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CHAPTER 8

Conclusions and Recommendations

Are development and the environment at loggerheads in tropical forests? This report has shown that trade-offs sometimes exist between the two. Poverty and deforestation are not closely linked at the local level, so we shouldn't expect fixing one problem to automatically solve the other. Indeed, some deforestation contributes a lot to development, poverty alleviation, or both. And when poor people deforest for paltry gains, it's often because the alternatives—including forest maintenance—are less attractive. The vast environmental benefits of forests have been difficult to tap in ways that motivate forest conservation while improving livelihoods.

Moreover, forest poverty and deforestation are difficult problems to solve. They revolve around the allocation and enforcement of rights. Strong, equitable institutions are needed to resolve these problems—but such institutions are in short supply in many developing countries.

Still, there are grounds for hope. Technological and institutional innovations create possibilities for catalyzing change and for minimizing or transcending trade-offs. But problems must be properly diagnosed. Challenges for poverty, equity, and the environment are systematically different in areas in and beyond the agricultural frontier, and different kinds of management institutions are needed at the international, national, and local levels. Various policy and institutional interventions could help reduce poverty, ease environmental damage, and make allocations of wealth more equitable (box 8.1).

Box 8.1 This Report's Recommendations

International level

- Mobilize carbon finance to reduce deforestation and promote sustainable agriculture.
- Mobilize finance for conservation of globally significant biodiversity.
- Finance national and global efforts to monitor forests and evaluate the impacts of forest projects and policies—including devolution of forest control.
- Foster the development of national-level research and evaluation organizations through twinning with established foreign partners.

National level

- Create systems for monitoring forest conditions and forest dwellers' welfare, make land and forest allocations and regulations more transparent, and support civil society organizations that monitor regulatory compliance by government, landholders, and forest concessionaires. The prospect of carbon finance can help motivate these efforts.
- Make forest and land use regulations more efficient, reformulating them to minimize monitoring, enforcement, and compliance costs. Economic instruments can help.

Areas beyond the frontier

- Avert disruptive races for property rights by equitably assigning ownership, use rights, and stewardship of these lands.
- Options for forest conservation include combinations of indigenous and community rights, protected areas, and forest concessions. Still, some forest may be converted to agriculture where doing so offers high, sustainable returns and does not threaten irreplaceable environmental assets.
- Plan for rational, regulated expansion of road networks—including designation of roadless areas.
- Experiment with new ways of providing services and infrastructure to low-density populations.

Frontier areas

- Equitably assign and enforce property rights.
- Plan and control road network expansion.
- Discourage conversion in areas with hydrological hazards, or encourage community management of these watersheds.
- Use remote sensing, enhanced communication networks, and independent observers to monitor logging concessionaires and protect forestholders against encroachers.
- Consider using carbon finance to support government and community efforts to assign and enforce property rights.
- Encourage markets for environmental services in community-owned forests.

Disputed areas

- Where forest control is transferred to local communities, build local institutions with upward and downward accountability.
- Where community rights are secure and markets are feasible, provide technical assistance for community forestry.
- Make landholder rights more secure in "forests without trees."

Box 8.1 (*continued*)

- When forest tenure is secure, use carbon markets to promote forest regeneration and maintenance.

Mosaiclands

- Reform regulations so that they don't penalize tree growing.
- Promote greener agriculture—such as integrated pest management and silvopastoral systems—through research and development, extension efforts, community organization, and reform of agriculture and forest regulations.
- Develop a wide range of markets for environmental services—carbon, biodiversity, water regulation, recreation, pest control—to support more productive, sustainable land management.

International Level

Two areas stand out for international cooperation.

Financing Forest Environmental Services

Internationally financed incentives for avoiding deforestation and stimulating forest regrowth could catalyze global forest conservation and agricultural development while cutting the costs of mitigating climate change. Any serious effort to grapple with global climate change must place an explicit or implicit charge on carbon dioxide (CO_2) emissions. And at any reasonable charge on CO_2 emissions, there are huge dividends to engaging in more intensive, labor-absorbing agriculture on degraded lands—instead of deforestation that yields trifling, ephemeral gains.

That substitution, which would also provide domestic benefits, won't happen automatically because private incentives work against it. But sharing the global dividends of CO_2 reduction could provide the funds and motivation for needed national-level efforts. The UN Framework Convention on Climate Change, whose 189 signatories have agreed to the goal of stabilizing greenhouse gas concentrations in the atmosphere, provides a natural venue for negotiating financing for international incentives.

These efforts would have to be coordinated with research, development, and diffusion of environmentally friendly agricultural technologies and practices. Some approaches to agricultural intensification can create or exacerbate environmental problems,

including eutrophication, pesticide pollution, and emergence of new pathogens related to animal husbandry. New technologies—such as integrated pest management and other landscape management techniques—could mitigate the potential side effects of intensification.

The international community could also provide direct incentives for global biodiversity conservation. Financing sources might include industries dependent on biodiversity, such as agriculture based on plants with wild relatives in forests. Financing could be funneled through national programs for environmental service payments.

Addressing Monitoring and Information Needs

The international community could undertake monitoring efforts that would have immediate payoffs while contributing to these long-term financing goals. A priority is to fund and coordinate basic monitoring on the rate, location, and causes of global deforestation and forest poverty and the impacts of project and policy interventions. Without this information, policy makers are flying blind, and interest groups lack a solid basis for dialogue. For instance:

- Despite intense concerns about deforestation, among developing countries only Brazil and India report forest cover on a regular basis. (Indonesia is developing a system.) For Africa, estimates of deforestation vary by a factor of 10.
- Despite billions of dollars spent setting up and running protected areas, there has been little analysis of their conservation and development impacts and of how these are related to their funding, management strategies, and context. Similarly, there has been little monitoring and analysis of the impacts of the massive transfers in forest tenure of recent years.
- Despite hopes for securing support for forest conservation based on local environmental services such as hydrological benefits, there are few studies and tools for quantifying those benefits and relating them to specific interventions in specific places. And measurements of weather and rivers, the foundation for such studies, are increasingly difficult because meteorological and gauging stations are being abandoned.

- Despite concerns about forest poverty, information is spotty on the numbers and conditions of people in two distinct poverty situations: deep forest (highly forest-dependent people in remote areas) and mosaiclands (who get a small but significant share of their income from forests).
- Despite concerns about global biodiversity loss, information on the global distribution of biodiversity is inadequate. Conservation scientists have made great strides in organizing available data, but systematic sampling is lacking.

With the possible exception of the last, these information gaps are relatively easy to remedy. New remote sensing technologies make it feasible and affordable to identify hotspots of deforestation. Ridder (2006) estimates that it would cost $12 million to create a global network for forest monitoring that could produce annual, medium-resolution estimates of deforestation. That price tag includes support for building local capacity to acquire and interpret remote sensing data. A World Bank–WWF survey tool for managing protected areas (Stolton and others 2003), already in use by the Global Environment Facility (GEF), could be applied more widely and integrated with quantitative indicators of biodiversity status. Household survey instruments could be adjusted to better account for forest income. In addition, collaborative research institutes—twinning staff from industrial and developing countries—could conduct monitoring and evaluation studies from a policy perspective, as well as research and development on land and forest management. Such efforts would build capacity and generate analytic and research results and could nurture the development of policy entrepreneurs as described in Steinberg (2001).

National Level

At the national level, strengthening the voice and influence of diffuse interests—for environment and for poverty—is essential to institutional reforms. Environmental councils might be one way to mobilize people affected by forest externalities. There may be a virtuous circle between mobilizing these interests and generating better information on forest conditions: interest groups demand

information, which empowers them to negotiate better outcomes. The critical factor is local demand for forest regulation, which external sources of finance (such as for carbon) could help spark.

National monitoring of forests is increasingly easy thanks to improvements in remote sensing and communications. A national forest monitoring program—combined with mapping of indigenous areas, protected areas, forest concessions, and other tenure zones—can form the basis for better forest law enforcement and fire control, and for certification or rating of large logging firms and landowners. Public disclosure of this information is important for encouraging enforcement. Internationally financed incentives for forest carbon could be a powerful inducement for countries to set up national monitoring.

Within countries, this report's policy recommendations are differentiated by three forest regions: beyond the frontier, at the frontier and in disputed areas, and within the frontier.

Areas beyond the Frontier

A few countries have large, remote forests beyond the range of most agriculture or timber extraction. Pressures to exploit those forest resources will likely eventually arise—in some places chainsaws are already almost within earshot. In other, more remote forests such pressures may be decades off and will result from technological changes. For instance, the development of productive, forest-competing biofuel crops could greatly increase global land demands and pressures for forest conversion.

Now—before those pressures arise and stakeholders are entrenched—is the time to think about how to manage those forests, accounting for their unique ecological values. This process entails recognizing and enforcing indigenous land claims where applicable and demarcating and institutionalizing protected areas. Indigenous and protected areas have been relatively successful in deterring deforestation, though the determinants of their effectiveness and their impacts on livelihoods are poorly understood. Now is also the time to think about long-term planning of road networks in areas beyond the frontier. Strong technical methodologies exist for planning roads and protected areas, but must be exercised in a context that mediates between competing interests.

Poverty is often high in transfrontier areas, as is the proportion of indigenous people. Protecting rights and building capacity can help empower these isolated people. In addition, innovative tech-

nologies—such as satellite communications—can lower the cost of providing services such as health and education to low-density populations.

Frontier and Disputed Areas

Governance at the frontier and in disputed areas requires equitable, secure assignment of land and forest rights. There is no easy prescription for achieving that, since forests are subject to elite capture as they take on value. Although models of participatory zoning and conflict resolution exist for small areas, challenges remain in scaling them up to legitimately disentangle forest claims at the provincial and national levels. A special challenge is rationalizing tenure in "forests without trees"—areas where agriculture is legally prohibited but forest has been severely degraded.

Many forests are nominally owned by governments, but poorly administered. Devolving nationally owned forests to local ownership and control might result in a more equitable allocation of forest rents and better management. But local ownership and management are no panacea, because communities face their own institutional issues, including elite capture. Where markets are accessible, building capacity, providing marketing assistance, and streamlining regulations could help community forestry.

In some contexts, putting forests under regulated logging concessions could provide income to the forest owner (whether state or community) while maintaining environmental values. New tools—including auctions and independent monitoring—are available for ensuring that concession awards and operations contribute to the public good.

Shifting the balance from forest degradation toward forest maintenance could require technical assistance in production, management, and marketing. But neither concessionaires nor local communities have strong incentives to manage forests for national or global environmental benefits. So regulations or incentives (or both) will be needed to secure those benefits. Efficient regulation focuses on the flexible achievement of clear environmental goals, uses criteria that are cheap and easy to monitor, does not lend itself to petty rent seeking by enforcers, and imposes low opportunity costs on those who comply.

Because roads are an important driver of deforestation in frontier areas, some control should be exercised over the expansion of road networks—especially discouraging road extensions into areas

with low agricultural potential. In other places clarification of forest tenure should precede road extension.

Mosaiclands

Within the frontier, high-density mixes of people and forest fragments generally lead to both stronger pressures for deforestation and greater incidence of environmental benefits. But this is a heterogeneous region, presenting a range of challenges. Where marginal uplands are near agriculturally favorable lowlands, intensification of the latter might ease pressure on hillside forests.

Elsewhere, balancing environmental externalities against pressures for forest conversion or exploitation will require a variety of interventions. There is scope for exploring technological and institutional innovations for greener management of agriculture and forest mosaiclands. Again, efficient regulation is needed, placing on landholders only restrictions and responsibilities that provide clear external benefits, are easy to monitor and enforce, and do not burden poor people.

Areas within the frontier have the greatest scope for developing payment systems for environmental services. But if they are to be effective in delivering the promised services, these systems must be tightly focused on efficiency. International finance for forest carbon or threatened biodiversity could be important in these areas, which are likely to be home to threatened species.

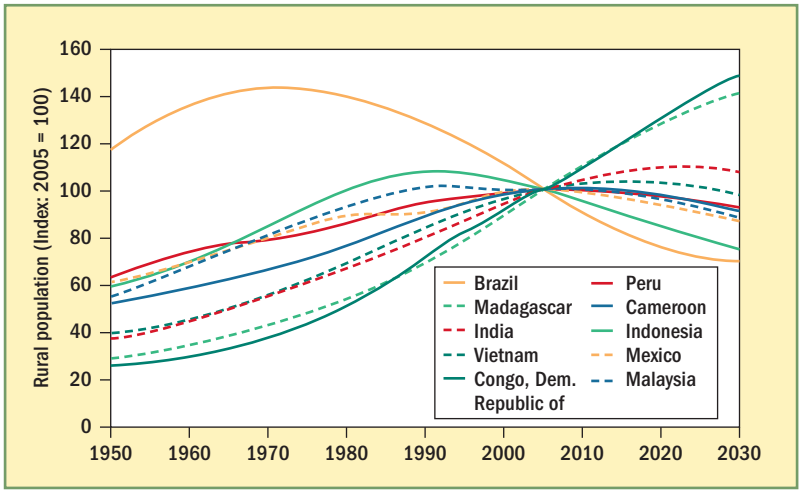
Accelerating the Forest Transition

As development progresses at the national level, rising wages attract farmers to urban employment and away from low-return farming at the forest fringe (see box 2.1). In some countries a demographic transition—with shrinking youth populations—will intensify this trend, driving up wages and reducing the number of people willing to live hard lives at the frontier. Many developing countries are at the cusp of another demographic transition, with their rural populations poised to decline (figure 8.1).[1] In much of Sub-Saharan Africa, however, this transition is distant.

The prospect of a forest transition isn't cause for complacency. True, industrial countries have seen a remarkable rebound in forest cover. For instance, despite its high population and economic densities, Japan is about two-thirds forest.

But the quality and nature of regenerated forest may be quite different from the original. This risk is profound in tropical forests,

Figure 8.1 Some Forested Countries Will See Shrinking Rural Populations



Source: UN Population Division 2004.

where ecologies are far richer and more complex than in temperate regions, and where soils are poorer and more degradable. The danger is that, for ecological reasons, the pulse of tropical forest clearance over the next few decades will often yield paltry benefits and leave behind not a renaissance of the original forest but a degraded landscape where biodiversity and carbon storage have been permanently impaired.

At the global level, pro-poor growth, the creation of sustainable cities, and the development of agricultural technologies that are intensive, labor-absorbing, and environmentally benign can help accelerate the forest transition. Incentives for carbon storage and biodiversity conservation can help countries maintain these assets, bridging the trough of the transition. It is in this important sense that poverty alleviation, development, and forest conservation are fully aligned.

Endnote

1. However, the figure shows a cautionary lesson from Brazil. There, market forces and road building drove deforestation even as the rural population declined.