WHO CONSERVES THE WORLD'S FORESTS?

A NEW ASSESSMENT OF CONSERVATION AND INVESTMENT TRENDS

Augusta Molnar | Sara J. Scherr | Arvind Khare

FOREST TRENDS

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Augusta Molnar, Sara J. Scherr, and Arvind Khare

Forest Trends
Washington, D.C.

Ecoagriculture Partners
Washington, D.C.

Who Conserves the World's Forests? A New Assessment of Conservation and Investment Trends.

ISBN 1-932928-05-7

* This paper is the complete research report by these authors. A shorter policy brief, *Who Conserves the World's Forest? Community-Driven Strategies to Protect Forests and Respect Right,s* by the same authors, is also available through Forest Trends (www.forest-trends.org).

COLLABORATING INSTITUTIONS

Forest Trends (http://www.forest-trends.org): 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.

Ecoagriculture Partners (http://www.ecoagriculturepartners.org): Ecoagriculture Partners seeks to transform rural landscapes where both agricultural production and natural biodiversity are highly valued to 'ecoagriculture'—land use systems that improve agricultural productivity and rural livelihoods while also enhancing biodiversity and ecosystem services. Ecoagriculture Partners is an umbrella organization engaging diverse actors whose work is essential to developing and scaling up ecoagriculture systems. The partnership was publicly established at the World Summit for Sustainable Development in Johannesburg, South Africa in 2002, and is jointly sponsored by the World Conservation Union (IUCN), Forest Trends and the World Agroforestry Centre (ICRAF). Partners come from conservation non-governmental organizations (NGOs), agricultural NGOs, international research organizations, farmers' organizations, universities, private sector companies, inter-governmental organizations, and public agencies. To mainstream ecoagriculture, Ecoagriculture Partners works to: (1) build capacity of Partners to implement ecoagriculture; (2) catalyze joint field projects by Partners in high-priority sites; (3) provide strategic information and analysis about ecoagriculture to key stakeholders; and (4) promote policy dialogue and public awareness about ecoagriculture.

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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 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 in 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. This has led to an increasing interest in the role of community forest management that in many situations is 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 our earlier Forest Trends report *Who Owns the World's Forests?* which found that 420 million hectares or 11% of global forests are legally owned or administered by communities and 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 effectively 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 estimates the financial flows generated by local people's investments in conservation and summarizes the lessons learned to date on what steps are needed to make this approach successful.

In addition, this global study combines lessons from the conservation practitioner community and the natural resource and forestry practitioner communities. To date, policy and technical dialogues on forestry and conservation have not been well integrated on a sub-national, national or global level. As a result, researchers and practitioners from the different disciplines tend to focus upon the conservation by communities in individual sites or projects, often unaware of the complementary knowledge on community conservation emerging from the agricultural, forestry or natural resources sub-sectors and vice versa. This paper seeks to bridge this gap and to help local people and their organizations to understand the scope of the broader global trend of which they are a part.

These community conservation initiatives are being recognized at a time when policy makers and governments are scrambling to meet the Millennium Development Goals of reducing poverty by 50% by 2015 and enhancing livelihoods. Meanwhile, conservationists are recognizing the need for a more integrated approach to agricultural and other working landscapes and are exploring new opportunities for biodiversity conservation in areas of multiple use, especially in landscapes where population is increasing.

If the current trends in forest tenure continue, some 50% of the developing country forests will be community-owned or -administered by 2015. Many of these community-owned or -managed forests are likely to be located in agriculture and pasture landscapes, where they contribute biodiversity and environmental values and services that include insect pollination, pest and predator control, wild relatives of crop cultivars, soil microorganisms, the generation of water and the storing of carbon.

Identifying the provision of these services through community conservation and helping communities to maintain or improve their initiatives is advantageous for a number of reasons. First, such efforts are consistent with the global process of decentralization and the growing recognition of property rights that is currently taking place in many countries. Second, success rates of conservation initiatives are clearly boosted by building on existing institutional structures and long-term community commitments. It is also more financially efficient to build on existing initiatives and structures rather than creating new ones. 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. There are effective and ineffective communities. In some cases, the vision of communities cannot be reconciled with the vision of conservationists. Communities do not operate in isolation in many cases the state plays an important role.

The dramatic and continued shift in forest and landscape boundaries and in tenure and customary rights, combined with emerging new 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 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

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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 acknowledge the contributions of Sofia Aggarwal, Janis Alcorn, Barbara Bamberger, Jill Blockhus, Grazia Borrini-Feyerabend, 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, Xu Jianchu 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.

ACRONYMS

CBD	Convention on Biological Diversity
CEESP	Commission on Economic, Environmental and Social Policy (IUCN)
CI	Conservation International
CIMI	Indigenous Missionary Council of Brazil
ECOSOC	Economic and Social Council of the United Nations
FSC	Forest Stewardship Council
GEF	Global Environmental Facility
IPF	Intergovernmental Panel on Forests
ICDP	Integrated Conservation and Development Projects
ILO	International Labor Organization
IUCN	World Conservation Union
JFM	Joint Forest Management
NTFP	Non Timber Forest Products
ODA	Overseas Development Assistance
PA	Protected Areas
SFM	Sustainable Forest Management
TILCEPA	Working Group on Indigenous and Local Communities and Equity in Protected Areas
UNCED	United Nations Conference on Environment and Development (1992)
UK	United Kingdom
USA	United States of America
WCMC	World Conservation Monitoring Centre
WCPA	World Congress of Parks and Protected Areas
WSSD	World Summit on Sustainable Development
WWF	World-Wide Fund for Nature (in USA, World Wildlife Fund)

INTRODUCTION: COMMUNITY-DRIVEN STRATEGIES TO PROTECT FORESTS AND HUMAN RIGHTS

Three decades of Earth summitry – from Stockholm in 1972, to Rio in 1992, to Johannesburg in 2002 – have been produced, directed, and attended principally by official government delegations. If conservationists cannot connect short-term human betterment with conservation for long-term sustainability, they will lose the opportunity to influence the future of global public policy (Sanderson 2002).

In May 2003, a Petén community ecosystems specialist, and one-time commercial floral arrangement palm-frond collector, named Carlos Sosa died in Guatemala of cancer at the age of 46. But he left behind an NGO he had created for integrated conservation and development but now with dedicated staff and future indigenous leaders, ready to carry on their shared dreams of a viable biological corridor which sustains human livelihoods (Memorial Address, Lisa Branden, Secretary, ProPetén Board of Directors).

The management and rational exploitation of the forests has to come hand in hand with the just distribution of their riches among the forest stewards and with biodiversity conservation. Only through the participation of all sectors of the population ... can a forest culture evolve that favors sustainability (National Forest Commission, Guadalajara, Mexico 2003).

The current system of protected areas continues to be severely under-funded 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). It is the thesis of this paper that current proposals for expanding protected areas in many developing countries continue to be made without sufficient understanding of the alternatives or of the current financial, political and social limitations for even maintaining the existing protected areas coverage. Just as expanding the public protected areas system significantly is not an option in most developing countries, effective exclusion of people from many parks is neither viable nor affordable, particularly given the real human rights issues and costs of compensating for lost livelihoods or resettlement.

There is a growing recognition of the extent of human presence in the most biodiverse regions, a large number of which belong to the world's poorest people. More than 1 billion people (at least 25% of which are malnourished) who live in the 25 global biodiversity "hotspots" identified by Conservation International subsist on less than one US dollar per day (McNeely 1999). 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 a more mainstream approach to biodiversity that moves beyond protected areas and seeks to address root causes of biodiversity loss and 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.

This paper is organized as follows. Section 1 of this paper summarizes the status of forest biodiversity conservation in developing countries, in relation to human population, Section 2 provides evidence of the extent of the contribution of communities to biodiversity conservation in forested landscapes and the benefits of a community-driven conservation approach. It presents diverse types of community-driven

conservation and assesses their benefits and potential scale of impact. Section 3 analyzes the global trends that make community conservation an attractive opportunity, including trends in forest tenure and ownership, private, government and donor financing, and the challenges of addressing the needs of local livelihoods while managing conservation areas. Section 4 describes the enabling conditions that can encourage and support community-driven conservation, and the concluding Section 5 suggests how to pursue these opportunities.

1. STATUS OF BIODIVERSITY CONSERVATION AND HUMAN NATURE INTERACTION

Biodiversity conservation can be defined in many different ways (**Box 1**). The public park-centered biodiversity conservation model stems from European protection of royal game and forest reserves (Pretty 2002). It took its modern form in the national parks created in the U.S. in the late 19th century. This model divided the landscape into distinct categories that either included or excluded human settlement and use. While some elements of natural biodiversity remained part of traditional cultural norms, modern agricultural and rural development emphasized financially important land uses and relied on protected areas for conservation values. Productive areas were largely private property, while protected areas were usually claimed by the state, to be managed on behalf of the public good, even where the lands were previously owned by private individuals or communities (Pretty 2002). This model was modified in Europe where higher population densities resulted in most protected areas being actually blends of agriculture and managed habitat. But the model mostly adopted in the developing world was the U.S. "wilderness" model where human presence was excluded to the extent possible and human-managed biodiversity accorded a lower status compared to "pristine environments."

Box 1 – Defining 'Biodiversity Conservation'

Biodiversity is the "total diversity and variability of living things and of the systems of which they are a part" and includes ecosystems, species and genetic diversity (Heywood 1995). Biodiversity conservation has a number of approaches and definitions. A recent article in *Conservation Biology* (Redford et al. 2003) compared the different approaches to biodiversity conservation, categorizing the sometimes quite different definitions of biodiversity implied in different approaches. Biodiversity targets and objectives can range from valuation of presence of species, ecosystems and ecological processes, scenery, and landscape integrity to biodiversity measured as an intrinsic good or something of current or future utilitarian value. Approaches can further differ by a focus on a particular place or particular conservation method, by scale ("both grain and extent") and by underlying principles. The authors find a wide variation in the measures used for specific objectives, with few programs explicitly defining the targets and their measures. Most programs focus on large spatial scales, such as ecosystems, which "miss" some rare species or local-scale ecosystems. As a result of the diffusion of approaches and lack of agreed-upon definitions for management, many opportunities for collaboration towards overlapping goals can be lost.

Sources: Redford et al. 2003; Heywood 1995.

GEOGRAPHY OF BIODIVERSITY AND HUMAN POPULATION

Over one-tenth of forest area is under public systems of protection. According to the latest UN statistics, the number and size of protected areas on the UN list has grown more than tenfold since it was first produced in 1962, cataloguing 102,102 sites covering an area of 18.8 million square kilometers. About 10-12 percent of the world's forest ecosystems are within protected area boundaries according to figures from World Conservation Monitoring Centre (UNEP-WCMC) and the World Conservation Union (IUCN) data (UNEP-WCMC 1998 and IUCN 2003). The ten largest areas cover 3.5 million square kilometers – 1/6 of the total area under protection – while over 40,000 protected areas are less than 1,000 hectares each. Europe has the higherst number of protected areas (43,000), but Central and South America have the highest percentage of land under protection if indigenous reserves are included (more than 25 percent each). One third of the 68,000 areas within the six IUCN Categories system are classified as Category I, II, or III, the categories more restrictive of human activity, with many of these in developing countries where population pressures are greatest (**Box 2**; Pretty 2002). A majority of protected areas include forest ecosystems. Recent figures of the FAO Global Forest Assessment document that 479 million hectares of forest area out of 3.88 billion hectares worldwide (including plantations) are inside protected areas systems, 360 million of which are in the developing countries; the rest are in the developed countries (FAO 2001).

Culture and politics defines "high-value" biodiversity as much as science. The IUCN categories were designed to aid management choices for official protected areas by defining for each category the appropriate management objective and the relationship to human population. However, the data shows that designations have been highly political, so that the application of the categories is highly variable from one country or region to another with little relationship to differences in the particular biodiversity values being preserved. The graph in **Box 2** compares the use of the categories across countries. Clearly the planned internal logic of these categories as ranging from the "most pristine" to "less pristine" and "most in need of protection" to "more able to withstand human presence" has been subsumed by political dimensions. Yet the pressures on protected areas make it a very risky step to reclassify established areas for fear of losing the political support that enabled its creation in the first place.

Difficult debates about competing biodiversity conservation priorities reveal how important cultural perspectives can be. In Europe, much of the clamor for biodiversity conservation is to protect those wild species associated with several hundred years of intensive crop agriculture—reforestation is often viewed as landscape degradation. This contrasts with the near-fixation on natural forests as the ideal land cover in tropical areas of the Amazon. Much of what outsiders view as "wild" ecological communities are in fact the outcome of long periods of human intervention and management (Redford and Padoch 1992; Tuxill and Nabhan 2002; Adams and McShane 1992; Toledo and Ordoñez 1998).

Box 2 – Protected Area Definitions

Protected areas are areas of land and/or sea especially dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources. They are managed through legal or other effective means and serve as stores of valued biodiversity, suppliers of natural products, protectors of water supplies, centers for tourism, education and recreation, and as cultural assets. The IUCN has established six categories for protected areas:

Category Ia: Strict nature reserve/wilderness protection area managed mainly for science or wilderness protection.

Category Ib: Wilderness area

Category II: National park

Category III: Natural monument

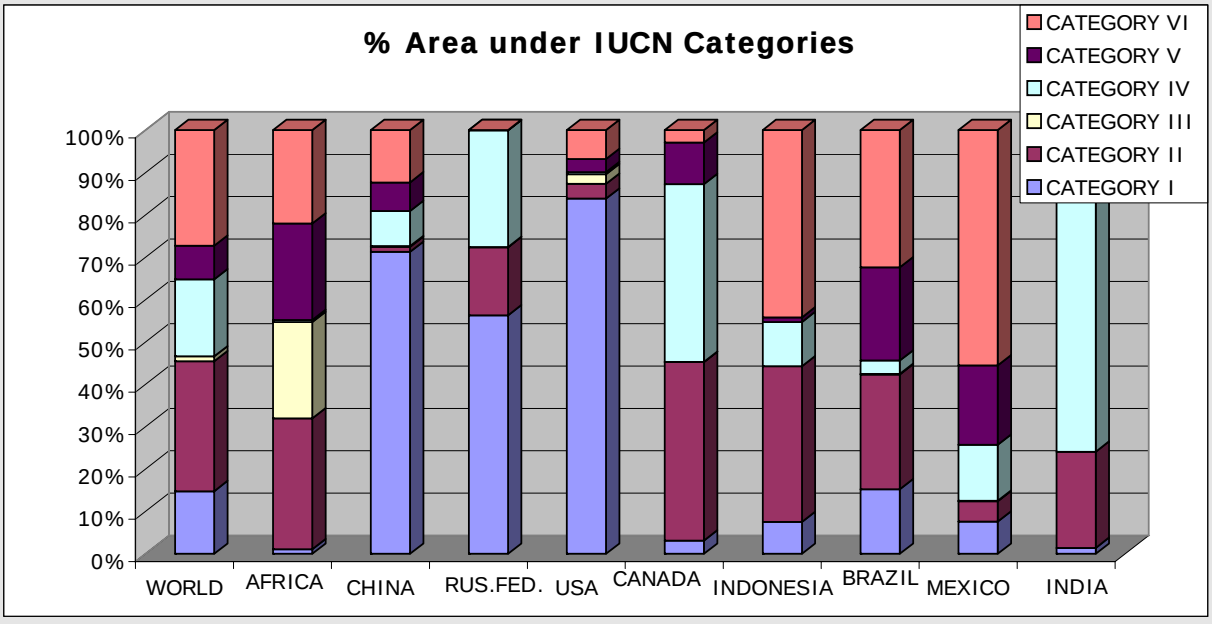
Category IV: Habitat/species management area

Category V: Protected landscape/seascape

Category VI: Managed resource protected area

The most flexible rules governing human-nature interactions are found in Category VI, although the application of these categories has been quite variable from one country to another—see graph. There is an on-going discussion as to whether indigenous reserves and community-conserved areas can fit in this category or whether IUCN should create a new, people-oriented category with new rules. But the categories are highly political as the variation of category choice among large countries makes clear.

Sources: Laird 2002; World Conservation Union 1994; World Conservation Union 2003.



Public protected areas are widely characterized by a high human presence. The relationship between human populations and biodiversity challenges dominant paradigms in two ways. First, much of the world's biodiversity is actually found in areas of human settlement, not necessarily in the protected areas systems. Many public protected areas are mostly small in size, with the result that many ecosystems and key species habitats are not found within these systems. Indeed, protected areas are often not biologically "in the right place". Conservation International and Mexican colleagues are undertaking the first comprehensive spatial analysis of ecologically critical habitats required for conserving 100 percent of species in this mega-diversity country. Preliminary results are indicating that the most critical areas for biodiversity conservation in Mexico are outside protected areas and unlikely to be depopulated (Brandon 2003).

Where population densities are low and there is limited dependence on biodiversity for livelihoods, human pressures can be very low. If this is the case, simply declaring public protected areas as "paper parks" can easily succeed in directing human activity elsewhere, particularly where poor tenure definition could put that biodiverse area at risk. However, such areas are decreasing in availability (Borrini-Feyerabend 2003). Appearances are also deceiving – historical circumstances in both developing and developed countries have led to false perceptions of "wilderness", due to misreading the origin of landscapes only recently emptied of people because of disease, war or out-migration. Protected areas boundaries overlay territories already in the domain of indigenous peoples, particularly in the U.S., Australia, Indonesia, India, Brazil, and Canada. Countries that were colonized have the added problem that colonial powers imposed their own values on local tenure policies, failing to understand the existing dynamic between ownership and use systems, and favoring central control for their own political flexibility (Burnham 2000; Geisler 2004; Ellsworth 2004; Brechin et al. 2003).

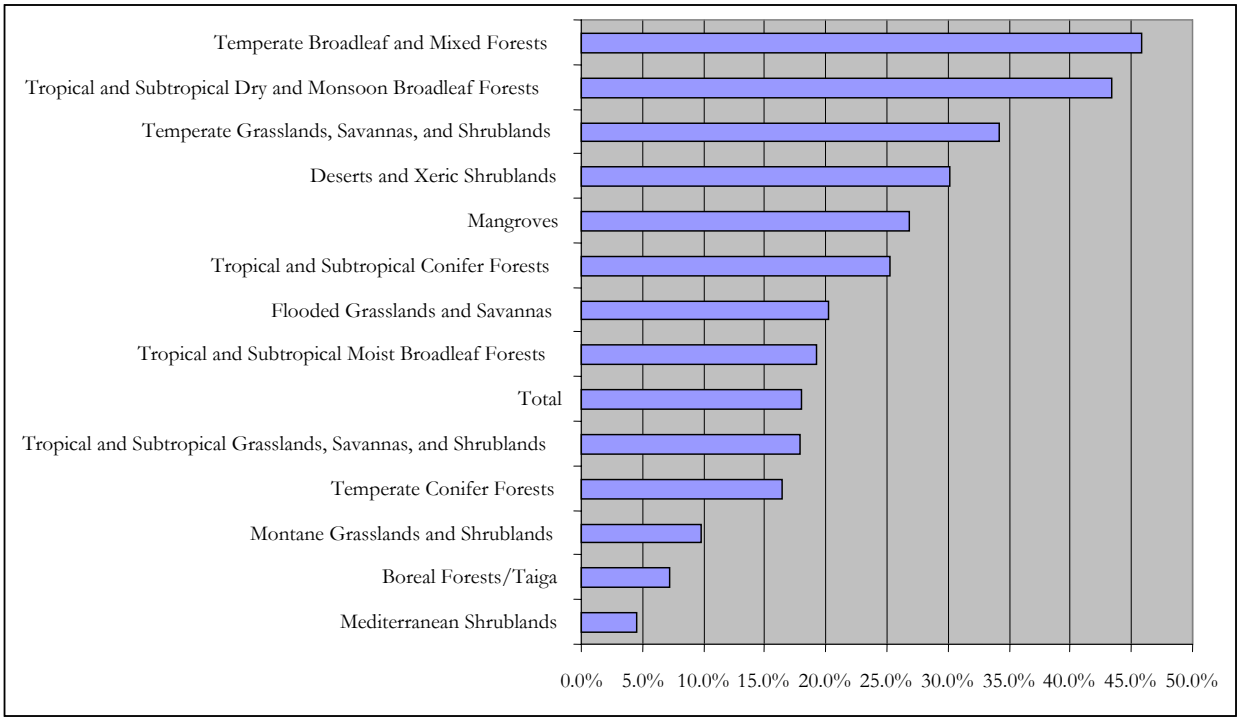
A significant number of protected areas have forest-dependent or resident populations, at least a third of them include populations of indigenous peoples. About 50% of the 20,000 state protected areas which were created in the past 40 years overlap indigenous customary territories (86% in Latin America) (Clay, Alcom, and Butler 2000; MacDonald 2003). Many of these areas have not resolved issues of compensation for land or foregone income and only 44,000 of the IUCN categorized protected areas have GIS mapping information that identifies the actual scope or boundaries of those areas (Cernea and Schmidt-Soltau 2003).

Biodiversity is under the greatest threat in landscapes where human presence and use intensity is very high. Rural populations in developing countries are projected to peak at 3.09 billion in 2015 (accounting for 94 percent of the worlds' total rural population), and then decline by 2025 to 3.03 billion. However, in the lowest-income (often biodiversity-rich) countries, rural population is expected to continue to grow for several more decades (McNeely and Scherr 2003). Sixteen of the 25 hotspots are in areas where over 20 percent of the population is not only poor but also malnourished—accounting for a quarter of all the malnourished people in the developing countries (Cincotta and Engleman 2000). Global estimates state that 300 million people live inside forests and another 200 million people live adjacent to them (Pretty 2002).

The extent of agriculture or herding inside parks is very high. Only some of these inhabited areas are on an agricultural frontier. Some agricultural landscapes in areas of high biodiversity have a history of human settlement reaching back 800 or 900 generations. Population relationships are particularly complex in the montane and arid environments where human populations have made very extensive seasonal use of large

areas with complex livelihoods. Most populations living inside protected areas farm or herd for a living. Satellite images indicate that at least 27 percent of all land (far more, if one includes only land outside of deserts and high mountains) is heavily influenced by the presence of annual crops and unshaded plantation crops or planted pastures (see data in **Figure 1**; Wood, Sebastian, and Scherr 2000). This includes the 10 percent of land units whose satellite image showed more than 60 percent of area under crops and planted pastures, plus another 17 percent of spatial units that had 30 to 60 percent of area under crops, i.e. crops in landscape mosaics with grasslands or forests. These figures significantly underestimate the real extent of cropping, as they exclude areas cropped in land units with less than 30 percent of total area in crop, including a significant share of irrigated farms in dry areas and crops grown in forest swiddens. They also exclude tree crops in forested ecosystems and areas left in fallow in seasons not captured by the satellite imagery (Wood, Sebastian, and Scherr 2000). **Figure 1** shows that in certain types of natural habitats, nearly one-half of total global land area is heavily influenced by crops.

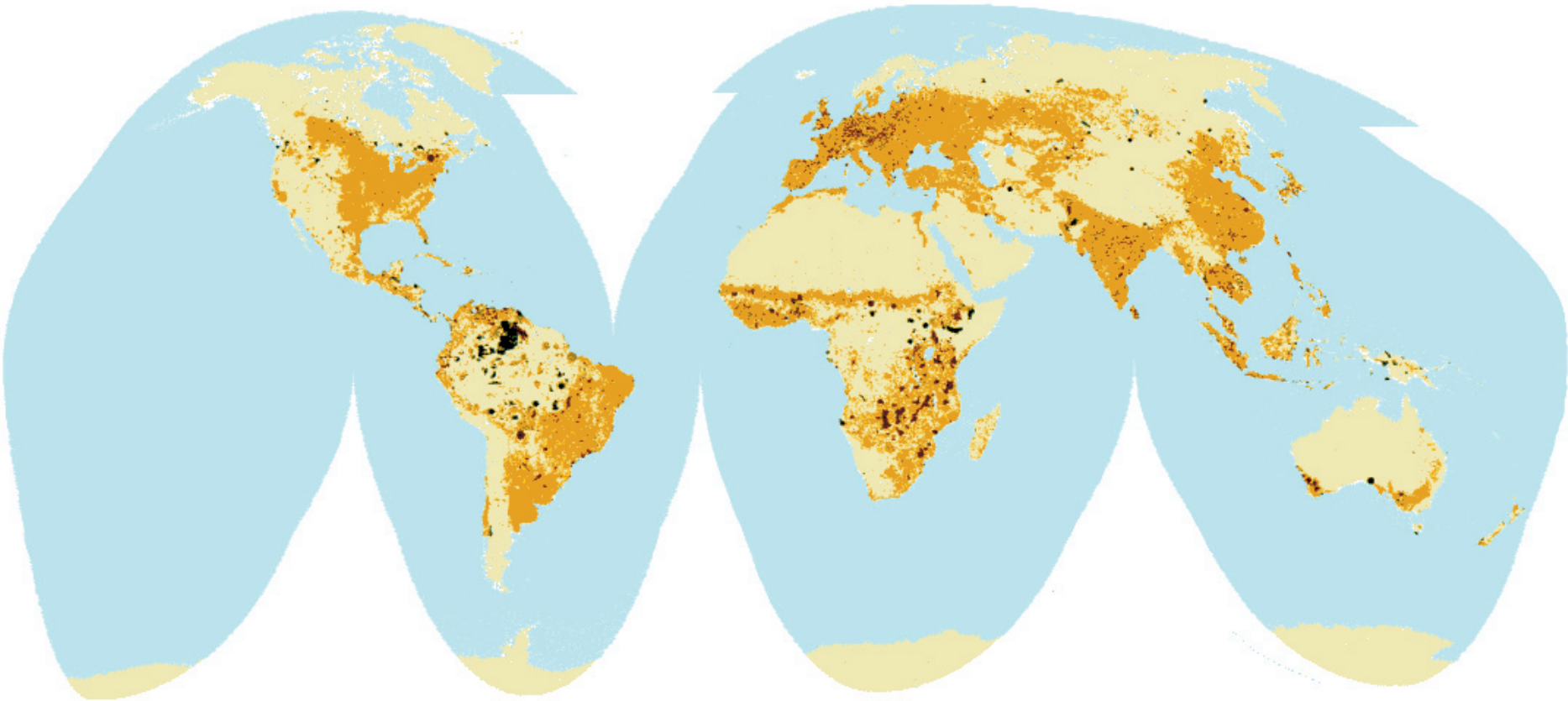
Figure 1: Estimated Percentage of Agricultural Land within Major Habitats



Source: WWF 1999 (Ecoregions Database).

Note: The agricultural area within a habitat type was determined by applying a weighted percentage to each PAGE (see Wood, Sebastian, and Scherr 2000) agricultural land cover class (80% for PAGE class >60% agricultural; 50% for class 40-60% agricultural; and 5% for class 0-30% agricultural).

Figure 2: Agricultural Share of Protected Areas



Agricultural Share of Protected Area (%)

- **1 - 5**
- **5 - 30**
- **30 - 100**
- **Within the extent of agriculture**
- **Outside the extend of agriculture**

NOTES: The extent of agriculture estimate from Pilot Analysis of Global Ecosystems (PAGE) (Wood et al., 2000) includes areas with greater than 30 percent agriculture, based on reinterpretation of GLCCD, 1998 and USGS EDC, 1999, plus additional integrated areas based on Doell and Siebert, 1999. The protected areas within the extent of agriculture were derived from *Protected Areas Database* (WCMC, 1999). For protected areas represented only by points, a circular buffer was generated corresponding to the size of the protected area. The share of protected areas that is agricultural was calculated for each protected area using the PAGE agricultural extent.

PROJECTION: Interrupted Goode's Homolosine

This situation would seem to argue the urgency of establishing more protected areas. But agricultural land use is also widespread within protected areas. Satellite overlays of land use in more than 17,000 major protected areas found that 45 percent (accounting for one fifth of the world's protected areas) were heavily used for crops. Many of the rest are islands in a sea of farms, pastures and production forests that are often managed in ways incompatible for long-term species and ecosystem survival (McNeely and Scherr 2003; **Figure 2**).

Biodiversity is critically important to human populations. Designation of areas for public protection is a highly political process driven by actors who may have quite divergent values on the goals of biodiversity conservation—a point reflected in **Box 2**. The figure displayed there shows that the allocation of protected area categories in regions with similar vegetation and geography (for example Canada and the US, Brazil and Indonesia, China and India) varies significantly. These values determine who should be the beneficiary of the biodiversity being conserved and "which" biodiversity is of importance. International attention to biodiversity focuses mainly on conservation of "globally-important" biodiversity: rare, endemic and endangered species and ecosystems. Less widely recognized is the centrality of biodiversity to food security and livelihoods of the poor. Low-income rural people rely heavily on the direct consumption of wild foods, medicines and fuels, especially for meeting micronutrient and protein needs and during hunger periods. An estimated 350 million poor people rely on forests as safety nets or for supplemental income. Farmers earn as much as 10 to 25 percent of their household income from non-timber forest products. The poor often harvest, process and sell wild plants and animals in order to buy food (Scherr, White, and Kaimowitz 2004). Sixty million poor people depend on herding in semi-arid rangelands which they share with large mammals and other wildlife. Bushmeat is the main source of animal protein in Central Africa (Brown and Williams 2003).

The rural poor rely directly on ecosystem services for clean and reliable local water supplies. Ecosystem degradation results in less water for people, crops and livestock; lower crop, livestock and tree yields; and higher risks of natural disaster (McNeely and Scherr 2003). In the more than two thirds of agricultural regions in landscape mosaics with less than 60% area cropped, there will often be significant biodiversity still conserved under local management regimes. In the other third of agricultural regions (with crops in over 60% of the landscape), local people will often perceive an urgent need to protect or restore ecosystem services.

Thus, the conservation values and behavior of rural communities becomes critical for long term conservation. To what extent do they perform this function now?

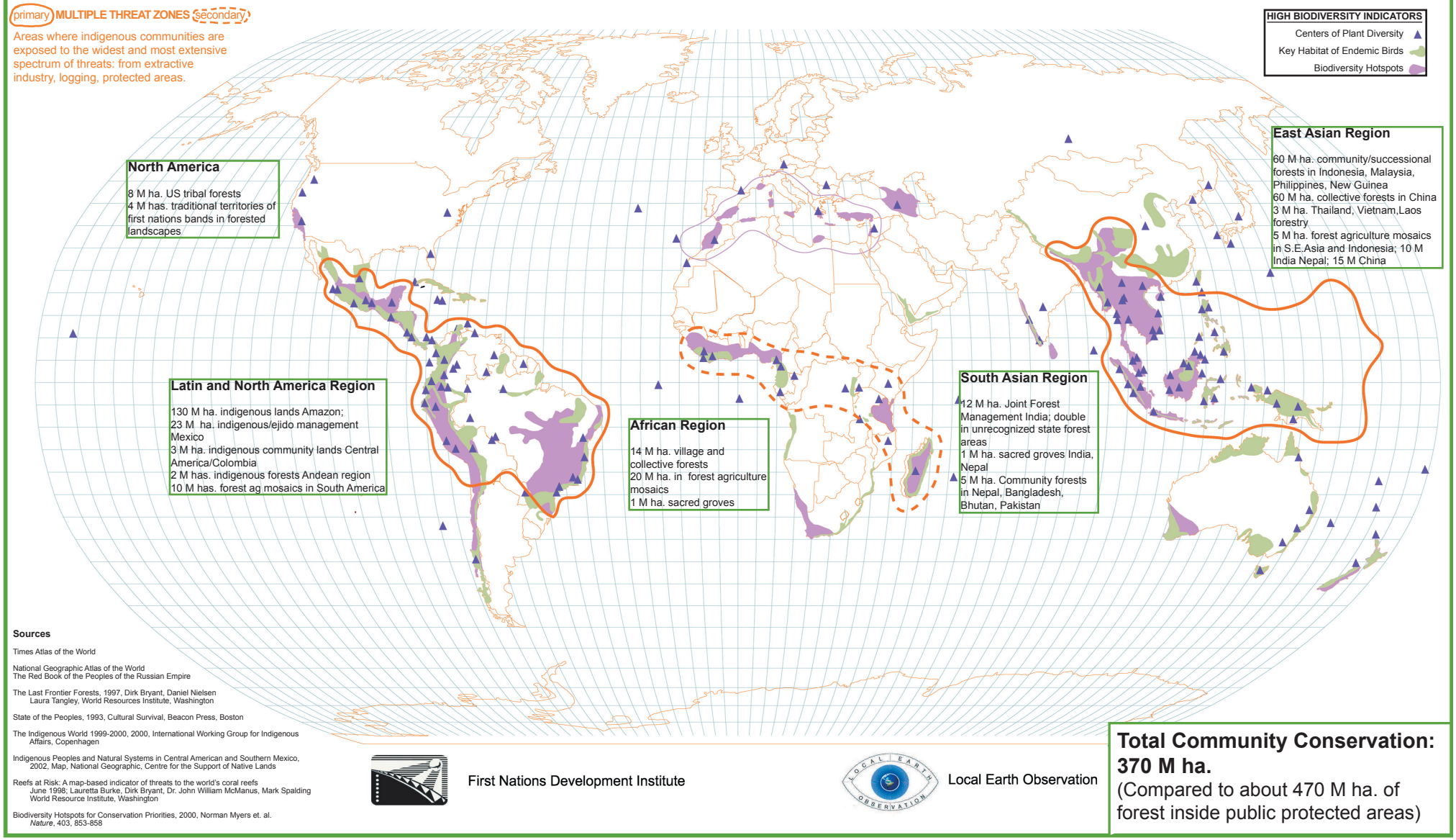
2. THE EXTENT OF COMMUNITY-INITIATED AND -SUPPORTED CONSERVATION

Community conservation has been expanding in recent decades with the recognition of indigenous and other community land rights and decentralization of government forest administration functions to community levels. This section examines the extent of community-driven conservation outside of public protected areas systems in community-owned and -administered lands and in some 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 forests but not on forest landscapes or forest agriculture mosaics and only on the areas currently legally recognized as community-owned and -administered. Our analysis does not include a complete analysis of community conservation, but draws upon the available case material to provide an estimate of the global trend that is likely to be on the lower end. A summary of the case material provided is presented in **Figure 3** below. We first look at the main types of community-driven conservation, assess their benefits and then estimate their potential scale in contributing to local and global conservation.

There have been no previous attempts to produce a global estimate of the scope of community conservation and our analysis should be seen as a first step in developing a global estimate or approximation of the current situation. We started with the global threat 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 was taken from case studies gathered by different research teams and has been layered on this global assessment in **Figure 3** 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, Robalino, and Nelson 2004; Borrini-Feyerabend 2003). The figure 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 and other forest areas in Soviet Russia, Europe and the Mideast are included. Other websites often referred to 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 assemble a large number of community conservation examples inside protected areas (Borrini-Feyerabend 2003). This 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.

The source data has been captured as a series of indicative cases of community conservation by type in **Table 4** at the end of this document. It is presented graphically by geographic region overlaid on the biodiversity hotspots and distribution maps of threatened bird and plant species (**Figure 3** and **Table 5**).

Figure 3. Community Conservation Overlay on Biodiversity in Plant and Bird Distributions



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

TYPES OF COMMUNITY-DRIVEN CONSERVATION

Community-conserved forest landscapes identified in the three geographic regions 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. These areas aggregate to an initial estimate of 370 million hectares of community conserved area. This includes a portion of the 420 million hectares of community-owned and -administered forest lands identified in *Who Owns the World's Forests?* but is not coterminous with them. The four types are:

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 (minimum 120 million hectares).
2. Forest landscape mosaics which contain large patches of natural habitat interspersed with concentrated land uses 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 that 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 are described briefly below including some examples.

TYPE 1: Large areas of natural habitat with Indigenous and traditional stewards that achieve similar conservation as the public protected areas (at least 120 million hectares):

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 in the ILO 169 definition of Indigenous Peoples, while others would consider themselves "traditional people". In this Type 1 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.

- 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)
- One 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).

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 in total, 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 this category 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.

Indigenous reserves in the Brazilian, Peruvian, and Bolivian Amazon are rapidly increasing in area due to the recognition of Indigenous Peoples' rights and due to a strong interest among these peoples in conserving their territories for long-term cultural survival and livelihood development. Such reserves can be 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 examples in **Boxes 3** and **4**.).

Box 3 – 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 magico-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 one 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.

TYPE 2: Working landscape mosaics managed by communities and compatible with or favorable to biodiversity conservation (at least 100 million hectares)

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. 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-Feyerabend 1997). The forest landscapes are fragmented but provide effective corridors as links to adjacent conservation spaces.

- 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, see example in **Box 6**)

- At least 7 million hectares managed as commercially viable Community Forestry Enterprises in southern Mexico of the nation's 40 million hectares of forest under ejido and community ownership (Bray and Merino-Pérez 2002; 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 traditional and tribal peoples with successional forests (Poffenberger 2000; Colfer and Byron 2001)
- One 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 are 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).

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Box 4 – Mexico's Community Forestry Enterprises

Mexico's Community Forestry Enterprises are one of the most advanced Indigenous timber-based enterprise systems. In Mexico, nine thousand ejidos and Indigenous communities of high linguistic diversity own and manage 80% of the nation's forests. An estimated 270 to 480 communities manage 7 million hectares of forests in southern Mexico for sustainable timber and non-timber harvests. They do this with significant investments of community time and money in forest planning, delimitation of conservation and protection zones, fire control, and mapping of geographic information including some monitoring of biodiversity (Bray et al. 2003). Communities in the state of Oaxaca, one of 9 states with high forest cover, have designated at least 18,000 hectares as community conservation areas (National Forestry Commission data). A study of three states – Oaxaca, Michoacan, and Guerrero – found that 1,300 community areas had equal biodiversity values as adjacent non-community areas already designated or identified as appropriate for public protected areas. Biologists have estimated the economic value of non-timber management and extraction in these forests to be extremely high while sustaining incomes, health, shelter and nutritional needs of the poorest Oaxacans.

Sources: CONAFOR 2003; Bojorquez 2000.

Agroforests located in rainforest ecosystems are complex, multistrata mixtures of high-value commercial perennial crops with other subsistence, commercial and wild species that closely mimic the structure of the humid rain forest. Millions of hectares in Southeast Asia, Sri Lanka, Latin America, and Central and West Africa produce tea, coffee, rubber and cocoa as well as minor produce. In Indonesia alone, 3 million hectares of agroforests have been developed by local people either by modifying the natural forest or re-establishing forest cover after crop clearing, all on lands publicly recognized as belonging to the state. For example, the rubber agroforests near Gunung Palung National Park produce seeds from *Shorea stenoptera*, durian fruits, rubber and timber, forming a mosaic of rubber gardens, fruit gardens and dry rice fallows (De Foresta and Michon 1994). Study plots in complex dammar agroforests of Sumatra suggest that a high proportion of the regional pool of resident tropical forest birds, mammals, soil flora, fauna and local plants occurs in these agroforests. Even orangutans have been sighted, as have footprints of the rare Sumatran rhino (Leakey 1999).

Some dryland ecosystems exhibit similarly high compatibility between biodiversity and production. For example, observations in a number of sites in eastern and southern Africa suggest that wild ungulates and domestic cattle can be co-managed effectively, because of their differing use and timing of rangeland species. Successfully integrated management has been demonstrated in the Ngorongoro Conservation Area of Tanzania, which was set up explicitly as a multi-objective area (McNeely and Scherr 2003).

The long history of many of these systems has enabled farmer experimentation over many generations (4000 generations in the case of slash and burn agricultural systems, 2000 for livestock pastoral systems, and 1,500 for aboriginal hunting and gathering, compared to a mere 3-4 generations for industrialized agriculture (Pretty 2002)). The sustainability of these systems is very high, but their lessons have yet to be incorporated into more industrial forms of commercial agriculture and forestry (McNeely and Scherr 2003). There are many studies of shifting cultivation and larger areas of secondary successional vegetation, which creates the dynamic of tropical ecosystems as well as habitats for either wildlife, such as manmals and birds (Padoch and Piñedo-Vasquez 1996).

Box 5 – 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 Samsoedin 2001.

TYPE 3: Forests on the agricultural frontier with community-driven conservation (at least 100 million hectares)

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. They are adapting or willing to adapt their economic activities by securing adequate livelihood returns through sustainable management. Documented examples 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) (see **Box 8**)
- 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 Samsoedin 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 identified to date 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 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 to 20 percent of total income from a diverse set of forest products, while northern Thai villagers collect close to 40% of their total food supply from fields and forests, reducing their need for more agricultural area (Smith et al. 2002). In the Guatemalan Petén and Brazilian Amazon, immigrant farmers are adapting their agricultural systems to maintain forest ecosystems and are aiming to manage the resource base more sustainably (Schneider et al. 2000; Amaral and Amaral Neto 2000). In Mesoamerica, community ecosystem management is evolving in both Indigenous and frontier forest communities with an increasing collaboration between these two differently organized communities who nonetheless apply common eco-management standards with values particular to their own culture and history, not those promoted by government technical agencies (Chapela 2000).

Securing their forest tenure is a crucial issue for these immigrant settlers in forested landscapes. Their commitment to conservation is related to a long-term commitment to their adopted resource base. Yet because they are not the historic populations resident in those areas, states often do not find securing their tenure rights or granting them resource rights for the long-term as justified. The community concessions in Guatemala described in **Box 6** exemplify clearly the potential impacts of granting secure tenure rights to settlers. These concessions have improved their forest cover to generate more biodiversity values than this is true for the core public protected areas and they have developed community instittutions with sophisticated management structures.

Box 6 – Conservation by Forest Settlers in the Mayan Biosphere Reserve

The Mayan 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 after 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 Mayan Biosphere Reserve. These communities are in the process of integrating their production and are working to improve their operations, increase incomes, 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 longer 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.

TYPE 4: Intensively-managed landscapes being actively restored by communities to conserve values (at least 100 million hectares)

This fourth category of community-driven conservation in intensively-managed landscapes is perhaps the most widespread, but there is not 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 key connectivity among habitats. Areas in this category 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)
- A portion of the 150 million hectares of community plantations and 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 are still an important percent 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) (**Box 10**)
- Community windbreaks established in Costa Rica to protect crops and livestock that provide ecological connectivity between forest remnants (**Box 11**).

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 can be maintained with such landscapes.

In the many sub-montane forested areas of Africa, Asia and Latin America, there is landscape-scale evidence of extensive numbers of villages with high population densities where 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 (see **Figure 7** for a land-change map of a Cambodian village studied by Jefferson Fox.). Rather, forest cover in upper catchments has stabilized as land use in lower areas intensified to sustain upland forest systems (FNDI and LEO 2003). A meta-review of 80 studies about the impacts of rising population density in tropical hillside regions found that patterns of degradation associated with low densities shifted to forest restoration and agroforestry at higher densities (Templeton and Scherr 1999).

Why and how are local people restoring habitats and biodiversity in this conservation category? In South Asia, Nepalese and Indian community forestry has become a key strategy for restoring degraded forests in and around human settlement, maintaining forest cover and a flow of forest products and watershed services in sub-montane and montane regions, and NTFP-based economies in traditional tribal 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; see **Box 9**).

The recognition by governments that such restoration and adaptation is taking place is quite variable. Communities in this conservation category face a problem that governments have traditionally addressed problems of degradation by taking tenure away from local communities and private people and put the forests into the public domain. These cases demonstrate that many of these use systems are highly adaptive and that communities with long-term tenure can respond to resource scarcity and new opportunities by recovering their forest resource base and its biodiversity without state control.

Box 7 – Community Investment and Community Forest Management in India

Kandamahal district is one of the most forested regions of Orissa due to the presence of 806 villages illegally settled in state forest lands. The official census only has data on half of these (or 425) villages, but all settlers of this subset are documented as living in the area long before its designation exclusively as state forest. Villagers practice swidden agriculture and rely on the surrounding forests for supplemental income. The state-level foresters have turned a blind eye to their illegal presence, unable to recognize their rights under current legislation but valuing their community management practices. Despite an absence of state investment, some villages have witnessed a doubling of their nearby forest cover, with total community-managed area increasing by 45,000 hectares compared to only 1,679 hectares cleared for new agriculture in the protected past 12 years.

The reforestation initiative was born of the communities themselves as they realized that they needed forest cover for increased rains, improved watershed protection and erosion prevention. The villagers have formed community forest committees which meet once a month and report quarterly to the village on the status of forest protection and management. Commercial tree felling is banned. However, the committee allows tree use for housing, fuelwood and other non-commercial household requirements. A set of community-derived standards sanction non-approved practices and provide a norm for approved uses, including a nominal fee charged to help finance management costs. Payments are prorated based on the economic condition of the family.

The individual villages work in tribal federations to collaborate more effectively, build political support and exchange lessons learned. Should this scheme be legally recognized, however, current law and policy would make it very hard for the forest department to support this "indigenous" institutional structure as the only legal model available to the forest department for community engagement is joint forest management through the local government or "panchayat". Government foresters recognize that the autochthonous system is more rooted in traditional decision-making systems and therefore prefer to turn a blind eye on this rather than undermine what is recognized as a strong positive force for conservation.

Source: Singh and Sinha 2004.

There are many examples of "ecoagriculture" where farmers have raised their productivity in ways that also enhance biodiversity. In the highly threatened Atlantic Forest of Brazil, small-scale farmers who were provided with technical assistance that doubled productivity of dairy operations willingly agreed to convert marginal grazing lands back into forest (Pro-Natura 2002; Schneider et al. 2000). Maize farmers in western Kenya and in Zambia adopted short-rotation woody fallows as a strategy to restore soil fertility and raise yields. These same fallows, which form a patchwork on the landscape, improve habitat conditions for a wide range of small fauna and below-ground microorganisms (Franzel and Scherr 2002). **Box 8** describes how community groups in both Australia and the Philippines have worked together to rehabilitate degraded landscapes.

Box 8 – 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 pencillata) 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.

BENEFITS OF COMMUNITY-DRIVEN CONSERVATION

Important conservation benefits accrue from community conservation systems; incorporation of local knowledge, commitment to a conservation practice and significant long-term community investment in conservation, as well as support of rural poor livelihoods. Moreover, local control over management protects and respects human rights.

Local communities can have superior conservation practices. Many traditional and indigenous communities have a firm, long-term commitment to their lands and are anxious to demonstrate good stewardship to their country and outsiders, as well as their local constituents for whom these resources constitute a major asset. Their collective knowledge of local species and ecosystems as well as that of local specialists (such as healers familiar with medicinal plants) can be invaluable in designing conservation strategies, selecting sites for strict protection and finding cost-effective ways to make sustainable use compatible with conservation.

Resident communities play a critical role in protecting forests from outside encroachment and controlling fires. This is reflected in the fact that insurance companies assess risks for commercial forestry operations to be lower where there is active community involvement (Mundy and ARM 2000). Their continuous presence

in and around the conservation areas facilitates ecological monitoring and a rapid response to threats or problems. Indigenous people are capturing indigenous knowledge and exchanging information horizontally inside and outside of protected areas. Some indigenous and community forest managers are acquiring professional resource management skills for their own enterprises.

At the same time, there are many examples of poor use—e.g. logging contracts in Papua New Guinea and others. Community ownership is not a guarantee of conservation behavior.

Community investment in conservation compares favorably with fiscal and donor investment. Many local people are already investing in their natural resource base over the long-term. Indigenous timber enterprises in Mexico invest twice the amount per hectare annually in their forest conservation activities than the government does in adjacent protected areas, US$ 2 compared to US$1 (Bray et al. 2003). Given the multiple returns and the opportunity to complement community objectives and existing investments, investing in these on-going conservation initiatives—which include everything from demarcating areas for conservation, policing access, building a conservation consensus, monitoring biodiversity, and/or restoration— can yield higher returns than investing in protected areas where there is no community conservation.

The Mexico case because has been well analyzed (**Box 9**). Five years of technical assistance support in a Mexican forestry project enabled communities to bring 175,000 hectares under more sustainable forest management, setting aside 13,000 new hectares of conservation areas and creating 1,300 permanent jobs, while generating US$1.2 million per year in new fiscal revenues to the federal government—the same amount as the original project annual investment at state level. Forest profits going to communities are invested in social goods as well as economic goods: social infrastructure, health services and scholarships. Community investments of volunteer labor, including forest monitoring and application of better management practices, equal 2-10 person years of employment per year in each village.

This is comparable to investments by the still-functioning 5,000 Van Panchayats in Uttar Pradesh, India, in which villagers volunteer for fire control, patrolling, management meetings and resource monitoring activities (Sarin et al. 2003). Brazil foregoes spending hundreds of thousands of dollars a year in high conservation value forests for conservation patrolling and protection against encroachment provided voluntarily by indigenous tribes in the 570 indigenous lands making up 100 million hectares of the Brazilian Amazon. (ISA 2001; Bamberger et al. 2003)

Conservation organizations that invest in community conservation have discovered a number of financial advantages, such as:

- Savings in institution-building and a greater chance of sustaining the institutions over time and through new circumstances (Margoluis and Salafsky 1998; Wycoff-Baird et al. 2001)
- Savings in compensation to local communities (Clay, Alcorn, and Butler 2000; Sayer et al. 2004)
- Savings in conflict management where one set of stakeholders already enters in with a long-term commitment (Brown 1998; BSP (Biodiversity Support Program) 2001)

- Savings in regulatory enforcement—community biodiversity conservation brings rewards to the communities that reduce the need for outside control of degradation and over-harvesting (Borrini-Feyerabend 1997; Oviedo 2002)
- Greater generation of local employment and local livelihoods, reducing welfare expenditures by other programs and service agencies (Salafsky et al. 2001; Burch, Singh, and Kanel 2003).

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 current estimates for the area populated by Indigenous Peoples who are present in the world's forests—238 million in the overlays by First Nations Development Institute and Local Earth Observation (FNDI and LEO 2003) and in linguistic mapping by World Wildlife Fund and Terralingua (Maffi 1996). Given the poor documentation of agroforestry systems and agricultural landscape mosaics in the three continents, this estimate will still be lower than the actual total. (If estimates were to include the broader global range of agro-forests, home gardens, sacred groves and forest-agriculture mosaics outside the three geographic case regions, the total area of the world's forest under community systems of conservation could possibly be up to 1 billion hectares or 1/3. In addition, there are undoubtedly additional areas in the European and Eurasian continents. 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, does not a necessarily determine where community conservation systems concentrate. There are 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 community conservation systems with the greatest coverage, however, is located in forested areas where rural population densities are medium to high and includes indigenous communities in Mesoamerica and ejidos in Mexico, communities managing village forests in South Asia traditionally and through joint forest management, village forests and "village conservancies" in Sub-Saharan Africa and in North America. In North America, this includes the desert peoples of the US Southwest – Otomi, Huichol, Odami, Pima, Navajo, Hopi, and Menominee lake peoples. Population density is not a major limiting factor where tenure is secure and governance has been established, although size of habitat patches will influence the types of biodiversity that can be conserved (Tuxill and Nabhan 2001).

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" models 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. 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 models 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.

3. GLOBAL TRENDS AFFECTING STRATEGIES FOR BIODIVERSITY CONSERVATION

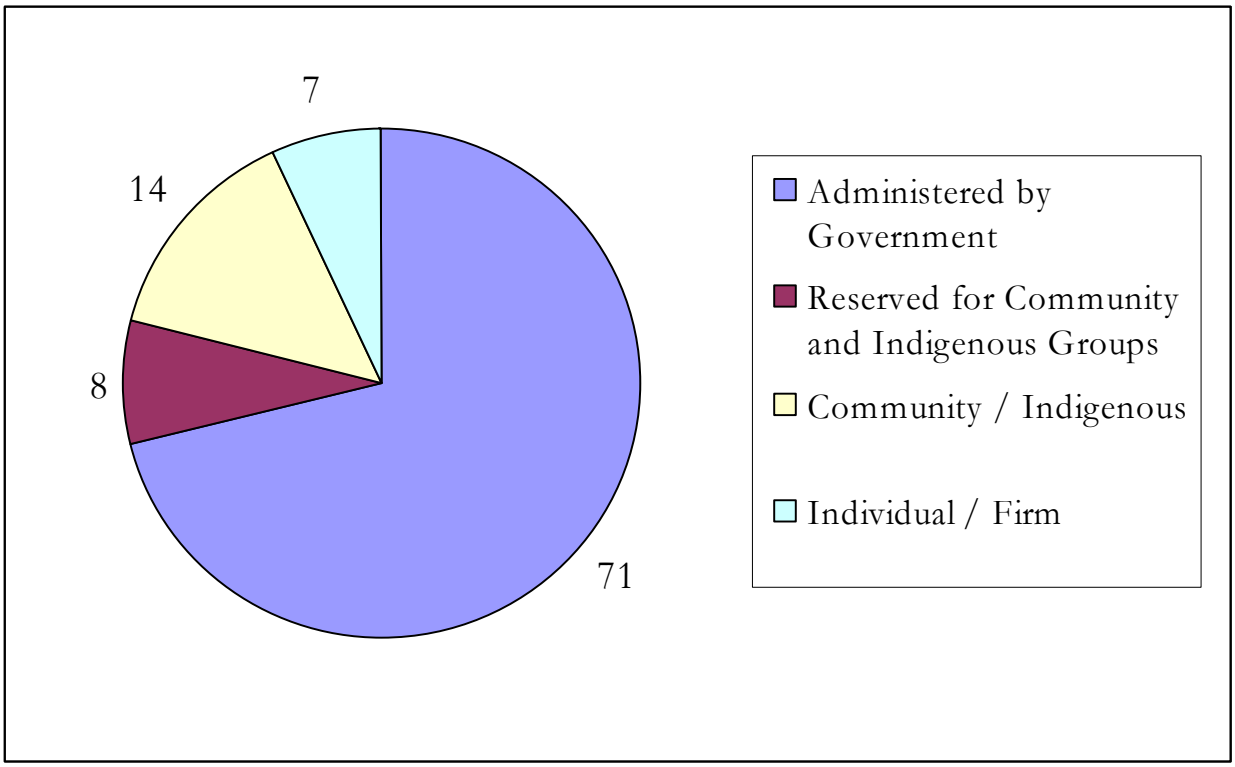
To put the potential role of community initiatives in conserving biodiversity in perspective, it is useful to review some important global trends in the forest and environmental sector. Dramatic changes are underway in forest tenure and forest ownership, particularly in the developing countries where poverty is highest: in the amounts and sources of conservation financing; in the markets for forest products and environmental services, including the emergence of environmental service markets for carbon, water and biodiversity; and in political dimensions of public protected areas system management. These changes, in combination, make community conservation a strategy. They are shifting the context in which conservation decisions are made into one with less control from the state and NGOs and more influence from local stakeholders and the marketplace.

CHANGES IN TENURE AND FOREST OWNERSHIP

Global forest tenure is shifting towards community ownership and access. The tenure environment in which state forests and state protected areas were established or codified has been in transition for the past decade and continues to shift. Social movements by indigenous peoples and other forest dependent peoples combined with policy decisions to decentralize and devolve management responsibility over forests have had dramatic outcomes in the past decade. 15 years ago, only 7% of the world's forests were officially community-administered – now 11% are community- owned or -administered worldwide, rising to 22% in the developing countries (see **Figure 2**). This trend shows every sign of continuing at the same or even an increasing rate.

Figure 4 shows the percent of forest land under community-ownership or -administration in a sub-set of the 12 most forest-rich countries—which own collectively 3.1 billion of the 3.6 billion hectares of the world's forests. Some of these countries, such as China or India, have recognized rights or transferred responsibilities to a significant extent – 12-17 million hectares of forests are under joint or community management in India and 150 million hectares under community management in China. Other major forested countries, including once with highly centralized systems like Indonesia and Russia, are actively engaged in a decentralization process with strong demands from the local population for stronger forest tenure. As this trend continues to evolve, community-owned or -administered forest areas in developing countries are conservatively expected to at least double again by 2015 to 700-800 million hectares of the total 3.6 billion hectares of forest. Many of the community-owned and -administered forests overlap with Conservation International's biodiversity hotspots and the WWF Global 2000 Priority Ecoregions. This contrasts with the 250-460 million hectares of forest currently in public protected areas, most of which still retain their original ecological conditions.

Figure 4: Forest Tenure in the Developing Countries: Percentage of Forest Land under Different Tenure Categories

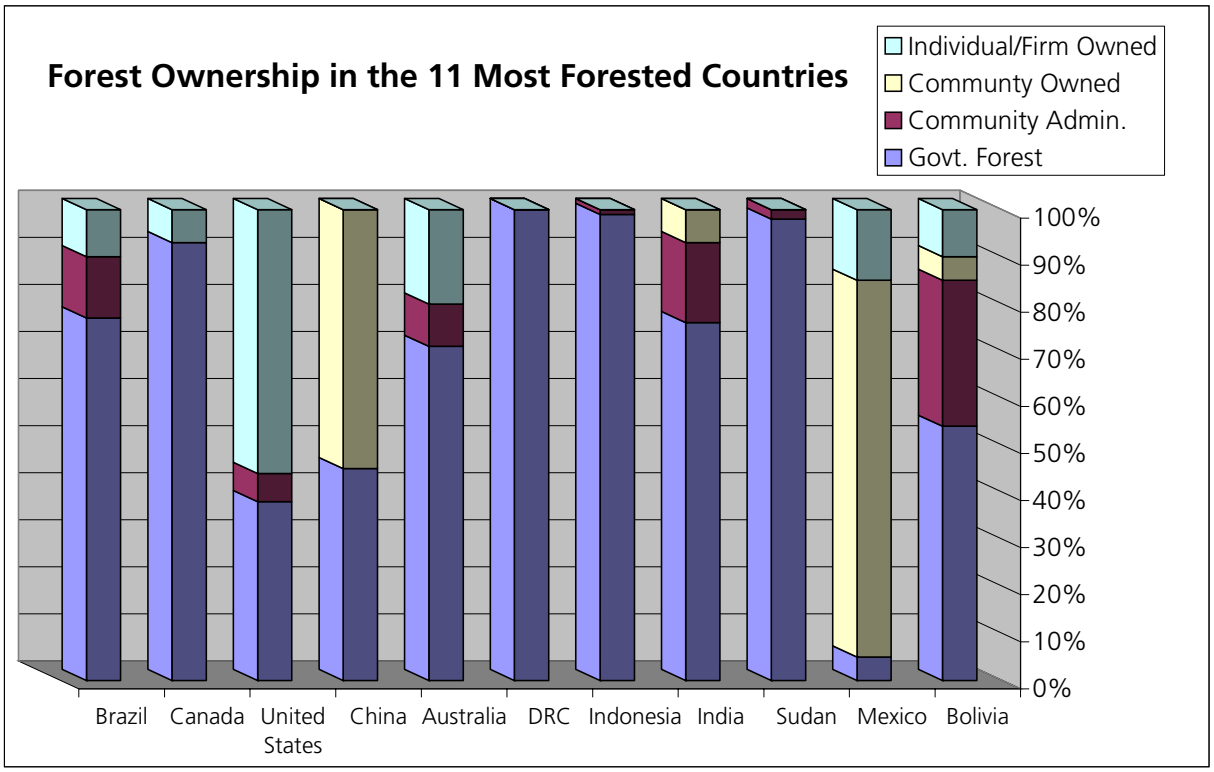


Source: White and Martin 2002. The world's forests total about 3.6 billion hectares. The developing countries' forests constitute approximately 60% of this area. Within the 2.2 billion hectares of developing country forests included in this analysis, 22% are community-owned or -administered.

Yet, few governments and international environmental agencies are positioning themselves to realize the potential for community-driven biodiversity conservation, poverty alleviation related to improvements in forest-based livelihoods, or private sector investments in community initiatives that this shift makes possible. And few communities realize how extensive this tenure shift is in their own geographic region or worldwide, even as they advocate for greater recognition of their own rights and greater control over their resource decisions. It is not hard to imagine the area of community administration increasing in some of the forest-rich countries shown in **Figure 5**, such as India, Canada, Indonesia, or the Democratic Republic of the Congo.

Devolution to communities is taking place in complex situations where non-traditional peoples have settled in forest areas and where displaced traditional and indigenous peoples have become established, generating considerable controversy over tenure rights. In the Maya Biosphere Reserve in the Petén, Guatemala, forest timber concessions were granted to surrounding communities to manage the human presence and guard against outsiders. Recent proposals to expand archaeological tourism threaten to reverse concession agreements and undermine the hard-won conservation action of the community enterprises whose forests are now in better condition than the adjacent protected areas (Cortave 2004; see **Figure 8** showing forest concession integrity). India has put 12 million hectares under joint forest management in degraded forest areas but is now facing similar pressures to provide greater tenure and resource rights in these forests and to expand community management models to the high forests where both tribal peoples and more recent settlers have tenure claims (Khare et al. 2000; Ellsworth 2004).

Figure 5: Pattern of Forest Ownership in Selected Forest-Rich Countries



Source: White and Martin 2002. Peru was not included as it only has official estimates for the public areas reserved for community groups and indigenous reserves.

Indigenous movements are seeking to reclaim forest and land rights. The recognition of Indigenous Peoples' rights to land and resources is a highly dynamic element of this tenure shift, one grounded in international rights processes as well as indigenous rights movements within countries. Indigenous movements in forest-rich countries have developed a much clearer stand regarding the overlaps between public protected areas and their rights over indigenous-owned or -administered lands. They argue that the conservation community's objective of achieving reserves of minimum biological size can be in direct opposition to their attempts to restore ancestral rights and domains, particularly in formerly colonized countries. Despite interest in resource conservation, they perceive protected areas overlaid on their territories as a land grab similar to other forms of state control and as an artificial construct incongruent with their own more integrated resource traditions.

The fit between indigenous rights movements and international environmental and public protected areas conventions is still under discussion. National protected areas systems have introduced people-parks models of participatory co-management and degazetted some lands from protection to recognize indigenous territorial rights. Over the past decade, major conservation organizations have developed indigenous peoples policies (e.g. World Wildlife Fund, Conservation International), reflecting articles ratified in international agreements on the rights of indigenous peoples, such as the ILO Convention 169 and the UN Convention on Biological Diversity or the IUCN resolutions 19.1 and 19.23 (community-based approaches) of the 19th Session of the IUCN General Assembly, the Resolutions on Indigenous Peoples and Conservation, and on

Collaborative Management for Conservation of the First World Conservation Congress, Montreal, 1996 as well as the Resolution on Collaborative Management of the Second World Conservation Congress, Amman, 2000. The Dana declaration (IUCN) from April 2002, among others, outlines the rights of transhumant and nomadic populations to resources. The ILO Convention 169 has led to tenure recognition in millions of hectares of Latin America and continues to provide an international rights framework (Colchester et al. 2001). The community forum at the WSSD confirmed tenure and indigenous knowledge rights; the latter established in the Convention on Biological Diversity – Articles 8(j), 10(d,c) and 17 (Global Caucus on Community Based Forest Management 2003).

Some Indigenous Peoples' social movements demand much greater sovereignty. The Conselhi Indigenista Missionaico Encuentro Nacional de Povos e Organizaciones Indigenas do Brazil (CIMI) demanded from the Brazilian National Congress in April 2003 that no new protected areas be declared without their permission, that all overlays between indigenous reserves and protected areas be eliminated and that indigenous enterprises receive priority support (ISA Newsletter 2003). This is the most direct request to date, but other Indigenous Peoples are moving in this direction as well. A recent meeting of tribal villages in Jharkhand state, India, presented a platform rejecting continued state ownership and administrative control of forest lands that, in their bulk, are part of customary and ancestral domains. Mosquitia peoples in Honduras have asked that park designations be rethought (Indigenous Federation of MASTA 2004). Amazonian peoples, Canadian bands, and US tribes question the inherent paternalism in a relationship that makes them "wards" of the state for many resource decisions and subject to national or international standard setting for forest management plans or forest certification, particularly when this entails hiring outside, non-indigenous professionals to evaluate or improve their forest management practices (Smith and Ross 2002; Jansens 2002).

The ruling by the Inter-American Court of Human Rights in favor of Awas Tingni Community in Nicaragua establishes an important precedent in the international system against the illegitimate allocation of forest concessions in indigenous territories by the government (Borrini-Feyerabend 2003). It has not been applied as a precedent for questioning sovereignty in relation to biologically protected areas, but potentially could be. The Economic and Social Council of the United Nations (ECOSOC) has created the permanent forum of indigenous peoples where resource and land rights are central to the agenda (UN Permanent Forum 2003). Claims include issues related to intellectual property rights over the use of biodiversity. While there are positive examples of inclusive agreements with traditional peoples over development of specific botanical products, most intellectual property legislation has not yet developed a means to recognize traditional knowledge or use by a dispersed set of traditional peoples.

TRENDS IN FINANCING OF FORESTS AND FOREST PROTECTION

The conservation community estimates a gap of US$27-30 billion in financing required annually for the management and expansion of the existing protected areas, if infrastructure, research, outreach and staffing requirements are taken into account. Current global trends, however, indicate that public expenditure and international financing are flat or declining, although there seems to have been a marginal increase in private sector investment. As a result, 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 public spending on public protected areas in developing countries. Developed countries spend 80 to 100 times more on public protected areas than the developing countries if expenditure per hectare of protected area is considered. A 1997 study of 123 conservation agencies in 108 developed and developing countries (comprising 28% of public protected areas) records US$3.2 billion in annual budgets or US$893/km^2 overall, but only US$10/km^2 in 13 of the developing countries studied and less than US$100/km^2 in 32 of the developing countries studied (Green and Paine 1997). The 60% of the sample public protected areas which are in developing countries received only 10% of the total capital expenditure.

Poor countries are especially vulnerable. African countries generally allocate a similar percentage of their Gross National Product (GNP) to protected areas as do the developed countries. That however translates into very small budgets for protected areas and many forested developing countries have already committed large portions of their forest estate to public protected areas. At the same percentage of Gross Domestic Product (GDP), the United States and Germany spend US$2000 and US$1300 per hectare annually, while Cameroon and the Democratic Republic of Congo spend US$20 and US$12 respectively (Brown 1998). A politically charged goal of doubling or tripling the GDP percentage does little to eliminate the underlying problem.

Trends in Overseas Development Assistance (ODA) funding to protected areas are stagnant. Overseas Development Assistance (ODA) has been a major source of income to forest conservation. According to Program on Forests (PROFOR), the multi-donor policy support program of the World Bank, ODA funding shows a declining trend. Bilateral donors and multilateral agencies follow the same trends. 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.

Looking at the historical data and projecting funding trends based on it provides a fairly credible estimate of the future trends in ODA financing for conservation. **Table 1** compiles the data from the World Bank Global Development Finance Report of 2003 and PROFOR and projects this data to estimate future flows.

Table 1: ODA Flows to Forest Sector Projected to 2006

Years	1998	1999	2000	2001	2006
ODA from DAC donors	52.1	56.4	53.7	52.3	61.8*
ODA to Forest sector	1.14	1.23	1.17	1.14	1.35*

** 2006 estimate is calculated on the basis that Development Assistance Committee (DAC) donors will continue to allocate their historic 0.26% of Gross National Income (GNI) from their fiscal budgets.*

Assuming donor countries honor pledges made to the International Conference on Financing for Development in Monterrey in 2002 to make aid flows equal 0.26 percent of the donor countries' GNI by 2006, total ODA commitments would then amount to US$62 to US$65 billion in total. Based on historic

flows of ODA to the forest sector, which are never more than 2% of the total ODA, the estimated available finances to the sector will at best be around US$1.42 billion by 2006.

It is difficult to estimate ODA investments in different activities within the forest portfolio. However, by using the recent assessment of biodiversity funding in Latin America and the Caribbean (Castro and Locker 2000) and other indirect indicators, a fair assessment can be made. For the period from 1990 to 1997 the Castro study estimates that 3,489 conservation projects were funded by 65 funding sources, which equals a total biodiversity conservation investment of US$3.26 billion. Public protectd Areas received 35.12 percent of the total allocation. Biodiversity conservation within larger natural resources management projects received a slightly higher amount, 35.87 percent. Despite the fact that 65 different sources accounted for the total investment in the survey, 81 percent of funding came from bilateral and multilateral sources. Since the survey covered all types of investment agencies, it is reasonable to assume that approximately 35 percent of investments in the forest sector go to public protected areas systems. An assessment of the World Bank portfolio yields the same result (Khare 2003). At the current level of ODA funding, this would mean an annual ODA investment between US$350 and US$420 million for protected areas systems, down from US$700 to US$770 million in the early nineties.

International financing is key for particular countries. In Brazil, it constitutes 75 percent of the conservation funding and in several megadiverse African countries, it consitutes 50 percent. Private foundations are providing slightly more each year, but not more than US$150 million globally and the private sector spends not 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 protected areas.

Limited private financing is available for public protected areas. Private sector financing for biodiversity protection has taken three main forms: contributions to conservation trust funds, privately financed and managed reserves, and payments to land managers for ecosystem services. Unfortunately, at this time none sources of these promise major new funding for protected areas, although positive tendencies can be noticed. By 1998, more than 46 conservation trust funds had been established for a number of protected areas, with 45 more in the planning stages, attracting private finance and increasingly capturing payments for energy and water generation (Bayon and Deere 1998).

An increasingly popular conservation model 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. This model offers certainly scope for future expansion. In many cases, however, these areas are not in the regions of highest priority for conservation. Some may also pose problems of elite land concentration, foreign land control or ownership, or disputed land claims.

By contrast, communities have been documented as spending significant amounts of time, labor and financial resources on forest management and conservation activities, roughly estimated at US$1.2-2.6 billion per year in project reports from programs supporting community forestry (Khare 2003). This is about the same amount as developing countries annually allocate to their protected areas systems, and 2-3 times the annual allocation of all ODA for protected areas conservation worldwide.

Communities areas already are, and could potentially be, a more important source of financing for conservation. **Table 2** shows the combined estimated financing from all sources, based on the earlier analysis. The developing country share of public protected areas, based on World Conservation Monitoring Centre data, is about 7.9 million km² of 13 million km² worldwide. The national protected areas budgets contribute about US$1.6 billion annually, ODA US$0.3-0.4 billion annually with small additional investments by foundations and capture of finance through trust funds. Communities currently actually contribute as much or more to their community conservation efforts as do other sources.

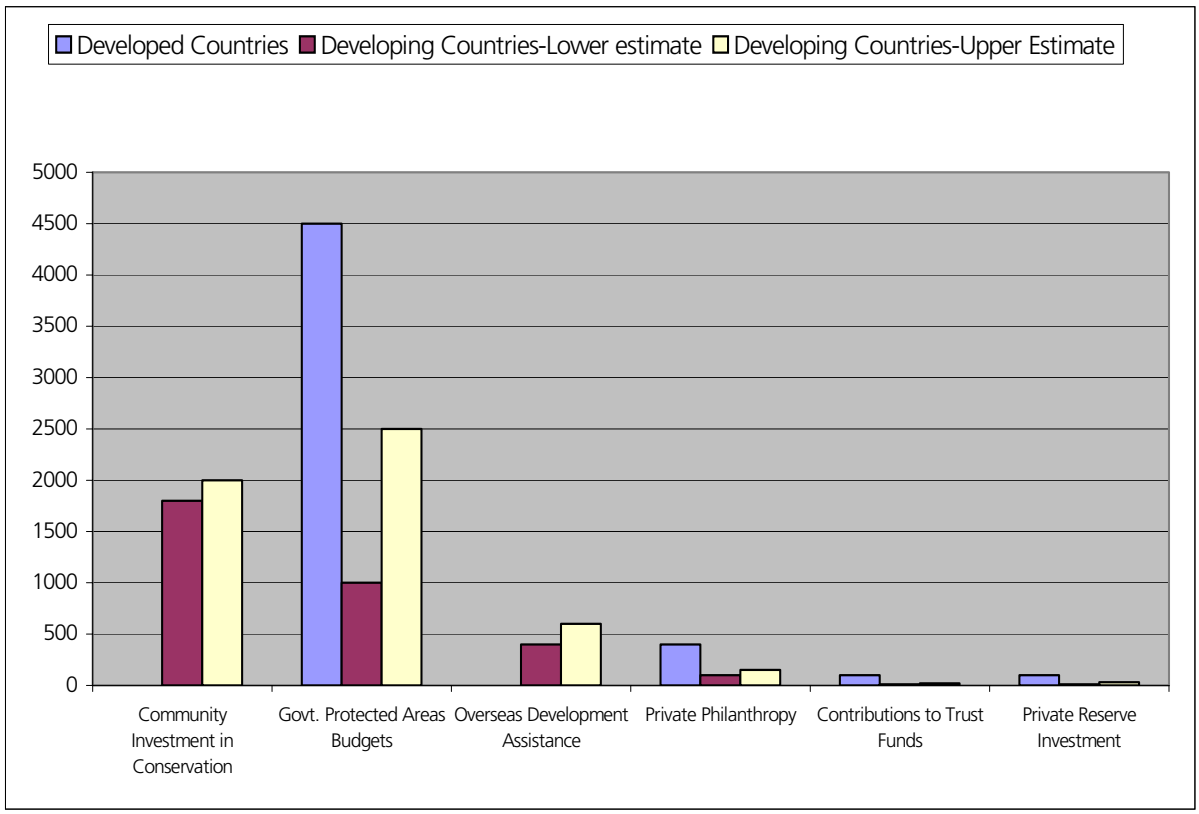
Table 2: Per Year Conservation Financing Estimates by Source in Developing Countries

Community Initiatives	National Park Budgets	ODA	Philanthrophy	Private Reserves and Conservation Trust Funds
US$1.3-2.6 billion	US$1.6 billion	US$350-420 million	US$150 million	US$10 million in funds from taxes, energy and water payments separate from ODA

Source: Khare 2003.

Community conservation investment estimates include policing of access and boundaries, conservation management plans and studies, demarcation of conservation areas, restoration activities, boundary marking, monitoring of biodiversity and habitat health. They do not include time and resources allocated for community organizing or planning around conservation.

Figure 6: Annual Estimated Financing of Forest Conservation by Source (in US$ Million)



Source: Khare 2003.

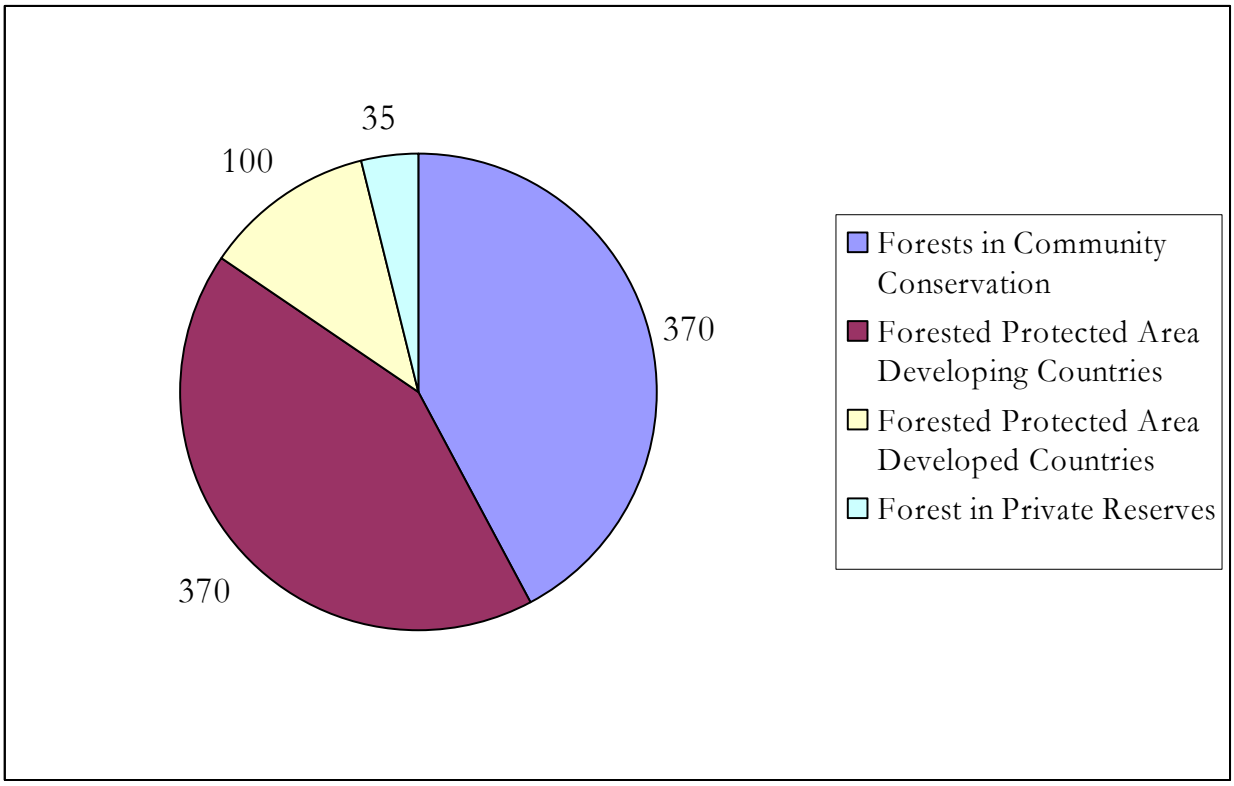
All sources that contribute to public protected areas management and community conservation have not been estimated. However, the total available finances for public protected areas are unlikely to be higher than US$1.5 billion, falling far short of the estimated requirement of US$24 billion for protected areas, just for the developing countries. Based on the discussion in the previous section and the picture that emerges from **Table 3**, the main findings can be summarized as follows:

- ODA flows for the forest sector in general and for public protected areass in particular have declined and are unlikely to reach the early nineties level even by 2006.
- It is unlikely that public expenditure on forests and public protected areas will substantially increase from the currently estimated levels.
- Philanthropic contributions are likely to increase but constitute less than 3 percent of total available finance for the forest sector. The philanthropic contributions are slightly underestimated and do not include self-generated funds by NGOs. It is also possible that a good portion of philanthropic funds goes to public protected areas compared to other needs of the forest sector.
- The traditional private sector makes a negligible contribution to the forest sector. However, as the new markets for environmental services and products from sustainably managed forests emerge, the private sector contribution may increase (see next section).

- 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 forest administration. Currently, they constitute the largest single source of investment for forests, greater than ODA and public expenditure on public protected areas.

- The size of the area conserved by communities is also at least equal to that included in the public protected areas system in developing countries and at least 70% of that conserved in all public protected areas.

Figure 7: Area Conserved by Public Agencies and Donors versus Community or Private Actors or Investors



Source: FAO 2001. The Global Forest Assessment estimates that about 460 million hectares of forests are inside public protected areas and 100 million in developed countries.

NEW SOURCES OF INVESTMENT FOR FORESTS: PAYMENTS FOR ECOSYSTEM SERVICES AND NON TIMBER FOREST PRODUCTS

Ecosystem Service Payments. Emerging ecosystem service markets are a new source of financing for conservation, mostly in private non-state areas. Payments by private companies for environmental services—carbon sequestration, water flow and quality, biodiversity, scenic and cultural qualities of the landscape—are emerging and growing rapidly. However, such investments remain concentrated in the developed countries and are evolving to scale (moving beyond spatially limited pilots) only where legal frameworks exist, tenure and governance structures are stable, and where the environmental values are highest. Moreover, these instruments have been used primarily to finance conservation on private lands. Public lands are not often seen as eligible for such payments since citizens are already financing protection through taxes, although there is experimentation in using carbon payments to help reforest cleared areas within parks and to connect protected areas through biological corridors.

The opportunities and initiatives in developing countries center around four categories of markets and payment schemes: (1) public payment schemes to private forest owners to maintain or enhance ecosystem services; (2) open trading under a regulatory cap or floor; (3) self-organized private deals; and (4) eco-labeling of forest or farm products, an indirect form of payment for ecosystem services (Scherr, White, and Khare 2004). Payments for biodiversity, specifically, can take many different forms. Some markets are local—watershed protection, for example—while others are global. Carbon offsets constitute a global market seeking the cheapest and least risky source of a metric ton. Public payment schemes predominate and these payments can make a significant contribution to conservation as well as local incomes to provide sufficient incentives to maintain forest cover. In Costa Rica, for example, landholders in critical watershed conservation areas are paid between US$30 and US$50 per hectare per year and similar levels of payment are planned in Mexico. In the US, government payments for ecosystem protection range from US$25-125 per hectare per year.

Evolving markets for carbon emission offsets offer an important opportunity to tap private sector and OECD resources to pay for investments in sustainable rural development and conservation in poor regions of developing countries. Land use change and deforestation are major contributors to climate change and poor rural dwellers are likely to suffer the harshest consequences from climate change. Well-designed and sited carbon project investments therefore have enormous potential for supporting biodiversity conservation, the transition to sustainable production systems, and the improvement of rural livelihoods. The Clean Development Mechanism of the Kyoto Protocol provides a very modest first step in this direction by allowing OECD countries to offset up to a fifth of their (very modest) obligations for emission reductions in the first commitment period (2008-2012) through investments in developing country energy or forestry projects. Unfortunately, current limits on forestry project eligibility mean that total resources forthcoming from this source are modest—at best US$200–300 million per year, and, in practice, much less. Moreover, there are significant challenges for low-income communities to capture these resources (Smith and Scherr 2002). This could change if policymakers and rural development and conservation leaders at international, national and local levels actively advocated for and supported climate action that integrates the goals of international conventions regarding climate change, the Conservation of Biological Diversity, Desertification and achievement of the Millennium Development Goals (www.katoombagroup.org/forestcarbon.org).

Markets for Non-Timber Forest Products that Support Community Conservation Efforts. Deriving local income from Non-Timber Forest Products (NTFP) can be an important incentive for community conservation as well as a source of investment funds for this purpose. Recognition of indigenous property rights to forest products is increasing the potential return to communities from their traditional NTFP**.** The scale of NTFP markets is large and growing, although very difficult to estimate reliably and largely under-documented in national economic accounts (Belcher and Ruiz Perez 2003; Marshall, Newton, and Schreckenberg 2003). Globally, it is easily several times the value of internationally traded timber, based on the data for a few visible products like rattan (US$2-4 billion a year in international trade) or medicines and medicinal plants (US$108 billion in international trade). Locally sold and consumed products contribute significantly to local subsistence and incomes and are the bulk of NTFP use and marketing (Scherr, White, and Kaimowitz 2004; Cavendish 2002).

For example, the local market value of palm thatch collected and used or sold as roofing material in the Yucatan Peninsula of Mexico alone is US$137 million per year (Bye 1993). NTFP produce constitute 24 percent of foods in Botswana, 70 of medicines in Sub-Saharan Africa, 25-50 percent of total incomes for families living around the Korup National Park, and bushmeat provides major cash income as well as food security for the millions of forest dwellers in Africa (World Bank Forest Strategy for Sub-Saharan Africa 2002; Wunder 2000). Brazilian forest producers, collectors and cultivators regularly supply 220 NTFP products—140 of them wild—to the daily open market in Belém from upriver sources (Shanley et al. 2002). Many families supplement their livelihoods through the sale of fruits, which in turn improves nutrition and food security and fosters fruit-product based businesses (fruit ices, ice creams, juices) throughout the area.

For community conservation, NTFPs can provide a strong incentive to maintain areas in forest and to maintain a high level of biodiversity. They generate forest income that can be invested in conservation activities. And increasingly, there are examples of communities capturing the values of their NTFP management practices, traditional knowledge, and use. The marketplace rewards this capture with very sporadic, but significant, returns. The Huta of Botswana have negotiated a receipt of 8 percent of all royalties on an appetite-suppressing medicine derived from a root collected and used in their traditional gathering area (Mail and Guardian Online 2003). INBIO, a Costa Rican biodiversity institute and one of the first to experiment with bioprospecting, has amended its pharmaceutical agreements to provide royalties and employment to Indigenous Peoples who are traditional users of many of the plant substances being investigated in a series of agreements and biodiversity collections projects (Laird and ten Kate 2002).

CHANGING POLITICAL DIMENSIONS FOR ESTABLISHMENT AND MANAGEMENT OF PUBLIC PROTECTED AREAS SYSTEMS

It is difficult to integrate conservation and development in protected areas with significant population pressure. Park management models have changed to respond to the pressures from people living in and around protected areas and to the fact that the islands of protected areas are not large enough to ensure the maintenance of the ecosystem or the reproduction of the diversity of species. Park managers are beginning to experiment with ambitious approaches to build local support for conservation and reduce

pressure on high-value protection areas by providing more attractive alternatives than extraction or conversion in the parks and public protected areas. Integrated conservation and development programs (termed ICDPs) were added to park management models to make management of core habitat viable by engaging populations in and around buffer areas which surround core biodiversity of the protected area. Core ICDP elements include building institutional relationships between local people and park management and supporting economic activities that provide alternative livelihoods and approaches to economic activities to reduce those that degrade or destroy the ecosystem to be conserved.

Over time, ICDPs have been modified to bring local people more closely into the design of management models and management activities and not just to buy their compliance and lobby regarding outside pressures. Where buffer zones do not exist or biodiversity depends on movement of flora and fauna over larger landscapes, conservation agencies have tried to develop biological corridors linking sets of publicly declared protected habitat to allow movement of bird and animal species and to ideally manage parks within a larger landscape. A more participatory model has evolved over time, termed adaptive co-management, where local populations are treated as partners and assets for conservation with greater flexibility in activities and more creative institutional arrangements, creating more trust for political alliances between people and parks (Koziell and Vermeulen 2002).

More and more, both ICDPs and adaptive co-management models are taking a landscape approach to conservation. Models for compatible forest use include forests managed for sustainable use with reduced impact logging, modified systems of slash and burn cultivation, the valuing of agroforestry systems and home gardens, recognizing values of secondary forest growth, and applying CITES conventions to commercial extraction. Programs seek to involve surrounding populations in income- generating, monitoring and protection activities, and even improve social infrastructure to raise living standards (BSP 2001; O'Riordan and Stoll-Kleemann 2002).

For some Indigenous Peoples living in and around protected areas, co-management has provided the support of government authority to reduce pressures from outsiders, channel funds for self-development and foster legitimacy in states that do not otherwise recognize ancestral claims to land and resources (Brandon, Redford, and Sanderson 1998; Ribot 2002). A recent analysis of a random set of 200 protected areas conducted by WWF shows that these approaches were effective when they were carried out with adequate financing, adequate training of park staff in participatory approaches, supported by the provision of adequate technical knowledge of potential markets and market chains for alternative livelihoods, and when these are politically legitimate land uses. Unfortunately, these conditions are seldom present in the public protected areas systems (Borrini-Feyerabend 2003; Lynch and Maggio 2000; O'Riordan and Stoll-Kleemann 2002; MacDonald 2003).

Integrated conservation and development approaches and more participatory co-management approaches share an inherent limitation in that they set the rules based on an outside set of values and then encourage local people to "fit" into the protected areas definitions and rules. Because they tend to be planned and implemented in a time frame established by an outsider—a government administration, a donor funding cycle, or a local political cycle— the time frames are often inappropriate to the local organizational processes that are to be fostered (Salafsky et al. 2001). These approaches also miss the opportunities for identifying the

conservation opportunities for biodiversity that is outside of the protected area, and the opportunity of defining biodiversity objectives according to local values and interests. The biodiversity as prioritized by conservationists, who may, for example, focus on flagship species, is different from the biodiversity that supports local livelihoods and which is valued in local cultures, but not inherently more important. Starting from a community set of goals instead leads to a very different plan (Xu 2005; Escobar 1998).

Competing political claims complicate protected areas designation. Politically justifying the establishment or expansion of public protected areas where there is local conflict is much harder in a climate of emerging local and indigenous rights to land and forests. As a number of conservation analysts have observed, the establishment of protected areas in a particular space and at a particular time is as much a political as a scientific decision. (Pimbert and Pretty 1995; Barraclough and Ghimire 1995; Brechin et al. 2003). Historically, this decision was often taken by conservation interests, colonial authorities and/or state governments with little voice or power of local people involved and little recognition of the biodiversity conservation value of traditional livelihood systems (Colchester 1999; Clay, Alcorn, and Butler 2000). Participation was sought after the fact to endorse a priority set elsewhere. In many public protected areas, populations have shifted or grown in size and demands, but new negotiations are difficult or impossible, because a climate of mistrust, originating in the creation of the park, persists. Establishing zones of strict protection limits the options of traditional peoples to establish or regain livelihoods. Where ecologies are fragile and traditional livelihoods depend upon a delicate human-nature balance, it is often difficult to devise alternative livelihoods once the original way of life and related ecological knowledge are lost (Colchester and Griffiths 2000).

Some protected areas have resulted in lost livelihoods and displacement. Conservation literature also documents the cost of compensating or replacing traditional livelihoods. For example, Masai pastoralists in Kenya, like a number of African pastoral societies, responded to grazing restrictions in the Serengeti reserve by expanding agriculture. This increased competition over crops with a growing park population of elephants, and eliminated cattle-elephant balances that had controlled wild mammal reproduction in the savannas historically (Barrow, Gichohi, and Infield 2000). In Latin America, 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). In the African tropics, 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 a lack of land and resource bases for the poor elsewhere (Adams and McShane 1996).

In an environment of stable or declining finance, conservation authorities have underestimated – and continue to underestimate – the cost and livelihood impacts of restricting these areas on local people's assets and livelihoods, particularly in the event of weather or politically induced crises. Even less attention is paid to the repercussions on settlements that become unwilling hosts of displaced populations (Geisler 2002 and 2003). Local people make more demands for what they deem fair compensation, not only for existing assets and the cost of resettlement but foregone rights and negative livelihood impacts. Yet, the costs of such compensation can be prohibitive. More than 800,000 people are illegal residents of India's protected areas, many of them indigenous peoples, and 3 million people would have to be resettled to conform to current conservation legislation (Khare et al. 2000). In just the Lake Mburo National Park of Uganda, the estimated

value of income foregone from restricted access to traditional resources is calculated at US$1,465,000 per year (Barrow, Gichohi, and Infield 2000). Economic studies of protected areas often miss the additional costs for host communities receiving resettled populations, the cost of foregone livelihood strategies, or the cost of delays in implementation (Cernea and Schmidt-Soltau 2003). Communities waiting to be "moved" can become "stateless" in the interim with no compensation for this loss of status and rights. In addition to economic losses, these communities also face the loss of "cultural identity".

A telling example comes from South India where six villages in the expansion area of a tiger reserve were left waiting for 14 years to be resettled. During that time, they had no access to rural development investments, were left with virtually no social services, were excluded from tribal development income transfers and were assigned to no local government jurisdiction to claim their rights. Resettlement plans take no account of these lost assets (Ghate 1999; see **Box 9**). This story is repeated in numerous countries due to the inability of state institutions to address the problem of jurisdiction over such villages and delays in implementation (Geisler 2002).

Box 9 – 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 Ghate studied six villages in the Tadoba-Andhari Tiger Reserve in Maharastra state that have been awaiting resettlement under the Wildlife Protected Act (1972) for 14 years. As potential resettlees, 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 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: Ghate 1999.

Conflicts are arising over land and forest rights and livelihoods of the poor. In a climate of growing requests for recognizing land and forest rights, governments are less able to enforce protected areas boundaries, particularly in conflictive situations (Neumann 1998; Richards 2002). The inability to enforce the rules can stem from a lack of resources and a related lack of training of park personnel appropriate to the pressures, as well as a contested legitimacy of governments and conservation agencies establishing state sovereignty over these resources. Many parks still do not have their lands systematically adjudicated or demarcated and subsequent recognition of ancestral claims has created overlaps in some countries. Policies designed to control illegal activities, such as timber logging bans, have often proven counterproductive because powerful political interests continue to find means to log the forests while more vulnerable poor and small-scale forest producers have been unable to find alternative sources of livelihoods.

Recent studies of logging bans and subsequent expansion of reserve boundaries in the Monarch Butterfly Reserve in Mexico show that these policy measures eliminated economic opportunities from forestry for all

communities, even those with sustainable harvesting practices, while not effectively stopping illegal harvesting. Compensation packages further skewed equity as they were not equal to value of the timber forgone by communities in the buffer zone and included only communities with active timber harvesting permits, not all communities with forest rights (Merino 2003). Comparative studies of logging bans in other parts of the world prove these to be generally less effective and less equitable than negotiating a middle ground for sustainable use (Contreras-Hermosilla 2002; Richards 2002). As in the case of other misapplied regulations in many forest-rich countries, elites continue to break the rules while the poor suffer.

An increasingly popular conservation approach is the creation of private reserves, often encouraged by tax and other incentives. There is considerable controversy around the equity and potential scope of this alternative. With regards to the scale of conservation goals, it still represents a very small portion of biodiversity and forest habitat protected. Second, private reserves entail important concerns around equity—both concerning capital flows from developing country governments to often wealthy private owners of areas to be reserved and the rights of other stakeholders in the society to the same resources. In developing countries, there is a danger that private reserves become a means of legitimating land concentration by elites or of permitting control of land and forests by well-meaning foreign conservationists. Currently 23 percent of Latin American private reserves and 33 percent of those in Africa are actually foreign-owned (Pretty 2002; Colchester and Griffiths 2000). There are many reasons to take a serious look at community conservation as a complement or, in some places, alternative to a private protected areas system.

COMMUNITY ENGAGEMENT IN CONSERVATION SCIENCE

A critical emerging issue is who decides what should be conserved and how it should be conserved. Control over and participation in research and monitoring of biodiversity and in developing strategies for conservation are key enabling conditions for communities. Their participation in research creates local capacity and results in different questions being asked and different answers emerging.

Currently, local people are marginalized in the research process. A 2000 literature review of research on ethno-botany and indigenous practices in large intact forest areas of the Andean and Amazon region (Type 1) revealed that more than 95 percent of the research findings were unavailable in local languages or in public venues to which indigenous peoples and forest dwellers had access (Berelowitz and Martinez 2000; World Bank 2000). Conversations with key indigenous leaders representing stakeholders in international environmental policy forums revealed that despite their high level of engagement in policy areas, they had little access to knowledge about the negative impacts of their current hunting and wildlife management practices due to the poor dissemination of study findings and were therefore not helping local communities to modify practices – even in quite intact forest areas (Katrina Brandon, personal communication).

The US communities in forested regions and upper watersheds whose livelihoods have traditionally been linked to the forest industry or to the collection of wild non-timber forest products from private and public lands have coined the term "civic science" for an alternative model of participatory conservation research (Barry et al. 2003; Aspen Institute 2002). Civic science is a very powerful tool for these forest communities, defining a relationship with academic scientists and technical resource professionals in which the community

is a partner in identifying the nature of the problem and designing action-oriented research. Research topics relate strongly to restoring habitat (Type 4) and commonly include sustainable harvesting of commercial NTFPs, watershed management, market opportunities for locally produced products, labor relationships and job creation in traditionally timber-based local economies, and local implications of natural resource and forest policies (Brown and Williams 2003). Non-timber product collectors in public forests can also identify policy contradictions that escape unconnected authorities. A recent study of medicinal herb collection practices in public forest lands elicited the contradictions of fining small-scale collectors for failing to renew permits in an area where the public works department regularly razed mature herbal stocks in road maintenance and nearby goat graziers legally herded large numbers of animals in the same plant growing range. Until the release of this study, local forest scientists were oblivious to the issue (Jones, McLain and Lynch 2004).

In "civic science" the knowledge and rules governing research and its application reflect the central role of local people in controlling the process. Their values underlie knowledge creation and dissemination. Because communities and local resource users are those most interested in conservation and livelihoods over the long-term, it is much more beneficial and cost-effective to invest in building their capacity to take on roles many parks assign to expatriate or city-based researchers and staff. Community engagement also leads to greater sharing of existing knowledge.

Box 10 – Research Policies for Community Conservation in Panama and Brazil

The Proyecto de Estudio para el Manejo de Areas Silvestres de Kuna Yala (PEMANSKY) and the Association of Employed Kunas (AEK) of Panama have produced an information manual for researchers on scientific monitoring and cooperation. This governs their 60,000-hectare forest conservation reserve established at their initiative in 1983. Kuna objectives are outlined with regard to forest management, conservation of biological and cultural wealth, scientific collaboration, research priorities, and guidelines for researchers. Collaboration with Western scientists is encouraged for basic ecological research, botanical and faunal inventories, and the study and recording of Kuna traditions and culture. Research is designed to provide the Kuna with information useful to them and under their control.

The Woods Hole Research Centre/EMBRAPA research project in the Eastern Amazon carried out with researchers from CIFOR, Indonesia, has been "giving back" the research findings on analyses of the scope and returns from the extraction and the marketing of timber and non-timber forest products in the Capim River basin in Para, Brazil. Before completing scientific research publications, the research team and a group of local community leaders captured and presented the findings on the costs and benefits of logging and non-timber forest product based economic activities in visual and graphic form to collectors. Presentations were designed to help them make more rational decisions as to whether to permit logging of trees rather than managing their forests for other products, including extractive harvesting practices for these non-timber products. Recognition of the higher value from non-timber forest products and of the declining availability of products has led to important changes in community decision-making.

Sources: Laird and Noejovich 2002; Shanley et al. 2002.

For example, in Mesoamerica communities in landscapes with forested fragments invest in training young community members in specialized fields to provide them leadership training and comparative experience to better fill future leadership roles. When they can build on indigenous ecological knowledge and scientific training, local communities may develop solutions to biodiversity conservation challenges very different from

those conceived by outsiders (Cortave 2004; Garí 2000). Mesoamerica has pioneered the development of inter-country indigenous community management standards and sought their acceptance by resource professionals. Outside criteria can miss important local values—e.g. Mexican enterprises prioritize job creation over production-cost efficiency and job rotation for future leadership development over specialization. Management practices favor sacred and culturally important species that outsiders would overlook. Training local people to undertake biological monitoring enriches the knowledge base and generates employment to reduce resource pressure.

4. ENABLING CONDITIONS FOR COMMUNITY-DRIVEN CONSERVATION

Community conservation is no more a panacea for biodiversity conservation than public protected areas, but trends suggest that communities will soon own far more of the world's forests than can be found in protected area systems. The question is how to best support these community owners and administrators so that they can optimize their conservation decisions and forest management as resource stewards. Experience suggests a minimum set of enabling conditions can advance community conservation and make the difference as to whether community efforts can succeed and sustain the commitment to conservation goals in a complex world. Key enabling elements include:

1. secure tenure rights and resource access, respecting Indigenous Peoples rights,
2. flexibly channeled finance to complement local initiatives, rather than planning or designing models from outside or governing from above,
3. adequate institutional, regulatory and policy support and the flexibility to grow local community institutions,
4. access to markets, including green markets, that value community products and the multiple values that are produced along with these products, and
5. engagement of communities in conservation science and research partners.

SECURE TENURE AND MANAGEMENT RIGHTS

Secure tenure and resource access rights are crucial to the success of community conservation initiatives. Some governments have recognized significant forest areas as indigenous and ancestral domain. This includes forest agriculture mosaics where communities manage complex systems of seasonal pastoralism, shifting cultivation, multi-canopy homegardens and successional forest management with high incidence of biodiversity. In other cases, tenure has been recognized, but with so many restrictions on access and use that these areas remain effectively under state or local government control, distorting markets, livelihoods and local incentives (Ribot 2002; Anderson 2002).

It is time for serious and comprehensive reflection on tenure rights. 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 creation of environmental goods and services. Appropriate tenure respects the multiple definitions of biodiversity, both those as defined by outside scientists as well as those defined by local cultures and users (Escobar 1998).

State tenure or co-management can be a valid model where outside pressures are too great for local people to control, e.g. Madre de Dios in Peru (Type 1) where Indigenous Peoples have lobbied for a state reserve with an Indigenous presence to help them achieve tenure security with protection from outsiders. However, where outright tenure for local communities is feasible, ownership can have a tremendous impact on the incentives

for communities to practice sustainable production methods (both in extensive forest areas with indigenous territories, Type 1, and in forest areas of new agricultural settlement, Type 3). Land tenure not only empowers communities to make good sustainable use decisions, but also enables them to have more bargaining strength vis-à-vis other actors (White and Ellsworth 2004). In lands with historical and ancestral claims, tenure is a right which needs to be respected as well as a positive force for long-term resource management. In frontier areas new rights need to be established and in more intensively managed areas with fragmented forests, Type 2, where traditional demographics are shifting, a new definition of tenure rights may be needed to reflect changing settlement patterns. Those protagonists of expanding public protection to new areas would do well to examine the lessons of the communities in areas of restoration (Type 4) where, significant numbers of communities have nurtured successional forests in degraded "state forest lands" as well as in privately owned, abandoned agricultural lands despite lack of official recognition of tenure rights.

In addition to granting tenure rights, governments must see to it that these rights are protected via access to a fair and efficient legal regime to deal with disputes. Local communities must have legal recourse in case their tenure rights are violated. Tenure rights amount to very little if property cannot be secured from outside abuse. Additionally, the government must be willing and able to enforce legal findings. Community conservation works best where judicial institutions are able to hear and act upon cases and claims and where the tenure information base is adequate to make appropriate judgments on tenure rights.

ACCESS TO MARKETS INCLUDING GREEN MARKETS

Forest communities must be able to ensure secure livelihoods if they are to protect their forests and invest in forest conservation. Sustainable sources of income from the forest will usually be a critical component in this matter (together with sustainable agriculture in part of the landscape mosaic). Much more can be done to support community livelihoods and enterprises through access to markets. The literature on community forestry abounds with examples of restricted access to harvesting, onerous and expensive systems of permits and approvals, state monopolies on sales of forest products, capture of environmental service benefits by governments or outside parties, and lack of negotiating power in setting and modifying policies and rules. Yet there are interesting new green market opportunities for communities which can give a preference to socially responsible products generated in harmony with local values. Until now, these constitute a very small share of community market options and will need to be developed more equitably if communities are to access them and have a voice in defining them.

Make forest market policies and regulations favorable for communities. In this changing climate, policy and regulatory frameworks can have a sizable impact on the success of biodiversity conservation. Again, there is a need to conceptually re-think regulatory frameworks designed for a very different historical situation (Scherr, White and Kaimowitz 2004). Expensive resource management plans, requirements 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 in India ten-fold in some regions. Markets for NTFPs are notoriously restricted in most geographic regions, leading to low returns, inefficient collection and marketing, control of prices by monopoly traders, inability of local people to develop processing or value-added processing by legal means, or competition with substitute products that have favorable subsidies. Plantations established to generate a commercial supply of wood are often subsidized directly or indirectly undermining market competition with wood produced in natural forests (Bull et al. 2004).

Create pro-poor policies and rules governing new markets for ecosystem services. One of the biggest opportunities for financing community-driven conservation are markets for ecosystem services such as watershed protection, biodiversity protection, and the sequestration and storage of greenhouse gases that are causing climate change. Payments for ecosystem services can finance community protected areas as well as create supplemental incentives for the long-term conservation management of biodiverse forested landscapes. As these markets develop, it is critical to get the rules right to enable communities to benefit (Scherr, White, and Khare 2004).

Pro-active efforts are needed to design and implement payment systems in ways which enable low-income producers to participate and which favor developing countries. Key elements include establishing legal frameworks, securing property rights and the rights of local people to sell services. They also include ensuring access to market information, designing payment and operating systems to include small-scale producers and contracts, and constructing bundling mechanisms to reduce transaction costs. Markets for ecosystem services should increasingly be linked to community-conserved spaces where long-term commitment is potentially high and transaction costs can be lowered by the strength of local social systems and institutions.

Facilitate markets for sustainable timber production. One way to recognize conservation efforts where forest communities are engaged in timber and non-timber extraction (and some processing) is forest certification. Forest Stewardship Council certifiers have worked with donor-funded community forestry programs in Latin America to certify small-scale timber and non-timber enterprises in Mexico, Guatemala, Brazil and in a few other countries in this region and outside of it. Certification has helped a number of these communities gain recognition from environmental groups and governments that they are maintaining important environmental values in their forests. Until now, however, this process has been expensive for communities and consumers have not favored products from community-managed natural forests over more inexpensive certified wood from plantations or large-scale operations where the certification costs are more easily absorbed (Molnar 2003). Should community eco-management standards become a part of forest certification standard-setting and the process increasingly cost-effective, this could be an important marker of community management.

Facilitate markets for non-timber forest products. Internationally traded non-timber forest products exceed US$85 billion annually. The 1985 value of plant-based medicines in developing countries was US$45 billion. Much of this use is based on original knowledge gathered from Indigenous Peoples, less than 0.001% of the value of which has been returned to the appropriate Indigenous Peoples (Posey 1999). Opening of markets for NTFPs, which account for as much as 25 percent of the income of perhaps one billion poor people, can have a very high payoff and create assets for community forest conservation and allow for better monitoring of the impacts of controlled extraction (Scherr, White, and Kaimowitz 2004; Belcher and Ruiz

Perez 2003). Adaptive co-management models have explored the potential of livelihood and commercial returns from non-timber forest products to sustain community conserved systems but have been constrained by the limited opportunities available to them in the environs of a specific public protected area, the negative ramifications of government policies and regulations that distort markets and market access, and the artificial timeframe for developing enterprise opportunities resulting from expectations of donor and project cycles.

Outside of the public protected areas, there are some excellent examples of NTFP enterprises, especially where new opportunities have been created by the deregulation of NTFPs and lifting of monopoly arrangements. 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. In the program area, biodiversity in fact increased as producers now had both incentives and income to invest in improving their resource base (Subedi 2002). Applied research programs in the Brazilian Amazon have used broad dissemination of information on collection techniques and market opportunities to help collector communities make sounder choices on the tradeoffs between harvesting different products for the range of markets and product end-users. Mexican forest enterprises are experimenting with value-adding initiatives to ensure higher returns from their products in competitive markets.

Forest certification standards currently exist for 36 NTFPs with international trade value, many of which can be found in the Brazilian Amazon. There is broad scope for establishing standards for other internationally traded products with stable markets and sufficiently understood sustainable management criteria. Ethical collection standard systems are also in place in a number of countries for specific products and harvester associations. These provide potential access to fair trade and other labeling, including organic production.

On the positive side, there is a trend in the increased consumption of ethnic foods and products by middle classes in the developing countries and more interest in the social and environmental values of local production. Water bottling enterprises in Mexico, medicinal products in Ayurvedic and homeopathic systems, wild fruit consumption in sweets and juice drinks or cosmetic botanicals in Brazil are all likely to increase in volume with more market testing and consumer awareness. On the negative side, NTFP product markets are volatile and communities must be flexible to adapt to changing demand and supply for products, to shift markets when there is substitution in their traditional markets and to find ways to reduce costs of reaching more distant markets. These markets are rapidly growing, however, on a global scale. Even in communities where NTFP sales will not be a main source of income, appropriate mix of NTFP in livelihood streams can make the difference between the ability to sustainably conserve a community's resource base and losing ground.

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; and
- branding in socially responsible markets (Scherr, White and Kaimowitz 2004).

INSTITUTIONAL AND POLICY SUPPORT FOR LOCAL CONSERVATION INITIATIVES

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 institution-building support and technical assistance. Successful networks link communities to one another for horizontal learning exchanges and alliances across larger landscapes.

Rethink Policies and Strategies. Institutional rethinking and new conceptual models are needed at the level of policy and regulatory frameworks as well. The protected areas model was designed in a historical context of land-use zoning by centralized government administrations whereby protection and conservation were conceived as primarily a government or state responsibility to control over-extraction. In the process of decentralizing and devolving 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.

Eco-management is expanding in the agricultural landscape with models of shade or organic coffee production, such as have proved successful in Mexico, El Salvador, Guatemala and Costa Rica, and which are very bird and biodiversity-friendly. Environmental policymakers have paid relatively little attention to these alternatives as models of biodiversity conservation deserving public support comparable to that provided for protected areas (Toledo et al. 2001). Most public support for conservation and forest management is designed to meet the agendas of actors outside local communities, rather than designed to support existing conservation initiatives at the local level.

Provide strong institutional support. Mexico and Brazil have begun to actively explore alternatives. The Mexican government and non-governmental outreach organizations and federations have several support programs for community forest enterprises, both indigenous and peasant-run. One government technical assistance program works in all forest-rich states with complementary matching finance from state and local governments. As a complement to support forestry enterprises, Mexico is setting up pilot environmental service payment schemes for watershed protection and exploring carbon markets, as well as linking existing programs of state development funds to the creation of biological corridors in the south. These initiatives

recognize the multiple values of the forest and the potential of poverty alleviation in enlisting local support for forest conservation. A much broader range of business support services are needed to enable communities to compete, such as accounting skills, business organization, financial planning, etc. These could come from the government initially and eventually from the private sector.

A dialogue is emerging in Brazil to find more cost-effective strategies for conserving the Amazon and Atlantic forests with active lobbying by Indigenous Peoples and groups of extractivists and agriculturalists to channel more conservation finance to their initiatives and lands, rather than concentrating protection on new reserves and industrial-scale timber concessions. Green markets are providing new incentives for environmental restoration and management in the forest agriculture mosaics of Asia, Latin America and Africa. They are also generating new sources of non-regulatory incentives for conservation. These involve partnerships with the private sector and require a new form of government support and regulation. A few forward-looking wood-processing companies are partnering with these enterprises to enter certified forest markets with social products.

Theses developments are consistent with the trend of decentralizing responsibilities for biodiversity conservation, particularly in countries with limited protected areas budgets and related financing. Honduras has reconfigured its national protected areas system, identifying a limited number of areas which are of national significance and priority, and devolving responsibilities over time to local authorities and stakeholders. The tenure and use rights of Indigenous Peoples in protected areas in the agricultural frontier have led to participatory analyses of potential co-management strategies and greater attention to livelihoods and indigenous institution-strengthening.

Engage Communities as Leaders and Partners in Conservation Science. The emerging examples of participatory or community-focused research provide a wealth of approaches for engaging community members in the science of conservation. Examples to follow include:

- participatory biodiversity research monitoring as practiced by the Inuit in their territories in Canada and the Kuna Comarcas in their territories in Panama (Laird and Noejovich 2002)
- mapping and conservation planning in the still forested regions of the Bolivian Amazon (Field Museum and University of Pando collaboration with Pando extractive industries communities; Alcorn et al. 2004)
- studies of NTFP products in the Brazilian Amazon (Belém marketplace) in collaboration with collectors and enterprises, disseminated to semi-literate and illiterate communities and producers in a user-friendly format to promote community-driven sustainable harvesting techniques and controls for commercial products (Laird 2002) and
- regional market promotion and management exploitation by U.S. communities in forest regions once controlled by large-scale industry or government forestry operations (Jones, McLain and Lynch 2004).

Training of young research paraprofessionals and professionals with "civic science" approaches enables community members and leaders to conduct research with outsiders. Resulting findings of such approaches favor local value systems, build on traditional knowledge, find locally acceptable solutions to over exploitation, and identify species that outsiders would ignore.

5. CONCLUSIONS

Only recently has the potential for community-driven conservation as a response to the threats to the world's biodiversity begun to be explored. Our preliminary analyses estimate that the current scale of community conservation in the world's forested areas is at least equal to the area currently under protection in the public protected areas systems, the scale of community conservation is probably two to three times as extensive as protected areas, including landscape mosaics, especially in the developing countries. Traditional peoples in large intact forest areas make up a significant part of this community conserved area (Type 1 in our paper). But significant habitat and species conservation takes place in the large connected patches of fragmented forests found in more actively farmed and managed forest landscapes (Type 2). Frontier settlers are adapting their land use to conservation goals and opportunities in a surprising number of cases (Type 3).

An analysis of geographic information through remote sensing and digitalized mapping has documented significant restoration of forest and habitat in upland and dryland landscapes with more intensive agricultural or protected pastoral use, even with growing population densities (Type 4). This is good news, for protected areas cannot protect enough of the species, habitat and ecosystems that are under threat.

Community conservation has not received the attention it deserves, however, in terms of government policies or international and local action. A range of different approaches to biodiversity exist and forest conservation in a complex world of competing priorities, multiple pressures on landscapes and species, and continued high levels of poverty in many parts of the globe. Clearly, simply expanding public protected areas to cover the range of priority biodiversity is not an option. Developing country governments are not in a position to maintain the protected areas already in place, let alone create significant new ones in the face of a continuing decline of ODA devoted for that purpose and limited national budgets. While other sources of financing remain level or are declining, communities' contribution to the forest sector has increased rapidly and reflects the positive benefits that emanate from recognition of their rights and the decentralization of forest management. Currently, communities constitute the largest single source of investment for forests: greater than ODA or public expenditure on forests. Community investments are especially significant in biological monitoring, demarcation of conservation set-asides, fire control, community protection vigilance, community assemblies involving conservation dialogue, and management measures to enhance biodiversity.

This paper presents a preliminary scoping of the scale of community conservation, as well as an exploration of associated issues and steps that can be taken to strengthen this contribution to forest conservation. Community conservation builds upon traditional systems that provide positive models and develops new adaptive management models where there is a potential synergy between people and nature. The advantages are many:

1) a commitment of resident peoples to biodiversity conservation and a willingness to invest over the long-term, reducing the costs of conservation;
2) income generated to reduce poverty, sustain livelihoods and reduce pressures;
3) a wider range of ecosystems and biodiversity protected across biological corridors and political boundaries;

4) an approach consistent with movements for Indigenous Peoples' greater land rights and for asset creation among the poor;

5) an approach that facilitates the application of indigenous ecological knowledge to management and protection;

6) more local employment and expertise created for biodiversity conservation, complementing expertise in parks and forest agencies and reducing dependency on top-down initiatives;

7) more financial resources mobilized, increasing the available funds for ecologically critical protected areas.

In sum, community conservation increasingly makes sense as a key biodiversity conservation strategy both because of its potential to conserve more ecosystems and species than can be publicly protected inside parks and reserves and because it reduces the pressures on forests while increasing incomes and respecting people's rights. It also makes sense because it broadens the resources that can be brought to bear—government, civil, and local institutions in addition to local, national and international sources of financing.

More of the limited available forest and conservation financing needs to be invested in community conservation areas, thereby matching community investment in the multiple goals of resource conservation and enhanced livelihoods. Actions need to be tailored to the specifics of the different characteristics of the community conservation areas. The most important finding from the case material is that tenure security and rights to the forest resource and its products need to be strengthened to create the long-term security and incentives for local management. Many of the boundaries of private, community and public forests were drawn in an earlier period of history and no longer reflect the opportunities at hand. Management categories within the public forest estate need to be updated to reflect current realities and opportunities—in some cases this brings about dramatic changes in tenure recognition and new integration of management with the larger landscape.

Communities offer institutional alternatives. Some traditional communities in large intact forests (Type 1) require secure tenure rights and support for building local institutions and skills for better conservation outcomes. Others require stronger partnerships with 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 and economic strategies with titive advantages that outside models too often seek to change, rather than replicate. Newly settled communities in forest areas (Type 3) tend to require more outside assistance to develop their management structures and seek viable enterprises, but can draw upon an existing or adapted knowledge base that is often underestimated. Communities that are actively restoring forested landscapes or agriculture-forest mosaics (Type 4) often 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 an important input, one that 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 local community managers and the next generation of community leaders are able or supported to perform these roles, the more forest conservation will be effective and sustained.

There is a clear need to re-examine global forest conservation conventions and mechanisms to ensure that these foster and support community conservation. 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 important initiatives; however, without parallel regulatory or policy reform, community actors find that their subsistence and commercial activities are not recognized or permitted, undermining their incentives for long-term management and conservation. Community voices have been introduced into international fora, but often are limited to a few representatives with insufficient resources to enable communities to form respected opinions or exchange views within and across regions.

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 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.

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ANNEX 1

Table 3: Examples of Community-Driven Conservation

Conservation by Long-Settled Organized Communities with Large Contiguous Areas of Natural Habitat

Country/ Region	Title	Area in Hectares	Description	BioRegion	Source
Mesoamerica	Mesoamerican Biological Corridor	76,999,000 (km^2)	Land tenure is being strengthened to bring locals into the process of creating the corridor over 350 landscapes, it is a regional strategy for sustainable development based on the conservation and sustainable use of biodiversity and natural resources	Mesoamerican Pine-Oak Forests, Talamancan and Isthmian Pacific Forests	Rivera et al. 2002
India	Great Himalayan National Park Conservation Area	117,100 (km^2)	Pastoralism is the dominant livelihood of the local population, the creation of protected areas that prohibit grazing would be harmful in that remaining areas would suffer from overgrazing thereby devastating biodiversity and the welfare of the local communities	Western Himalayan Temperate Forests	Mehra and Mathur 2001; Borrini-Feyerabend 2003
Mexico	Community Forest Enterprises	7,000,000	Megadiverse landscapes with important corridors in landscapes with organic agriculture, shade coffee, homegardens, forests, endemic pine-oak forests	Mexican Dry Forests, Mesoamerican Pine-Oak Forests	Bray and Merino-Pérez 2002; Chapela 2000
Brazil	Indigenous Reserves	1,000,000	Indigenous Reserves are compared with protected areas and no real difference is found in the forest canopy. Indigenous Reserves are found to be just as effective at preserving forest cover as protected areas.	Southwestern Amazonian Moist Forests	Bamberger et al. 2003
Peru	Sira Mountain Range		Biological indicators related to hunting activities of the Ashaninka	Central Andean Yungas	Berelowitz and Martinez 2000
Madagascar	Manambolo Valley	5,500	Restoration of land tenure and traditional forestry management systems	Madagascar Forests and Shrublands	Isely and Scherr 2003
Cameroon	Batoufan Sacred Forests		100 independent chiefdoms in Western Cameroon control access to sacred groves with high biodiversity; access to the forests is strictly controlled by the local communities.	Western Congo Basin Moist Forests	Nelson and Gami 2002; Borrini-Feyerabend 2003
Ecuador	Cofan Bermejo Ecological Reserve	50,000	Legalization of land tenure for local communities in an effort to preserve their sustainable management of the forests and prevent intrusions from outsiders.	Northern Andean Montane Forests	Oviedo 2002
Belize	Seven Biological Corridors		Integrated ecosystems, megadiverse	Mesoamerican Pine-Oak Forests	Rivera et al. 2002

Nepal	CFM in Western Nepal	100,000	43 forest user groups, management systems for essential oils and traditional bark paper developed which enhance forest health and maintain biodiversity while improving markets and prices for these NTFPs; model and market benefits are expanding to another 100+ villages replicating the experience	Western Himalayan Temperate Forests	Subedi 2002; FAO 2001; Burch, Singh, and Kanel 2003
India	Van Panchayats, Uttar Pradesh		5000 villages, state revenue department forests assigned in the 1930s to customary users for management; interspersed with national forests where rights are much more restrictive and therefore face artificial pressure on resource use; despite pressures from population growth and some continued forest degradation a strong relationship to the resource base with 30-60% under forest cover compared to 40-50% of reserve forests under forest cover.	Terai-Duar Savannas and Grasslands	Sarin et al. 2003; Khare 2003
Canada	Iisaak Joint Venture	87,000	Timber and forest tenure enterprise in Clayoquot Sound, BC, 9 Nuu Chau Nuuth tribes; FSC-certified temperate rainforest with environmental standards agreed on by board of joint venture	Pacific Temperate Rain Forests	Baird and Coady 2000
USA	Appalachian NTFP		Sub-temperate and temperate forests; population density of 10-50/km^2; agroforestry practices have created "islands of forest" and "thickets within savanna" over the past 4 decades through deliberate human activity	Appalachian and Mixed Mesophytic Forests	Rural Action and the Community Strategies Group 2002; Jones, McLain, and Weigand 2002
Indonesia	Sumatra rubber agroforests		Ecoagriculture applications to rubber agroforestry, agroforestry resemble natural forest and house a high percentage of natural animal and plant species including the orangutan	Sumatran Islands Lowland and Montane Forest	McNeely and Scherr 2003
Indonesia	Agroforestry		Traditional agroforests in tropical landscape where mix of species and incidence of flowering plants and fruits is due to human interaction	Borneo Lowland and Montane Forest	ASB 2003; Poole 1995; McNeely and Scherr 2003
Philippines	Mapawa Landcare Unit		Mindanao island near Mt. Kitanglad Range NP, several hundred farmer groups, agroforestry system that includes annual crops, fruits, eucalyptus for fuel and construction and respect for NP conservation	Philippines Moist Forests	ASB 2003; Garrity et al. 2001
Italy	Community-Managed Forests		Local communities in the Val di Fiemme have been sustainably managing the forests since well before Roman times; local management institutions very strong and local communities have always resisted attempts by the state to influence the management of the forests.	European-Mediterranean Montane Mixed Forests	Merlo 1995; Borrini-Feyerabend 2003
Ghana	Sacred Groves		Local communities protect and conserve local forest groves as places of spiritual and cultural significance.	Guinean Moist Forests	IIED 1994

Community Conservation in Agricultural Frontiers

Country/ Region	Title	Area in Hectares	Description	BioRegion	Source
Guatemala	Community Forest Concessions	500,000	Forest concessions created around the Mayan Biosphere Reserve and awarded to communities willing to undergo forest certification as an independent measure of sustainable forest management; communities comprised of indigenous and non-indigenous settlers into the Petén region of Guatemala who have adapted to the Petén ecology over the protected past decades.	Mesoamerican Pine-Oak Forests	Soza 2002; Cortave 2004
Honduras	Tawakha Biosphere Reserve	250,000	5,000 indigenous residents and increasing immigration on frontier; one of last intact rainforest habitats in Central America of high relative biodiversity; indigenous peoples seek co-management to ensure tenure security vis-à-vis powerful encroachers	Mesoamerican Pine-Oak Forests	Berelowitz and Martinez 2000; Rivera et al. 2002
Peru	Amarakaeri Reserve Zone in Madre de Dios		Indigenous-state partnership for securing land rights and controlling encroachment from the agricultural frontier and extractivists; traditional zoning carried out	Napo Moist Forests	Oviedo 2002; Gonzalez and Arce 2001
Colombia	Mataven Forest	970,000	A population of 10,449 constitutes 16 indigenous resguardos that form a collective belt surrounding the forest; by establishing indigenous territories around a protected area, the hope is to contain colonization by coca growers on the western edge of the forest.	Rio Negro-Jurua Moist Forests	Oviedo 2002

Community Conservation in Intensively Managed Working Landscapes

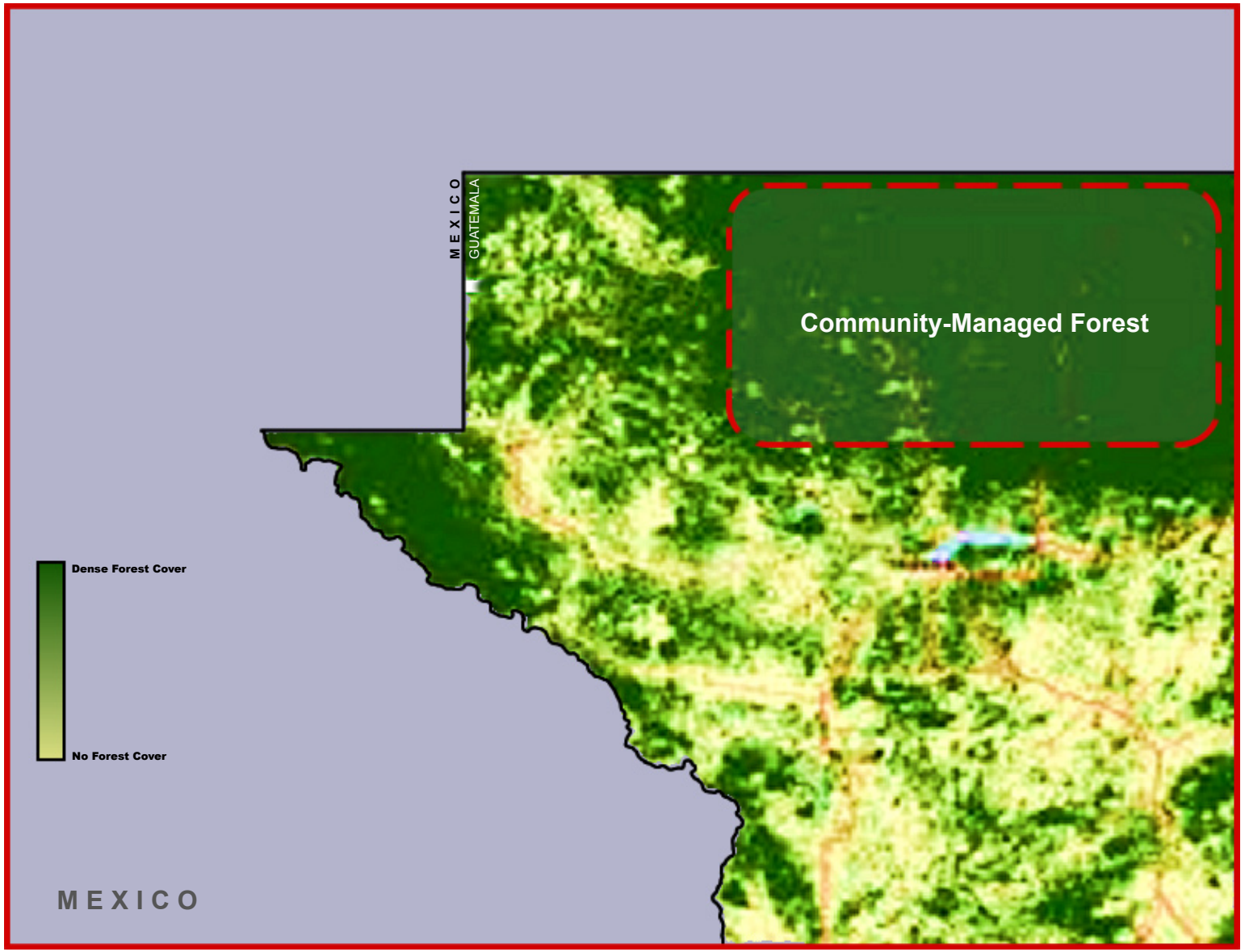
Country/ Region	Title	Area in Hectares	Description	BioRegion	Source
Guinea	Forest savanna transition zones		Agroforestry practices have created "islands of forests" and "thickets within savanna" over the past 4 decades through deliberate human activity	Guinean Moist Forests	Fairhead and Leach 2003
Australia	Farming for the Future		New South Wales farming families discuss ways in which farm management practices can enhance the farm's natural environment and make the farm more robust against impacts such as climatic variation and insect attacks	Southern Australia Mallee and Woodlands, Eastern Australia Temperate Forests	MacDonald 2003; Sutherland and Scarsbrick 2001
India	Wahdi system		Wahdi system introduced as a means to implement ecoagroforestry for poverty reduction for formerly landless communities		Isely and Scherr 2003
India	Orissa Community-Managed Forests		806 illegal villages in Orissa province have successfully reforested over 45,000 hectares by their use of sustainable forest management	Eastern Deccan Plateau Moist Forests	Singh and Sinha 2004
India	Joint Forest Management	12,000,000	Concentrated in degraded areas but covering some forest types with potentially megadiverse ecosystems; lessons are applicable to high forests should Indian policies change	Eastern Deccan Plateau Moist Forests	Khare et al. 2000

Table 4: Summary Table Estimating Extent of Community Conservation by Sub-Region

Subregions covered are Africa, Asia, and Latin America – not including Europe and the former Soviet Union or Australia; conservative estimates from existing literature, excluding homegardens, plantation areas, agroforestry system and most pastoral grassland systems		
Asian Region *195 million hectares*	**African Region** *35 million hectares*	**Latin America and North America** *182 million hectares*
12 M ha. Joint Forest Management India; double in unrecognized state forest areas 1 M ha. sacred groves India, Nepal 5 M ha. community forests in Nepal, Bangladesh, Bhutan, Pakistan 60 M ha. community/successional forests in Indonesia, Malaysia, Philippines, New Guinea 90 M ha. collective forests in China 3 M ha. Thailand, Vietnam, Laos forestry 4 M ha. forest agriculture mosaics in SE Asia and Indonesia; 10 M ha. in India, Nepal; 20 M ha. in China	14 M ha. village and collective forests 20 M ha. forest agriculture mosaics 1 M ha. sacred groves	130 M ha. indigenous lands Amazon; 25 M ha. indigenous/ejido management Mexico 3 M ha. indigenous community lands Central America/Colombia 2 M ha. indigenous forests Andean region 10 M ha. forest agriculture mosaics in South America 8 M ha. tribal forests 4 M ha. traditional territories of first nations bands in forested landscapes
Total community conservation at least 370 million hectares in forests, agroforests, and forested landscape mosaics.		

ANNEX 2.

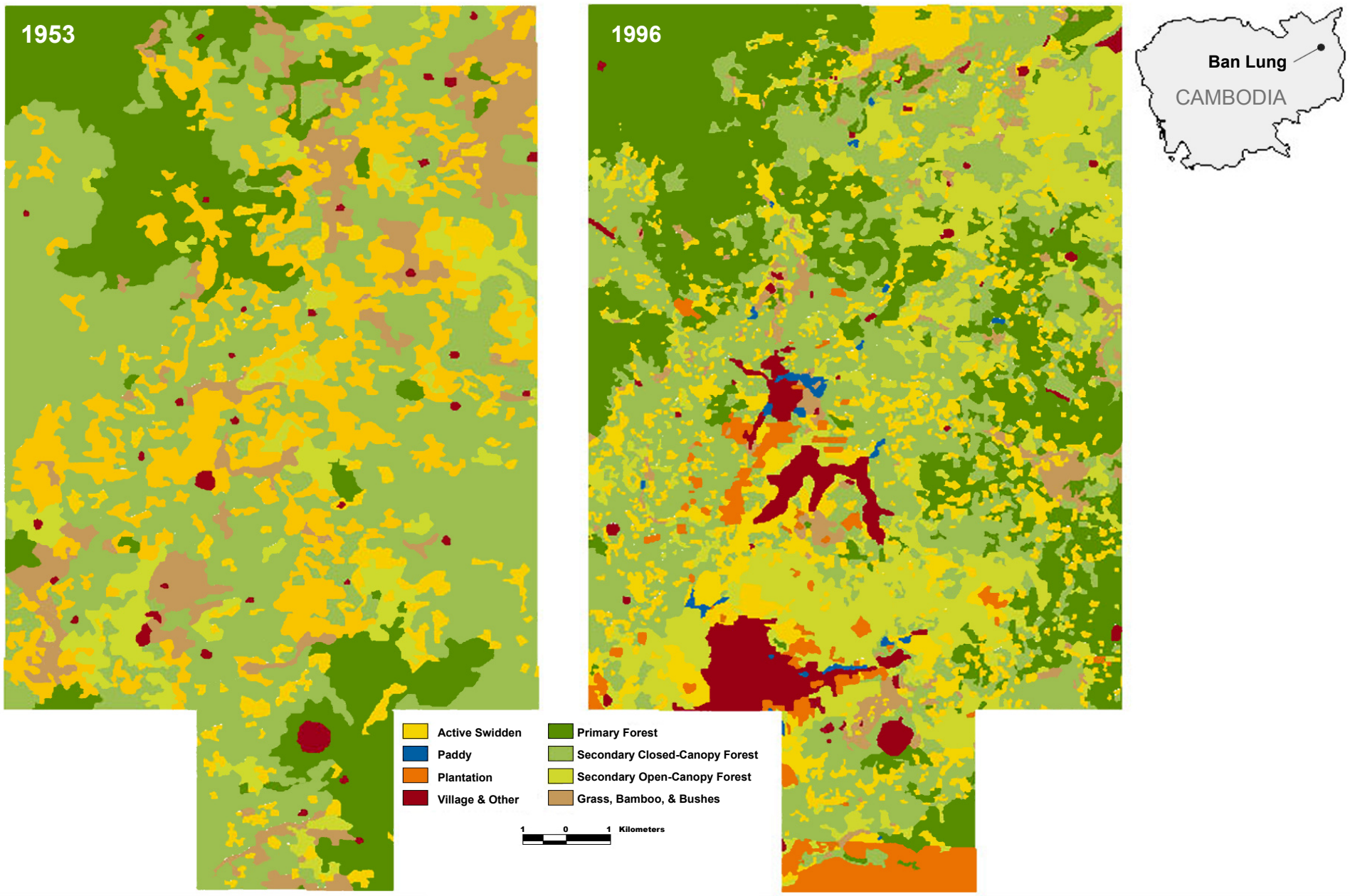
Figure 8: Conservation of Forest Cover in Community Concessions in Petén, Guatemala



Note: The comm□ re protection and more intact forest than the adjacent government protected areas.

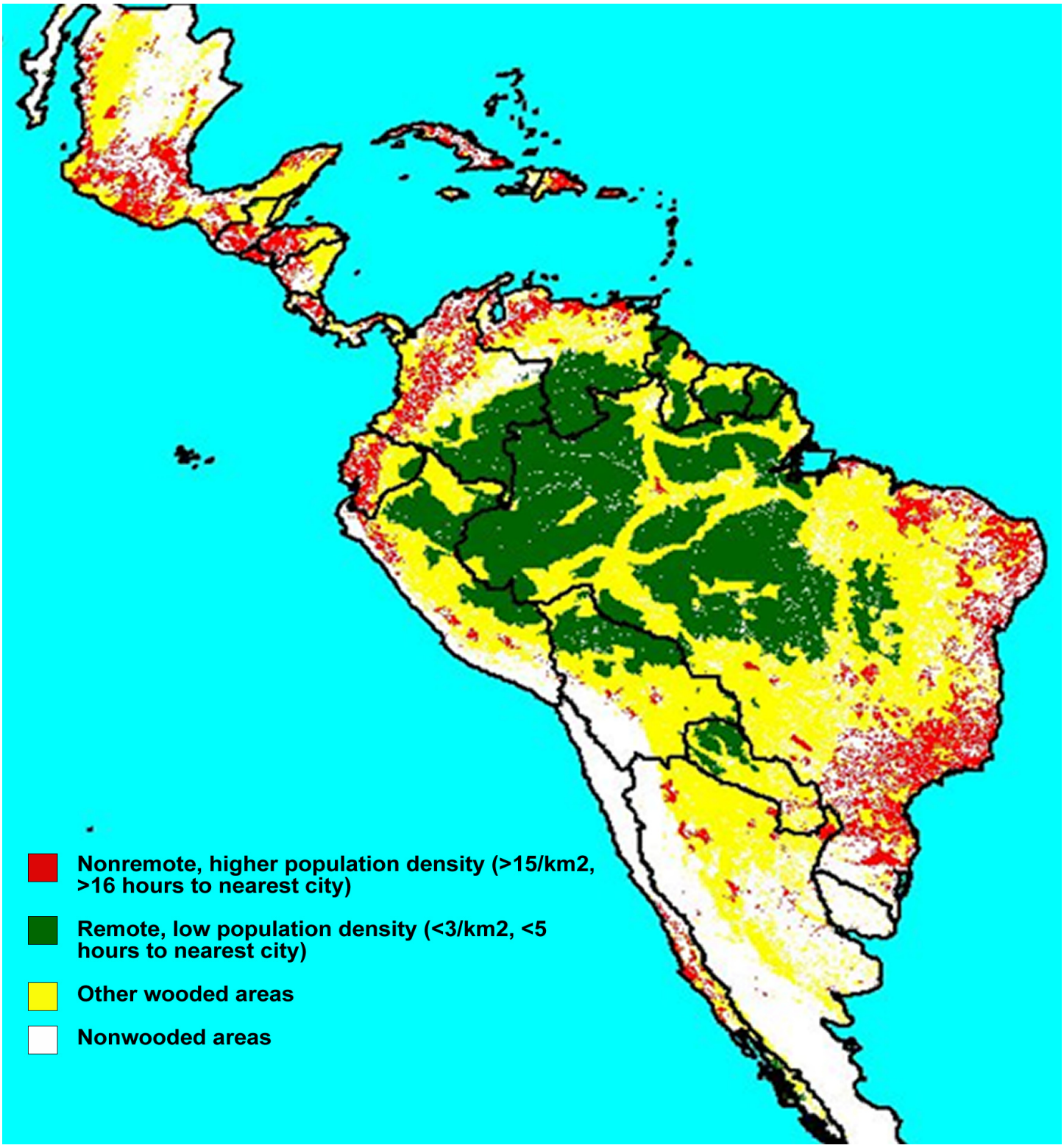
Source: Cortave, Marcedonio 2004. The Experience of the Community Concessions and ACOFOP in the Maya Biosphere Reserve, Petén, Guatemala, presentation to the Workshop on Forests: Resources for Development, Tegucigalpa, Honduras, May 2004. PBPR, Government of Honduras and World Bank.

Figure 9: Restoration of Forest Area in Agriculture Forest Mosaics in Southeast Asia: Example of Ban Lung Village, Cambodia, 1950s and 1990s



Source: Fox, J. 1999. Mapping a Changing Landscape: Land Use, Land Cover, and Resource Tenure in Northeastern Cambodia. Submitted to Conservation Biology. EWC Working Papers: Environmental Series No. 50. Honolulu, Hawaii: East-West Center.

Figure 10: Forest and Population Overlay in Latin America



Data sources: Population: CIESIN, Gridded Population of the World, 1995; access calculations based on Digital Chart of the World; forest cover: FAO

Map source: K.M. Chomitz, J. Robalino, A. Nelson. A note on forest populations in Latin America and the Caribbean. World Bank, Development Research Group, processed. 2004.