmer more impoverished and more dependent on foraging, ultimately leading to more land degradation.

Since goats are resilient to drought conditions, they are considered as a crucial financial security by marginal land holders in times of liquidity crisis. In hamlets located inside the reserve forest areas, goat rearing is usually banned, and sheep rearing is more popular. In some cases natives take up grazing contracts for goats from farmers in the plains. Incidences of crop failures or fallowing practices[3] reduce fodder supply in the form of crop residue and make them instead depend more on foraging.

[3] Crop failure due to drought, resource constraints preventing ploughing and sowing as well as wild animal attacks result in leaving the land uncultivated.

9.4.5 Crop Raiding and Land-Use Pattern

Regular crop raiding by elephants and other animals from the forests has been a recent phenomenon according to the respondents. Increased human disturbance inside reserve forests and closure of corridors hinder animal movements. Newly built enclosed campuses in elephant corridors are generally cited as reasons for such unprecedented animal intrusion in marginal holdings. Changing cropping pattern, biomass depletion inside the forests and illicit activities like bootlegging in some parts may have also contributed to this. Crops lost to raiding by wild animals can severely affect the seasons' yield in marginal farms. In many cases, crop loss occurred in places where sugarcane and bananas were grown. It is pertinent to note that these crops that attract elephants were grown on a large scale mostly by settlers.

Instead of addressing this problem by avoiding or managing the causes, costly and short-term solutions like electrified fencing were being adopted, mainly by the settler farmers. Viability of such electrified fences in the long run is debatable as elephants find new methods to overcome these obstacles. As far as Adivasi hamlets were concerned, community management of sponsored power fences has not been successful so far. Maintenance schedules of these fences are cumbersome and expensive despite being subsidised by various agencies. In the choice of species for agroforestry and plantations, many tribal respondents were keen on avoiding crops which are known favourites of the wild pachyderms like sugarcane, banana and bamboo. Certain crops like dolichos beans (*Dolichos lablab*) and horse gram (*Dolichos uniflorus*) not so palatable to the pachyderms were gaining acreage in the area. If attacks were very frequent, fields were left fallow or abandoned.

9.5 Analysis: Lack of Regulations and Persistent Poverty

The consequence of a lack of appropriate regulations in land-use practices (agriculture or others) manifests itself in the persistent poverty of these communities, creating a mutually reinforcing cycle of ecosystem degradation and livelihood insecurity. In the following section, two instances that highlight the need for appropriate regulations are reviewed. The first is the increasingly widespread brick-kiln industries that have emerged in this landscape – a highly degrading activity that at the same time provides new livelihoods in wage labour. The second reviews local preferences towards cropping patterns in tandem with local geography and socio-economic needs. In both cases, the role of land regulations in enabling an escape out of persistent poverty is highlighted.

9.5.1 A Case Study of Brick-Kilns

Brickmaking is an enterprise that uses surface soil, water, fuel wood and human resources. In the absence of any land-use regulations, they establish rapidly on leased lands of suburban villages. Anaikatty area has over 80 brick-kilns (in 2003)

Table 9.1 Economics of brickmaking in Anaikatty[a]

Input	Source	Quantity	Price (Rs.)	Details
Soil	Agricultural fallow	One cart load	10	Depth of soil digging varies. Soil bought for Rs. 20,000–30,000 per acre. (One acre of land yields about 3,000 cartloads)
Water	Bore wells/stream	200 l		Bore wells are dug up to 700 ft
Fuel wood	Open market and open access areas	400 kg	200	Coconut husks, shells and residues as also waste from sugarcane processing substitute the firewood to an extent
Electricity	Local power grid		10	For running a 7.5 HP motor for 5 min for drawing water from 400 ft depth
Labour	Locals	10 days	700	Labour to transport and bake bricks. Paid according to the number of bricks handled

Source: Primary survey
[a]For 1,000 bricks priced at Rs. 1.50 per brick (2001)

mostly situated towards the Tamil Nadu side. The availability of suitable soil, water and cheap labour encouraged expansion of this industry. Higher labour wages and scarcity of land could explain the fewer number of kilns on the Kerala side. Bricks from Anaikatty area started reaching the construction sites in an around Coimbatore (in Tamil Nadu) and Mannarkad (in Kerala) a decade ago. Buying soil from the fallow lands around, mining underground water in the leased land, burning locally available firewood and engaging cheap Adivasi labour, these brick-kilns run on profit (Table 9.1). Table 9.1 reveals that brick-kilns would be profitable only when soil, water and fuel wood are underpriced.

Clearly, as Table 9.1 reveals, profits arising due to market and regulatory failures in natural resources give rise to rent-seeking behaviour like excessive extraction of water and productive top soil. At the same time, brick-kilns may have rescued many from starvation providing labour opportunities, especially when down-scaled operations in large farms and plantations no longer demand much labour, as mentioned in the previous section. Thus brick-kilns acted as 'necessary evils' in the locality providing much needed employment benefits in the short run on the one hand, but degrading natural resources, the only long-standing asset of many marginal land holdings, on the other.

Wage income from brick-kilns was critical for many, but, selling topsoil to the kilns was an emergency option kept for major liquidity crisis like medical emergency or funeral. Nevertheless, there appears to be an increasing incidence of selling soil to kilns in recent years, due to consecutive failure of monsoon and lack of access to micro-credit. Small holders appear rationale in the process of selling topsoil thinking of reclaiming land productivity over years after the lease is over. This process had a benefit-cost ratio of above 1 (1.42 at 8 % discount rate and 1.53 at 12 %) and was better than the option of borrowing money from local lender at the lowest prevailing interest rate (20 %). In short, for the resource poor with no

Fig. 9.4 Workers at a brick-kiln in Anaikatty

possible source of liquidity, there seems to be economic rationality in adopting degrading land uses. With fields lying fallow and regular employment a remote possibility, many find solace in the contract wages offered by brick-kilns or the liquidity provided by selling topsoil (Fig. 9.4).

Generally brick-kilns do not thrive in the same geographical area permanently. Once the cost of inputs shoots up as extraction of soil becomes difficult, the brick-kiln owners gradually migrate in search of places with comparative advantage in terms of raw material and labour cost. When the industry makes an exit from an area, those who sold their soil and thrived on the jobs offered by the kilns face a crisis. Surplus unskilled labour, high cost of land rejuvenation and low crop yields ignite a livelihood crisis. The situation could spiral down to impoverishment as alternate employment for unskilled workers is difficult to find. Unlike many other communities, Irulas are generally reluctant to migrate, as found during the study.

At present, certain internalisation of ecological costs is being accomplished across the state of Tamil Nadu. The Tamil Nadu Minor Minerals Rules for soil prospecting from private lands were modified in 2003. As per the amended rule, apart from annual renewal of registration, brick-kiln owners are charged for extracting soil. The impact of this increased cost on topsoil of the suburbs depends on whether the incremental cost gets easily transferred to the consumer, on demand for bricks compared to alternatives as well as on the growth of construction industry in nearby towns.

Assessing the long-term ecological impact of large-scale soil mining in the area would have answered many questions on its long-term impact on local economy. But that was beyond the scope of the study which confined to identifying

economically appropriate land uses and the role of land-use regulations to facilitate these land uses. The above example of employment generation through unregulated brick-kilns on marginal lands shows that temporary income generation is no solution to poverty and at times can undermine sustainability of existing livelihood options.

9.5.2 Case for Rain-Fed Farming in Forest Peripheries

Despite recurring drought and subsequent decline in productivity witnessed in these areas, there has been no effective investment in land quality in spite of various governmental and non-governmental efforts. Soil erosion and increasing use of chemicals without technical expertise have affected the health of both the land and farmer adversely. With increasing dependence on wage income and dietary pattern swinging away from millets, the need for conserving rain-fed lands is being ignored. These lands near tropical dry forests are crucial not only for indigenous people but also for conservation as buffer ecotones between forests and large-scale commercial agriculture. The importance of sustaining and enhancing the skills of dry farming also raises a pertinent question as to whether it can impart better resistance to random shocks like drought or animal raids. Incorporating perennials into the dry farming system was found to be an important consideration with respect to long-term income security.

Dry/rain-fed farming is important to the indigenous community living near forests, both as means of sustenance and as their traditional occupation. In addition to these factors, Adivasis' dietary preference for millets and coarse grains coupled with lack of alternate source of employment highlights the significance of this land-use system. It was perceived as the most feasible land-use option by farmers possessing marginal land holding and low family income.

In this context, the research need is for finding feasible combinations of millets and fruit trees for the area identifying cropping systems around existing field crops and farmers' needs. However, these systems (as a whole, and not necessarily all components) need to have proven socio-economic and ecological benefits (Current and Scherr 1995). In addition to the socio-economic and ecological advantage, these systems could leverage on positive health impacts by balancing the skewed dietary habits which are currently in tune with the public distributions system and nutritionally deficient. Thus adding indigenous multipurpose tree components into the existing millet-based systems can help build resilience in the dry land social-ecological system, by providing nutrition, firewood, fodder and green manure. It is also useful to know the pattern of preference for feasible agroforestry models.

In a study conducted in Anaikatty, farmers were asked to rank their preferences for different cropping patterns. Table 9.2 reveals that the relatively better off among small farmers were willing to consider options of planting trees with long-term investments. However, the poorest and most risk averse were inclined to continue with current practices.

Table 9.2 Land-use preferences across income groups and land holdings in Anaikatty

Preferred land-use option	Household income (Rs '000/year)	Land holding (ha)
Dry farming	19	1.14
Rain-fed agri-horti[a] system	22	2.29
Rain-fed agri-silvi[b] system	27	2.48
Horticultural plantation	29	2.70
Horti-silvi plantation	31	2.12

Source: Primary survey
[a] Agriculture-Horticulture
[b] Agriculture-Silviculture

Rain-fed farming in the study area involved millets and legumes grown in a mixed cropping system without chemical inputs and irrigation. The first crop usually sown in June–July had finger millet (*Eleusine coracana*) as the main field crop, in addition to dolichos beans (*Dolichos lablab*) and horse gram (*Dolichos uniflorus*). During the second crop sown in October, when the major cropping season starts with Northeast monsoon, finger millet and sorghum (*Sorghum bicolor*) are sown, along with cow pea (*Vigna unguiculata*) and sesame (*Sesamum indicum*). Small areas were sown with lesser millets (*Setaria italica* and *Panicum miliaceum*) and vegetables. Following settler farmers, some Adivasis who could afford to, used chemical fertilisers and pesticides especially if they wanted some marketable surplus. In Anaikatty area, marginal farmers did not have tree components in their farming systems so far. This could be due to the absence of a tradition of planting trees, mainly attributable to easy access to forest lands. Dwindling forest cover, increased population pressure and stringent forest laws, rendered access to fodder, firewood, leaves and tubers as well as timber inside the forests increasingly difficult. There is a gradual realisation about the need for food, fruits and firewood from one's own land. This could drought-proof their subsistence to a considerable extent as well as protect the soil cover. Taking into account the economic returns and local preferences, it was found that millets-fruit tree combination would be the most feasible.

Dry farming in the land possessed by Adivasis used to be abandoned only in dire situations like extreme drought or very frequent elephant raids. Except the above situations, dry farming continued in whatever low scales possible within the resource limits. Current practices however did not take care of associated risks. Benefit-cost analysis shows that there were positive net returns even when the yields came down to 50 %. The benefit-cost ratio came down to 1.39 from 2.49 (at 8 % discount rate) with drought and wild animal attacks. Yet, in the absence of varietal information and availability, as also awareness about the need to supplement biomass, dry farming as currently practised appeared to be the rational choice even when crop loss occurred. Though benefits in terms of net carbon sequestration in dry farming was not comparable to that of silvicultural options, it had positive net carbon sequestration, both in soil (top 15 cm) and in the woody biomass of tree species. The analysis

also showed that soil conservation measures using locally available materials and adopting agroforestry practices could improve the yields and hence the net benefits from dry farming.[4]

9.6 Learning from Anaikatty: Regulatory Facilitation of Rain-Fed Agriculture

Irrigated agriculture needs about 3,000 liters of water for producing food required by a person for '1 day'. Even though small investments in incentives, regulations and institutions for rain-fed farming can provide reliable benefits to many, expensive irrigation projects are still the most politically popular tools. Apart from a probable advantage in cost effectiveness, the rain-fed systems have other advantages in providing reliable food security and sovereignty. By ensuring basic subsistence, it helps to harness full benefits of welfare schemes in health and education. Certain measures to facilitate rain-fed farming can be elicited from the discussions related to rural poverty in forest ecotones. Potential of some of these measures and probable mechanisms for implementation are addressed below:

1. For all habited watersheds, *water budgets* to be prepared based on stakeholder interactions on expected demand and supply. The water budget should lead to an annual water plan, prioritising the primary needs as drinking for all, community water sources and rain-fed agriculture. PRIs (Panchayati Raj Institutions) in a watershed should have a common forum (in many watersheds, committees exist but mostly confine to users of canal water) to prepare their water budget and plan with a social-ecological approach. This forum should have the support of technical expertise in watershed hydrology and institutions building and can be responsible for ensuring prioritisation of needs or demand with distributional equity and transparency.
2. Set *limits to water extraction* from surface, sub-surface and ground water sources so that water bodies used for common and essential requirements are constantly replenished. For example, consortium of local governance bodies in a watershed should ensure recharging of community wells and tanks, avoiding any interruption to or subversion of recharge flows. Limits to commercial water extraction including large farms should be set considering this recharge requirement and the impact on soil moisture if any, in adjacent rain-fed farms. PRIs in a water scarce region can consider a policy of differential taxing of water guzzling crops and industries and also mandate a certificate to ensure noninterference with local hydrology and priority needs.

[4] The cost of materials needed for this improvement came to Rs. 560–1,000 per ha at prices in the year 2000.

3. PRIs need to be *informed about other negative externalities* like pollution of essential water bodies from proposed enterprises/projects by concerned agencies like pollution control board. PRIs should make periodic data on monitoring of water bodies for quantity and quality, available in the public domain.
4. *Conversion of water bodies* or wetlands should be banned, and conversion of common land resources should be allowed only after an objective and transparent social benefit-cost analysis.
5. Incentives for installing and monitoring *indigenous water harvesting and erosion preventive structures*, as well as soil moisture-saving techniques like mulching. Land-use technical expert can plan soil and moisture conserving techniques along with stakeholders and recommend incentives.
6. Provide planting or propagation materials of *native multipurpose trees and crops* in time, e.g. establish and support seed collectives and nurseries. For income security in lean periods, communities need livestock and casual employment opportunities. Employment in biomass regeneration could be complementary to building fodder, firewood and income security.

Evidently, these measures will be effective only if coordinated between various departments. For instance, while the local agricultural officer can identify locally feasible cropping pattern, the land-use manager can recommend adequate soil and water conservation measures, and the hydrologist can provide inputs on the impacts on local water availability for various needs. All of them need to know and discuss with community representatives, any new project (e.g. expanding tourism) in the locality. Developing rural capacity to plan usage of resources without impacting on prioritised sectors requires an integrated and inclusive policy-making mechanism (also discussed in Chap. 6).

9.7 Conclusion

Marginal communities in forest peripheries depend for sustenance on natural resources with common and private property rights. Based on the experience of the Irula community in the forest fringes of the Western Ghats in Anaikatty, this chapter illustrates where and how land-use regulations can be instrumental in reducing poverty in dry forest peripheries. It emerges that food sovereignty and fertile land are crucial for poor communities to sustain viable land uses, an important livelihood option in the long run. Unsustainable land uses triggered by inequitable access and perverse incentives are catalysed further by soil moisture stress, wild animal raids and dearth of livelihood options. These adversities were reinforced by water mining, agro-climatically unsuitable crops and conversion of forests in the wildlife corridors. Regulating natural resource use can prevent rent-seeking behaviour associated with underpriced but valuable resources, as in the case of brick-kilns.

Water being a flagship natural resource necessary for resilient ecosystems, innovative grassroot mechanisms involving adequate incentives for rain-fed farming and water harvesting are discussed for informing policies.

Incentives for sustainable land management and regulated commercial use of natural resources, together with education, health and social security, can make a potential antipoverty package to help forest-dependent people emerge out of poverty-degradation cycle. The task ahead is to establish cohesive and integrated institutions and mechanisms to implement these regulations and incentives.

Regulatory measures, as advocated here, are one among the possible efforts to address the shrinking space of livelihood opportunities of fringe communities. Nevertheless, like any such interventions, regulatory measures could have regressive impacts particularly in equity outcomes across different and distinct stakeholders. The likely distributional outcomes of regulatory measures need to be ascertained before implementation. Such an assessment for a regulatory measure in the form of a targeted cess on a non-timber forest product is discussed in the following chapter.

Acknowledgements The field study for this project was supported by South Asian Network for Development and Environmental Economics (SANDEE).

References

Current, D., & Scherr, S. (1995). Farmer costs and benefits from agroforestry and farm forestry projects in Central America and the Caribbean: Implications for policy. *Agroforestry Systems, 30*, 87–103.

Darwish, M. R., Hamadeh, S., & Sharara, M. (2001). Economic sustainability of dry land use. *Journal of Sustainable Agriculture, 17*(4), 91–102.

Gadgil, M., & Guha, R. (1995). *Ecology and equity: The use and abuse of nature in contemporary India*. New York: Routledge.

George, A. (2004). *India untouched: The forgotten face of rural poverty*. Chennai: East West Books.

Ghonemy El, M. R. (1990). *The political economy of rural poverty: The case for land reform*. New York: Routledge.

Janakarajan, S., & Moench, M. (2006). Are wells a potential threat to farmers' well-being? *Economic and Political Weekly, XLI*(37), 3977–3980.

Kulke, H., & Rothermund, D. (1986). *A history of India*. London: Routledge.

Lipton, M. (1985). *Land assets and rural poverty* (World Bank Staff Working Papers 744). Washington, DC: The World Bank.

Mamoria, C. B. (1985). *Agricultural problems of India* (12th ed.). New Delhi: Kitab Mahal.

Mehta, B. C. (1993). *Rural poverty in India*. New Delhi: Concept Publications.

Mehta, L. (2000). Drought diagnosis: Dryland blindness of planners. *Economic and Political Weekly, 35*(27), 2439–2441.

Nadkarni, M. V. (2000). Poverty, environment and development. A many-patterned nexus. *Economic and Political Weekly, 35*(14), 1184–1190.

Purushothaman, S. (2012). Evaluating the green revolution. In P. Jacquet, R. K. Pachauri, & L. Tubiana (Eds.), *Development, the environment and food: Towards agricultural change?* New Delhi: TERI Press. ISBN 978-81-7993-443-2.

Purushothaman, S., & Abraham, R. (2011). Scaling up and sustainability: The experience from rural India. *Sustainability in Debate, 2*(2), 21–42.

Ravallion, M. (1998). Food prices and rural poverty. *Economic and Political Weekly, 33*(28), 1870–1871.

Sainath, P. (1996). *Everybody loves a good drought: Stories from India's poorest districts*. New Delhi: Penguin.
Sen, A. K. (2000). *Development as freedom*. New York: Alfred Knoff.
Sen, A. (2005, January 1). India's poor need a radical package. *The Hindu*, p. 14.
Singh, B. (1981). *Regional planning explorations in agriculture and industry*. New Delhi: Oxford and IBH.
Singh, I. (1990). *The great ascent: The rural poor in South Asia*. Baltimore: Johns Hopkins University Press.
Swaminathan, M. S., & Medrano, P. (2004). *Towards hunger free India – From vision to action*. Madras: East West Books.
Wani, S. P., Rockstrom, J., & Oweis, T. (2009). *Rainfed agriculture: Unlocking the potential*. Cambridge: Cabi International. http://www.iwmi.cgiar.org/Publications/CABI_Publications/CA_CABI_Series/Rainfed_Agriculture/Protected/Rainfed_Agriculture_Unlocking_the_Potential.pdf

Chapter 10
Economic Instruments to Reconcile Conservation and Livelihoods: Analysing the Potential for Bamboo in Karnataka

Sheetal Patil, Seema Purushothaman, and Elisabeth Gsottbauer

10.1 Introduction

The forests that India is renowned for are also the source of non-timber forest products (NTFPs) that have several important household and commercial uses. Collecting NTFPs is a livelihood option for lakhs of poor households that live on the fringes of these forests, aspect that was well illustrated in the case of Natham, Kanakapura and Mudumalai in the preceding chapters (Chaps. 2, 3 and 4). As a result of this dependence, it is likely that unsustainable harvesting practices emerge resulting in the loss of natural stock (Murthy et al. 2008), loss of in situ diversity and consequent undermining of the livelihoods of these communities. Therefore, the management of NTFPs needs policy solutions in order to sustain these resources for both biodiversity and livelihood. However, apart from regulatory measures like permits to harvest and transport as well as access provisions in Scheduled Tribes and other Forest Dwellers Act (2006), there are no effective mechanisms in place.

Though theoretically, production of any NTFP can be sustainable if extraction rates do not exceed maximum sustainable yield (Tewari and Campbell 1995); in practice, the regulatory, regenerative and monitoring efforts to ensure the above have been prohibitive. Exclusive policy instruments like quantity restrictions or ban on NTFPs extraction will also be decreasingly effective in ensuring sustainable harvests due to the increasing

S. Patil (✉)
Ashoka Trust for Research in Ecology and the Environment, Bangalore, currently
Azim Premji University, Bangalore, India
e-mail: ssheetalpatil@rediffmail.com

S. Purushothaman
Azim Premji University, Bangalore, India

Adjunct Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: seema.purushothaman@gmail.com

E. Gsottbauer
Autonomous University, Barcelona, Spain

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_10, © Springer India 2013

demand and number of players, making the monitoring process difficult. Economic instruments are easier to achieve compliance and are potentially inclusive though they may only be supplementing the regulatory restrictions, rather than replacing them.

Economic instruments can take the form of fiscal tools such as taxes and subsidies. Taxes and subsidies in this context are supposed to be on goods which are dependent on natural biodiversity. Through fiscal measures, relative prices are either raised or lowered in order to discourage or encourage consumption or production of goods. Therefore, it is crucial to see that these economic instruments have minimum impact on poor gatherers and poor consumers. Hence imposition of economic instruments for biodiversity conservation requires an ex ante assessment of their distributional impacts and institutional transfers needed to channelise the revenue towards inclusive measures for biodiversity conversation. Hence a tax incidence analysis is attempted here to demonstrate how to approach distributional and equity questions arising from a proposed taxation policy for NTFP conservation and livelihoods there from. In this context, this chapter focuses on the issue of testing the regressivity of a fiscal instrument like a targeted 'cess' on any product sourced from forests, thereby determining the distribution and equity implications. We confine to the example of natural bamboo for paper production in Karnataka mainly due to data availability. Moreover, as we assert in the coming sections, it should be noted that final realisation of the expected linkage of taxation to conservation and livelihood activities cannot be fully analysed here, as it is entirely dependent on emergent institutional mechanisms needed to reconcile conservation and livelihoods.

The next section provides a brief overview of literature on the theory and practice of economic instruments for conservation. We then introduce the case of natural bamboo in Karnataka – quantities extracted, dependent communities and revenue to the exchequer. This is followed by a section on how regressivity and distributional impacts are tested. Finally, we discuss potential revenue from a targeted cess and utilisation before arriving at concluding remarks.

10.2 Setting the Scene: Brief Survey of Literature on Environmental Taxes and Equity Concerns

The use of economic instruments in providing support for environmental conservation has been studied widely (see Hasset et al. 2007; Parry et al. 2005; Metcalf 1998; Porteba 1990). Drawing examples of tax measures with environmental objectives, Williams (2008) highlights behavioural effects, redistribution impacts and economic implications, i.e. revenue generation. In the case of an excise duty on road fuel, he points out behavioural effects like incentives to share cars for commuting or for avoiding unnecessary journeys or to switch to public transport. While transaction cost is low for such measures, the increasing prices for goods fall heavily on the less well-off. Mostly found in the fuel-energy sector (carbon, gasoline and energy taxes),

environmental taxation appears regressive, the burden being borne by lower-income consumers to a higher degree than higher-income groups. This probably has been a deterrent for economists and policymakers to consider the feasibility of fiscal instruments in biodiversity conservation in poor countries.

In the context of NTFPs, another factor that discouraged the emergence of economic policies for their conservation was the very low (almost zero) economic value of many NTFPs. As Dove (1993) discusses and institutional economics explains (Bardhan 1987), when the value of a resource increases in economic terms, it will attract more powerful players trying to control the resource and/or the market. Also there is evidence that successful commercialisation by small-scale poor producers provides much higher economic and employment multipliers for forest-dependent poor households than most other patterns of economic growth (Scherr et al. 2003), without compromising the effectiveness of other welfare and conservation measures. This hinges on the idea that conservation of commercially important NTFPs could have a livelihood dimension and that the concerned conservation measure could be an economic instrument.

Thus in the context of biodiversity-related products, though there exists few in practice or in academic literature, economic instruments may still be considered as means to reconcile conservation and livelihoods.

We had reasons to assume that a biodiversity cess could behave differently in distributional sense from energy taxes based on the facts that (a) the products arising from the NTFP that are marketed are not the most essential commodities consumed and (b) they are generally collected by the poor from the wild, marketed by agencies and bought by the relatively better-off. Hence their demand could be elastic and could be arising more from the high-income groups. So if a marketed NTFP or its processed forms (note that this excludes those NTFPs that are collected for own consumption) collected by the poor are bought more by the non-poor, a tax or cess could potentially be progressive and may discourage wasteful consumption, thereby avoiding overexploitation while supporting the livelihood base.

10.3 Analysis: Bamboo: India's Green Gold

Owing to the increasing commercial trade in natural products (Kumar et al. 2009; Ticktin 2004), NTFPs need mechanisms that will sustain their supply while supporting the livelihoods of the poor gatherers, without affecting poor consumers. Southern India offers a variety of NTFP of which bamboo – often referred to as India's 'green gold' due to its economic importance – is widely traded and used (Fig. 10.1).

Wild bamboo in general is gathered by the poor and its products like paper and furniture are bought by people from all income classes. Table 10.1 below provides some idea on how different NTFPs may have different interfaces with the poor.

Fig. 10.1 A clump of bamboo

Table 10.1 NTFPs, gatherers and buyers

	Poor gatherers	Commercial gatherers
Poor buyers	Beedi leaves, broom grass, honey, leaf plates, tamarind fruits	
Non-poor buyers	Amla, bamboo, cane, honey, lichen, rattan	Amla, lichen, medicinal herbs

10.3.1 Utilisation of Bamboo Resources

Bamboo utilisation in Southern India is marked by traditional as well as commercial usage. Communities like Medars are engaged in handicrafts and basket weaving out of bamboo, while it is also used at large scales in pulp and paper industry.[1] It was heavily extracted in its entire Western Ghats habitat when the state used to subsidise wild bamboo resources for rayon industries. Uma Shaanker et al. (2004) note that the major paper and pulp industries in the Western Ghats are located at sites proximal to the natural occurrence of bamboo. As the natural sources of bamboo dwindled,

[1] The discussion in Chap. 11 further highlights the trade route, the local dependence and the externalities in bamboo trade to look at possible institutional changes.

Fig. 10.2 Bamboo furniture ready for sale

governments became reluctant to subsidise the raw material, and industries started captive plantations or moved to other raw materials for paper manufacturing. Still, bamboo is used in paper manufacture to a considerable extent being sourced mainly from auctions conducted by the state forest department or imported from the north-eastern parts. Dependence of paper industry on bamboo has been reduced to 10–20 % of the raw materials used. Despite this, in most parts of southern India, even this demand far exceeds the supply (Fig. 10.2).

The deficit of bamboo for industrial uses is met from imports, while communities traditionally dependent upon bamboo as a source of livelihood have to explore other opportunities to make their living in the event of a shortfall in supply. This current level of threat to bamboo-based livelihoods could be resonated in the case of many other NTFPs that are traded widely like honey or medicinal plants. Thus analysis of policies to stabilise populations of wild bamboo such that the long-term livelihood objectives of the dependent communities are met could also provide learning for other NTFPs.

10.3.2 Marketing of Bamboo Products

The marketing channel of bamboo from its traditional habitat in Shimoga forest division (major trading in bamboo happens in this division in Karnataka) shows that the Forest Department is the sole supplier of bamboo from the wild (Fig. 10.3) and that over the last few years more natural bamboo is being disbursed. Data compiled from various sources in Karnataka Forest Department (KFD) indicate the fluctuating disbursal of bamboo from about 7,000 t in 2001 to 6 lakh tonnes in 2005. Though there are two sectors demanding wild bamboo (the pulp and paper industry and the Medars), the disbursement to the pulp and paper industry represented by the major paper mills was the only channel that follows formal transactions till the end consumer.

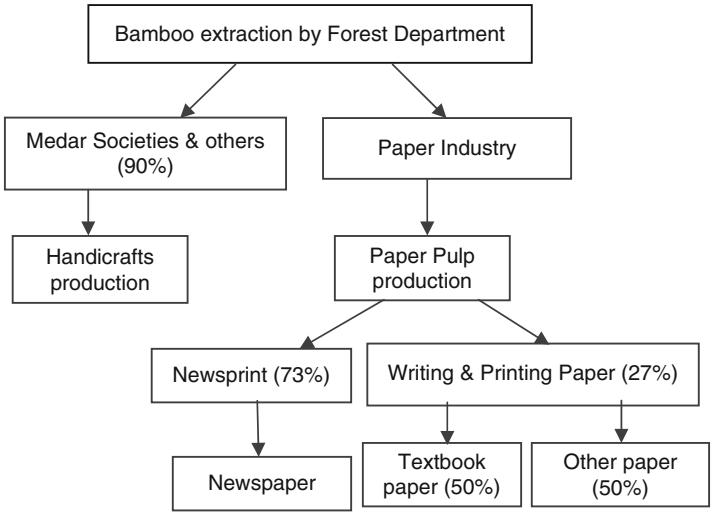

Fig. 10.3 Trade route of bamboo in Karnataka

Since taxing local low-income communities like the Medars will be regressive and since the trade here is largely informal, the alternative route, i.e. the use of bamboo in paper manufacture, is the channel used here to analyse the incidence of a tax or cess.

10.3.3 Revenue Collection from Bamboo Sale

The royalty rates differ according to the size of bamboo and the buyer. Estimated lowest bamboo disbursal of bamboo and revenue from its royalty accrued to the forest department was to the tune of 28.08 crores in 2004–2005. Available figures indicate increasing extraction and nearly Rs. 5.3 crores of annual tax (direct and indirect) revenue from industrial use alone (Tables 10.2 and 10.3); 51 % of which goes to the treasury (Karnataka) and 45 % to the central pool accruing to the Central Government (Fig. 10.4). The revenue accruing to the state is from the Forest Development Tax (FDT) collected by the State Forest Department and goes exclusively to the State Forest Development Fund. The amount accruing to the central pool is collected in the form of Central Sales Tax (CST), Education Cess, Income Tax and Surcharge and the Excise Duty.

The fact that neither the royalty funds nor the taxes collected ensure the sustenance of wild bamboo resources indicates that the generated revenue gets diverted and/or there are institutional lacunae in ploughing back the resources for conservation and dependant livelihoods. Hence it is unlikely that any additional revenue generated in the form of a targeted cess by itself will fix the problems of forest degradation and loss of livelihoods in the case of bamboo in Karnataka.

Table 10.2 Direct tax revenue from bamboo sales in Karnataka (in Rs lakhs in 2004)

	Sale value	KST + SC	FDT	Service charge (10 %)	IT + SC	Education cess (on KST)	APMC @ 1 %	Total tax
Medar bamboo from FD	4.43	–	0.35 (8 %)	–	–	–	–	0.35
Medar bamboo from KFDC	1.93	0.077 (4 %)	0.16 (8 %)	–	0.05	0.0015	–	0.28
Industrial bamboo from FD	72.33	3.33	8.68 (12 %)	7.23	–	–	–	19.24
Industrial bamboo from KFDC/ KSFIC	36.71	1.47 (4 %) (CST)	0.405 (12 %)	–	–	–	0.37	2.24
Total	115.4	4.87	9.59	7.23	0.05	0.0015	0.37	22.11

Source: Compiled from Karnataka Forest Department annual reports
KST Karnataka Sales Tax, *FDT* Forest Development Tax, *IT* Income Tax, *SC* Surcharge, *APMC* Agriculture Produce Market Committee, *FD* Forest Department, *KFDC* Karnataka Forest Development Corporation, *KSFIC* Karnataka State Forest Industries Corporation

Table 10.3 Estimated indirect tax revenue from bamboo-based industries in Karnataka (Rs lakhs in 2004)

		Tax revenue on bamboo component			
Use	Sales value	KST (4 %)	Education cess (2 %)	Excise duty (8–16 %)	Total tax
Newsprint production (73 %)	3,498.6	140	2.8	–	142.8
Writing and printing paper (27 %)	3,317.6	132	2.6	231 (265.4)	364.6
Total	6,816.2	271	5.4	231	507.4

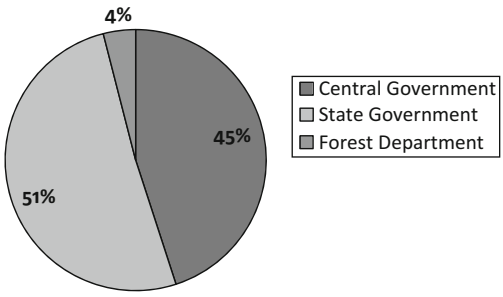

Fig. 10.4 Treasury-wise breakup of taxes on bamboo (Source: Annual reports of the Forest Department, Government of Karnataka)

Nevertheless it may be worth using this revenue data for understanding possible equity impacts of a potential cess in order to see whether it is reasonable to recommend a new fiscal instrument for any product derived from forests. It is in the case of NTFPs that are harvested by the poor and consumed by high-income groups and those with a formal channel of transactions that a fiscal instrument could be of use for conservation as well as livelihoods. To summarise the chapter so far, we test the socio-economic impacts of such an instrument for paper, a widely used commodity, production of which involves the use of bamboo from the forests of Western Ghats, as a representative case for a typical consumer product derived from NTFP collected by poor gatherers.

10.4 Tracing the Flow of Expenditure on Bamboo

The study thus investigates the paper and pulp marketing channel of bamboo for a possible imposition of a 'cess' aimed at fostering livelihoods by sustaining bamboo resources. We trace the formal transactions of natural bamboo leading to paper products (printing paper and books) bought in the retail market with the intention of testing the regressivity of this targeted 'cess'.

The impact of cess across various classes of consumers for paper products logically depends on the price elasticity of demand for paper products. Through short interactions with paper wholesalers of Bangalore based on a predesigned checklist, it was learnt that demand for paper increased steadily during the last few years and this was accompanied by a price increase for paper and pulp products. Based on the responses and information gathered from wholesalers, the demand for paper in urban Bangalore was found to have a price elasticity of 1.3 (despite a 4 % VAT applicable to all transactions during the study period). The greater than unity elasticity implies two-way increase (price and demand), scarcity of the resource and increasing demand for paper (including wastage) along with an increasing income.

In order to find the regressive impact on different income groups, we need consumer expenditures on paper products. As the Household Consumer Expenditure Survey carried out by NSSO (National Sample Survey Organisation India) does not record expenditures on book and paper, an exit poll was undertaken to identify average expenditures by different income groups on paper products. The estimates based on the poll and other data serve as indicative magnitude of possible real income impacts and signal the feasibility of analysing the distributional impacts. It may be noted that the analysis is based on annual income which is said to create a bias in the direction of increased regressivity in comparison to lifetime income calculations (Chernick and Reschovsky 1997).

Thus primary data was collected through an exit poll survey conducted in book and paper stores of Bangalore city in 2008. Targeted respondents were classified in relevant income groups as found in the reports of NCAER (2005) and McKinsey (2008). The survey was conducted verbally in the form of personal interview with a

questionnaire administered to 89 respondents.[2] Real expenditure by various income groups on paper and book products per month was measured from their primary source of income and contribution to the household budget and then classified within selected income ranges.

10.5 A Cess on Bamboo Products: Potential Impacts

10.5.1 Regressivity Analysis

Table 10.4 presents mean absolute and proportionate expenditure per month on paper and books by respondent households based on the responses in the exit polls. Monthly expenditure on paper and book products range from Rs. 159 in the low-income group to Rs. 2,251 in the highest-income range.

Table 10.4 shows that monthly paper and book expenditure (including that for educational purposes) is progressive with expenses rising from 2.39 % of their monthly income in the lowest bracket to 4.90 % in the high-income bracket. Individuals in the high-income group spend about twice as much on paper and pulp products than the poor in the lower-income group. Taxing these products hence could be progressive, meaning that impact will be larger with increasing income. Still the impact of cess on bamboo paper on poor households may be significant, and this depends on how the household's relative income is affected.

10.5.2 Changes in Income with the Imposition of Cess

After taxation, the higher prices will require households to spend a greater proportion of their income to obtain the same amount of goods purchased as before the introduction of the cess. This is referred to as fall in the 'real income'. A sensitivity

Table 10.4 Class-wise monthly expenditure on paper and books

Income class (Annual income range) (Rs. in '000)	Mean expenditure per month (Rs.)	Mean expenditure as percentage of monthly income (%)
Low-income (0–90)	159	2.39
Middle-income (90–500)	519	2.89
High-income (> 500)	2,251	4.90
All income groups	**777**	

[2] Though target was to cover 100 customers in the exit poll of 10 days, only 89 responses were complete.

Table 10.5 Absolute and percentage change in real annual income

Income bracket	Cess paid as part of annual expenditures (Rs)			Real income reduction as a percentage of annual income at different levels of cess		
	1 %	2 %	3 %	1 %	2 %	3 %
Low	19	38	57	0.02	0.05	0.07
Middle	86	173	259	0.03	0.06	0.09
High	294	588	588	0.05	0.10	0.15

Table 10.6 Cess revenue from sale of paper products made from bamboo in Karnataka

Mean annual paper consumption quantity (MT)	Mean sales price (Rs./MT)	Average bamboo content 18 % quantity (MT)	Tax revenue on bamboo component, VAT 4 % (Rs. in lakh)		Tax revenue on bamboo component, total value (Rs. in lakh)
			VAT 4 %	Cess 2 %	Cess 2 %
371,000	38,000	66,780	1,015.1	20.3	507.5

analysis (Table 10.5) indicates changes in real income reflecting the distributional and equity impact at different levels of cess. Under all assumed rates of cess (1 %, 2 % and 3 %), a progressive impact on real annual income is estimated with high-income groups bearing a greater proportion of this burden. In case of a medium (2 %) cess, real income reductions range from 0.05 % of their total annual income in the lowest-income group to 0.10 % among the high-income buyers.

The potential progressive impact of cess by itself may not justify an economic policy instrument unless it generates enough revenue to cover transaction costs in the channelisation of revenue towards conservation of bio-resources and livelihoods.

10.5.3 Potential Cess Revenue

The potential revenue from an indirect tax or cess on sale of bamboo products in Karnataka can be calculated in different ways depending on the placing of the instrument in the marketing channel. The following analysis presents cess imposed in three ways: first based on the VAT component of transactions; second, based on the total value of transactions; and third, based on unit rate of paper products using the annual quantity consumed (7 kg of paper and pulp per capita (Gupta 2008) in India). In order to measure the impact of taxation on sale of bamboo products, only an estimated average percentage (18 %) of bamboo content for paper and books was assumed. Thus, the estimated revenue should not be taken as exact value for these products. Rather, the revenue estimate has only indicative significance, as an order of magnitude for policy consideration and methodology. Table 10.6 shows the expected indirect tax revenue generated on bamboo products with 2 % cess in the

Table 10.7 Cess revenue analysis on unit rate

Unit rate/quintal (Rs.)	Mean bamboo content (Quintals)	% increase in cess revenue
50	667,800	–
100	868,140	1.6
200	1,128,582	1.6

State of Karnataka, using two of the three methods of imposing cess – either on the VAT component or on the total value of transactions.

Estimates show that 2 % cess generates annual indirect revenue amounting to Rs. 20.3 lakhs (on the VAT component of transactions) or Rs. 507.5 lakhs (on total value of transactions). With an estimated price elasticity of 1.3 (as in Table 10.7), an increase of the cess revenue by 1.6 % every year is predicted, at least for the initial years, during which a linear relation can be assumed. These predictions show the potential of a cess to create a viable revenue fund.

This example is illustrative of the feasibility of an ex ante impact assessment of an economic instrument aimed at conservation and livelihoods. In practice, any tax targeting only natural bamboo is hard to undertake due to constraints in product differentiation by source of origin (natural or planted). The proposed cess is understood as a mechanism of local levy – a 'biodiversity and livelihood cess', as an instrument which can potentially cover a forest product that is collected by the poor and used for producing a consumer goods for the rich so as to create a fund supporting biodiversity and livelihoods.

10.5.4 Utilisation of Cess Funds

Most criticisms on any economic instrument (apart from distributional impacts) arise from their unimpressive track record in converting fiscal revenues to the concerned purpose. The purpose of a fiscal levy calls for utilisation of cess funds to improve the NTFP sector comprising of both the poor forest-dependent community of collectors and the resource itself. The revenue can be utilised to support methods of sustainable harvests through participatory monitoring and conservation measures and insurance schemes (bamboo habitat also report wild elephant attacks on collectors) or other welfare schemes for dependant households. Specifically, cess funds could be used for the following purposes:

- Community regeneration of different bamboo species/varieties facilitated by governmental and research organisations.
- Participatory monitoring of diverse bamboo resources facilitated by research and governmental agencies.
    - Both the above could be linked to employment guarantee schemes for rural poor for partial support.
- Improving handicraft skills and designs adding value to bamboo products, especially among women working on bamboo.

- Encouraging ex situ planting to decontrol bamboo trade and transport and to treat it as an agricultural product. Once in situ protection is assured by participatory methods as mentioned above, illegal harvests will be minimised. In the past, the governance and administration failure to effectively monitor wild resources got translated to restricted transport and trade, generating disincentives for propagating the species ex situ (Viswanath et al. 2008).
- Subsidised bamboo poles for the Medar or other communities traditionally depending on the resource and repositories of traditional skills as well as knowledge on its ecology.

10.6 Conclusion

Bamboo, in a sense, straddles the two worlds that the communities in the peripheries are caught in, i.e. the forests, where it is harvested, and the urban centres where it is sold and consumed. Its close linkages with the two can be harnessed like a targeted cess to channel the positive feedbacks of one to the other.

The limited impact that regulatory controls and bans have on the exploitation of forest resources and poverty of forest-dependent communities makes a case for economic instruments along with institutional arrangements. Rejecting taxation of consumer products derived from NTFP, based either on the regressive consumer impact, or based on experience in the fuel sector, or on the poor track record of channelising fiscal revenue for their intended purposes, may not be ideal, given the increasing demand and income elasticity for these products. Nevertheless, it is essential for each case of taxation to undertake a tax incidence or regressivity analysis as the elasticity and real income impacts differ from product to product. Based on data generated through a survey of traders and consumers in Bangalore, a possible taxation of natural bamboo in the pulp and paper industry shows a progressive impact on expenditures and real income. Therefore, although measurement of tax incidence is difficult in India due to considerable data constraints, it need not be overlooked in fiscal decisions on natural resources.

This chapter supports a well thought-out and selective imposition of a biodiversity and livelihood cess (along with regulatory measures) on products from NTFPs, collected by the poor and consumed by the rich if there is no regressive distributional impact on real incomes. Apart from equitable impact and potential revenue, the success of fiscal instruments for biodiversity and livelihoods depends also on institutional mechanisms. The integration of policies and institutions is crucial for the success of either, an issue addressed in greater detail in the final chapter.

References

Bardhan, P. (1987). The new institutional economics and development theory. *World Development, 17*(9), 1389–1395.

Chernick, H., & Reschovsky, A. (1997). Who pays the gasoline tax? *National Tax Journal, 50*(2), 233–259.

Dove, M. R. (1993). A revisionist view of tropical deforestation and development. *Environmental Conservation, 20*, 17–24.

Gupta, N. (2008). Paper manufacturing – Is it viable in India? *The Hindu,* May 28.

Hasset, K. A., Mathur, A., & Metcalf, G. E. (2007). *The incidence of a U.S carbon tax: A lifetime and regional analysis* (NBER Working Paper Series 13554). NBER, USA.

Kumar, A., Arvind, N. A., Shaanker, R. U., Ganeshaiah, K. N., Purushothaman, S., & Kashyap, S. (2009). Herbal exports from India- trends and implications. In R. U. Shaanker, A. Hiremath, C. G. Joseph, & N. Rai (Eds.), *Non-timber forest produce- conservation, policies and management in the tropics* (pp. 129–138). Bangalore: ATREE/UAS.

McKinsey Global Institute. (2008). *The bird of gold. The rise of India's consumer market*. San Francisco: McKinsey Global Institute.

Metcalf, G. E. (1998). *A distributional analysis of an environmental tax shift* (NBER Working Paper 6546). NBER, USA.

Murthy, I., Bhat, P., Ravindranath, N., & Sukumar, R. (2008). Financial valuation of non-timber forest product flows in Uttara Kannada district, Western Ghats, Karnataka. *Current Science, 88*(10), 1573–1579.

NCAER. (2005). *The great Indian market: How India earns, spend and save*. New Delhi: Sage.

Parry, I., Sigman, H., Walls, M., & Williams, R. (2005). *The incidence of pollution control policies* (RFF DP 05–24, Discussion Paper). Washington, DC.

Porteba, J. M. (1990). *Is the gasoline tax regressive?* (NBER Working Paper 3578). NBER, USA.

Scherr, S. J., White, A., & Kaimowitz, D. (2003). *A new agenda for forest conservation and poverty reduction: Making markets work for low income producers*. Washington, DC: Forest Trends.

Tewari, D. D., & Campbell, J. Y. (1995). Developing and sustaining non-timber forest products: Some policy issues and concerns with special reference to India. *Journal of Sustainable Forestry, 3*(1), 53–79.

Ticktin, T. (2004). The ecological implications of harvesting non-timber forest products. *Journal of Applied Ecology, 41*, 11–21.

Uma Shaanker, R., Ganeshaiah, K., Srinivasan, K., Ramanatha Rao, V., & Hong, L. (2004). *Bamboos and Rattans of the Western Ghats: Population biology, socio-economics and conservation strategies*. Bangalore: ATREE/IPGRI.

Viswanath, S., Dhanya, B., & Rathore, T. S. (2008). Domestication of *Dendrocalamus brandisii* and upland paddy fields in Coorg, Karnataka. *Journal of Bamboo and Rattan, 6*(3&4), 215–222.

Williams, D. F. (2008). *Taxation and the environment* (Discussion Paper). KPMG's Tax Business School, UK.

Chapter 11
Institutions for Sustainable Livelihoods in the Forest Fringes: Towards Integration

Seema Purushothaman and Neha Ambastha

11.1 Introduction

Natural resources of a socioecological system (SES) individually and collectively constitute the foundation of human sustenance and livelihood. Any activity in an SES is linked to others, as the same resources cater to all. This implies the need to adopt a systems approach to policies which are meant to reduce the socioecological footprint of our pursuits of sustenance and livelihood. In spite of policy statements with this intention and mandate, integrative actions to protect and maintain the rural resource base of its people's livelihoods are conspicuous by its absence in India.

Instead, policies, regulations and execution remain centralised, often citing deficiencies in technical capacities at the grass roots. Resources continue to degrade, while conflicts spread and accumulate, thereby weakening the social fabric. If a comprehensive treatment of these SES is to be materialised, rather than relying on centralised approaches to resolve such conflicts, policies that foster increased regional self-reliance that encourage greater investment in local natural capital and favour the development of strong, inclusive local economies have to be institutionalised.

This chapter is adapted from the paper 'Rational Policies in Natural Resource Management' presented at the Ninth Biennial Conference of the International Society for Ecological Economics, held in Delhi, India, from 15 to 19 December 2006.

S. Purushothaman (✉)
Azim Premji University, Bangalore, India

Adjunct Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India
e-mail: seema.purushothaman@gmail.com

N. Ambastha
Ashoka Trust for Research in Ecology and the Environment, Bangalore, India

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes*,
DOI 10.1007/978-81-322-1626-1_11, © Springer India 2013

In forest peripheries where production and natural landscapes meet, crafting such integrative institutions is all the more imperative. These regions are distinct, both geographically and culturally, from the socioecological systems that they adjoin (generally forests and suburban regions) and function as vital buffers between managed and wild landscapes. Therefore, locally crafted and contextually appropriate institutions and policies are crucial here.

This chapter focusses on the scope for integrating policy mechanisms for forest resources in the case of Karnataka. Tracing the trade routes of some important goods and services from this landscape, this chapter explores the feasibility and role of local institutions towards mainstreaming a sustainability approach to natural resource management (NRM). It concludes with suggestions for inclusive and integrated policies and mechanisms for sustainable livelihoods in the forest peripheries.

11.2 Setting the Scene: Know-How on Institutions, Livelihoods and Natural Resources

Impacts of individual activities involving natural resources amidst prevailing policies have been analysed in different contexts, especially with respect to forest products (see, for instance, Murali et al. 1996; Shankar et al. 1996; Hegde et al. 1996). Most prevailing mechanisms in this direction confine to command and control measures formulated centrally and implemented locally. Once implemented, these measures may regulate individual enterprises and raise some revenue for the exchequer. But these have not been able to take natural resource use towards sustainability in both quantity and quality terms.

With many developing countries increasingly shifting responsibility for natural resource management from central to local government authorities, devolution of adequate responsibilities by the state has been offered as a means for institutions to negotiate their concerns and build credibility for a stable institutional path towards integrated resource management (Saravanan 2002). An argument for participatory resource management comes from the theory of corruption in natural resource governance and the challenge it poses for sustainable use. Robbins (2000) and Palo and Lehto (2005) thus argue for inclusive institutions in mediating the relationship between the state and the civil society. Moreover, for harnessing the traditional knowledge and rural social capital towards a successful natural resource management (NRM) model, community institutions have proven credentials. Also, people, according to Campbell and Townsley (1996), like to have a say in the ways that government intends to use their land resources.

Despite the above positive elements identified in literature, popular forms of community management of natural resources (e.g. intricate water management systems managed and co-ordinated by community stakeholders, clan councils supervising age-old rules for sustainable grazing of pastures in the mountains and sharing systems among fishing villages, agriculturists and pastoralists) are on the decline, an issue discussed in Chap. 8, due to a combination of factors. These include

individualisation of rights, questionable legitimacy, weakening cohesion within communities, regulatory lacunae and the overshadowing of community needs by compulsions for private profit instilled in economic development. This erosion of traditional and crafted social institutions has given rise to case studies cautioning against full devolution of authority to local communities without safeguards to maintain good governance and adequate capacity (Balint and Mashinya 2006). Changing rights and regulatory regimes with respect to the common, state-owned or private lands thus necessitates the support of the state, judiciary and constitution along with evolution of social values around livelihoods and sustainability.

Another study in India on institutional efficacy of resource management (Pavri and Deshmukh 2003) indicates that efficacy of management regimes in satisfying user needs hinges on equitably reflecting local socio-spatial complexities and incorporating temporal flexibility into its normative structure and questions the viability of locally managed regimes under heterogeneous social settings. Nevertheless, it suggests that regime efficacy can be fostered through state–civil society partnerships, widely distributed stakeholdership and firmly embedded regimes that adapt to changing socio-spatial contexts. Others like Ho (2006) emphasise on institutional credibility and the role of government, rather than trust between social actors, for meeting the institutional needs in the forestry sector. Together these studies appear to suggest that failure to effectively undertake institutional reform might put the social acceptability or credibility of institutions at risk, leading to the emergence of 'empty institutions' with little, or even a negative, effect on social and political actors. Inclusive regimes in management of resources are both necessary and desirable in a pluralistic society, while official and legislative support imparts legitimacy, compliance and viability.

While democratisation and political accountability are identified as essential (Nygren 2005), a focus on understanding institutions that mediate access to and control over natural resources is seen as a way forward to improving management regimes that include local people (Nunan 2006) while accounting for intracommunity dynamics and ecological heterogeneity. This may not translate to just decentralisation of governance and devolution of powers. In fact, discussion on decentralised governance for reconciling conservation and livelihoods brings up many challenges.

Some challenges in realising the principles of democratic decentralisation on the ground are explored in Mahanty (2002) through the role of relationships and networks between actors in a conservation and development intervention. The paper concludes that practitioners need to focus on negotiation and network building as a central rather than subsidiary part of the intervention process. Hove (2006) also elucidates the necessary existence of 'negotiations' in participatory approaches to effectively utilise plurality of values and the necessity of common existence. They argue that ignoring the negotiation dimension of participatory approaches can impede their legitimacy and effectiveness as learning processes to resolve complex environmental issues beyond the interest of the more powerful actor.

Discussion thus far showcased the myriad of attributes that need integration for institutionalising sustainability of natural resource management for rural livelihoods. This integration of attributes apparently needs to get reflected in production systems. The outcome of a production analysis of collaborative forest management

(Misra and Kant 2004) indicates that the contributions of nonconventional factors (social, cultural and organisational) dominate the contributions of conventional factors (land, labour, capital). The participatory and integrated policy process (PIP) designed in the Vanuatu land-use project in the Pacific (Campbell and Townsley 1996) is another example of a mechanism that promotes the involvement of stakeholders in the policy process, harmonising the conflicting objectives, strategies and capacities for microeconomic and physical planning.

While the above discussion focussed on what could be done at community scale, at the level of an individual, choices of collective strategies are attributed to incentives (Ostrom 1991). The institutional analysis and development framework finds three factors to be conditioning a participatory strategy – attributes of resource, of users and the institutional arrangement. Founded on the above lines and drawing insights from community forest management practices in India, Sekher (2001) analysed the process of organised participatory management. His study highlights the role of processes, rule formulation and internalisation of stakeholder incentives in moulding the outcome of organised participatory resource management in terms of restraints, opportunities and legitimacy. There have been attempts to develop appropriate tools like rapid economic valuation, to be used for decision making by an inclusive grass-roots level body (Cannon and Surjadi 2004) based on diverse individual attributes. Governance and production systems that rely on information flow and information gathering need to build up and synergise capacities at the grass-roots level.

The next section explores the scope for designing such policy and institutional mechanisms for the forest resources of Karnataka, by tracing the trade routes of some important non-timber forest products (NTFPs) and a forest-related service, towards livelihood security with ecological integrity.

11.3 Socioeconomic Context: Dependence and Pressure on Forest Resources of Karnataka

About 90 % of the forests in Karnataka contribute towards the livelihood needs of 7,130[1] villages comprising nearly nine million people. Forest dependence of communities mainly pertains to household consumption though at times, it is also market driven. Though increasing penetration of markets into forests and other natural areas is evident in the increasing trend in extraction levels of most of the products (Fig. 11.1), the share of cash income from the forest products mostly remained constant among the forest-dependent people (Hegde et al. 1996). Rising population density around forests and deprivation of these communities make this dependence crucial from both the resources and the community perspectives.

[1] kaforest.gov.in/english/forest_glance/forest_at_glance.htm

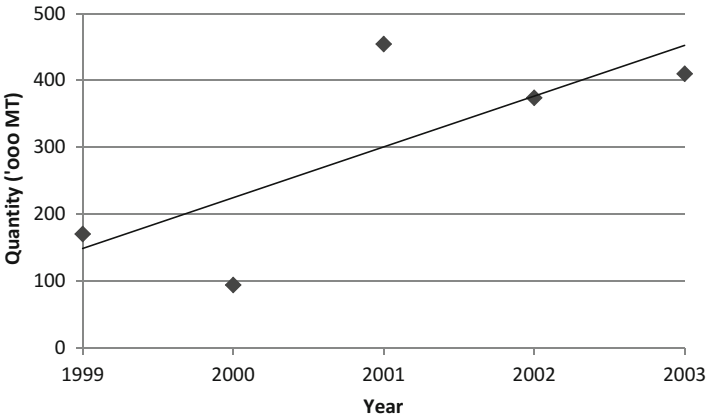

Fig. 11.1 Extraction of NTFPs (NTFPs include Alalekai, Antwalakai, bamboo, beedi leaves, charcoal, Citroda, Dalchini, eucalyptus oil, fodder grass, fruits, Mauraganahuli, Nellikai (Amla), rosha grass, rubber, Saladupa, Seegekai, tamarind, and Uppige) in Karnataka state from 1999 to 2003 (Source: Data collected from records in Karnataka Forest Department)

Table 11.1 Decline in dense forest area in Karnataka (in sq. km; percentage to total forest area in parenthesis)

Year	Dense forests	Open forests
1993	24,854 (77)	7,491 (23)
1995	24,832 (76)	7,632 (24)
2000	26,156 (70)	10,835 (30)
2003	22,461 (62)	13,988 (38)

Source: Compiled from State Forest Reports, FSI

With extraction increasing for livelihood and commercial industrial needs, as also with increasing disturbance from expanding tourism and infrastructure, quality of forests declined. Between 1992 and 2003 (Table 11.1), dense forests in the state dwindled from 81 % to 62 %, open forests increased from 23 % to 38 % and the share of degraded forests increased by 33 % between 1992 and 2000 (ICFRE 2000).

In the backdrop of mounting pressure on the forests of Karnataka, we trace the trade routes of certain enterprises depending on the forest resources of the state providing a reality check for the integration being emphasised and deliberated here. Forest-based livelihoods existing in areas near forests can be categorised into two – one based on non-timber forest products (mainly bamboo, harra, honey and beeswax; often, fodder and fuel wood too) and the other based on tourism. Both have positive and negative externalities at each phase of raw material extraction/harvesting, processing and consumption/use. The following section discusses the ecological and social externalities associated with these enterprises at each of these stages. This excludes externalities in those stages in the product's life cycle that are not directly linked to forest-dependent livelihoods and related policies.

11.4 Analysis: Impact of Dependence on Forests in Karnataka

Socioecological impacts of each resource use are often interlinked and hence difficult to segregate, especially when we attempt to derive insights from these on policymaking at the grass-roots level. Nevertheless, these overlapping impacts are brought to light for each enterprise under consideration. Individual trade routes are traced from the origin of the resource to its consumption, enabling the analysis of resource linkages and institutional lacunae at each stage with respect to people and ecology. Later the analysis attempts a synthesis to highlight overall impact on the resource base of the state. Impacts subsequently are extended to integrative policies and then to institutional needs for these polices.

11.4.1 Bamboo Resources and Related Industries

The trade of bamboo in Karnataka is mainly for handicrafts and paper as depicted in Fig. 10.3 of the previous chapter discussing an ex ante assessment method for possible distributional impacts of a fiscal instrument in regulating demand for forest bamboo in paper manufacture. Demand for bamboo can potentially be affected by the proportion of bamboo pulp in paper manufacturing and by the demand for making cocoon trays by the traditional silk industry. The unmet demand of bamboo in the state for *agarbathi* (incense sticks) making and scaffoldings is met from other states.

11.4.1.1 Paper Industry and Natural Bamboo Resources

The pulp and paper industry in India is characterised by the dominance of small units below 10,000 t per annum capacity. While mills of large capacities mainly use wood and bamboo as raw materials, small mills also depend on agricultural residues and wastepaper. The contribution to paper manufacture from forests (wood and bamboo), agricultural residues and recycled fibre comes to 38 %, 36 % and 26 %, respectively. Considering that forest sources accounted for 95 % of paper production in 1970, the progress in the utilisation of non-wood sources is impressive. But other parts of the world perform still better in using non-wood pulp, mainly from paddy straw. In China, these form the main raw material for paper and paperboard constituting nearly 40 % (Capretti 2002) of raw material. Continued dominance of bamboo pulp in Indian paper industry was predicted by many surveys and reports (FAO/UNEP 1981; FAO 1991, 1980) considering the slow progress in utilising non-wood non-forest fibre sources. The inadequacy of fodder supply for livestock makes availability of agricultural residues for paper production less likely and less desirable.

11.4.1.2 Sericulture and Bamboo Resources

Cocoon trays used for rearing silk worms in traditional sericulture are made of bamboo. The Indian sericulture industry, concentrated in the three southern states of Karnataka, Tamil Nadu and Andhra Pradesh, is one of the most labour-intensive sectors of the rural Indian economy, providing full- and part-time employment to some six million people. In fact, this sector has been identified as a sector of the Indian economy with strong potential for job creation. Karnataka contributes 70 % of the silk produced in India, producing about 5,000 t of silk annually and employing about 800,000 families.

Though silk forms only a miniscule percentage of the global textile fibre market (less than 0.2 %), it generates a multibillion-dollar trade, with unit price for raw silk roughly 20 times that of raw cotton. The present market context for silk in India is one of the vigorously growing internal demands for silk fabrics, with growth rates of above 10 % per year (MAYA 2000). India's silk exports were expected to grow with sericulture sector in the country on a revival after going through a tough phase of low production due to droughts as well as a fall in prices on account of dumping of cheap silk from China. In terms of production, as per the provisional figures provided by the Central Silk Board (CSB) for the 6-month period of April–September 2004–2005, raw silk production has gone up by around 24 %, at 7,931 t. Though sericulture has good livelihood potential, the use of child labour, unhygienic disposal of dead pupae in the locality and the drain on bamboo resources pose unaddressed sustainability challenges. Any increase in demand for silk can have more than a proportionate impact on the negative externalities mentioned.

Addressing these diverse but interlinked externalities will necessitate integrative design of governance measures. Here, integration involves establishing policies and institutions to curb child labour, to ensure safe disposal of waste and also to promote bamboo plantation, by synergising the participation of stakeholders from bamboo cutters to silk manufacturers. The potential for expanding the plantations as ex situ bamboo sources in wastelands is declining in Karnataka. Figure 11.2 depicts a decline of cultivable wastelands amounting to nearly 36 % between 1966 and 2006. Thus, natural bamboo sources will continue to be the major source of extraction for the paper and silk industries unless cultivation of bamboo does not expand. Prevailing disincentives for cultivating bamboo, including the requirement to get a formal transit pass for transport, also need to be addressed. The premise that such regulations for cultivated bamboo will help curtails illegal extractions from forests looks unfounded as it indirectly disincentivises cultivation, further undermining wild resources. The transport permits obviously cannot also substitute the needed enforcement in ensuring that natural forests are not targeted for illegal harvests.

If enforcement can be effective, then ex situ cultivation can be encouraged to meet growing demand without depleting natural sources. Disincentives for raising resources ex situ and inefficient protection of natural areas can result in many local externalities like depletion of water and bamboo resources.

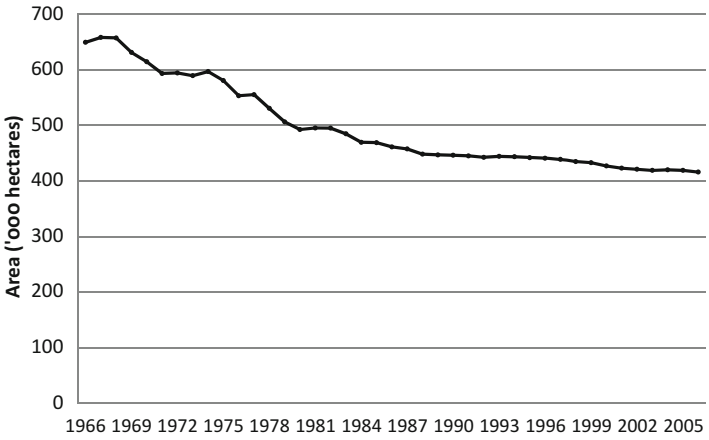

Fig. 11.2 Trend in area under cultivable wasteland in Karnataka (Source: Directorate of Economics and Statistics, Karnataka)

11.4.1.3 Minimising Externalities and Leveraging Social Benefits from Bamboo-Dependent Industries

As shown in the bamboo trade route for Karnataka (Fig. 10.3 in previous chapter), most of the natural bamboo goes to dependent communities. This along with the demand from pulp and silk industry provides an opportunity for sustaining bamboo-based livelihoods and natural resources if the challenges in integrating policies and governance as discussed earlier are addressed.

This means to incentivise bamboo-dependent societies to invest in (a) raising bamboo as community plantations, (b) incorporating bamboo in agroforestry systems, (c) establishing links to bamboo-based industries and (d) building capacities in synchronised paper-making and paper-recycling technology. These integrative measures have the potential to reduce pressure on the natural sources of bamboo as well as to provide employment in value-added enterprises. Such measures need to be complemented by integrative institutional mechanisms at the grass roots in order to address the externality issues therein, as the impacts of child labour, unhygienic disposal of pupae or illegal extraction of bamboo as well as the impact of untapped livelihood opportunities are felt locally.

*11.4.2 Harra (*Terminalia chebula*)-Dependent Industries*

Mature fruits of *Terminalia chebula* or *harra* – a forest tree occurring in the dry deciduous forests – are used for tanning in the leather industry and as an antidiabetic or laxative in ayurvedic drugs (Fig. 11.3). The leather industry has both forward

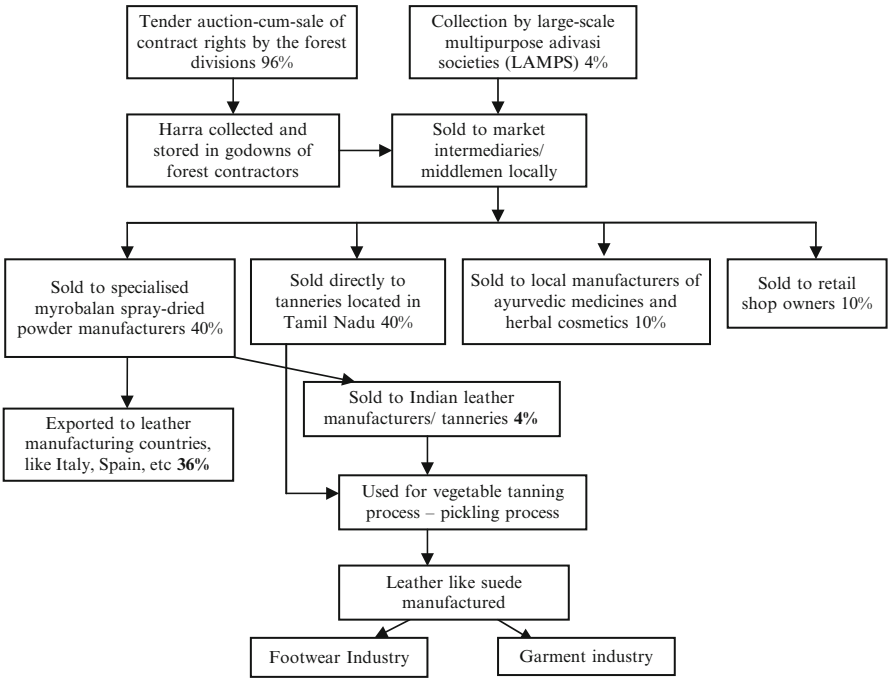

Fig. 11.3 Trade route for *T. chebula* (Harra) in Karnataka

and backward linkages with natural resources. Attempts to reduce the ecological footprint of the leather industry formed by its use of heavily polluting chemical substances by means of vegetable dyes and tanning agents often become counter-productive through transferring the externality to forests by exploiting forest sources of harra. Stress on sources of harra also comes from the ayurvedic industry for which 20 % of the collected fruit from Karnataka forests is destined (Fig. 11.3).

11.4.3 Minimising Externalities Affecting Harra Sources

Harra is mostly harvested from the forests except for a few pockets in central India, where the tree is grown on field bunds. Being a slow-growing tree, the potential for finding cultivated sources of Harra is also very low. According to harra collectors, given the trend in demand by the tanning industry and ayurvedic drug industry, the dwindling density is no surprise. While protecting natural (forest) sources includes regeneration measures, ex situ sources could be encouraged in homesteads and other agroforestry systems. Popularisation of harra-based crop–tree systems prevailing in central India could be considered for agro-climatically similar regions. In areas where harra occurs naturally, local institutions could form networks for

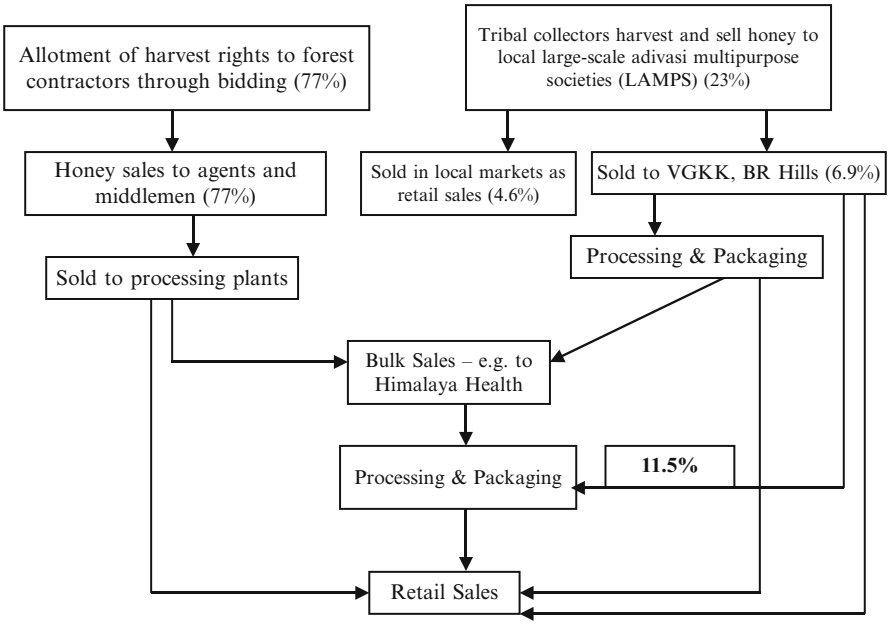

Fig. 11.4 Trade route of honey in Karnataka

cultivating and marketing harra fruits so as to sustain agricultural productivity and farm income. The use of this fruit to reduce the footprint of leather industry could actually do so only through integrative measures of ensuring sustainable rates of extraction from natural forests, regeneration and cultivation, all involving communities in the forest fringes as well as linking with leather manufacturers and users.

11.4.4 Honey and Beeswax-Dependent Industries

One-third of the total honey produced in India comes from Karnataka, and an increasing number of foreign countries are looking to India for supply. During 1991, the developing countries collectively accounted for 68.6 % of the total honey exports, compared with 55.5 % in 1983. Demand for forest honey is distinct and increasing, even in the context of increasing supply of apiculture honey. Apiculture often suffers from spread of diseases among bee colonies when natural bee colonies come to the rescue of crop cultivators and honey market.

Figure 11.4 shows the linkage of honey trade to pharmaceutical industry. Demand for herbal products like forest honey is increasing both in volume and premium willingness to pay, the latter being attributable also to an increase in purchasing power of the middle-class Indians.

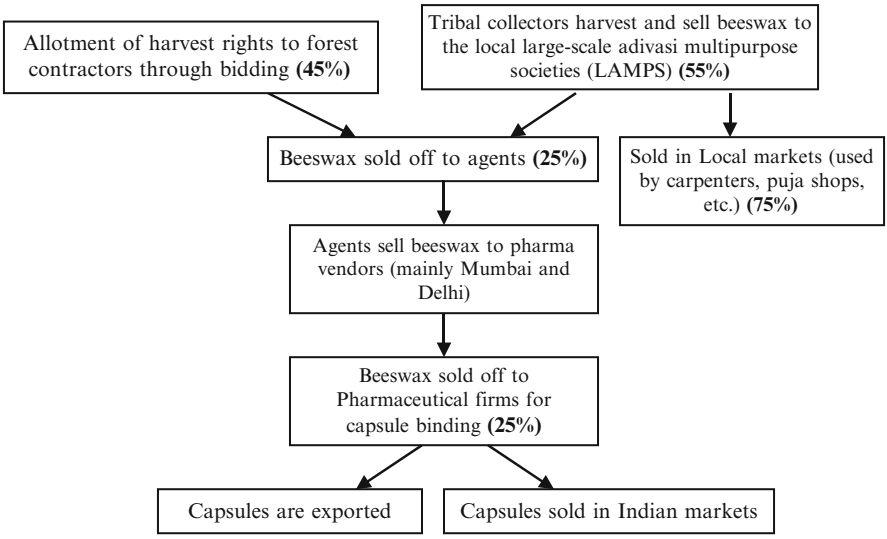

Fig. 11.5 Trade route of beeswax in Karnataka

There are basically two market segments, namely, the market for table honey and the market for industrial honey, the former accounting for bulk of the honey marketed. Some quantities are also used in natural sweeteners. Industrial honey finds its uses in baking, confectionery, cereals, beverages, honey-roasted nuts, baby foods, pharmaceutical products and cosmetics. World trade in honey and related products rose from 287,191 t in 1989 to 317,580 t in 1991 or by 10.6 % in quantity and 7.6 % in value (ITC 1986, 1993).

Honeycombs are also valued for beeswax. Figure 11.5 shows the trade linkages of beeswax. In Karnataka, at present as depicted in the figure, nearly 70 % of beeswax harvested goes to pharmaceutical industry. Global demand for cosmetics containing raw materials derived from natural sources and a shortage in major world markets show the market prospects for beeswax from developing countries.

11.4.4.1 Managing Honey Resources

Pure honey is supplied to the market from a few areas in the state such as Sirsi, Belgaum and Coorg. Honey and wax extraction from natural sources can be unsustainable with destructive harvests from the combs, cutting branches, etc. There are successful attempts at participatory resource monitoring in parts of forest of BRT in Karnataka. Capacity building in resource monitoring by the Ashoka Trust for Research in Ecology and the Environment (Setty et al. 2008) in parts of the forest of the state has shown a model for reconciling conservation and livelihoods.

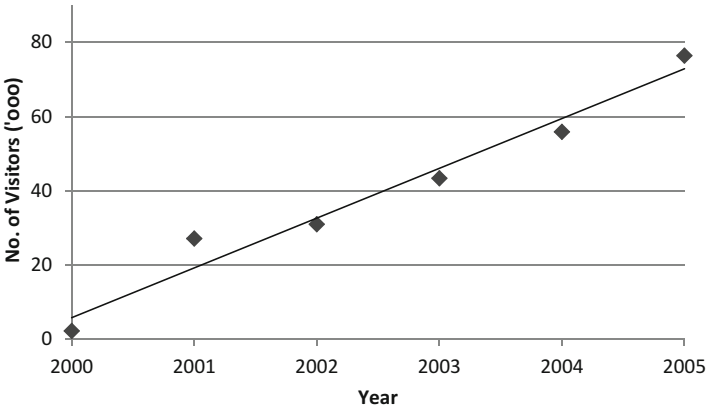

Fig. 11.6 Tourists (excluding day visitors) in the forests of Karnataka (2000–2005) (Source: Jungle lodges and resorts, Karnataka)

This implies the role of crafted institutions in regulating extraction and that of incentivising processes to monitor regeneration. Such replicable institutional models involve community-based and non-governmental organisations as well as the state forest department. Integrating participatory resource monitoring of honey extraction with honey market will ensure not only supply of good honey for longer time and livelihood options but also pollination of crops in the forest peripheries.

11.4.5 Nature-Based Tourism

Tourism depends on the same natural landscape which provides livelihoods and raw materials for various NTFP-based industries as well as ecosystem services. Major natural attractions in the state include protected forests for wildlife watching and rivers for game fishing. Public sector undertakings are a major player in marketing the tourism products of the state, while private (small and large) enterprises also mushroomed around the forested areas.

The concept and practice of ecotourism are becoming more and more popular, so as to significantly increase the flow of tourists. Figure 11.6 provides an indication of the increasing trend in forest tourists in Karnataka.

Tourism is important both for earning foreign exchange and to provide employment and hence is encouraged for both the reasons in all possible places. Figure 11.7 provides a glimpse of how the tourism enterprise has employed locals to manage rapidly increasing tourism near the forests of Karnataka.

Apart from international visitors, increasing flow of domestic tourists mainly from the Indian middle class with better disposable incomes is reaching the pristine areas of the state. There are few policies to address their impact on the socioecological

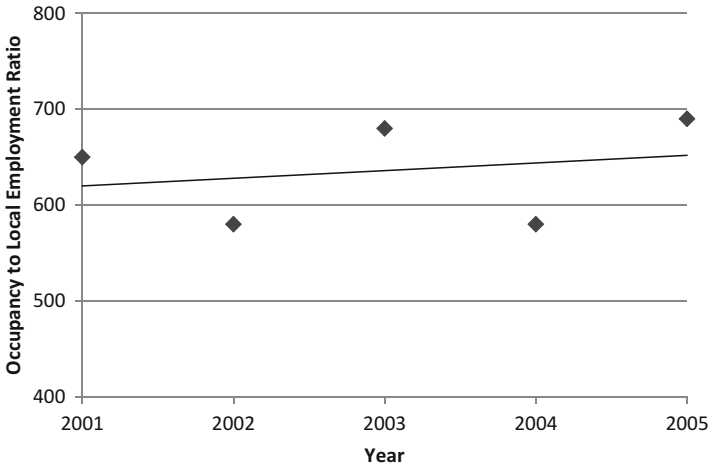

Fig. 11.7 Local employment benefits of forest-based tourism in Karnataka (2001–2005) (Source: Jungle lodges and resorts, Karnataka)

resource base on which the industry is based. With India signing the General Agreement on Trade in Services (GATS) and with the proposed opening up of the economy for foreign direct investment, the tourism pressure on the natural and cultural resources is poised to increase further. While policies are yet to mandate or encourage the local community's role and the monitoring processes, there is a clear need for a bottom-up approach to evolve rules for minimising ecological, distributional and cultural impacts. Purushothaman et al. (2007) propose an integrated institutional structure involving the state, corporate and voluntary players under a broad policy umbrella with enlisted indicators and processes for monitoring various impacts in different tourism models. The scope and opportunities for reconciling sustainability and better livelihood linkages through community-driven ecotourism ventures in the context of expanding urbanisation have been explored in Chap. 5.

11.5 Findings and Recommendations: Institutions for Integrating Livelihoods and Sustainability in the Forest Fringes

India has formulated and enacted distinct sectoral legislations either at aiming natural resource conservation or at providing livelihoods. Conservation policies include the Wildlife (Protection) Act 1972, Forest (Conservation) Act 1980, Environment (Protection) Act 1986, National Forest Policy 1988, Wildlife Action Plan 1988, Biological Diversity Act 2002 and National Environmental Policy 2006. Karnataka, apart from having to abide by these laws of the country, also has its own regulations

related to natural resource management like restrictions on transport of timber and for wilderness tourism. National and state rural livelihood missions and the National Rural Employment Guarantee (NREG) Programme are at the other end of the spectrum exclusively looking at income-generation activities. Very rarely can we find policies or schemes that seamlessly integrate both the objectives and leverage upon each other. Of late, policy statements like that of Scheduled Tribes and Other Forest Dwellers (Rights) Act (2006) have discussed to some extent the integration of the two.

While such emerging policies provide suggestive guidelines for integration of livelihoods and sustainability, they fail to emphasise the role of inclusive policy dialogues and integrated approach. Often at the economy level, sectoral policies contradict mutually, and any of them can be overlooked as per political convenience.

It has been shown that more than *which* rules a country adopts, what matters is *how well* the rules that are already set are monitored and enforced (Barrett et al. 2005). Divergent, compartmentalised legislations and implementation aiming at conservation and at livelihoods and negative externalities continue to degrade the socioecological landscapes of the forest peripheries threatening livelihoods and forcing seasonal and permanent migration from distress in rural India.

Table 11.2 reveals the forward and backward linkages (positive and negative) of selected natural resource-based industries in the state. It also touches upon some incentives and regulations that can help policies for minimising adverse impacts. Table 11.2 also brings forth questions on how to fill institutional gaps for adopting the integrated approach discussed here. Clearly, there is no single agency that can consider all the location-specific problems, which range from health hazards and resource depletion to child labour.

Synergies between rural community needs and NRM may not emerge naturally in the neoliberal context where macroeconomic linkages form the focus of the government, though they are intrinsically linked and share common drivers (Barrett et al. 2005). Policies and institutions have to be designed and stimulated to harness potential synergies between local natural resources, livelihoods and the macroeconomic drivers. Institutions need to evolve an informed mechanism with the potential to address the regulatory needs for minimising negative externalities and enhancing positive ones. Policies have to reflect the local needs and impacts in order to avoid actual outcomes of practices conflicting with expected outcomes of policies. Policies insensitive to multiple linkages and feedback from industries (like silk, paper, vegetable leather dye or ecotourism) do not monitor changes in these industries. Thus they will continue to segregate rural livelihoods and natural resources artificially, undermining both.

The diverse resource linkages discussed from Karnataka in the case of bamboo, honey, beeswax, harra and tourism converge into 36,000 sq. km of forests (19 % of the geographical area). Commercial NTFP harvests, contributing to quantitative decline combined with the qualitative decline due to tourism and related infrastructure, all affect the same resource stock. The mastery of policy creation here is in trying to sustain the positive impacts of enterprises from the resource flows of goods

Table 11.2 Linkages and policy gaps with respect to natural resource-based enterprises

	Ecological				Societal			
	Backward		Forward		Backward		Forward	
	+	−	+	−	+	−	+	−
Paper	Incentive to grow bamboo*#1	Declining bamboo forests	Can recycle used paper	Water pollution	Employment in bamboo extraction	Reduced supply to communities depending on handicrafts#1	Employment in factories	Health and occupational hazards from polluted water
Sericulture	Incentive to grow mulberry and bamboo*#1	Pressure on bamboo sources	Recycling*#2	Unhygienic disposal of dead pupae	Employment in making trays and conservation skills	(No identified significant linkage)	Employment in looms	Health and other hazards from unhygienic disposal of wastes
Leather	Saves the cost of disposing skins from slaughterhouses	Depleting natural sources of harra	Recycling*#2	Severe pollution of land and water	Provide part of livelihood of forest-dependent people	Reduced supply of harra for local use	Employment	Health and occupational hazards from pollution
Cosmetics and pharmaceuticals based on honey	Apiculture can help pollination and crop yield#3	Exhaustive collection can deplete bee colonies in the forests	(No identified significant linkage)	(No identified linkage)	Livelihood provision	(No identified significant linkage)	Nutritional benefits	(No identified significant linkage)
Tourism	Incentives to protect landscapes*	Degradation, disturbance and higher extraction#4	Increases awareness for conservation	Accumulation of nondegradable, and pollution#4	Employment while conserving ethnic traditions#3	(No identified significant linkage)	Cultural and educational awareness	Reduced access to locals; cultural pollution#4

*Potential, not prevailing

#Policy/regulatory gap: 1 Gaps in supplying planting materials and market links, 2 policies like VAT exemption for recycled products and regulations to make it mandatory, 3 no prevailing incentives, 4 no regulatory deterrents

Table 11.3 Potential institutional channel for integrating NTFP-based livelihoods and sustainability

Facilitator	Process	Associates	Target groups
FD	1. Identification of stakeholders (communities, CBOs, private agencies and other government agencies, NGO)		
	2. Inventorying (species and density) block/range wise	2. RO, locals	
RO	Assess regeneration and sustainability of harvest rates	FD, locals	FD, CBO, PRI, PE
RO	Access mapping, assess distributional impacts of harvests	NGO, CBO	PRI, FD
FD	Build capacity on rights, rules and regulations in NRM	PRI	FD, PRI, CBOs, GO, NGO, PE
RO	Build capacities in identification, monitoring and conservation	FD	CBO, NGO
NGO	Document and exchange traditional knowledge, customary NRM practices and rights	CBO	KFD, PE
NGO	Deliberate NRM policy constraints, gaps and impacts and needed improvements, incentives	CBO, RO	KFD, PRI, GO, PE
FD	Recommend inclusive policy process, regulations, extraction limits, cess	PRI	MoEF
FD	Participatory enforcement, monitoring and interaction plan	NGO, CBO	PIFM

FD forest department, *RO* research organisation, *GO* other government organisations, *PE* private enterprises, *NGO* non-governmental organisations, *CBO* community-based organisations, *PRI* Panchayati Raj Institutions, *PIFM* Participatory Integrated Forest Management

and services, keeping the current stock intact. This also includes sufficient insights on institutional possibilities.[2]

Given the complexity inherent in integration of measures aiming at social and ecological benefits at the same time, envisioning suitable institutional structure for the same may not be realistic in this chapter. Yet, an attempt is made here to suggest possibilities in this task and to trigger discussions. Thus, Table 11.3 is an example depicting a potential institutional channel in the case of livelihood options with the natural resources detailed in this chapter. The facilitating agency might differ according to the resource under consideration, but the processes remain. Even within the forest ecosystem, management processes of different resources might differ, depending on the stakeholders involved.

The challenges identified in such a process are (i) how to ensure distributional equity (between regions and stakeholders) and (ii) how to ensure appropriate

[2] A comparative assessment of institutional networking in NRM in the state is provided in Uma Shaanker et al. (2004).

harvest rates. These are potentially guided by central policies but dealt with by a network of institutions with various capacities. The table brings to light the following roles for different institutions:

Community-based organisations (CBO): Share and document traditional processes in resource management. This will facilitate intercommunity and intergenerational equity in distribution of knowledge and/or benefits.

NGOs are best used to facilitate creation and enrichment of social capital (e.g. to address equity concerns in a caste- or class-ridden society or among regions, integrate modern and local knowledge), help Panchayati Raj Institutions (PRIs) in the establishment of institutional mechanisms and be the society's watchdog on transparency.

Research organs: Augment capacities in documentation (knowledge, legal aspects and processes), technical, academic and accounting practices.

Government organisations and PRIs: Provide supportive legislative environment for suitable customary laws, processes and practices, reducing unsustainability and inequity, and facilitate capacity building.

Thus, though the institutional channel discussed here is only indicative, diverse strengths in the possible institutional linkages imply feasibility, subject to harnessing and synergising political will and capacities at various scales.

11.6 Conclusion

Tracing the channels followed by selected NTFPs and tourism, the concluding chapter reveals that in spite of existing legislations and literature on the need for integration across resources, institutions and stakeholders, an inclusive policy formulation process and integrated policy discussions are conspicuous by absence. This leaves unaddressed the social, ecological and economic repercussions of depleting resource stocks and livelihood options. The optimal strategy for participatory formulation of integrated mechanisms in natural resource use emerges as community-driven, government-facilitated approach and informed mechanisms operating at the grass roots, resonating with a broader trend in literature towards acknowledging the polycentric and nested nature of effective institutions (Ostrom 2010). This would translate to integration between NRM issues apart from integration among institutions and stakeholders.

While accepting the challenge posed by the concept of integration through participatory process, it cannot be sidelined as infeasible, since the efficacy of an informed, empowered and locally owned institutional system towards socially sustainable NRM practices is apparently valuable. However, inclusiveness in policies and institutions as well as in respective processes is only one side of the coin for livelihood and ecological security in the forest peripheries. This needs to be supplemented by official and legislative support for legitimacy and viability.

References

Balint, P. J., & Mashinya, J. (2006). The decline of a model community-based conservation project: Governance, capacity, and devolution in Mahenye, Zimbabwe. *Geoforum, 37*(5), 805–815.

Barrett, C. B., Lee, D. R., & McPeak, J. G. (2005). Institutional arrangements for rural poverty reduction and resource conservation. *World Development, 33*(2), 193–198.

Campbell, J., & Townsley, T. (1996). *Participatory and integrated policy: A framework for small-scale fisheries*. Exeter: IMM.

Cannon, J., & Surjadi, P. (2004). Informing natural resources policy making using participatory rapid economic valuation (PREV): The case of the Togean Islands, Indonesia. *Agriculture, Ecosystems & Environment, 104*(1), 99–111.

Capretti, G. (2002). *Suitability of non-wood fibres for the paper industry. Experimental station for cellulose and paper*, Milan, Italy.

FAO. (1980). *Pulp and paper capacities: Survey 1979–84*. Rome: FAO.

FAO. (1991). *Trade yearbook*. Rome: FAO.

FAO/UNEP. (1981). *Tropical forest resources assessment project forest resources of tropical Asia*. Rome: FAO.

Hegde, R. S., Suryaprakash, L., & Bawa, K. S. (1996). Extraction of non-timber forest products in the forests of Biligiri Rangan Hills, India. 1. Contribution to rural income. *Economic Botany, 50*(3), 243–251.

Ho, P. (2006). Credibility of institutions: Forestry, social conflict and titling in China. *Land Use Policy, 23*(4), 588–603.

van den Hove, S. (2006). Between consensus and compromise: Acknowledging the negotiation dimension in participatory approaches. *Land Use Policy, 23*(1), 10–17.

ICFRE. (2000). *Forestry statistics India 2000. Table 4.3.p55*. Dehradun: ICFRE.

International Trade Centre (ITC). (1986). *Honey: A study of major markets*. Geneva: International Trade Centre, NCTAD/GATT.

International Trade Centre. (1993). *Beeswax. EC overview. Market brief*. Geneva: International Trade Centre, UNCTAD/GATT.

Mahanty, S. (2002). Conservation and development interventions as networks: The case of the India ecodevelopment project, Karnataka. *World Development, 30*(8), 1369–1386.

MAYA. (2000). *Which silk route this. A situational analysis of child labour in the sericulture industry*. Bangalore: MAYA.

Misra, D., & Kant, S. (2004). Production analysis of collaborative forest management using an example of joint forest management from Gujarat, India. *Forest Policy and Economics, 6*(3–4), 301–320.

Murali, K. S., Shankar, U., Shaanker, R. U., Ganeshaiah, K. N., & Bawa, K. S. (1996). Extraction of non-timber forest products in the forests of Biligiri Rangan Hills, India. 2. Impact of NTFP extraction on regeneration, population structure, and species composition. *Economic Botany, 50*(3), 252–269.

Nunan, F. (2006). Empowerment and institutions: Managing fisheries in Uganda. *World Development, 34*(7), 1316–1332.

Nygren, A. (2005). Community-based forest management within the context of institutional decentralization in Honduras. *World Development, 33*(4).

Ostrom, E. (1991). A framework for institutional analysis. *Workshop in political theory and policy analysis* (Working Paper No. W91–14). Bloomington: Indiana University.

Ostrom, E. (2010). Beyond markets and states: Polycentric governance of complex economic systems. *The American Economic Review, 100*(3), 641–672.

Palo, M., & Lehto, E. (2005). Poverty reduction by tropical forests? *Silva Carelica, 50*, 44–61.

Pavri, F., & Deshmukh, S. (2003). Institutional efficacy in resource management: Temporally congruent embeddedness for forest systems of western India'. *Geoforum, 34*(1), 71–84.

Purushothaman, S., Jojo, T. D., & Patil, S. (2007). Ecotourism policy: A framework for India. In G. Radhakrishna (Ed.), *Tourism: Perspectives and issues* (pp. 51–78). Hyderabad: ICFAI Press.

Robbins, P. (2000). The rotten institution: Corruption in natural resource management'. *Political Geography, 19*(4), 423–443.

Saravanan, V. S. (2002). Institutionalising community-based watershed management in India: Elements of institutional sustainability. *Water Science Technology, 45*(11), 113–124.

Sekher, M. (2001). Organized participatory resource management: Insights from community forestry practices in India. *Forest Policy and Economics, 3*(3–4), 137–154.

Setty, R. S., Bawa, K., Ticktin, T., & Gowda, C. M. (2008). Evaluation of a participatory resource monitoring system for nontimber forest products: The case of Amla (Phyllanthus spp.) fruit harvest by Soligas in South India. *Ecology and Society, 13*(2), 19.

Shankar, U., Murali, K. S., Shaanker, R. U., Ganeshaiah, K. N., & Bawa, K. S. (1996). Extraction of non-timber forest products in the forests of Biligiri Rangan Hills, India. 3. Productivity, extraction and prospects of sustainable harvest of Amla *Phyllanthus emblica* (Euphorbiaceae). *Economic Botany, 50*(3), 270–279.

Uma Shaanker, R., Ganeshaiah, K. N., Krishnan, S., Ramya, R., Meera, C., Aravind, N. A., & Chinnappa Reddy, B. V. (2004). Livelihood gains and ecological costs of non-timber forest product dependence: Assessing the roles of dependence ecological knowledge and market structure in three contrasting human and ecological settings in South India. *Environmental Conservation, 31*(3), 242–253.

About the Authors

Editors

Seema Purushothaman is Professor at Azim Premji University, and Adjunct Faculty at Ashoka Trust for Research in Ecology and the Environment (ATREE) in Bangalore. Her research interests include sustainability, livelihoods and production landscapes, investigating how they link to food and agrarian crises using ecological economics and policy research. E-mail: seema.purushothaman@gmail.com

Rosa Abraham is a Ph.D. scholar at the Institute for Social and Economic Change, Bangalore. She previously worked at ATREE as Senior Research Associate, on issues relating to ecosystem services. For her Ph.D., she is working on the linkages between distributional outcomes and the informal economy. E-mail: rosaabraham@gmail.com

Contributors

Neha Ambastha is from the Indian Institute of Forest Management, Bhopal, and was working with Madhya Pradesh District Poverty Initiatives Project before joining ATREE where she worked as Research Associate. E-mail: whoisneha@rediffmail.com

Soubadra Devy is Fellow at the Suri Sehgal Centre for Conservation Science at ATREE. Her interests include various aspects of conservation biology and ecological interactions. Her main field of research is pollination ecology of wild and cultivated plants with particular focus on the sustenance of plant-pollinator/animal interactions in human dominated landscapes. E-mail: soubadra@atree.org

B. Dhanya is currently Assistant Professor of Environmental Science at University of Agricultural Sciences, Raichur, Karnataka. With a Masters degree in Environment Science and Management, she has since been working on interdisciplinary issues pertaining to environment and rural livelihoods. Her specific areas of interest include sustainable agriculture, socio-economic-ecological analysis of

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes,*
DOI 10.1007/978-81-322-1626-1, © Springer India 2013

agricultural/agroforestry systems and policy issues in natural resource governance. E-mail: krupaias@gmail.com

Elisabeth Gsottbauer is a Ph.D. candidate at the Institute of Environmental Science and Technology (ICTA) in Universitat Autònoma de Barcelona (UAB), Spain. She was earlier an intern at ATREE where she worked on exploring the use of fiscal instruments for promoting conservation. E-mail: elisabeth.gsottbauer@gmail.com

Priya Gupta has a diverse academic background with a Bachelors degree in Mathematics and a Masters in Natural Resources Management. Having worked with WWF-India, she is currently pursuing Ph.D. from National Institute of Advanced Studies, Bangalore, looking at the land, livelihood and conservation issues of the tribal communities in India. E-mail: vowpriya@gmail.com

Benson Issac is a faculty member at Azim Premji University, Bangalore. Closely associated with Samvada, a Bangalore-based NGO, he has done extensive work in sensitising and mobilising youth around social change and in alternative livelihoods while contributing to the body of knowledge around youth studies. Exploring the politics of knowledge and traditional livelihoods, especially handicrafts, has also been a significant area of his engagement. E-mail: benson.issac@gmail.com

Gladwin Joseph is Professor at Azim Premji University and senior Adjunct Faculty at ATREE. With a background in forestry science, his current interests include biodiversity, livelihoods and ecological farming in the fringe geographies. E-mail: gladwin.joseph@apu.edu.in

Sham Kashyap has a multi-disciplinary academic background. He has Masters Degrees in Computer Science and Agricultural Economics. Sham has worked in the development sector in various capacities including that of social scientist, policy analyst, subject matter expert, trainer and Panchayat Development Officer. His research interests include Agricultural Policy Analysis, Computer Aided Policy Simulation models and Decentralized Rural Governance Systems. At GRAAM, Sham currently coordinates projects related to technology for development and health governance systems. E-mail: shamkashyap@gmail.com

A. Kavitha is a senior researcher at ATREE, Bangalore. She has been working towards conservation and sustainable management of natural resources and studying the livelihood pattern of forest dependent communities. Involved in conservation education programs, her current interests lie in looking into the Land development and Environmental Management in the urban fringes. E-mail: akavitha@atree.org

M.C. Kiran headed the Eco-informatics Lab at ATREE before joining International Water Management Institute in Colombo, Sri Lanka. E-mail: kiranmc@gmail.com

Siddhartha Krishnan, a sociologist, is Fellow at ATREE affiliated to the Suri Sehgal Centre for Biodiversity and Conservation. E-mail: siddhartha.krishnan@atree.org

Sharachchandra Lele is Senior Fellow and Convener of the Centre for Environment and Development and Programme Leader – Forest and Governance. His research

interests include conceptual issues in sustainable development and sustainability, analyses of institutional, economic, ecological, and technological issues in forest, energy, and water resource management and methodology of interdisciplinary research. E-mail: slele@atree.org

Akai Mao worked as Research Associate with ATREE Bangalore looking at eco-tourism models around Bangalore and its vicinities. E-mail: akaimao@gmail.com

Sheetal Patil is Resource Person in the Research Center at Azim Premji University, Bangalore. Before this she worked with ATREE as Senior Research Associate. With formal training in engineering and computer applications, her current involvements in research are in study of policy and market linkages and drivers of agrarian dynamics in rural, peri-urban and urban areas.

At the Research Center, she is involved in studies that explore the gaps, challenges and strengths of public preschools with focus on nutritional and health care and education functions and primary schools with focus on comparing the learning levels with that of private schools in same areas. E-mail: ssheetalpatil@rediffmail.com

Nitin Rai is Fellow at the Center for Environment and Development, ATREE, Bangalore. His research incorporates ecological science, history of landscape transformation, cultural ecology and local knowledge. Such integrated studies might challenge current narratives that view nature as static and human presence in forests as being inimical to biodiversity. These are being explored in association with the indigenous community in the Biligiri Rangaswamy Temple Wildlife Sanctuary, Karnataka. E-mail: nitinrai@atree.org

Poosanavel Saravanan has a background in agro-forestry, coordinates ATREE's Community Conservation Center at Natham, Tamil Nadu. E-mail: poovelsaravanan@yahoo.com

Tarsh Thekaekara works with The Shola Trust, an NGO involved with research and conservation initiatives at the interface of people and wildlife in the Nilgiris, Tamilnadu. At present he is involved in understanding the spatial and temporal spread of *Lantana camara* and how local communities can be encouraged to 'use' the problem. He is also trying to better understand the human-elephant relationships, and how people are able to continue to live alongside these large and dangerous mammals. E-mail: tarsh@thesholatrust.org

Thomas F. Thornton is Director of the Master's degree programme in Environmental Change and Management at Oxford's School of Geography & the Environment and a Senior Research Fellow at the Environmental Change Institute. A social anthropologist by training, he has worked for more than two decades with indigenous groups in North America and Eurasia. His main research interests are in human ecology, adaptation, local and traditional ecological knowledge, conservation, coastal and marine environments, conceptualizations of space and place, and the political ecology of resource management among the indigenous peoples and states. E-mail: Thomas.Thornton@ouce.ox.ac.uk

Nishita Vasanth works with The Shola Trust. E-mail: nishita@thesholatrust.org

Kanmani Venkateswaran, a graduate from Kenyon College, Ohio, worked as Research Associate at ATREE. She currently works as Research Intern with Red Cross/Red Crescent Climate Centre in Zambia. E-mail: kanmani.venkateswaran@colorado.edu

Index

S. Purushothaman and R. Abraham (eds.), *Livelihood Strategies in Southern India: Conservation and Poverty Reduction in Forest Fringes,*
DOI 10.1007/978-81-322-1626-1, © Springer India 2013