

## Publications

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**Joe Human and Manoj Pattanaik, *Community Forest Management: A Casebook from India*.  
Oxfam GB, 2000. ISBN 0-85598-439-2**

**Clark C. Gibson, Margaret A. McKean, and  
Elinor Ostrom (eds), *People and Forests:  
Communities, Institutions, and Governance*.  
The MIT Press, 2000. ISBN 0-262-07201-7**

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Within the academic and policy-making environment, the subject of how to manage forests is addressed at a number of levels. Important issues that are examined include growth parameters, optimal harvest and area decisions based on species composition, time horizons, timber and/or non-timber values, dominant or multiple use features, opportunity cost of land and so on. The question of whether individuals or the state are the best manager is a topic for debate, and questions are asked about how to deal with the externalities and problems associated with undefined and traditional property rights. At a higher level still, analysis may focus on factors such as carbon sequestration and biodiversity protection; the claims to, and contributions of, the forest economy are determined and considered; and reasons for deforestation examined. The first of these books does not test a specific research hypothesis, but instead draws together a number of issues to produce a picture of community forest management. The picture it draws is then used as a guide to practical policy proposals for tropical forest management.

The book tells of how a remarkable organisation – Friends of Trees and Living Beings (in the Oriya language, *Bruksha O' Jeevar Bandhu Parishad* or BOJBP), from Kesharpur village, Nayagarh District, Orissa State, India – brought about change in a region of economic deprivation and where a

sense of social responsibility was low. Over the course of eight chapters, the book provides a dramatic description of the links between human existence, the forest ecosystem and the economy.

In brief, the story of the BOJBP runs as follows: By the late 1960s, the denudation of the hill forests surrounding Kesharpur and neighbouring villages had led to severe gully erosion, rendering the crop fields infertile. This was followed by a decrease in rainfall, an increase in droughts and acute shortage of fuel wood. The result was economic misery for the people. Acutely aware of the need for environmental preservation, a small number of villagers initiated a reforestation programme, but their first attempts were a failure. It took the shocking find of the remains of a body by the local river – left by relatives unable to acquire enough wood to build a funeral pyre – before the seriousness of the situation became widely acknowledged. In the summer of 1978, and in response to this incident, National Service Scheme volunteers (a student movement for community-service work) held a camp for afforestation in the village. The selfless efforts of the student volunteers and the encouragement of Mr Pratap Patnaik (the then local Divisional Forest Officer) was the catalyst that promoted a change in direction for the villagers. Patient and inspirational work by Mr Joginath Sahu (the Headmaster of the local Middle Education School and a keen advocate for environmental issues) built on those beginnings, and by 1982 the BOJBP had been formed. Further development and growth of the organisation arose simply as a product of its own success. Developing from an organisation of 22 villages to what is now a *Mahasangha* (a federation of community forest movements and action groups), BOJBP has had an impact not only in Orissa and India, but also at the international level. Its success was publicly recognised when it won a UNEP Global 500 Award.

The first chapter of the book takes the reader to Kesharpur to show him the degree of devastation to the forests that finally stimulated the villagers into action. The next two chapters then go on to provide the setting for the story, with a description of the wealth of India's forests, and the century-old policies and statutes that govern them, an inheritance from the British rule. They describe the failure of early efforts to protect the forest – efforts that failed because they did not take account of a people dependent on those forests. The forest peoples of India are then examined in greater detail – the richness of their knowledge and skills, and the impact of progress on their lives and livelihoods. Having set the scene, the book then describes the growth of community movements throughout Orissa and India, bringing us up to the current day, a picture of a powerful and active network that is able to respond quickly to any development proposal that threatens people's lives and livelihoods.

The focus then moves on the growth of the BOJBP, the problems and challenges it has faced in the struggle to promote a 'green culture' and examines the factors that contributed to its success. These include high-quality leadership that adopted a Gandhian philosophy, non-violent techniques of persuasion and an ideology of a single 'Forest Caste'. The approach was socially just and appropriate to both genders. The enthusiasm of volunteers was harnessed, benefits for all promoted, and the value of working with and through children recognized. Cohesive

external links were formed with organisations such as the NSS, JFM (Joint Forest Management scheme of the Government of Orissa) and Oxfam. As mentioned, the success of the BOJBP was marked through national and international awards.

Finally, the last chapter lists the lessons that can be learnt by policy makers, bilateral donors, non-governmental organisations, and by other communities attempting to protect forests or the environment in general. It describes a basic approach of the BOJBP that has had a very widespread and lasting impact at the international level – *Thengapalli* – a rota-based forest protection system. The name is derived from the Oriya words *Thenga* (stick) and *Palli* (rotation). The sticks symbolize authority and a responsibility to protect the forest. They are left at the doors of two families every day and are an invitation for those families to provide a security service to the forest. The practice has appealed so much to Oxfam Education Workers that they now use it as a tool to raise environmental issues among children and it even forms part of a cross-curriculum primary-school education pack in Britain. *Thengapalli* is an inspirational story and an encouraging contrast to the bleaker pictures with which we may be familiar, such as that painted by Oliver Goldsmith in *The Deserted Village*.

Perhaps what is most interesting is the way in which the book demonstrates that, at a critical level of human failure, a spontaneous response is generated. It is this that must be picked up, promoted and nurtured by voluntary agencies, NGO's and other organisations seeking to work within communities. Since the book tells a story – a very real story – it is unlikely to provide the kind of hard scientific evidence that would satisfy a researcher. It is referenced, but not sufficiently for academic purposes. It provides authentic quotes from people directly involved, but is not a formal survey report. But it does serve its purpose very well by conveying the message of the value of community participation. It is therefore a useful tool for policy makers, and NGO development workers, but will be of interest to the ordinary reader. The story is powerful and well told, and the lessons learnt, useful.

The second book considers the problem of unplanned deforestation. Policies created and applied on a large scale have proved counter-productive. This failure may, in part, be due to the kind of data that have been available, thus policy makers and researchers have focused on issues such as hardwood scarcity, global warming and biodiversity depletion, rather than examining the cost of deforestation in terms of the welfare of local people. But things are changing. In recent years there has also been increasing recognition that a failure by policy makers to take account of the local skills and knowledge of stakeholders may also have contributed to policy failure. But where is the evidence for this? Is a forest better protected when people's rights are recognized? Or is protection more effective when local people are prevented from using the forest resource? In the former scenario, there is opportunity for communities to develop principles of stewardship and equal distribution of resources. But there are long-term risks as success may be a function of a number of factors, including size of the community groups, as well as other social and geographic attributes. In contrast, if people are excluded, a sense of ownership is lost, people are

alienated, and any motivation for careful stewardship of the forest resource is lost. For example, in India, a forester will allow local people to collect firewood, but in return for this gesture will obtain a fire protection service from them. These kinds of services would be lost. It appears, therefore, to simply attribute deforestation to population pressure and unscrupulous behaviour is wrong. As a result, policies are changing, but at a slow rate due to a dearth of information to act as a guide to those changes.

Viewed against that background, this edited volume is a carefully designed and extremely useful interdisciplinary attempt to research the many complex interactions between local communities and their forests. Because of the interdisciplinary nature of the problems and issues addressed by the book, authorship is divided amongst a team of eleven researchers, contributing a total of nine chapters. Chapters 1 and 2 examine background issues and theory. Chapters 3 to 8 examine studies carried out at the local level, and look at the experiences and insights of people, and at forests in five countries across the world, namely India, Uganda, Nepal (two papers), Ecuador and Bolivia. Finally, Chapter 9 concludes by drawing together the lessons that can be learnt.

The analytical approach that the book takes is commendable, the more so because it also manages to address a diverse range of issues. It uses a research strategy created by the IFRI (International Forestry Resources and Institutions) that was designed around an IAD (Institutional Analysis and Development) framework. As a result a common methodology is used throughout that is applicable to a diverse range of situations. Although it may therefore appear that the detail of each scenario may be lost, there is in fact strength in the approach. In fact, the method appears flexible enough to accommodate the minutia of individual situations, and is applicable to long-term research – this volume gives only the first results of on-going projects. Further, the IFRI protocols allow a wide array of variables to be examined, the resulting data proving rich enough to test a large number of theories concerning problems such as property rights, collective action, rule enforcement, human foraging patterns, market performance, transportation systems, institution building and evolution, informal norms, distributive justice, ethnicity, agricultural livelihoods, population and so on. It is this that has allowed the involvement of a broad field of researchers – anthropologists, economists, political scientists, foresters, ecologists, sociologists and lawyers.

Chapter 1, written by the editors, opens by describing the scope of the book and the role of local institutions in deforestation. It describes the lack of agreement about the underlying causes of deforestation, possibly because so many processes are at play. In so doing, it highlights the current gaps in our knowledge. The second chapter (written by Margaret A. McKean) goes on to examine property rights and common property regimes. It classifies goods, property rights and owners, and puts forward the idea that political economists have overlooked club or toll goods (excludable but non-subtractable) and common-pool goods (subtractable but non-excludable) in their analyses. While little harm is done by ignoring club goods that can be produced, the neglect of common-pool goods, which include most environmental resources, including forests, has had tragic results as they

are easy to deplete, but difficult to replace. McKean therefore argues that vesting property rights in groups or nearby communities is more efficient for natural resource systems. Four reasons are given. First, some resources are indivisible, while others contain fugitive or mobile resources. Second, some involve a high degree of uncertainty. Third, co-ordination is essential to cope with externalities. Fourth, group enforcement of rules can minimise the cost of monitoring boundaries. But where is the evidence? Chapters 3 to 8 go some way to providing this.

In Chapter 3, micro-level empirical studies concentrate on the considerable influence of local-level institutions on forest use and condition. Arun Agarwal investigates how the forest council system of the 1931 *Van Panchayat* Act in Kumaon Himalaya, India, has led to different outcomes of forest management. Contrary to the common observation that economic factors and age of organisation account for success in managing forest resources, he finds that size of the council is the most important factor influencing performance. Very small councils are at a disadvantage as they are unable to generate sufficient human and other resources to monitor and enforce local rules. In contrast, larger, but still moderate-sized councils, perform better as they have greater resources at their disposal. In an analysis of the forests of Uganda (Chapter 4), Abwoli Y. Banana and William Gombya-Ssembajwe emphasize further the diversity of outcomes from local-level management. They attribute overall degradation of the forestlands of that country to the general lack of tenure at the local level, but in more detailed regional studies, they observe that widely differing levels of human consumptive activity has a very strong impact on the physical condition of the forests, whilst the level of enforcement and involvement of local communities explains the difference in the state of forests.

In Chapter 5, Charles M. Schweik analyses the spatial variation of the Sal (*Shorea robusta*) tree in Chitwan District of southern Nepal using a sophisticated set of tools including GIS (Geographical Information System) software and ML (Maximum Likelihood) regression models, used within the IFRI protocols. The study shows that Sal exhibits a pattern of natural regeneration where there is no human disturbance. His evidence supports the optimal foraging theory, which is altered by local institutions and social norms. The hills of Nepal are also the focus of Chapter 8, which addresses population and forest dynamics. Substantial variations occur both in forest condition and community management, but population pressure is not the major factor driving this variation. Instead, George Varughese concludes that communities with higher-level organisations tend to protect the resource better.

In the sixth chapter, Clark C. Gibson and C. Dustin Becker examine the relation between the members of Loma Alta commune and their fog forests in Ecuador. Under a distinct property right arrangement, the community holds the land in common but allocates plots to its members to use as they see fit. The only proviso is that the land may not be sold. Plots are therefore treated as private property, on which the members make capital improvements. Forest condition varies across plots because on some there is potential for establishment of plantations. There is also a threat from the expansion of farming. But in addition to this variation, where forest plots

have not been allocated to individuals, degradation is evidently visible. Community rules on land use and their enforcement therefore determine forest condition. A similar study by C. Dustin Becker and Rosario León on the patterns of behaviour of a single ethnic group at three settlements along a river in Bolivia (Chapter 7) also finds variations. This time forest condition is influenced by moisture gradient, distance to market and population pressure. Some plots are managed to increase game animals, while others are planted with fruit trees. Thus the forest is altered in accordance with the community preference for certain types of food. But as elsewhere, local-level management is currently threatened by markets that call for change in the people's preferences for food and labour.

Chapter 9 forms a useful summary in which the editors draw together the lessons learnt. Firstly, they conclude that local users of the forests can control the incentives they face better than normally believed. Second, local actions and institutions vary substantially. On the basis of the empirical chapters, they attempt to construct an abstract theory of the benefits and costs of local collective action.

In conclusion, although the book fails to address gender-related issues and the role of the non-governmental organisations (NGOs), it does provide a useful description of an ambitious and potentially productive research project which will doubtless produce many more interesting results as the programme progresses further.

DOI: 10.1017/S1355770X03211426

**Mohammed H.I. Dore and Rubén Guevara (eds),**  
***Sustainable Forest Management and Global***  
***Climate Change: Selected Case Studies from the***  
***Americas.* Edward Elgar Publishing, 2000.**  
**ISBN 1840641614**

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This book comprises a comprehensive selection of studies dealing with forest management in the Americas and its relationship with carbon storage. As a result it differs from other references on forestry that are more concerned with the driving forces behind deforestation and the policies that aim to control them. The book is an important contribution as it

demonstrates the relevance of forests to climate change policies, an issue that is always avoided in official international reports on climate change that instead are very much oriented to energy aspects.

At the time it was written, the Kyoto Protocol, which sets emission rights and obligations over carbon release to the atmosphere under the UN Framework Convention for Climate Change (UNFCCC), was struggling to be ratified by signatory countries. The Protocol, nevertheless, proposes flexible mechanisms on carbon savings trade between countries to achieve their emission caps, namely: the clean development mechanism (CDM), the international tradable quotas (ITQ) and the already known joint implementation (JI). While JI is a bilateral project-based agreement, CDM and ITQ allow for the creation of an international market for carbon. ITQ is a trade scheme for quotas among countries with emission caps and CDM is a mechanism that allows countries with no binding emissions to sell carbon savings to those with caps. In this new context of CDM, the amount of carbon captured by forests can form significant sources of carbon savings to be traded, thereby generating additional revenues for preservation practices that will counteract the driving forces of deforestation. This is the itinerary of this book.

Part I of the book deals with biophysical aspects of forestry and carbon-related management. It reveals in great detail ways of implementing forest management plans with an emphasis on economic and social aspects. Chapter 1 (Saénz and der Beek) offers guidelines for forest planning. A case study in the highland oak forests of Costa Rica shows how management, although diverse and specific for each forest, can be conciliated with sustainable practices, resulting in social and economic benefits. Also in Costa Rica, Chapter 2 (Shultz) presents a case study of forest management in which GIS are applied to demonstrate the possibilities for integration of socioeconomic and biophysical data.

Carbon counting in soil and vegetation is not a trivial task, as demonstrated in Chapter 3 (Johnston and Uhlig) in the case of forests in Northern Ontario, Canada. Different forms of measurement produce differing results, demonstrating the importance of sampling in the estimation process.

Part II is devoted to economic valuation of boreal and tropical forests. The chapters in this section use a diversity of methodologies to determine values for forest services that are not captured in markets. Although lack of data constrains analysis, all chapters aim to demonstrate how sustainable activities can succeed if proper pricing is in place to capture them. Carbon sequestration payment is a potential candidate that may play a decisive role in allowing sustainable forest services to compete with activities that convert forestland. Chapter 4 (Dore and Johnston) is an interesting study that estimates the shadow price of one hectare of forest, based on carbon captured in Canadian boreal forests, in terms of the value of carbon released under forest exploitation. Based on an econometric study applying a model of dynamic maximization, the value of these forests carries a premium of the order of 20 per cent to reflect carbon release costs.

Following a distinct approach, Chapter 5 (Ramirez) is an attempt to estimate carbon values in tropical forests in Costa Rica. Based on the

carbon content measures of these forests, the author estimates, under different forest management options, how much carbon could be secured and consequently exchanged in an international market. Although data constraints are dominant in the estimation procedures, the author concludes that current payments to land owners for sustainable practices already existing in Costa Rica are half of the carbon values they stock when a carbon price of US\$ 10 t/C is assumed. The author also points out that, if those carbon prices were paid to forest owners, sustainable forest management could compete with the land conversion activities that cause deforestation.

Accounting for forest carbon can also be valuable in developed countries for promoting a switch in land use from agriculture to forestry. Chapter 6 (Dore, Kulshreshtha and Johnston) addresses this approach applied to marginal lands used for agriculture in northern Saskatchewan, Canada. The methodology applied is based on ranking alternatives, using stochastic dominance in comparisons between net social benefits of agriculture and forestry activities in the region, simulated over the last three decades. Data on the estimation of net benefits were not complete enough to reflect social value added and its possible variation through time, but the stochastic modeling allows for control of the discounting factor effects on the valuation. Since marginal lands are currently presenting declining yields, the authors were thus able to show that forestry activities may not only maximize economic gains, but also create CO<sub>2</sub> savings that could attract investments from fossil fuel burning industries in Canada. It is possible, therefore, that the heavy subsidies currently in place to sustain the region's agriculture could be reformed towards forestry.

Chapter 7 (Ammour, Windevoxhel and Senci3n) is an heroic attempt to undertake an economic valuation of mangroves in the pacific coast of Nicaragua. The methodology is the usual partial and static model of estimating foregone use and non-use values of a natural resource. In this case, values arise from the depletion of mangroves in the region, such as wood, fishing, recreation, carbon sequestration and biodiversity. As is normal in the case of environmental valuation, biophysical aspects and measures are the main obstacle to the application of a monetary value. The authors attempt to estimate the ecological relationships between deforestation and the losses of goods and services, as well as soil erosion and biodiversity. In doing so, they either resort to dose-response functions estimated elsewhere, or make educated guesses. Conservative values are used, for example the price of carbon price was valued at US\$ 5.5/t, although sensitivity analyses were not taken in all cases. The authors also undertook contingent and travel cost methods for recreation, but relied on international funding expectations to value biodiversity losses. The results are both sound and useful in demonstrating how the sustainable management of mangroves will depend on finding payments for non-commercial forest services.

The closing section of the book, Part III, addresses forestry policy initiatives in Canada, Costa Rica and Brazil. Chapter 8 (Kulshreshtha) presents the experiment of the Canadian Model Forest Program that intends to offer a participatory approach in dealing with forest issues. Analysis is carried out on Prince Albert Forest where significant research has produced



an inventory of resources, and an understanding of ecosystems and socioeconomic information. The design and implementation of the forest management plan has been produced in partnership with stakeholders. Although still in progress the authors offer several indicators from the experiment that demonstrate that participatory procedures associated with scientific knowledge can lead to sustainable forest management. However, it is not clear how this approach can be replicated elsewhere in other distinct socioeconomic and ecological contexts.

Chapter 9 (Segura-Bonilla) offers us a comprehensive and detailed review of forestry policy in Costa Rica that is a typical example of an attempt to use fiscal incentives and financial compensation schemes to deter deforestation by stimulating sustainable forestry practices. Instruments applied vary from payment to land owners to keep forest standing as carbon sinks, to incentives for the modernization of the timber industry. The author concludes that despite all efforts policy has failed to achieve the desirable results due to the lack of integration among policy initiatives, capacity to incorporate the claims of social actors and rules to solve institutional conflicts. The chapter ends with a broad agenda for future research to address these issues.

Chapter 10 (Kegen, Pareyn, Barcellos and Campello) describes the semi-arid region of the northeast of Brazil ('Caatinga') where a type of thorn bush vegetation is dominant. Although it is one of the poorest regions of Brazil and carries a high degree of biodiversity, the Caatinga does not attract as much attention as the tropical forests, such as the Amazon. The region has been under great pressure. Forest depletion is associated with the basic needs of the poor population, mainly related to the need for wood for fuel and small constructions. The chapter discusses in detail how forest management may, therefore, play an important role in providing these goods on a sustainable basis, and in securing social benefits for the region. The authors emphasize the relevance and need for further regional forestry research as well as for adjustments in the existing credit schemes towards sustainable practices.

This book, therefore, directly addresses the relationship between ecological and economic sustainability aspects of forestry management. It draws from a diversity of methodological approaches and covers tropical as well as boreal forests. The literature may offer more sophisticated valuation exercises, but this book is a unique collection in which studies are confronted with real policy questions that are affecting the protection of important world ecosystems. Beyond simple monetary estimations, the contributing authors have succeeded in shedding light on ways to account for the still unpaid services of forests that on a global scale benefit the planet, and on a regional scale are essential to local communities. As a result, the authors have also attempted to take into account the expected potential market in carbon savings that the Kyoto Protocol could have offered in order to create additional revenues for forest protection based on carbon processes. These processes, in which forests are viewed as sinks or stores for existing carbon that is sequestered to them, may decrease deforestation, or encourage reforestation and sustainable logging. Unfortunately, the full value of flexible mechanisms (CDM and ITQ) is not accounted for by the

Protocol. Several countries, notably from the EEC, as well as several of the major international NGOs, did not support the inclusion of forests as carbon sinks because of the difficulties associated with carbon counting. The fear of high leakage in forest options, often neglected in energy options, is consistently put forward to block these opportunities. Crediting forests as carbon sinks may ultimately undermine the Protocol if all Annex 1 countries choose to credit them against their own emission caps. Nonetheless, all agree that deforestation is one of the major sources of carbon release, as this book brilliantly describes. Without economic sustainability there will be no ecological sustainability from forestry management, particularly in developing countries. If the Protocol survives the recent US decisions and becomes the first step towards combating climate change, lessons from this book should be considered in the plea for a fair recognition of sustainable forestry management as a vital source of carbon savings.

DOI: 10.1017/S1355770X03221422

**Kanchan Chopra and S.C. Gulati, *Migration, Common Property Resources and Environmental Degradation: Interlinkages in India's Arid and Semi-arid Regions*. Sage Publications India, 2001. ISBN 0-7619-9501-3 (US-HB) 81-7036-982-7 (India-HB)**

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Environmental degradation, poverty, and migration, are often hypothesised to be closely connected in a complex web of mutually aggravating cause and effect relationships. Poverty is generally thought to lead to environmental degradation by encouraging rapid depletion of common property resources to satisfy immediate needs. Consequently, people in environmentally distressed areas in developing countries ultimately migrate to urban areas in hopes of employment and greater income potential. In addition to this theory, Chopra and Gulati in their book, *Migration, Common Property Resources and Environmental Degradation*, emphasise the importance but often overlooked role of problems relating to the definition of property rights and other social institutions. They argue that these

problems may also lead to environmental degradation and thereby prompt the out-migration of populations to urban areas. They show how property rights affect individual and group motivations and strategies in resource management, and also how they reinforce or undermine the emergence and maintenance of institutional arrangements which facilitate collective action, including the management of common property resources (CPRs). They underscore the vital role of institutional change in positively influencing the productivity of environmental resources through creation of well-defined property rights with a case study of arid and semi-arid regions of India.

Comprised of original articles which report empirical research and field experiences, this thought-provoking book will interest those in the field of environmental studies, forestry, economics, management, politics, human geography and development studies, as well as policy makers, bureaucrats and non-governmental organisations. The book is one of the more far-sighted and genuinely significant works to emerge in current years on environmental resource management, migration, property rights and poverty.

The core of the book is an in-depth analysis of linkages between population movements, environmental degradation and the role of institutions in creating well-defined property rights to CPRs and mechanisms of enforcing them. The various chapters analyse both the institutional context and the effective bounds of participatory CPR management; the nature and the extent of dependence differentiated by caste, demographic issues, economic heterogeneity and gender among CPR dependent communities. In Chapters 1 through 3, the authors present the dynamics of rural–urban migration, and the existence of CPRs, their magnitude and distribution. There is a historical review of the various forest policies that have been tried in India and an analysis of their impacts on both CPRs and people. Chopra and Gulati observe that in arid and semi-arid parts of India, the area of common land resources is large, with a large number of people dependent on them. They argue that these resources can be sustained and protected for the present and the future generations by involving people in their protection and meeting people's needs. Chapters 4 and 5 draw attention to the various conceptual and empirical problems associated with the approaches to CPR management currently prevalent in the country. Chapter 6 tests hypotheses relating to the impact of alternative levels and modes of institutional creation using econometric techniques, while Chapter 7 presents a summary of findings and policy recommendations.

This book holistically addresses the environmental causes and consequences of migration, particularly in rural regions. Most of the research on migration to date has focused largely on sectoral issues; for example, research on agricultural productivity has not focused on related environmental degradation, such as deforestation, or contributors to migration, such as the productivity of CPRs or lack of education. This in turn has led to policies that do not approach these problems in an integrated fashion. The inverse is also true, when programmes to arrest environmental degradation are implemented, they may not readily integrate issues of migration, poverty and community development. Chopra and Gulati have

tried to address these issues. The results in Chapter 6 of their book show that there is significant evidence that environmental degradation, population pressure, poverty, property rights and migration are dynamically linked. In Chapter 7 they suggest how best to harmonise policies and programmes that address these issues.

The application of econometric techniques in studying the underlying factors of environmental degradation, poverty and migration predictions contributes greatly to the analytical framework of the land degradation literature. Chopra and Gulati's findings in Chapter 6 show that, among other things, the absence of well-defined property rights to CPRs is significant as it may create incentives to migrate. Population pressure and increasing environmental degradation may also result in increased migration during times of distress, especially during droughts. These important findings offer policy insights with respect to the environmental distress that leads to migration. Policies targeting the amelioration of environmental stress and population pressure on the land could play pivotal roles in reducing incentives to migrate. Therefore, well-defined property rights and better managed CPRs may provide alternative strategies of coping with distress situations by controlling migration.

Chopra and Gulati's findings demonstrate a strong correlation between environmental degradation, property rights to CPRs among rural households, the lack of capacity to participate in CPR management, and migration in India. The degradation of common lands in the rural arid regions of India is viewed as an important contributor to migration flows. Though the book is not conclusive in documenting the number of people migrating, it nevertheless shows that a significant number are leaving rural arid and semi-arid areas especially during the times of environmental stress. The low productivity of CPRs, and continued population pressures in arid areas also play a role in this dynamic. Reducing this pressure should be part of efforts to reduce migration at the source. The authors offer evidence that initiatives to strengthen institutional structures, such as more clearly defining the rights of individuals to use CPRs and encouraging the creation of common assets, reduce environmental degradation and increase the capacity of natural resources to sustain larger populations. Despite the micro nature of Chopra and Gulati's study, it provides compelling findings that can be used to evaluate and to improve upon approaches and analytical tools employed in the previous studies of migration and environmental degradation in general.

DOI: 10.1017/S1355770X03231429