



WHO CONSERVES THE WORLD'S FORESTS?

Community-Driven Strategies to Protect Forests & Respect Rights



FOREST TRENDS

Forest Trends is a non-profit organization that advances sustainable forestry and forestry's contribution to community livelihoods worldwide. It aims to expand the focus of forestry beyond timber and promotes markets for ecosystem services provided by forests such as watershed protection, biodiversity and carbon storage. Forest Trends analyzes strategic market and policy issues, catalyzes connections between forward-looking producers, communities and investors, and develops new financial tools to help markets work for conservation and people. It was created in 1999 by an international group of leaders from forest industry, environmental NGOs and investment institutions. (<http://www.forest-trends.org>)

ECOAGRICULTURE PARTNERS

Ecoagriculture Partners seeks to catalyze and facilitate the transformation of rural landscapes where both agricultural and natural biodiversity are highly valued to 'ecoagriculture'—land use systems that improve agricultural productivity and livelihoods while also enhancing biodiversity and ecosystem services. The partnership is jointly sponsored by the World Conservation Union (IUCN), Forest Trends and the World Agroforestry Centre (ICRAF). Ecoagriculture Partners works to (1) make information about ecoagriculture globally available; (2) generate research and knowledge about ecoagriculture; (3) provide strategic support, tools and capacity-building for ecoagriculture innovators; and (4) promote policy dialogue and action for ecoagriculture. (<http://www.ecoagriculturepartners.org>)

WHO CONSERVES THE WORLD'S FORESTS? **COMMUNITY-DRIVEN STRATEGIES TO PROTECT FORESTS AND RESPECT RIGHTS**

by Augusta Molnar, Sara J. Scherr & Arvind Khare

“A large area of the world’s forest is managed and, to varying degrees, conserved by forest communities. This presents both a unique opportunity and a unique challenge to governments, international organizations, the private sector and civil society all fostering more sustainable forest conservation. With global and forest populations increasing, it is timely—indeed urgent—to assist these communities in achieving their development—and conservation—goals.”



Forest Trends
Washington, D.C.



Ecoagriculture Partners
Washington, D.C.

Who Conserves the World's Forests? Community-Driven Strategies to Protect Forests & Respect Rights

© 2004 Forest Trends.

ISBN 0-932928-01-4

Reproduction permitted with attribution

Cover photos by Heriberto Rodríguez (PROCYMAF/CONAFOR) and ACICAFOC

PREFACE

Today, the forestry and conservation communities face a unique challenge. The model of “wilderness” preservation borrowed from the United States has proven too limited to meet the challenge of conserving biodiversity and ecosystem functions. Even more recent models of protected areas with integrated management of buffer and core protection zones are clearly inadequate. The current approaches are only partially conserving the world’s priority biodiversity areas and are not effectively addressing root causes of habitat loss. Alternative approaches are being explored because the public protection model is only effective under certain conditions and because significant portions of the world’s biodiversity are found outside of the public protected area systems, including 90% of the world’s forests. In addition, outside of the developed countries, protected areas have had limited funding with even less financing projected for the future. Community forest management has therefore been recognized as an essential means to sustainably manage forest resources while supporting local livelihoods and cultural values and being more respectful of community rights and assets. Community forestry management is also emerging as more effective in reducing pressures on “wilderness areas” and better at providing compatible means of livelihood to people living within priority biological corridors. Trends in community tenure in the world’s forests have been examined in an earlier Forest Trends report *Who Owns the World’s Forests* which found that at least 420 million hectares or 11% of global forests are legally owned or administered by communities; these forests make up 22% of developing countries’ forests. The new analysis presented here goes a step further and asks what amount of the world’s forest are being conserved by Indigenous Peoples and other communities with or without legal protections. It presents the new evidence that community-driven biodiversity conservation covers significant areas of the world’s forests, creating real opportunities to achieve biodiversity conservation through pro-poor policies and forest-based livelihood activities. It also analyzes global levels of investment in conservation, including the important contributions from communities, and looks at how to make this approach successful.

Helping communities to maintain or improve their conservation initiatives is advantageous because such efforts are consistent with the growing recognition of local communities’ property rights that is currently taking place in many countries. In addition, success rates of conservation initiatives are boosted by building on existing institutional structures and long-term community commitments, an approach that is also more financially efficient. Finally, community conservation efforts provide valuable models for solving similar people-nature conflicts in priority public protected areas.

Admittedly, there is no panacea in community conservation. Some communities are effective in conserving natural systems and some are not. But the dramatic and continued shift in forest and landscape boundaries and in tenure and customary rights, combined with emerging markets for forest products and ecosystem services, creates new challenges as well as new opportunities for people and for forest conservation. Enabling communities to conserve implies new management approaches, new research models, new models of organization and capacity-building and new relations between local people, conservation organizations and the state. But creating an enabling environment also has a large payoff, both in conservation and in community well-being.

Michael Jenkins,
President, Forest Trends

CONTENTS

INTRODUCTION	iv
THE EXTENT OF COMMUNITY-INITIATED AND -SUPPORTED CONSERVATION	1
TYPES OF COMMUNITY-DRIVEN CONSERVATION	3
Type 1: Large Areas of Forest Owned or Administered by Indigenous and Traditional Communities	3
Type 2: Forest Landscape Mosaics Managed by Communities and Compatible with or Favorable to Biodiversity Conservation	5
Type 3: Forest Frontier Zones with Community-Driven Conservation	7
Type 4: Intensively-Managed Landscapes Being Actively Restored by Communities	8
EXISTING AND POTENTIAL SCALE OF COMMUNITY CONSERVATION	10
GLOBAL TRENDS IN INVESTMENT IN FOREST CONSERVATION	11
THE IMPORTANCE OF POLICY AND INSTITUTIONAL FRAMEWORKS TO COMMUNITY CONSERVATION	16
CONCLUSIONS	19
REFERENCES	21
ABOUT THE AUTHORS	26
ACKNOWLEDGEMENTS	28

LIST OF BOXES

Box 1 — Biodiversity Conservation in Indigenous Lands in the Brazilian Amazon: Low Cost, High Conservation Benefit	4
Box 2 — Biodiversity and Forest Conservation in Agroforested Southeast Asia	6
Box 3 — Biodiversity Conservation by Agricultural Communities: Landcare Experience in Australia and the Philippines	9
Box 4 — Changing Community-Forest Conservation Relationships in the United States	10
Box 5 — Conservation Investment by Mexico's Forest Enterprises	14
Box 6 — Stateless Villages in a National Protected Area in India	15
Box 7 — Conservation by Forest Settlers in the Maya Biosphere Reserve	18

INTRODUCTION

There is a growing recognition of the extent of human presence in the most biodiverse regions and of the fact that a large portion of this population are some of the world's poorest people. More than 1 billion people (at least 25% of whom are malnourished) who live in the 25 global biodiversity “hotspots” identified by Conservation International subsist on less than one US dollar per day (Conservation International 2004a). Population growth in the world's last remaining wilderness areas is twice the world average (Cincotta and Engleman 2000). Recognizing this changing reality, the recent Durban Accord from the World Parks Congress endorsed an approach to biodiversity conservation that moves beyond protected areas and seeks to address root causes of biodiversity loss and to promote biodiversity at a landscape scale. The Accord also recognizes the sovereignty of Indigenous Peoples and forest dwellers over forest areas considered part of the public domain and their key role in determining categories of use and protection more flexibly. The Accord has been developed in line with the Millennium Development Goal Project, which is committed to reducing poverty by 50% by the year 2015 and enhancing existing livelihoods.

At the same time, the current system of public protected areas continues to be severely underfunded while not including enough of the world's priority biodiversity and natural habitats. At the present coverage and quality of protection, biologists estimate that only 50-70% of the existing species will be conserved (Myers et al. 2000). Moreover, current proposals for expanding public protected areas in many of the developing countries continue to be made without adequate appreciation of their impacts on human rights, their social, economic or political costs, or an adequate understanding of alternative choices. Just as expanding public protected areas significantly is not an option in most developing countries, effective exclusion of population from many parks is neither viable nor affordable. This is particularly true given the real costs of compensating for lost livelihoods or resettlement and the growing recognition of local rights.

An earlier Forest Trends analysis, *Who Owns the World's Forests*, examined global tenure trends and found that at least 420 million hectares or 11% are legally owned or administered by communities. This constitutes some 22% of the forests in the developing countries and three times as much forest as is owned by private individuals or firms (White and Martin 2002). This new analysis takes a different tack—identifying the amount of the world's forest that is being actively conserved by Indigenous Peoples and other communities with or without legal protections. It also assesses total investment in forest conservation, including estimates of local people's investments in conservation. The analysis reveals that community-driven biodiversity conservation covers significant areas of the world's forests and that those communities invest an important amount in their conservation. The analysis summarizes the lessons learned from this experience and identifies necessary steps to enable this approach to contribute more—to both conservation and communities. The report is based on a longer paper entitled *Who Conserves the World's Forests? A New Assessment of Conservation and Investment Trends* by the same authors, available at <http://www.forest-trends.org>.

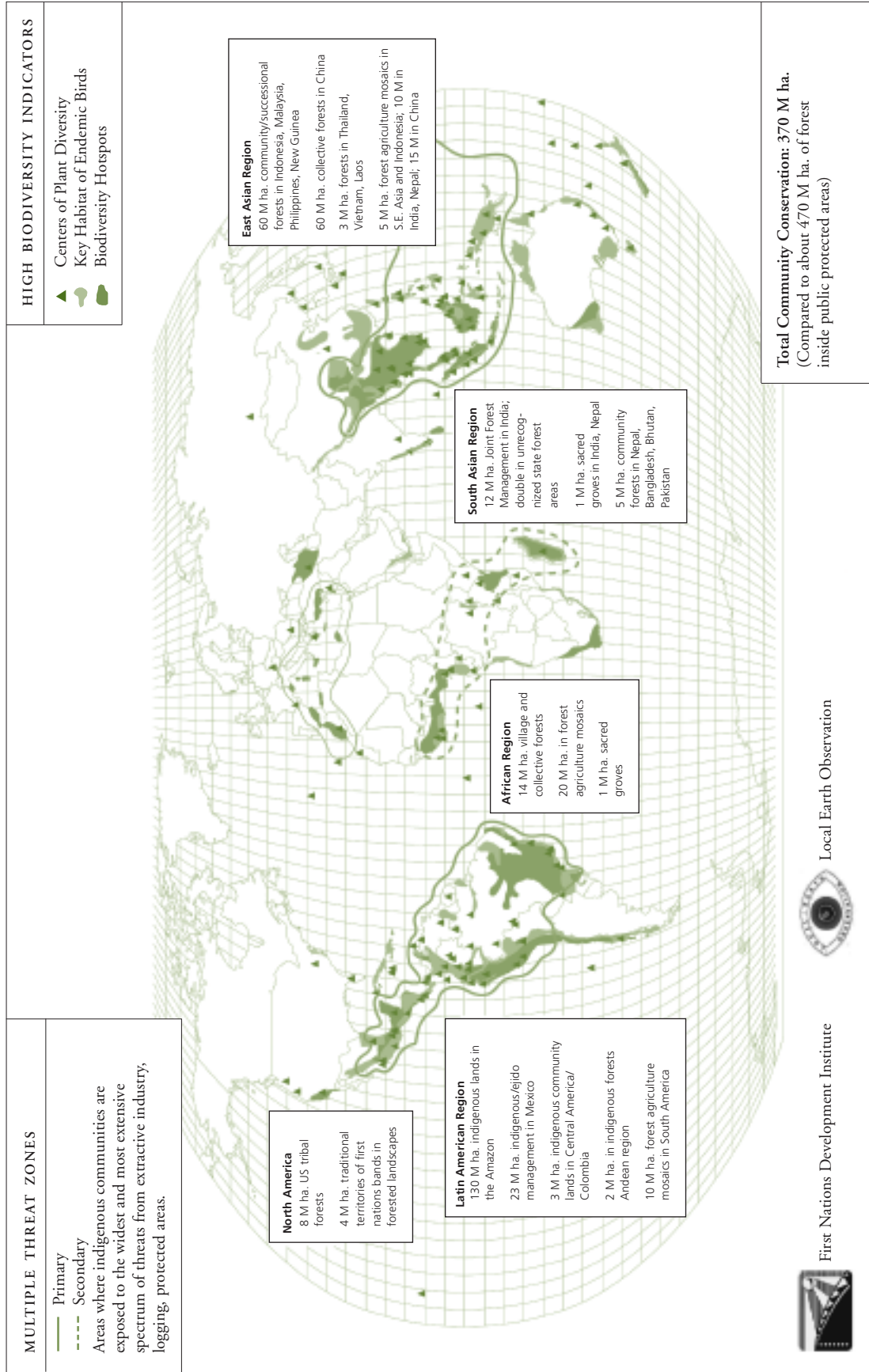
To our knowledge, this is the first attempt to produce a global estimate of the scope of community conservation. Given the limited quantity and quality of the data, this analysis should be viewed as a first step, and we hope it will encourage others to examine this issue and improve our collective understanding of community conservation.

THE EXTENT OF COMMUNITY-INITIATED AND -SUPPORTED CONSERVATION

This section examines the extent of community-driven conservation outside public protected areas systems in community-owned and -administered lands, and in other, public, forests where communities practice active management, but do not currently have legal recognition of this. The scope of this analysis is therefore broader than that of *Who Owns the World's Forests* which focused only on the areas currently legally recognized as community-owned and -administered in official statistics and which only included forests, not forest landscapes and forest-agriculture mosaics. This new analysis is based on remote sensing overlays and case studies, primarily from Africa, Asia and the Americas. Since the survey was not global, results provide a conservative, and therefore reliable, estimate of the global trend. A summary of the case material is provided in **Figure 1** below. We first look at the main types of community-driven conservation, assess their benefits, and then estimate their potential of contributing to local and global conservation.

The basis for Figure 1 is a map of global threats overlay created by First Nations Development Institute and Local Earth Observation which assesses relationships among forests, tenure, biodiversity, global hotspots and human presence. The community conservation data stems from case studies gathered by different research teams and has been layered on this global assessment in Figure 1 to provide a first reasonable estimate of the scope of community conservation (data sources include Cincotta and Engleman 2000; McNeely and Scherr 2003; FNDI and LEO 2003; Barrow, Gichohi and Infield 2000; Chomitz et al. 2004; Borrini-Feyerabend 2003). Figure 1 indicates that there is at least as much forest area under community conservation (370 million hectares) as is under conservation in forested public protected areas. The actual area could be double or triple this estimate if traditional agro-forestry or agro-pastoral systems in all regions of the world and other forest areas in Soviet Russia, Europe and the Mideast are included. Other websites often referred to in this context are those of the Commission on Economic Environmental and Social Policy (CEESP) and the Thematic Group on Indigenous and Local Communities and Equity in Protected Areas (TILCEPA) in the IUCN knowledge portal. They assemble a large number of community conservation examples inside protected areas (Borrini-Feyerabend 2003). Our data excludes human presence in public protected areas although it includes some buffer zones of biosphere reserve sites where communities have legal rights—such as the Maya Biosphere in Guatemala.

FIGURE 1 — COMMUNITY CONSERVATION OVERLAY ON BIODIVERSITY IN PLANT AND BIRD DISTRIBUTIONS



Community conservation data have been compiled by the authors into the global diversity map in Global Threat Overlay map series prepared by the First Nations Development Institute (FNDI) and Local Earth Observation (LEO), FNDI, 2003.

Sources: *Times Atlas of the World 2003*; *National Geographic Atlas of the World 2003*; *Humphries and Mits 2002*; *Bryant et al. 1997*; *Miller and Cultural Survival 1993*; *International Working Group for Indigenous Affairs 2000*; *Centre for the Support of Native Lands and National Geographic Society 2002*; *Burke et al. 1998*.

TYPES OF COMMUNITY-DRIVEN CONSERVATION

Community-conserved forest landscapes identified in the three geographic regions aggregate to an initial minimal estimate of 370 million hectares. They fall into four main types based on forest use intensity, cultural relationship, and the length of time that the human population concerned has been managing that particular resource:

1. Large, contiguous areas of natural forest that are only lightly used and are legally-owned or -administered by Indigenous and traditional communities in their ancestral territories. Their biodiversity conservation value is often comparable to that of large protected areas (area estimated to be at minimum 120 million hectares).
2. Forest landscape mosaics which contain large patches of natural habitat interspersed with agriculture compatible with biodiversity on lands owned or administered by long-settled communities. Land use activities include management of the natural forest and agroforestry, agriculture or grazing in the converted lands (minimum 100 million hectares).
3. Forest frontier zones where recent settlers are extractivists, agriculturalists and/or pastoralists but may or may not have legal rights over their resources. Land uses include low-intensity use of the remaining forest and types of agroforestry, agriculture or grazing that conserve ecosystem functions in the converted areas (minimum 50 million hectares).
4. Intensively-managed landscapes where long-settled communities are practicing individual and community-based resource management and restoration but may or may not have legal rights to their resources (minimum 100 million hectares).

These various types of community conservation, including some examples, are described briefly below.

TYPE 1: LARGE AREAS OF NATURAL FOREST OWNED OR ADMINISTERED BY INDIGENOUS AND TRADITIONAL COMMUNITIES

The most commonly identified category of community-driven conservation is in Indigenous and traditional peoples' lands and ancestral territories. People in such forests have sought to achieve cultural continuity and self-development on culturally relevant terms. A significant segment of the population in this category would fall under the ILO 169 definition of Indigenous Peoples, while others would consider themselves "traditional people". In this category, we did not include public forests demarcated as state land or protected areas where indigenous tenure or community responsibility is not currently recognized, such as high-cover state forest in tribal belts of central India. The areas in this category sum to at least 120 million hectares and include:

- Part of the 130 million hectares of indigenous reserves or territorial lands in the Brazilian, Peruvian and Bolivian Amazon (Instituto Socioambiental 2001; Bamberger et al. 2003)
- 1 million hectares in the southern cone of Latin America (Oviedo 2002)

- Five million hectares of forested areas of British Columbia, Ontario, Saskatchewan and Quebec provinces in Canada, where Indigenous Peoples continue to have important use rights over extensive territories (Smith and Scherr 2002)
- Eight million hectares of community-managed forest lands within the U.S. Inter-Tribal Timber Council member territories (IFMAT 1993, Brechin et al. 2003)
- At least 3 million hectares of community or village forests recently devolved to traditional populations in 5,000 African communities (Alden Wily 2000)
- Forests in montane regions of the Andes, the Himalayas, China and West Asia where traditional peoples have a high dependency on forests, yet forests cover significant landscapes of similar habitat and agropastoral systems are tightly linked to forestry (Poole 1995; Poffenberger 2000; Khare et al. 2000)

**Box 1 – Biodiversity Conservation in Indigenous Lands in the Brazilian Amazon:
Low Cost, High Conservation Benefit**

In a recent study with Woods Hole Research Center, Barbara Bamberger analyzed 90 biological reserves and indigenous lands in the strictly and non-strictly protected categories in the Amazon. The study looked at 80 Indigenous reserves and 19 federal reserves (there is currently 5 times as much area in Indigenous lands as in protected reserves). Comparing satellite imagery on changes in forest cover and population and data on the extractive pressures on the indigenous lands and the state-declared protected areas, the study found no significant difference in the rate of deforestation or loss of forest cover in the two types of “protected areas”. Despite the fact that the indigenous lands were more often the sites of colonization pressures—as the protected areas were more isolated from the agricultural frontier—these lands were effectively protected from encroachment and destructive activities with no government support for protection.

Indigenous peoples were active managers of their territories and boundaries. Outsiders respected these boundaries due to the supposed magic-religious powers of the indigenous peoples and due to the awareness of their active presence in the territory. There was variation among the indigenous reserves, with some ethnic peoples maintaining more effective internal organization for protection and resource management, and for negotiating conflict. On balance, however, this set of reserves was as effectively protected from forest degradation and deforestation as the public protected areas.

The study recommends more research into the dynamics of indigenous peoples’ protection of the forests within their lands. It also advocates a more balanced allocation of resources for biodiversity conservation—one that balances government investment in the management activities of indigenous peoples to better conserve their reserves and lands from outside pressures on the one hand with the more traditional allocation of government financial and technical resources for conservation of the publicly protected government reserves on the other hand.

Sources: Bamberger et al. 2003; Nepstad et al. forthcoming

This category of community-conserved areas has a number of advantages for conservation, including large non-fragmented areas able to support large species often protected by their religious value. A large portion of human languages are spoken by small numbers of people living in such traditional

spaces—3,400 of the world's 8,000 languages are spoken by less than 8 million people, most living in forested landscapes. These language groups carry with them important cultural assets—generations of local adaptation and knowledge generation, alternative cultural value systems and alternative social governance institutions (Pretty 2002). Community-managed areas that fall into these categories may support both resource and biodiversity conservation and local income and livelihoods; many livelihoods have been selected by communities for their long-term relationship with natural resources and adaptability to ecological changes (Toledo et al. 2001). Indigenous reserves in the Brazilian, Peruvian and Bolivian Amazon have rapidly increased in area due to the recognition of Indigenous Peoples' rights and due to a strong interest among these peoples in conserving their territories. Such reserves can be highly effective in conserving biodiversity; in some cases even more so than the traditional protected areas established around them as a study by Barbara Bamberger with researchers from the IPAM shows (Bamberger et al. 2003; Nepstad et al. forthcoming; see also Box 1).

TYPE 2: FOREST LANDSCAPE MOSAICS MANAGED BY COMMUNITIES AND COMPATIBLE WITH OR FAVORABLE TO BIODIVERSITY CONSERVATION

This second category of community-driven conservation is found in more intensively utilized spaces where people have a long-standing stewardship relationship with nature and its ecosystems and where they have developed extractive, cropping, grazing, as well as water and forest management practices over a long adaptive process. The development and conservation communities are beginning to recognize that there is a growing number of examples where local people are increasing agricultural productivity and achieving food security in ways that also protect and embrace biodiversity and other ecosystem services (McNeely and Scherr 2003). This includes privately owned land, community-owned and -administered forests, and lands with recognized usufruct. In some situations, people's management of nature is central to the composition and range of the present biodiversity, and local ecological knowledge and practice are crucial to that biodiversity's continuance. In a number of these cases, communities have set aside portions of their forest resource for more strict conservation; in others, biodiversity values are conserved by complementary management of the resource for multiple purposes (Borrini-Fereyband 1997). The forest landscapes are fragmented but provide effective corridors as links to adjacent conservation spaces. The areas in this category sum to at least 100 million hectares and include:

- At least 7 million hectares of agroforests in Central, South, East and West Africa etc. (Barrow, Gichohi and Infield 2000; Adams and McShane 1996; Neumann 1998)
- At least 7 million hectares in southern Mexico—part of the nation's 40 million hectares of forest under ejido and community ownership—managed as commercially viable Community Forestry Enterprises (Bray et al. 2003; Antinori 2003; Segura 2002)
- 3 million hectares of indigenous eco-management in Central America (Berelowitz and Martinez 2000; Chapela 2000; Toledo 2002)

- 20 million hectares of complex agroforestry livelihood systems in South and Southeast Asia, including those inhabited by traditional and tribal peoples with successional forests (Poffenberger 2000; Colfer and Byron 2001)
- 1 million hectares within the state-owned North American forests in the United States which are traditionally a source of commercial and non-commercial non-timber forest products and which have active permit systems and, more recently, community contracts for extraction, such as the Appalachian or New Mexican forests (Jones, McLain, and Weigand 2002; Rural Action and the Community Strategies Group 2002)
- 14 million hectares of silvo-pastoral systems in Africa, the Himalayas and Central Asia, in and around savanna and montane forests (Barry et al. 2003; Barrow, Gichohi and Infield 2000)
- 1 million hectares of forest land used as pasturing systems for the Sami and Russian Indigenous Peoples in the boreal region (Sayer et al. 2004)
- Community forestry initiatives in at least five million hectares of Sub-Saharan Africa which are expanding as forest management is decentralized to local levels and village forests are recognized as legal local assets (Alden Wily 2000; Anderson 2002; Bandyopadhyay et al. 2004)
- More than 1 million hectares of sacred groves each in India and Africa (Borrini-Feyerabend 2002; Pathak 2002)

Box 2 – Biodiversity and Forest Conservation in Agroforested Southeast Asia

While there are dynamic changes underway due to increases in population size and changing consumption patterns, many of the traditional peoples of South and Southeast Asia have maintained high levels of biodiversity in their mixed farming and forestry systems, while conserving important expanses of forests in secondary vegetation (successional forests). Studies of the Dayak communities of East Kalimantan document agricultural systems mixed with old-growth trees, high numbers of cultivar varieties and beneficial plants (91 in one village's agricultural plots and 21 rice varieties). This is similar to data from selected hill agricultural regions of Northeastern India, Pakistan, the Chittagong hill tracts and Western Nepal.

The people of Long Uli Village in the Outer Islands of Indonesia found their traditional land overlaid with a Forest Concession and Nature Reserve. NGOs helped them to carry out a GIS mapping exercise of their 18,000 hectares of customary lands, superimposing evidence from oral history and traditional knowledge with the boundaries of the state-claimed lands. The community was able to demonstrate that their own traditional management system in fact protected a more extensive area of forest (12,173 hectares) than was designated as nature reserve (7,154 hectares) and that it was in better condition. Agroforest systems adjacent to the protected areas contained more than 100 species of wild plants and animals. This and similar research is leading the Indonesian government to explore more co-management of biodiversity and protected areas in regions with a strong traditional management history.

Sources: Fox 1995; Sardjono, Agung, and Samsedin 2001.

TYPE 3: FORESTS FRONTIER ZONES WITH COMMUNITY-DRIVEN CONSERVATION

The third type of community conservation is found in large remaining patches of forests with natural habitat in and around land of agriculturalists and pastoralists. This category includes agricultural frontier zones where settlers are relatively recent arrivals in a region with important biodiversity values. Conversion of natural forest is limited and they are adopting low-intensity management practices of remaining forest or leaving it completely untouched. Areas in this category sum to at least 50 million hectares and include:

- Extractive reserves in Brazil, which are now expanding as new groups of producers seek to form community concessions in the Amazon (Amaral and Amaral Neto 2000; Sayer et al. 2004)
- Forest concessions of communities in the Maya Biosphere Reserve, Guatemala (Soza 2002; Sundberg 1998; Sayer et al. 2004)
- Transmigration areas of the Indonesian and Malaysian archipelago where agricultural systems incorporate agroforestry and successional forests (Contreras-Hermosilla 2002; Colfer and Byron 2001; Sardjono, Agung and Samsuudin 2001)
- Upland migrants who have maintained forested landscapes in some regions of the Philippines (Barry et al. 2003)

This category of community-driven conservation is perhaps least common as there are neither the scarcity-related incentives of the fourth category nor the local institutions and cultural norms present in the first two. Generally, the positive examples have emerged as a result of partnerships between settlers and NGOs or government programs which let settlers organize themselves to protect their interests and to find ways to adapt to the current policy and market environment. Some shifting cultivators are switching to perennial species of economic value and are conserving secondary forests to reduce the use of fallows and fire. CIFOR researchers have documented that colonists in the rainforests of Brazil, Nicaragua and Peru earn 10-20% of their total income from a diverse set of forest products (Smith et al. 2002). In the Guatemalan Petén and Brazilian Amazon, immigrant farmers have adapted their agricultural systems to maintain forest ecosystems and aim to manage the resource base more sustainably (Schneider et al. 2000; Amaral and Amaral 2000).

TYPE 4: INTENSIVELY-MANAGED LANDSCAPES BEING ACTIVELY RESTORED BY COMMUNITIES

This fourth category of community-driven conservation in intensively-managed landscapes is perhaps the most widespread, but there is no adequate information to assess its real scope. Biodiversity is found in critical habitat niches that supply food and water sources, pollinator habitats etc. of economic or cultural value to local people. Some communities have organized land use to provide important connectivity among habitats. Areas in this category sum to at least 100 million hectares and include:

- Organic and shade coffee cultivators of tropical forests in Latin America, many of whom are found in the humid cloud forest ecosystems (Soza 2002; Toledo 2002; Bojorquez et al. 2000)
- A portion of the 150 million hectares of community forests in agricultural villages in China (Miao et al. forthcoming)
- 10 million hectares of agroforestry in South Asia with successional forests or restored forest landscapes where settled agricultural communities have reforested areas adjacent to their communities and protected them from grazing (Pretty 2002; McNeely and Scherr 2003; Gilmore and Fisher 1995)
- Silvopastoral communities in the forest savannahs of sub-Saharan Africa where ecological balances were established between people and wild animals, and forest products still constitute an important percentage of local incomes (Sayer et al. 2004)
- Bushcare programs in Australia establishing biodiversity reserves in farmlands set aside for watershed rehabilitation (Garrity et al. 2001)
- Community windbreaks established in Costa Rica to protect crops and livestock that provide ecological connectivity between forest remnants

Landscapes with high human populations or a large proportion of land under intensive management have limited capacity to retain or restore wild species that require large areas of contiguous habitat. But with adequate protection of critical habitat niches and networks, and maintenance of more benign resource management practices, many wild species and ecological communities are maintained in such landscapes.

In the many sub-montane forested areas of Africa, Asia and Latin America, there is evidence at a regional scale that in an extensive number of villages with high population densities dense forests are stabilizing. Jefferson Fox, Peter Poole, Ken Chomitz, Mark Poffenberger and others have compared land use from the 1950s to the present in such regions as Nepal, Central America, the Andes, Mexico, Vietnam, Thailand and Laos to document that there is little new deforestation in upper watershed forests since the late 1980s. Rather, forest cover in upper catchments has stabilized as land use in lower areas intensified to sustain upland forest systems (FNDI and LEO 2003; Molnar, Scherr, and Khare 2004).

In South Asia, tribal and other Nepalese and Indian communities are restoring degraded forests in and around human settlement, maintaining forest cover and a flow of timber and non-timber forest products and watershed services in sub-montane and montane regions. Government-sponsored Joint Forest Management in India covers 14 million hectares with 63,000 user groups. Nepal's formally recognized community forestry user groups now total 12,000 in 900,000 hectares with many more informal ones. The Nepal-Australia forest project team (Gilmore and Fisher 1995) has documented significant biodiversity conservation in some of these forests and new studies of tribal regions in India show important gains in forest cover and habitat diversity (Singh and Sinha 2004).

Box 3 – Biodiversity Conservation by Agricultural Communities: Landcare Experience in Australia and the Philippines

The Landcare movement in Australia is premised on farm planning that keeps both production and conservation goals in mind. As of 2001, around 4,500 active community groups were working in partnership with the government, NGOs and corporations to address soil, water and biodiversity degradation. Networks to assist landholders and community groups with wildlife conservation planning and management were set up by governments under programs such as “Bushcare”, “Land for Wildlife”, and “Nature Search” (Millar 2001). The Genaren Hill Landcare group, for example, includes 14 farming families in the wheat/sheep belt of New South Wales. With community and government support, the group erected an 8.4-kilometer long fox-and-cat-proof fence around an area of good-quality remnant native vegetation. Motivation included improved watershed protection. All livestock and introduced predators were removed and two marsupial species were reintroduced to the area—the threatened brush-tailed bettong (*Bettonia penicillata*) and the endangered bridle nail-tailed wallaby (*Onychogalea fraenata*). Another 85 kilometers of fencing are being laid and 35,000 trees planted across a 50,000-hectare farmscape that will strategically link existing remnants of wildlife habitat. Covenants have been negotiated with government agencies to secure commitment to long-term conservation use.

The Landcare movement has spread to the Philippines as well as other countries. Since 1996, Landcare organizations in hillside communities in northern Mindanao have worked with the World Agroforestry Centre, municipal governments and NGOs to restore ecological conditions on a landscape scale. Key activities of the more than 4,000 organized farmers include establishing natural vegetative strips on all steep farmlands to control erosion and create terraces to enable higher-productivity agriculture, extensive tree-planting for joint economic and conservation objectives, reforesting riparian areas, monitoring water quality in the watershed and taking action to reduce pollutants, and establishing agreements with local and indigenous communities for the protection of natural forests.

Sources: Sutherland and Scarsbrick 2001; Garrity et al. 2000.

EXISTING AND POTENTIAL SCALE OF COMMUNITY CONSERVATION

The above scoping analysis documents at least 370 million hectares of community conservation in three continents. This is greater than the area of forest where Indigenous Peoples are known to be present—238 million hectares according to the First Nations Development Institute and Local Earth Observation (FNDI and LEO 2003) and the linguistic maps by World Wildlife Fund and Terralingua (Maffi 1996). Given the poor documentation of agroforestry systems and agricultural landscape mosaics in the three continents, our estimate is likely on the lower end. Plus, there are undoubtedly additional areas in the European and Eurasian continents. Yet, this paper has focused on the more forest-rich countries and the developing country landscapes where the bulk of the world's poor and world's tropical populations can be found.

Population density, although determining the type of land use, is not a significant determinant of where community conservation systems exist. The cases include forested areas with relatively low population densities that are remote from market access, such as the indigenous lands in the Brazilian Amazon or the boreal forests in the Taiga. The majority of cases and greatest coverage, however, are in forested areas where rural population densities are medium to high and include Indigenous communities in Mesoamerica and ejidos in Mexico, communities managing village forests in South Asia (both traditionally and through joint forest management), as well as village forests and village conservancies in Sub-Saharan Africa and in North America.

Box 4 — Changing Community-Forest Conservation Relationships in the United States

There is a rapid change in the United States towards the more active participation of native peoples in forest conservation and management, the development of forestry enterprises and the greater role of non-native communities in active forest and resource management.

Sixty five of the 103 tribes with forestry operations on their reservations are members of the Inter-Tribal Timber Council. With increased latitude from the National Indian Forest Resource Management Act of 1990 to pursue community management goals more in line with community values, a number of tribes have taken much greater initiative in managing their forests for commercial and non-commercial values and by 1996, Indian tribes had invested \$35 million in forest management to complement \$45 million allocated by the federal government. The Yakama Nation is one example of a serious commercial enterprise which is increasingly balancing its timber industry with indigenous cultural and religious values. Traditional clear cutting was replaced with uneven timber stand management and commercial thinning and, like many tribes, the Yakama follow more stringent riparian buffer and conservation zoning that is being mandated in state forest practices.

In non-tribal state forests, there is a growing number of examples of community watershed management activities, community forest participation of forest workers in natural forest working plans, community organization for adaptive ecosystem management in areas of important non-timber forest product harvesting, and community timber harvesting for production and fire management, including areas like New Mexico and Appalachia where local people have forest relationships that predate nationalization of these forests.

Sources: IFMAT 2000; Poffenberger and Selin, eds. 1998; Jones, McLain, and Weigand 2002; Rural Action and the Community Strategies Group 2002.

Growing appreciation of these potential advantages of community-driven conservation is encouraging governments to recognize and support local efforts. Africa has a number of village woodlot and conservancy approaches which evolved through the empowerment of local communities to manage forests. Tanzania has 400,000 hectares under community management. Cameroon is testing participatory and community conservation of protected areas (White and Ellsworth 2004). Hunters and grazers in the savannas of Botswana, Kenya, Rwanda and South Africa are seeking more integral rights and responsibilities in forests and protected areas (Alden Wily 2001; Barrow, Gichohi and Infield 2000). The evolution of these approaches in regions like the Congo Basin, where civil conflict is rife and historical relations between parks and local populations have been extremely bitter, is a surprising development.

GLOBAL TRENDS IN INVESTMENT IN FOREST CONSERVATION

In addition to the important shifts in forest tenure and property rights discussed above, there are other important shifts at the global level that make community conservation a timely and important alternative to explore. Perhaps the most important among them are the changes in financing for conservation and the growing share of community investment in conservation compared to fiscal resources, overseas development finance, philanthropy, and private conservation by corporations and individuals. These are discussed in the following section.

The conservation community estimates a gap of US\$27-30 billion annually in financing required for the management and expansion of the existing public protected areas, if infrastructure, research, outreach and staffing requirements are taken into account (Conservation International 2004b). Current global trends, however, indicate that public expenditure and international financing is flat or declining, although there has been a possible marginal increase in private sector investment (Khare 2003). As a result, public protected areas agencies and systems are likely to continue to suffer from limited budgets, lack of investment in building or maintaining infrastructure, limited resources for training and capacity building, and competition from other agencies for funds.

There is low overall government spending on public protected areas in developing countries.

Developed countries spend 80–100 times more than the developing countries if expenditure per hectare of protected area is considered (Brown 1998). A 1997 study of 123 conservation agencies in 108 developed and developing countries (comprising 28% of all public protected areas) records US\$3.2 billion in annual budgets or US\$893/km² overall, but only US\$10/km² in 13 of the developing countries studied and less than US\$100/km² in 32 of the developing countries studied (Green and Paine 1997). The 60% of sample parks which are in developing countries received only 10% of the total capital expenditure provided to all parks.

Trends in ODA funding to public protected areas are stagnant. Overseas Development Assistance (ODA) has been a major source of income to forest conservation. Bilateral flows were in the range of US\$600-900 million in the late 1980s, reaching slightly more than a billion dollars in 1990-92 before declining to the previous range in the late 1990s. Multilateral flows in the late 1980s hovered around US\$500-700 million, reaching a level of more than a billion dollars in 1990-92, and declining in the middle of 1990s to a level lower than US\$400 million (Khare 2003).

Assuming donor countries honor pledges they made to the International Conference on Financing for Development in Monterrey in 2002 to make aid flows equal 0.26% of their Gross National Income by 2006, total ODA would be US\$62-65 billion. However, considering historic flows of ODA to the forest sector, the estimated available finances to the sector will at best be around US \$1.42 billion by 2006. At the current level of ODA funding, flows to the forest conservation sector seem to equal an annual ODA investment between US\$350 and US\$420 million for public protected areas systems, down from US\$700-770 million in the early nineties (Khare 2003).

International financing is key for particular countries. In Brazil, it constitutes 75% of the conservation funding, and in several megadiverse African countries, it constitutes 50% of all funding. Private foundations are providing slightly more each year, but not more than US\$150 million globally; and the private sector does not contribute more than US\$20 or US\$30 million (Khare 2003). The resulting projection of ODA public protected areas expenditure is about US\$1.5 per hectare overall—and about US\$6 per hectare in the global “hotspots”. Limited funds are therefore being dispersed among an ever larger number of hectares of public protected areas.

An increasingly popular conservation approach is the creation of private reserves, where governments can encourage permanent conservation by providing tax incentives, easements or concessions to the private sector for conservation. Foreign conservationists have also purchased land for private conservation. There is certainly scope for future expansion of this model. In many cases, however, these are not in the areas of highest priority for conservation. Some private reserves may also pose problems of elite land concentration, foreign land control or ownership, or disputed land claims.

Community areas already are, and could potentially be, a more important source of investment for conservation. Communities have been documented as spending significant amounts of time, labor and financial resources on forest management and conservation activities; project reports from programs supporting community forestry roughly estimate them at US\$1.2-2.6 billion per year (Khare 2003). This is about the same as the annual budgetary allocation of the developing countries for their public protected areas systems and 2-3 times the annual allocation of all ODA for public protected areas conservation worldwide. **Table 1** shows the combined estimated financing from all sources, based on community estimates, government budgets, and estimates of ODA and foundation or private support.

TABLE 1 — PER YEAR CONSERVATION INVESTMENT ESTIMATES IN DEVELOPING COUNTRIES BY SOURCE

Community Initiatives	National Park Budgets	ODA	Philanthropy	Private Reserves and Conservation Trust Funds
US \$1.3-2.6 Billion	US \$1.3-2.6 Billion	US \$350-420 Million	US \$150 Million	US \$10 Million in funds from taxes, energy and water payments separate from ODA

The main findings on conservation investment can be summarized as follows:

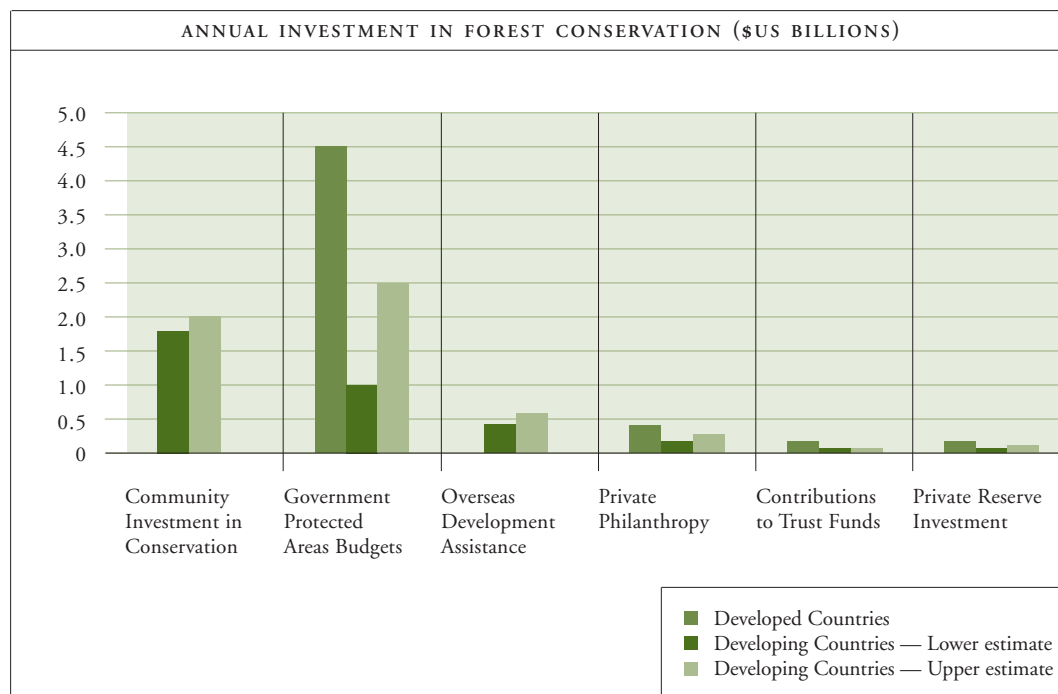
- ODA flows for the forest sector and protected areas have declined and are unlikely to reach the level of the early nineties even by 2006.
- There is little likelihood that public expenditure on forests and protected areas will substantially increase from the currently estimated levels.
- Philanthropic contributions are likely to increase but constitute less than 3% of total available finance for the forest sector. The philanthropic contributions are slightly underestimated in the above table and do not include self-generated funds by NGOs. It is also possible that a good portion of philanthropic funds go to protected areas. However, the overall trend in financial availability is unlikely to be affected by this type of funding, given the small size of philanthropic contributions to the forest sector.
- The traditional private sector makes a negligible contribution to conservation in the forested protected areas. However, as the new markets for environmental services and products from sustainably managed forests emerge, the private sector contribution may increase.
- The communities' contribution to the forest sector has increased most rapidly and reflects the positive benefits that emanate from recognition of their rights and decentralization of the forest management. Currently they constitute the largest single source of finance for forests, greater than ODA and public expenditure on forests.

Box 5 – Conservation Investments by Mexico’s Forest Enterprises

Mexico provides one of the clearest examples of the potential for devolving conservation responsibility and authority to Indigenous Peoples on their traditional lands. As part of the process of land reform before and after the Mexican revolution of 1910, 70-80% of the country’s forests fall within the boundaries of land reform blocks (ejidos) or indigenous lands. As a result of a long struggle, Indigenous communities regained control over their forests that had been granted to industry concessionaires, developing their own independent timber and non-timber harvesting and processing enterprises in a large number of communities and ejidos. A significant portion of Mexico’s priority biodiversity can be found within the boundaries of these communal forest areas. While pressures exist to clear forest for other land uses, like agriculture, counter-pressures from forest enterprises can be stronger. Enterprises allocated resources for identification of conservation areas and monitoring of biodiversity from their profits. Management plans increasingly draw upon and actively develop local environmental expertise. A government support program developed an endangered species field manual in collaboration with a conservation NGO to be used by community members for their own stewardship. Upper watersheds are being actively conserved to manage spring water bottled for the city market. Estimates from Oaxaca state indicate timber enterprises invest US\$2 per ha per annum, or double the amount invested by the government in nearby public protected areas.

Sources: Bray et al. 2003; White and Martin 2002; Ramirez 2004; CONAFOR 2003.

FIGURE 2 — ANNUAL ESTIMATED INVESTMENT IN FOREST CONSERVATION



Source: Khare 2003

The costs to manage existing public protected areas and/or to expand these, or to create new areas are increasing. These costs are related to the real costs of relocating populations and restoring their livelihoods elsewhere or creating viable alternatives. This is a key element often underestimated in the analysis of available financing and investment for public protected areas. New standards of respecting rights and social movements around resource use and cultural dimensions emphasize the long-term dynamism of human-nature interaction and the importance of traditional resource access to provide a survival cushion in times of climate stress or natural disasters.

In the past, protected areas were created with little calculation of the costs of relocation, alternative livelihoods, maintaining cultures, or sustaining communities during climate and weather shifts (Pimbert and Pretty 2000; Pretty 2002; Brechin et al. 2003). Decisions to establish public protected areas were often taken by those with conservation interests, colonial authorities and/or state governments, while local people had only little power in this process and while the biodiversity conservation value of traditional livelihood systems was insufficiently recognized (Colchester 1999; Clay, Alcorn, and Butler 2000). The costs of relocation can greatly exceed the available financing. Plus, the costs of recreating livelihoods or finding alternative livelihoods can be much greater than adapting existing livelihoods in fragile ecologies that are historically characterized by a delicate human-nature interaction and modified cyclically by weather shifts. Attempts to reestablish these balances when alternative livelihoods prove unsuccessful have been extremely difficult, once the original way of life and ecological knowledge has been lost (Colchester et al. 2001).

Conservation literature discusses many of the complicated pressures created by displacing traditional livelihoods and the high costs of addressing these. Masai pastoralists in Kenya, like a number of African pastoral societies, responded to grazing restrictions in the Serengeti reserve by expanding agriculture, increasing competition over crops with a growing park population of elephants and eliminating cattle-elephant balances that had earlier controlled wild mammal reproduction (Barrow, Gichohi and Infield 2000). Strict control of Brazilian reserves forced Huarani populations to migrate illegally into Argentina and Peru where there were no measures to accommodate them (Sayer et al. 2004). Pressures on Central African gorilla populations are high in areas of civil conflict due to pressure from hunting by guerrilla soldiers and refugees grounded in political unrest and due to a lack of land and resource bases for the poor elsewhere (Adams and McShane 1996). And little attention is paid to the repercussions on settlements that become unwilling hosts of displaced populations moved away from public protected areas (Geisler 2002 and 2003).

The declining levels of financing for public protected areas become even more alarming when these rising costs for addressing the social impacts and providing solutions and fair compensation for dislocations are included in the calculations. A study of the annual value of goods, income and services that were lost in the Lake Mburo National Park of Uganda estimated that fair compensation would be \$1,465,000 per year for alternative livelihoods, not counting any initial costs of dislocation.

Box 6 – Stateless Villages in a National Protected Area in India

The uncertainty of life in a village within a gazetted national protected area can be as dislocating as actual resettlement, as this example from India documents. Ruha Ghaté studied six villages in the Tadoba-Andhari Tiger Reserve in Maharashtra state that have been awaiting resettlement under the Wildlife Protected Act (1972) for 14 years. As potential resettles, villagers of Jamani, Nawegaon, Palasgaon, Rantalodhi, Botezari and Kolsa have virtually no social services or infrastructure—none have all-weather roads or fair price shops as people in other tribal village areas. Only one village has a post office or primary health center. Schools are provided only through 4th grade, and due to unreliable transport, most villagers have to walk 12 to 34 kilometers to the nearest marketplace. The lone employment provider, the Forest Department, has stopped its activities since the declaration of the sanctuary due to provisions of the Wildlife Act. In addition, other restrictions on the collection of minor forest produce and tendu leaves have affected nutrition standards directly and because of reduced incomes, the population is also denied access to rural and tribal development schemes. When relocated, compensation will not address these issues of past displacement or lost livelihoods.

Source: Ghaté 1999.

THE IMPORTANCE OF POLICY AND INSTITUTIONAL FRAMEWORKS TO COMMUNITY CONSERVATION

Policy and regulatory frameworks can have a sizable impact on the success of biodiversity conservation. A serious and comprehensive reflection on forest tenure rights is necessary. Just as state control of production and protection forests is being questioned by those with historical claims and alternative models, so state designation of existing and new areas as officially protected requires rethinking. The appropriate tenure is that which respects rights and which provides the appropriate incentive structure for the desired management. The desired management must balance potential returns to livelihoods and the creation of environmental goods and services.

There is also a need to rethink regulatory frameworks all of which were designed for a very different historical situation (Scherr, White, and Kaimowitz 2004). Expensive resource management plans, required for burdensome administrative approvals for extraction, processing, transport, marketing of forest-related products and taxation of commodities used most widely by the poor, such as fuelwood, can all reduce the income-generating potential of timber and non-timber products as well as dampen local incentives for controlling poaching or excessive use. Legal requirements and restrictions resulting from poor administration of regulations have reduced potential returns from farm forestry ten-fold in some regions in India, for example. Markets for NTFPs are notoriously restricted, leading to low returns, inefficient collection and marketing, control of prices by monopoly traders and the inability of local people to develop processing or value-added processing by legal means to compete with substitute products that have favorable subsidies. Plantations established to generate a commercial supply of

wood for sawnwood, pulp and paper are often subsidized directly or indirectly through infrastructure and energy subsidies, creating market competition with wood produced in natural forests (Bull et al. 2004).

Regulatory reform can have dramatic results. An enterprise promotion program in Nepal doubled the price received by collectors of essential oils and bark for traditional paper in 30 villages simply by gaining approval for direct marketing and advertising market prices paid by intermediate buyers in neighboring India. The market price information generated by this small program became common knowledge, and producers throughout Nepal and northern India were able to gain higher prices for these products. As a result of this program, biodiversity in this geographic area increased as producers now had both incentives and income to invest in improving their resource base (Subedi 2002).

Forest product and service market opportunities can create financial incentives for forest conservation and sources of financing for local conservation initiatives. Indeed, while in many forest product and service markets low-income community producers may be at a disadvantage, in other markets they may have strong competitive advantages, including:

- Control of commercially valuable forest resources near domestic market demand
- Lower cost structure for some products
- Greater incentives for sustainable forest management and for maintaining landscape mosaics that retain biodiversity values
- Better monitoring and protection
- Branding in socially responsible markets (Scherr, White, and Kaimowitz 2004)

New types of institutional and policy support are also needed for local organizations, including elements to strengthen local capacity to finance conservation. Much more can be accomplished by improving policy and regulatory frameworks for pro-poor forest management and conservation. Governments, donors, foundations and outreach organizations can also enable communities to reach long-term goals through building institutional support and offering technical assistance. Successful networks link communities to one another for horizontal learning exchanges and alliances across larger landscapes.

There is a need to rethink the public protected areas approach as well. The public protected areas model was designed in a historical context where protection and conservation were understood to require government or state ownership. In the process of decentralizing and devolving management of state forests for production and multiple use to local actors and right holders, new models of responsibility for conservation have emerged. Many of the forest policies, laws and regulations designed to allocate public forests to private and state-mandated uses are being replaced by local governance systems, greater local rights and the emergence of new markets, including those for ecosystem services.

Finally, new conservation science approaches engage communities in research and monitoring of biodiversity and in developing strategies. Communities with local capacity for research ask different questions and get different answers to research dilemmas. Examples from Brazil, Panama, Mesoamerica and the United States incorporate training of young research paraprofessionals and professionals with “civic science” approaches, enabling community members and leaders to conduct research with outsiders. Resulting recommendations favor local value systems, build on traditional knowledge, find locally acceptable solutions to over-exploitation and identify species that outsiders would miss.

Box 7 – Conservation by Forest Settlers in the Maya Biosphere Reserve

The Maya Biosphere Reserve was created in 1990 and covers 2 million hectares of the lowland Petén region of Guatemala. A process of integrating communities into the reserve management was initiated in the buffer zones as a response to increasing colonization pressures and uncontrolled illegal activities in the private commercial logging concessions and new agricultural areas. A strong social movement emerged among the diverse population of settlers supported by local and international NGOs with environmental and social programs in the Petén. Leaders in the social movement fought for concessionary rights to manage the buffer zone forests on their own (forests also sought by the forest industry for logging). The first community concession was awarded in the area around the Reserve in 1996 and there are now 13 concessions adjoining the Reserve with more in the process.

Lacking clear criteria for sustainability, the government established that access to community concessions should be conditional upon the community’s entry into a process of independent third-party certification which would provide a guarantee of sustainability of the forest management being applied to the concession area. Currently there are 387,821 hectares of forests in these concessions, 242,048 hectares of which are certified to nine communities: 227,368 hectares in the multi-purpose area and 14,680 in the damping zone of the Maya Biosphere Reserve. These communities are in the process of integrating their production and processing to improve their operations, increase incomes, and increase efficiency and access to better markets. They are also diversifying their livelihoods, experimenting with organic crops, shade coffee, ecotourism and other green ventures that generate new employment and income. The concessions have reduced the pressure on the forest resources in the Reserve and maintained biodiversity values while generating important sources of income for the colonists. Guatemalan communities have established horizontal learning exchanges with communities from Quintana Roo, Mexico, in similar forests to build on the lessons of the Mexican experience. Even more telling, satellite imagery shows better forest cover inside the concessions than in adjacent core biosphere areas.

Sources: Soza 2002; Toledo 2002; Cortave 2004.

CONCLUSIONS

Community conservation is clearly not a panacea for biodiversity conservation any more than are public protected areas. Indeed, although the two do produce similar ecosystem protection functions, it would be erroneous to directly compare them to or suggest that one be universally superior to another. They can operate in different parts of the landscape and be complementary. Community conservation clearly entails more active land use than public protected areas. On the other hand, the high conservation-value ecosystems in what are now public protected areas are the products of past land use by Indigenous and other communities. Given the history of the conservation community's focus on protected areas, this analysis does suggest that it is becoming increasingly important for conservationists to treat communities as allies, refocusing their efforts on assisting communities to achieve their own development and conservation goals.

Communities offer new institutional models for conservation that should be strengthened. Some traditional communities in large intact forests (Type 1) require more secure tenure rights, legal rights to actively use their forests, and support for building local institutions and skills for better conservation outcomes. Others require stronger partnerships with their government or private partners where their presence and control of boundaries are under threat from outsiders. Successful community managers in fragmented forest landscapes (Type 2) have developed organizational structures that have competitive advantages that outside models too often seek to change, rather than replicate. Communities in newly settled forest areas (Type 3) tend to require clarified and stronger tenure rights and more outside assistance to develop their management structures and seek viable enterprises. Communities that are actively restoring forested landscapes or agriculture-forest mosaics (Type 4) may already have secure tenure rights, yet policies or regulations often place formidable barriers and create disincentives for these communities to undertake conservation activities or economic activities that are compatible with and supportive of their conservation goals.

Technical assistance and support is helpful to strengthen such efforts and should be provided on local terms. Local community actors can play lead roles in research and monitoring, setting management goals, and implementing and developing economic activities that generate financial and subsistence returns from the resource base while conserving that resource's multiple values. The more that local community managers, and the next generation of community leaders, are able or supported to perform these roles, the more effective and sustained forest conservation will result.

In parallel, policy makers and governments should re-examine global forest conservation conventions and mechanisms to ensure that these foster and support community conservation. Exciting new markets for environmental services are emerging, but few of these are sensitive to equity issues or to the access of local communities to these markets and market players. Controls on trade in illegally harvested timber and forest products are an important initiative, but without parallel regulatory or policy reform, community actors find that their subsistence and commercial activities are not recognized or permitted, thus undermining their incentives for long-term management and conservation. Community voices have been introduced into international fora, but are often limited to a few representatives and still have insufficient resources to enable communities to form respected opinions or exchange views within and across regions.

The analysis suggests some important enabling conditions which would help increase the chances for successful community conservation. Without the minimum enabling conditions in place, communities will continue to find it difficult to maintain conservation in the face of the myriad counter pressures, including the need for increased incomes and livelihood stability. Key enabling elements include:

1. Secure tenure rights and resource access, respecting Indigenous Peoples' rights and development aspirations
2. Adequate institutional regulatory and policy support and the flexibility to strengthen local community institutions
3. Fair access to markets, including green markets, that value community products and the multiple values that come along with these products
4. Finance channeled in a flexible way to complement local initiatives, rather than planning or designing models from outside or governing from above
5. Engagement of communities in conservation science and as research partners

The opportunities will differ for different types of community-driven conservation, and sustainable strategies to support local initiative must be tailored to local conditions.

A large area of the world's forest is managed and, to varying degrees, conserved by forest communities. This presents both a unique opportunity and a unique challenge to governments, international organizations, the private sector and civil society all fostering more sustainable forest conservation. With global and forest populations increasing, it is timely—indeed urgent—to assist these communities in achieving their development—and conservation—goals.

REFERENCES

- Adams, J., and T. McShane. 1996. *The myth of wild Africa: Conservation without illusion*. New York: Norton Press.
- Alden Wily, L. 2000. Forest law in eastern and southern Africa: Moving towards a community-based forest future? *Unasylva* 203 (4): 19-26.
- _____. 2001. Making woodland management more democratic: Cases from Eastern and Southern Africa. Nairobi. Mimeo.
- Amaral, P., and M. Amaral Neto. 2000. *Manejo forestal comunitario en la Amazonía brasileña: Situación actual y perspectivas*. Brasilia, Brasil: Instituto Internacional de Educación del Brasil (IIEB).
- Anderson, J., ed. 2002. Nature, wealth and power. Report prepared on Natural Resource Management in Africa by a joint institutional team (World Resources Institute (WRI), Cornell University, Center for International Forestry Research (CIFOR), Cooperative League of the USA (CLUSA), Winrock and the International Resources Group). Washington, D.C.: United States Agency for International Development (USAID).
- Antinori, C. 2003. Vertical integration in the community forestry enterprises of Oaxaca. In *The community forests of Mexico*, ed. D. B. Bray, L. Merino-Perez, and D. Barry. Austin, TX: University of Austin Press.
- Bamberger, B., D. Nepstad, S. Schwartzman, M. Santilli, D. Ray, R. Schlesinger, P. Lefebvre, A. Alencar, and E. Prinz. 2003. Rainforest protection: Are people-free parks required for protection? Switzer Foundation and Woods Hole Research Center. Oral presentation to Washington D.C.-based conservation community at a conference hosted by the United States Forest Service, Washington D.C.
- Bandyopadhyay S., M. Humavindu, P. Shyamsundar, and L. Wang. 2004. Do households gain from community-based natural resource management? An evaluation of community conservancies in Namibia. World Bank Working Paper No. 3337. Washington, D.C.: World Bank Group.
- Barrow, E., H. Gichohi, and M. Infield. 2000. Rhetoric or reality? A review of community conservation policy and practice in East Africa. *Evaluating Eden* Series No. 5. London: International Institute for Environment and Development.
- Barry, D., J. Y. Campbell, J. Fahn, H. Mallee, and U. Pradhan. 2003. Achieving significant impact at scale: Reflections on the challenge for global community forestry. Center for International Forestry Research (CIFOR) Conference on Rural Livelihoods, Forests, and Biodiversity, Bonn, Germany.
- Berelowitz, K., and J. Martinez. 2000. Indigenous Peoples Community Biodiversity Management Initiative, Program of Collaboration with the Netherlands for Support to the Mesoamerican Biological Corridor, Central America Environmental Projects. Washington, D.C.: World Bank.
<<http://wbln0018.worldbank.org/MesoAm/UmbpubHP.nsf/917d9f0f503e647e8525677c007e0ab8/1a0c0f8e2ba4e641852569d6005b716a?OpenDocument>> (accessed October 14, 2004).
- Bojorquez, L. 2000. Background environmental analysis for the GEF Integrated Ecosystems Management Project (CONIBIO). Mimeo. Cited in World Bank Project Appraisal Document, June.
- Borrini-Feyerabend, G. 1997. *Beyond fences: Seeking social sustainability in conservation*. Gland, Switzerland: World Conservation Union (IUCN).
- _____. 2002. Indigenous and local communities and protected areas: Rethinking the relationship. *Parks* 12 (2): 5-15.
- _____. 2003. Community conserved areas and co-managed protected areas: Towards equitable and effective conservation in the context of global change. Report of the IUCN joint CEESP/WCPA Theme on Indigenous and Local Community, Equity and Protected Areas (TILCEPA) for the Ecosystem, Protected Areas and People (EPP) project. April. Draft.
<http://www.iucn.org/themes/ceesp/wkg_grp/TILCEPA/TILCEPA.htm> (accessed July 20, 2004).
- Bray, D. B., and L. Merino-Pérez. 2002. The rise of community forestry in Mexico: History, concepts, and lessons learned from twenty-five years of community timber production. A report for the Ford Foundation. Mimeo.
- Bray, D., L. Merino, P. Negreros, G. Segura, J. M. Torres, and H. F. M. Vester. 2003. Mexico's community managed forests as a global model for sustainable landscapes. *Conservation Biology* 17 (3): 672-677.
- Brechin, S. R., P. R. Wilshusen, C. L. Fortwangler, and P. C. West, eds. 2003. *Contested nature: Promoting international biodiversity with social justice in the twenty-first century*. Albany: State University of New York Press.
- Brown, D. 1998. Participatory biodiversity conservation: Rethinking the strategy in the low tourist potential areas of tropical Africa. *Natural Resource Perspectives* 33. London: Overseas Development Institute.

- Bryant, D., D. Nielsen, and L. Tangle. 1997. *The last frontier forests*. Washington, D.C.: World Resources Institute.
- Bull, G., M. Bazett, O. Schwab, S. Nilsson, A. White, and S. Maginnis. 2004. *Subsidies for industrial forest plantations: Impacts and implications*. Washington, D.C.: Forest Trends, International Union for the Conservation of Nature and University of British Columbia.
- Burke, L., D. Bryant, Dr. J. W. McManus, and M. Spalding. 1998. *A map-based indicator of threats to the world's coral reefs*. Washington, D.C.: World Resources Institute.
- Centre for the Support of Native Lands and National Geographic Society. 2002. *Indigenous Peoples and natural systems in Central America and southern Mexico*. Washington, D.C.: National Geographic Society, Centre for the Support of Native Lands.
- Chapela, F. 2000. Consultation Workshop for Biodiversity Community Management. MBC Studies and Activities. "Indigenous peoples' community biodiversity management initiative." Central America Environment Projects. World Bank.
- Chomitz, K. M., J. Robalino, and A. Nelson. 2004. *A note on forest populations in Latin America and the Caribbean*. Revised Draft Working Paper. Washington, D.C.: World Bank Group.
- Cincotta, R. P., and R. Engelmann. 2000. *Nature's place: Human population and the future of biological diversity*. Washington, D.C.: Population Action International.
- Clay, J. W., J. B. Alcorn, and J. R. Butler. 2000. *Indigenous peoples, forestry management and biodiversity conservation*. Washington, D.C.: World Bank.
- Colchester, M., F. MacKay, T. Griffiths, and J. Nelson. 2001. *A survey of indigenous land tenure: A report for the land tenure service of the Food and Agriculture Organisation*. Moreton-in-Marsh, United Kingdom: Forest Peoples Programme.
- Colchester, M. 1999. *Indigenous peoples and the new global vision on forests: Implications and prospects*. Washington, D.C.: World Bank.
- Colfer, C., and Y. Byron, ed. 2001. *People managing forests: The links between managing human well-being and sustainability*. Resources for the Future and Center for International Forestry Research (CIFOR). Draft. Washington, D.C.: Resources for the Future.
- Comision Nacional Forestal (CONAFOR). 2003. *Gestión comunitaria para el uso sustentable de los bosques*. Proyecto de Conservación y Manejo Sustentable de Recursos Forestales en México, PROCYMAF. Jalisco, Mexico: Government of Mexico.
- Contreras-Hermosilla, A. 2002. *Indonesia: Towards a rationalization of state forest areas*. Washington, D.C.: Forest Trends.
- Conservation International. 2004a. HOTSPOTS. <<http://www.conservation.org/xp/CIWEB/strategies/hotspots/hotspots.xml>> (accessed October 18, 2004).
- Conservation International. 2004b. <<http://www.conservationfinance.org>> (accessed October 18, 2004).
- Cortave, M. 2004. *The experience of the community concessions and ACOFOP in the Maya Biosphere Reserve, Petén, Guatemala*. Presentation to the Workshop on Forests: Resources for Development, Tegucigalpa, Honduras, May 2004. PBPR, Government of Honduras and World Bank.
- First Nation Development Institute (FNDI) and Local Earth Observation (LEO). 2003. *Biodiversity: Plants, birds, hotspots and chance map: Gaining recognition of tenure*. Series of Global Threat Working Map Overlays. Fredericksburg, Virginia, USA. Amsterdam, The Netherlands.
- Fox, J. 1995. *Indigenous peoples, mapping and biodiversity conservation: An analysis of current activities and opportunities for applying geomatics technologies*. Biodiversity Support Program. Peoples and Forest Program. Discussion Paper Series, p. 58. (Cited in Poole, P. 1995; originally from a WWF program case "Indonesia: Kenya Uma Lung, Long Uli Village").
- Garrity, D. P., D. Catacutan, R. Alvarez, and F. M. Mirasol. 2001. *Replicating models of institutional innovation for devolved, participatory watershed management*. In *Choosing a sustainable future: SANREM CRSP 1999 annual report*, ed. K. Cason. Watkinsville, Georgia: Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program.
- Geisler, C. 2002. *Endangered humans*. *Foreign Policy* 130:80-81.

- _____. 2003. Your park, my poverty: Using impact assessment to counter the displacement effects of environmental greenlining. In *Contested nature: Promoting international biodiversity with social justice in the twenty-first century*, ed. S. Brechlin, P. Wilshusen, C. Forwangler, and P. West. Albany: State University of New York Press.
- Ghate, R. 1999. Global gains at local costs: Imposing protected areas — A case study from India. Nagpur, India: Nagpur University.
- Gilmore, D. A., and R. J. Fisher. 1995. Villagers, forests and foresters. Kathmandu, Nepal: Sahogi Press, Ltd.
- Green, M., and J. Paine. 1997. State of the world's protected areas at the end of the 20th century. Paper presented at IUCN World Commission on Protected Areas Symposium, "Protected areas in the 21st Century: From Islands to Networks," November 24-29, Albany, Australia.
- Humphries, A. and K. Mits. 2002. *The Red Book of the peoples of the Russian empire*. Tallinn, Estonia: NGO Red Book.
- Indian Forest Management Assessment Team for the Intertribal Timber Council (IFMAT). 1993. *An assessment of Indian forests and forest management in the United States*. Portland, Oregon: Intertribal Timber Council.
- International Institute for Environment and Development (IIED). 1994. *Whose Eden? An overview of community approaches to wildlife management*. London: IIED.
- International Working Group for Indigenous Affairs. 2000. *The Indigenous world 1999-2000*. Copenhagen: International Working Group for Indigenous Affairs.
- ISA (Instituto Socioambiental). 2001. Mapa: Amazônia Brasileira.
- Jones, E., R. J. McLain, and J. Weigard, eds. 2002. *Nontimber forest products in the United States*. Lawrence, KA: University of Kansas Press.
- Khare, A. 2003. Funding conservation: The current status of conservation financing in the developing countries. Working Paper. Washington, D.C.: Forest Trends.
- _____, M. Sarin, N.C. Saxena, S. Palit, S. Bathia, F. Vania, and M. Satyanarayana. 2000. Joint forest management: Policy, practice and prospects. *Policy that works for forests and people series*. No. 3. London: International Institute for Environment and Development and Earthscan Publications.
- Maffi, L. 1996. Endangered languages, endangered knowledge, endangered environments. Results of an interdisciplinary working conference, October 25-27, 1996, Berkeley, Calif., U.S.A. <<http://www.terralingua.org>> and <http://ucjeps.berkeley.edu/Endangered_Lang_Conf/Endangered_Land.html> (accessed 20 July, 2004).
- McNeely, J. A. 1999. Forests, figs and fauna: Critical issues in conserving forest biodiversity. Presented at Forest Trends conference "Shifting Markets for Sustainable Forests," October 18-20, 1999, Garderen, The Netherlands.
- _____, and S. J. Scherr. 2003. *Ecoagriculture: Strategies to feed the world and save biodiversity*. Future Harvest and IUCN. Washington, D.C.: Island Press.
- Miao, G., S. Zhou, K. Zhang, S. Gao, X. Huang, and J. Jiang. 2004. Collective forests in China. Report prepared for Forest Trends by the China National Forestry Economic and Development Research Center (FEDRC). Washington, D.C.: Forest Trends, forthcoming.
- Miller, M., and Cultural Survival. 1993. *State of the peoples: A global human rights report on societies in danger*. Boston: Beacon Press.
- Molnar, A., S. Scherr, and A. Khare. 2004. Who conserves the world's forests? A new assessment of conservation and investment trends. Washington, D.C.: Forest Trends and Ecoagriculture Partners.
- Molnar, A. 2003. Forest certification and communities: Looking forward to the next decade. Washington, D.C.: Forest Trends.
- Myers, N., R. A. Mittermeier, C. G. Mittermeier, G. A. da Fonseca, and J. Kent. 2000. Biodiversity hotspots for conservation priorities. *Nature* 403: 853-858.
- National geographic atlas of the world*. 2003. Washington, D.C.: National Geographic Society.

- Nepstad, D., A. Alecar, A. Barros, E. Lima, E. Mendonza, C. Azevedo-Ramos, and P. Lefebvre. 2004. Governing the Amazon timber industry. In *Working forests in the neotropics: Conservation through sustainable management?*, ed. D. Zarin and F. Putz. New York: Columbia University Press.
- Nepstad, D., S. Schwartzman, B. Bamberger, M. Santilli, D. Ray, R. Schlesinger, P. Lefebvre, A. Alencar, and E. Prinz. Inhibition of Amazon deforestation and fire by parks and Indigenous reserves. Forthcoming.
- Neumann, R. 1998. *Imposing wilderness: Struggles over livelihood and nature preservation in Africa*. Berkeley and Los Angeles: University of California Press.
- Oviedo, G. 2002. Lessons learned in the establishment and management of protected areas by Indigenous and local communities. Washington, D.C.: The World Conservation Union (IUCN). Mimeo.
- Pathak, N. 2002. Lessons learned in the establishment and management of protected areas by the communities of South Asia TILCEPA/CEESP. Forthcoming.
- Pimbert, M. P., and J. Pretty. 1995. *Parks, people and professionals: "Participation" in protected area management*. Geneva: United Nations Research Institute for Social Development.
- Poffenberger, M. 2000. *Communities and forest management in South Asia*. Working Group on Community Involvement in Forest Management. Regional Profile Series. Washington, D.C.: The World Conservation Union (IUCN).
- _____, and S. Selin, eds. 1998. *Communities and Forest Management in Canada and the United States*. New York: Working Group on Community Involvement in Forest Management (WB-CIFM) and IUCN.
- Poole, P. 1995. Indigenous peoples, mapping and biodiversity conservation: An analysis of current activities and opportunities for applying geomatics technologies. Biodiversity Support Program. Peoples and Forest Program. Discussion Paper Series.
- Pretty, J. N. 2002. *Agri-Culture: Reconnecting people, land and nature*. London: Earthscan Publications.
- _____, and M. P. Pimbert. 1997. Diversity and sustainability in community based conservation. Paper presented to the UNESCO-IIPA regional workshop on Community-based Conservation, February 9-12, 1997, India.
- Ramirez, G. 2004. Indigenous community investment in conservation in southern Mexico: The growing significance of community conservation. Oral presentation in Spanish at the IASCP 2004 bi-annual meeting "The Commons in an Age of Global Transition: Challenges Risks and Opportunities," Oaxaca, Mexico.
- Rural Action and the Communities Strategies Group. 2002. The herb basket of Appalachia: Community based forestry and sustainable communities. *Forest Harvest Occasional Report 1*. Washington D.C.: Aspen Institute, Community-Based Forestry Demonstration Program.
- Sardjono, M, A. Agung, and I. Samsedin. 2001. Traditional knowledge and practice of biodiversity conservation: The Benuaq Dayak community of East Kalimantan, Indonesia. In *People managing forests: The link between human well-being and sustainability*, ed. C. Colfer and Y. Byron. Washington, D.C.: Center for International Forestry Research (CIFOR) and Resources for the Future.
- Sayer, J., C. Elliott, E. Barrow, S. Gretzinger, S. Maginnis, T. McShane, and G. Shepherd. 2004. *The implications for biodiversity conservation of decentralized forest resources management*. Paper prepared on behalf of the World Conservation Union (IUCN) and World Wildlife Fund (WWF) for the United Nations Forum on Forests (UNFF) inter-sessional workshop on decentralization, Interlaken, Switzerland: United Nations Forum on Forests.
- Scherr, S. J., A. White, and D. Kaimowitz. 2004. *A new agenda for forest conservation and poverty reduction: Making markets work for low-income producers*. Washington, D.C.: Forest Trends.
- Scherr, S., A. White, and A. Khare 2004. *For services rendered: The current status and future potential of markets for the ecosystem services provided by tropical forests*. Yokohama, Japan: International Tropical Timber Organization (ITTO).
- Schneider, R., A. Verissimo, E. Arima, and P. Barreto. 2000. Sustainable Amazon: Limitations and opportunities for rural development. Brasília and Belem: World Bank and IMAZON.
- Segura, G. 2002. Mexico forest sector and policies: A general perspective. México, D.F.: Ecological Institute, Universidad Nacional Autonomo de México.
- Singh, K. D., and B. Sinha. 2004. Findings from a study of CFM in Kandamahal district of Orissa. Brown-bag presentation to the World Bank/WWF Alliance. Washington, D.C.: Government of Orissa, Bhubaneswar.

- Smith, J., and S. J. Scherr. 2002. *Forest carbon and local livelihoods: Assessment of opportunities and policy recommendations*. Occasional Paper No. 37. Bogor, Indonesia: Center for International Forestry Research.
- Soza, C. 2002. The process of forest certification in the Mayan Biosphere Reserve in Petén, Guatemala. Annex in Forest certification and communities: Looking forward to the next decade, A. Molnar. Washington, D.C.: Forest Trends.
- Subedi, B. 2002. Towards expanded property rights of local communities over forest resources in Nepal: Lessons and strategies. Presentation to the Global Perspectives on Indigenous Peoples' Forestry: Linking Communities, Commerce and Conservation Conference, June 2-6, Vancouver, British Columbia. Nepal: Asia Network for Sustainable Agriculture and Bioresources (ANSAB). <<http://www.forest-trends.org>> (accessed July 20, 2004).
- Sundberg, J. 1998. Strategies for authenticity, space and place in the Maya Biosphere Reserve, Petén, Guatemala. *Yearbook, Conference of Latin Americanist Geographers* 24: 85-96.
- Sutherland, M., and B. Scarsbrick. 2001. Conservation of biodiversity through landcare. In *Response to land degradation*, ed. M. Bridges, I. Hannam, F. Penning de Vries, R. Oldeman, S. J. Scherr, and S. Sombatpanit. Enfield, NJ: Science Publishers.
- Times atlas of the world*. 2003. London, United Kingdom: Collins.
- Toledo, V. M. 2002. Ethnoecology: A conceptual framework for the study of Indigenous knowledge of nature. In *Ethnobiology and biocultural diversity*, ed. R. Stepp, F. Wyndham, and R. Zarger. Athens, GA: Georgia University Press.
- _____, P. Alarcon-Chaires, P. Moguel, A. Cabrera, M. Olivo, E. Leyequine, and A. Rodriguez Aldabe. 2001. El atlas etnoecológico de México y Mesoamérica. *Etnoecologica* 8: 7-41.
- United Nations Environment Programme and World Conservation Monitoring Centre (UNEP-WCMC). Protected areas data base: Annex summary of all protected areas recorded. <http://www.unep-wcmc.org/protected_areas/data/un_annex.htm>. (accessed July 20, 2004).
- White, A., and A. Martin. 2002. *Who owns the world's forests?* Washington D.C.: Forest Trends.
- White, A., and L. Ellsworth. 2004. *Deeper roots: Strengthening community tenure security and community livelihoods*. New York: Ford Foundation.
- World Conservation Union (IUCN). 2003. The Durban accord and action plan. Vth IUCN World Parks Congress, Durban, South Africa. Gland, Switzerland: IUCN. <<http://www.iucn.org/themes/wcpa/wpc2003>> (accessed July 20, 2004).

ABOUT THE AUTHORS

Augusta Molnar, Ph.D., is director of the Community and Markets Program at Forest Trends. Her work focuses on strategic analyses of trends and opportunities for community forest enterprises—with country analyses of Brazil and Mexico—, strategic analyses of trends and issues in forest certification, and support to forest communities for exchange of experiences, market intelligence and trends in policy frameworks for forest conservation and forest management. Before joining Forest Trends in 2002, Augusta was a project officer in the World Bank for a portfolio of natural resource management and Indigenous peoples' projects in the Latin America and Caribbean Region. From 1992 to 2002, she coordinated projects in Central America and Mexico on land administration, biodiversity conservation, Indigenous peoples' profiles and forestry. From 1988 to 1992, she provided social and gender analysis to forestry and rural development projects in South and Southeast Asia. She has worked as a consultant to the UNICEF office in Santiago, Chile, the US Agency for International Development, the Food and Agriculture Organization of the United Nations, the Government of Nepal and the World Bank. She has a doctorate in anthropology and a master's degree in South Asian Studies from the University of Wisconsin, Madison. She is fluent in Spanish and speaks two Nepali languages. AMolnar@forest-trends.org

Sara J. Scherr is an agricultural and natural resource economist specializing in land and forest management policy in tropical developing countries. She is Director of Ecosystem Services for Forest Trends and serves as Director of Ecoagriculture Partners, an international partnership to promote increased productivity jointly with enhanced natural biodiversity and ecosystem services in agricultural landscapes. She is a member of the United Nations Millennium Project Task Force on Hunger, and a member of the Board of Directors of the World Agroforestry Centre. Dr. Scherr's former positions include: Adjunct Professor at the University of Maryland, College Park, USA; Co-Leader of the CGIAR Gender Program; Senior Research Fellow at the International Food Policy Research Institute in Washington, D.C.; and Principal Researcher at the World Agroforestry Centre, in Nairobi, Kenya. Previously, she was a Fulbright Scholar (1976), and a Rockefeller Social Science Fellow (1985-87). Dr. Scherr received her B.A. in Economics at Wellesley College in Massachusetts, and her M.Sc. and Ph.D. in International Economics and Development at Cornell University in New York. She has published numerous papers and 11 books, including *Ecoagriculture: Strategies to Feed the World and Save Wild Biodiversity* (with Jeff McNeely) and *A New Agenda for Forest Conservation and Poverty Reduction: Making Markets Work for Low-Income Producers* (with Andy White and David Kaimowitz). Dr. Scherr's current work focuses on policies to reduce poverty and restore ecosystems through markets for carbon sequestration, watershed protection and biodiversity protection services; strategies to promote ecoagriculture; and development of local institutions for natural resource management. SScherr@forest-trends.org

Arvind Khare is a natural resources management specialist with more than twenty years of experience in the non-profit, corporate and public sectors. He has made significant contributions to the examination of poverty-environment linkages, initiated a number of innovative rural development projects and was involved in the social risk assessment of development investments in India. His work also involved policy development and analysis in the areas of infrastructure, forestry, tribal development, social development and watersheds. In this capacity, he worked for state and central governments, financial institutions, as well as private and public sector enterprises, non-government organizations, and bilateral and multilateral development institutions. Currently, he also serves as chair of the World Bank's External Advisory Group on Forest Sector Strategy Implementation.
AKhare@forest-trends.org

ACKNOWLEDGMENTS

This paper has drawn upon a wealth of research and stock-taking on community conservation both in the academic literature and in a growing set of networks of development and conservation practitioners. To mention some key data sets, the Biodiversity Support Program (administered by WWF), TILCEPA and the Commission for Economic, Environmental and Social Equity (CEESP) in the IUCN, the Global Forestry Caucus Network, the Global Environment Facility in the Convention on Biological Diversity, the Indigenous Ecomanagement Standards Initiative (ERA and CICAFOC in Mesoamerica), and the Evaluating Eden project of the International Institute for Environment and Development have documented rich case material. We would like to particularly thank Sofia Aggarwal, Janis Alcorn, Barbara Bamberger, Jill Blockhus, Grazia Borrini-Fereyabend, David Bray, Connie Campbell, Ken Chomitz, Marcus Colchester, Tom Erdmann, Andrea Finger-Stich, Michael Jenkins, Ashish Kothari, Leticia Merino, Jeff McNeely, Owen Lynch, Gonzalo Oviedo, Peter Poole, Kent Redford, David Rothman, Gerardo Segura, Jenny Springer, and Andy White for their inputs and critical comments on this and earlier iterations of the review. We would like to acknowledge the editorial and research support of Christian Isley, Jorge Ugaz, Gabriela Donini, Ben Dappen, Alexandra Kramer, Nathan Hamme, Ryan Booth and Anne Thiel. We would particularly like to thank the First Nations Development Institute, Local Earth Observation, and the International Food Policy Research Institute for the use of their geo-referenced data maps.

FOREST TRENDS BOARD OF DIRECTORS

Matt Arnold
Global Environment Fund (USA)

David Brand
Hancock Natural Resource Group (Australia)

James E. Brumm
Mitsubishi International Corporation (USA)

Bruce Cabarle
World Wildlife Fund (USA)

David Cassells
The World Bank (USA)

Linda Coady
World Wildlife Fund (Canada)

John Earhart
Global Environment Fund (Argentina)

Randy Hayes
Rainforest Action Network (USA)

Michael Jenkins
Forest Trends (USA)

Olof Johansson
Sveaskog (Sweden)

Catherine Mater
Mater Engineering (USA)

Miguel Serediuk Milano
Fundação O Boticário de Proteção à Natureza (Brazil)

Salleh Mohd Nor
TropBio Research (Malaysia)

Wade Mosby
Collins Pine Co. (USA)

Ken Newcombe
World Bank (USA)

Marta Isabel 'Patti' Ruiz Corzo
Sierra Gorda Biosphere Reserve (Mexico)

Serguei Tsyplenkov *Vice Chair*
Greenpeace Russia (Russia)

Bettina von Hagen *Treasurer*
Natural Capital Fund, Ecotrust (USA)



1050 Potomac Street, NW

Washington, DC 20007

USA

202. 298. 3000

<http://www.forest-trends.org>



1050 Potomac Street, NW

Washington, DC 20007

USA

202. 298. 3000

<http://www.ecoagriculturepartners.org>