Dantanpalli village is inhabited by the Gond tribal group and is part of the Andhra Pradesh (India) Community Forestry Project. In this meeting, the village community and Forest Department staff discuss forest management plans for the coming year.

Grant Milne / World Bank.

PART II

Institutional and Policy Responses

Villagers in East Cameroon carrying drinkable water from a facility constructed with funds from forest royalties.

Inhabitants of this village, near the Lobeke National Park in East Cameroon, usually clear forested land to plant plantains, cocoa and manioc.

CHAPTER 5

Improving Forest Governance

Emerging from the first part of this report are two overarching public policy issues that affect equity, incomes, and the environment: forest ownership and environmental externalities. Finding institutions to grapple with these issues is at the core of better forest governance.

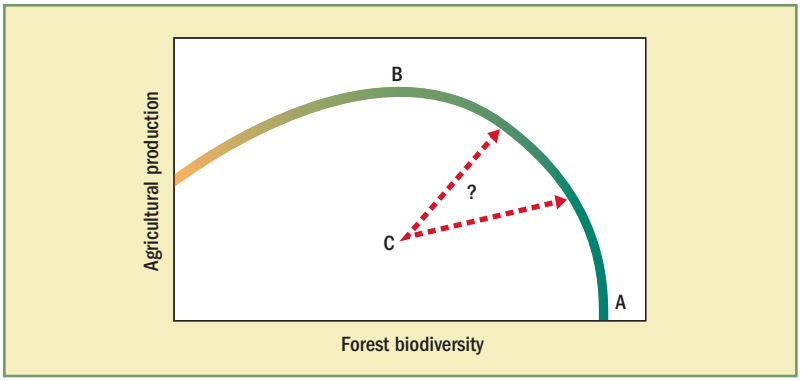
Who Should Have Rights over Forests? Which Rights?

Much of the world's tropical forest is under nominal state ownership—ownership sometimes disputed by indigenous groups and other forest dwellers. But even forests under community and private ownership are typically subject to some restrictions on timber extraction or against forest clearance. At stake is a vast amount of real estate, considerable timber wealth, and other assets including minerals, genetic information, and carbon rights. The public policy question is how to equitably adjudicate and efficiently defend these rights.

How Should Society Balance Environmental Services against Production of Food, Fiber, and Wood?

At all scales of land management, from the farmer's plot to the planet, there are trade-offs and complementarities between production of food and maintenance of environmental services. Consider a simplified example (with just one environmental service) that

Figure 5.1 Optimizing the Mix of Agricultural Output and Biodiversity



Source: Authors.

can be applied to all scales (figure 5.1). This production-possibility curve shows different combinations of agricultural production and biodiversity conservation arising from different ways of managing land. The curve shows the ultimate technical and biological trade-offs: the maximum production consistent with a given level of biodiversity. At point A all land is devoted to undisturbed forest. Movement along the curve upward and to the left represents conversion of forest to agriculture. At first, production is gained with little loss of biodiversity—for instance, by substituting forest gardens for native forest.

As more forest is affected, the trade-off becomes steeper. Increasingly marginal land is brought into production, increasingly critical habitats are disturbed, and more intensive production results in pollution from agrochemicals. Eventually at point B, further conversion to agriculture results in so much environmental damage that agricultural production suffers.

What combination of production and biodiversity should society pursue? A society that did not value biodiversity would choose point B, the point of maximum production. A society that valued biodiversity would choose some point along the curve between B and A. The precise point would depend on preferences for agricultural production relative to biodiversity. But in real life, societies have incomplete control over landholder behavior and are likely to end up at point C—inefficient for both agricultural production and biodiversity. The policy challenge is to reach societal consensus on

a target point between A and B, and then use carrots and sticks to urge land managers toward that target.

This challenge occurs at all scales. At the continental and global scale, scientists have worked on prioritizing the world's most unique spots for conservation, seeking a portfolio of locations that occupies little area but contains as many different species, ecosystems, and ecological processes as possible (Rodrigues and others 2004; Ceballos and others 2005; Burgess and others 2006). This is a search for the flat part of the curve to the right of point B, where major increases in biodiversity are secured for negligible opportunity costs in forgone agricultural production.

At the national level, agroecological zoning efforts follow a similar logic, seeking to allocate the most productive lands to agriculture while restricting agricultural uses on land that is marginal for agriculture and crucial for biodiversity. Decisions on regional development, such as road placement, also determine where a society ends up on the production-possibility curve. And at the local level, many interventions in community management of natural resources and in diffusion of land management technologies can be seen as seeking ways to push landholders away from inefficient points such as C.

Balancing Interests while Enforcing Commitments

To address these two big issues, society has to find fair ways to balance opposing interests, forge agreements, and commit to those agreements. This is the essence of dealing with environmental externalities (see chapter 4)—a problem particularly salient in less remote mosaiclands. The second problem is fair allocation of property rights. As the frontier expands into the forest, undefended trees, land, and environmental services take on value, and people scramble to claim them. Who should get the rights to these goods? Who or what will guarantee those rights? The same questions arise when communities challenge nominal ownership of forests by governments.

These are essentially institutional problems, and they are difficult to address due to imbalances of power, lack of information, and lack of checks and balances. With environmental externalities, typically a relatively few people benefit a great deal from logging or agricultural conversion. Those people are typically influential—often a wealthy elite of loggers or ranchers with close ties to politicians, with continuing deforestation at the top of their agendas.

The losers from deforestation—those who bear the burden of environmental externalities—are a large, diffuse, unorganized group. They may not be well informed about the losses because it is difficult to monitor forests, and the environmental impacts of deforestation are hard to track. And even if this group suffers large losses, deforestation may not be at the top of the agenda for each member of the group. These asymmetries of power, information, cohesion, and priority create hurdles to collective action. The hurdles may be even greater when there is a contest for resources between the powerful and the voiceless.

Institutions exist to mediate these interests and implement agreements: forest codes, zoning laws, logging regulations, courts, and forest services. But sometimes these institutions appear hopelessly broken. With wealth to be made in forests, regulators can become captured by powerful interests or powerless to intervene. The voices and interests of forest dwellers, far off and disconnected, are not heard. Constituencies for conservation are dispersed and difficult to organize. In many forests remoteness and poor communications have cloaked resource grabs, conflicts, and inequities.

Catalytic Innovations in Institutions and Technology

A combination of institutional and technological innovations has started to offer some hope for correcting this situation. These new approaches seek to catalyze change by organizing dispersed constituencies, improving transparency and information flows, and marshaling new counterweights against resource seizures. None of them is, by itself, a panacea. But together they provide an expanded portfolio of tools for addressing what have been almost intractable problems.

How Can Institutions Mobilize Domestic Constituencies?

In 1995–97 the World Values Survey asked people in 43 countries if they actively participated in an environmental organization (Steinberg 2005). The top-ranking countries were Nigeria (12.3 percent participation) and Ghana (11.5 percent). Environmental participation rates in these and 13 other developing countries surpassed those in Finland, Germany, Norway, Spain, and Sweden. Other surveys reinforce this finding: the developed world does not have a monopoly on environmental concern (Steinberg 2005).

A tougher question is whether the public is concerned specifically about forest conservation. Urban residents may be more con-

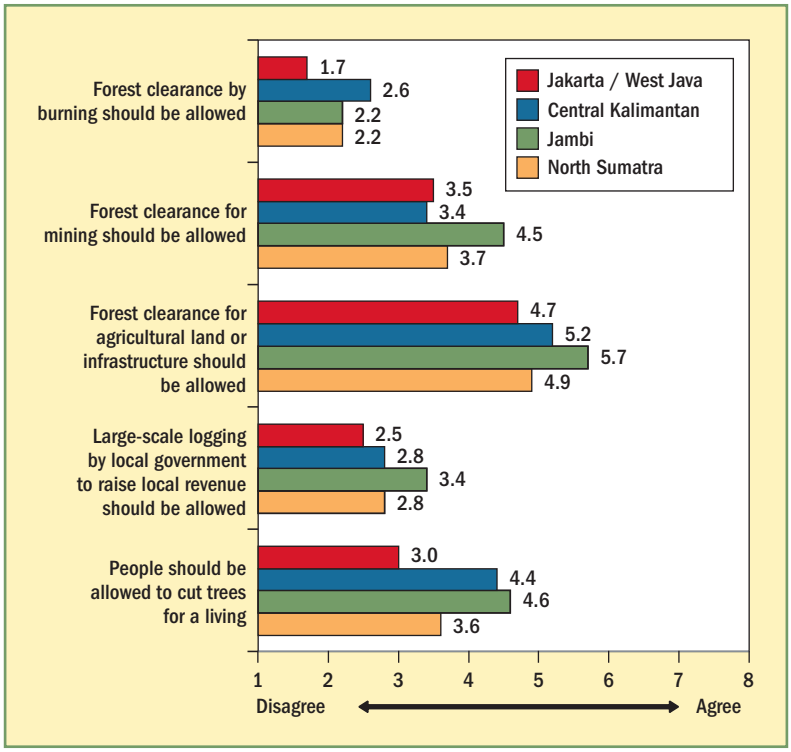
cerned about local environmental issues such as air pollution, while rural dwellers may favor forest exploitation over conservation. Some insight is provided by an opinion survey conducted in connection with Indonesia Forest and Media (INFORM), a campaign to promote conservation (Insan Hitawasana Sejahtera 2003). A purposive, stratified sample of three forested provinces and metropolitan Jakarta was evenly split by gender and location (urban or rural). Two-thirds of the 926 respondents were community leaders, the remainder high school and college students. Nearly all agreed that "Indonesian forests are mostly destroyed," and 90 percent considered local individuals and businesses responsible. At least 90 percent agreed that deforestation was linked to floods, fires, landslides, droughts, higher temperatures, and biodiversity losses. Respondents expressed strong opposition to forest burning and were inclined to oppose logging by local governments to raise local revenue (figure 5.2).

The group was mildly inclined to permit forest clearance for agriculture, with stronger support in the forested provinces. And despite the publicity attached to corruption in forestry, respondents overwhelmingly supported government control of forests. Less than 15 percent would make forest corruption their first choice for a media campaign. About half said they were willing to sign a petition opposing forest destruction, half said they would boycott products of forest-destroying companies, and a third said they would be willing to participate in a demonstration. These proportions were lower but not negligible in the forested provinces. In sum, local Indonesian opinion leaders are aware of forest loss, concerned about the environmental impacts of forest fires, and often support restrictions on clearing and especially logging.

To be heard, though, environmental interests must extend their bases and mobilize political resources. Environmental education is important. One subtle but perhaps catalytic intervention has been the creation of local-language guides to animals and plants. Appreciation of the importance of biodiversity conservation is difficult if people do not know what is at risk. The World Bank has sponsored about 100 of these field guides. One way that they may be effective is by increasing both the local demand for ecotourism and the supply of nature guides.

Another way to mobilize public support is through individuals and organizations that can frame environmental issues. Steinberg (2001) describes how "policy entrepreneurs" and "coupling" institutions catalyzed path-breaking environmental policy innovations in

Figure 5.2 Indonesians Favor Some Restrictions on Forest Exploitation



Source: Insan Hitawasana Sejahtera 2003.

Bolivia and Costa Rica. (A similar argument could be made for Brazil.) Internationally linked scientific research organizations served as incubators of expertise and action. They fostered the development of local capacity in ecology, created networks of domestic and foreign scientists and environmentalists, and fostered a nonpartisan atmosphere where policy entrepreneurs could draw on scientific findings to formulate locally relevant proposals. The results? Skyrocketing local appreciation of conservation—and a long list of globally influential local policy innovations in environmental finance and management.

Forging links between civil society and government is another way to mobilize environmental constituencies. One expression of this is the rapid rise in the number and prominence of environmental and other nongovernmental organizations (NGOs) over the past decade (Steinberg 2005).

Another way to mobilize is by incorporating civil society input into government activities. In the Philippines provincial and local multisector forest protection committees were created as part of a World Bank environmental adjustment loan (Cruz and Tapia 2006). The committees, which included participation by civil society groups and the National Resources Department, were charged primarily with monitoring forests but also with evaluating policies and operations and conducting information campaigns. Credited with reducing illegal logging, there were 314 such committees in 1999, when the loan closed. But many subsequently collapsed when funding ended, raising questions about the depth of popular support.

Brazil's local environmental councils offer an interesting view on the links between civil society and government. Local governments in Brazil, urban and rural, are organized around the country's more than 5,000 *municipios* governed by locally elected mayors and municipal councils. Municipal government also allows for advisory councils focused on certain sectors, including environment. Because Brazil presents continental-level variation among *municipios* in average income, education, size, rurality, and environmental conditions—while holding constant national laws and institutions—it provides an opportunity to look for evidence on the determinants and impacts of local environmental institutions.

The presence of an active environmental council is strongly related to income and education. (An active council is defined here as one that meets at least once a year, and at least half of whose members are from civil society.) Assume that the presence of an active municipal environmental council indicates environmental participation. About 14 percent of Brazil's 5,500 *municipios* meet this description. Councils are far more common in wealthier, better-educated *municipios* (29 percent) than in the poorest, least-educated *municipios* (6 percent). Multivariate analysis confirms that this is not merely because rich *municipios* are larger and thus have a larger pool of recruits. Although size and urbanization affect the likelihood of an active environmental council, mean income and education have a strong independent effect.

It is difficult to determine whether active environmental councils are effective in bringing forest-related environmental issues to the attention of local governments. One problem is forest and land fires. Used for forest conversion and pasture management, fires can create serious problems when they get out of control, damaging neighboring fields, fences, and woods (Nepstad and others 2001). Among

municipios that experienced fires (based on remote sensing data), a substantially higher share of those with active environmental councils reported a fire problem (28 percent versus 18 percent) and a smoke problem (23 percent versus 15 percent). Ongoing research is examining whether the council has a causal impact in prompting recognition of these problems.

Revolutions in Monitoring Have Raised Awareness and Accountability

For a long time forests have been invisible and their dwellers inaudible. It has not been easy for the public and the law to detect deforestation, logging, or mining deep in the forest. The scope of forest destruction and private appropriation of public property has gone unnoticed. So too has the extent to which public agencies charged with protecting forests have done their jobs. For most large forested nations in the developing world, reliable data on deforestation are lacking even at the aggregate level—let alone the provincial or regional level.

All that is changing due to synergistic developments in institutions and technology. These have the potential to drastically cut the cost of monitoring forest activities and to empower civil society to use this information to more fairly balance forest interests.

The first revolution involves remote sensing. Satellite images can detect deforestation and logging. Since the debut of Landsat in 1972, image quality and frequency have improved while the costs of acquiring, interpreting, and using images have plummeted. For detailed monitoring of particular sites, it is now possible to order snapshots with 1 meter resolution. For monitoring of global forests, MODIS images cover the entire world daily, can detect land cover changes as small as 25 hectares, and are available free of charge. The costs of hardware and software for analyzing and using images have also plummeted, placing them within reach of small NGOs.

The social and political impacts of this technology are becoming evident. In the developing world, Brazil has led the way in technology and applications. Its National Institute of Space Research (INPE) has long published annual or biannual reports on Amazônian deforestation by state. These reports have helped focus national and international attention on Amazônian deforestation. More recently, INPE has started publishing on the Internet real-time images of fire locations and detailed (30-meter resolution) maps of annual

deforestation. It also provides South Americans with free data from CBERS2, the Sino-Brazilian satellite. These data are used by government agencies to enforce land regulation and by local NGOs to draw attention to forest issues and galvanize public support.

Land and forest fire monitoring uses an even more accessible technology, providing nearly real-time results that can be used for fire prevention and control. CONABIO, Mexico's National Biodiversity Commission, began monitoring after the disastrous fires of 1998. Indonesia's space agency also provides nearly real-time information on fire occurrences and risks.

Monitoring information of this kind can become much more valuable when combined with information on forest ownership and control. A complementary technological revolution—geographic positioning systems—makes it possible to identify the boundaries of properties and concessions at minimal cost. A third revolution—cheap geographic information systems—makes it easy to overlay maps of deforestation on maps of property boundaries. This technology enables government enforcement agencies to do their jobs better, and civil society to make sure that they're doing their jobs.

For instance, prosecutors can use remote sensing images as evidence of illegal deforestation. The Brazilian state of Mato Grosso has set up a system that registers the location of large properties and uses remote sensing to track their compliance with land use regulations. In Cameroon NGOs are using remote sensing to correlate the construction of new logging roads with logging concessionaires' reports of timber extraction (Global Forest Watch 2005). Mismatches may indicate mischief. Roads without logs may mean that producers are evading taxes. Logs without roads suggest timber laundering—for instance, taking timber from a protected area but claiming it comes from a legal concession. In neither case has official enforcement been entirely successful. But the ability of outside groups to monitor the behavior of private parties and government may put pressure on both to comply with laws.

As information gets better and cheaper, new possibilities emerge. Several groups are working on ways to use MODIS to cheaply detect large-scale deforestation, at an annual frequency or better, for entire nations or even the world. At the global level this would be a quantum leap in tracking deforestation. Among developing countries only Brazil and India regularly report remote sensing information on forest cover, though Indonesia is creating such a system.

At the national level such a monitoring system could detect hotspots of deforestation rapidly enough to trigger action. It could be used, for instance, to track the impacts of new road construction or macroeconomic policy changes. It could also be used to direct higher-resolution monitoring for enforcement purposes. Technologies to detect hidden logging have been demonstrated by Asner and others (2005), and progress is being made in the use of satellite-based cloud-piercing radar.

Complementing the use of remote sensing is the rapidly growing potential for participatory, ground-based observations by citizens. These observations could be used to help interpret satellite images and to provide information unavailable from the sky. The Confluence project (www.confluence.org) provides a hint of the possibilities. It has asked for volunteer observations of the world's latitude and longitude intersections, at 1-degree intervals. The map is rapidly filling in. The explosive growth of cell phone coverage is rapidly putting a lot of mosaic forest within instant communication and reporting range. Already, about a quarter of the world's "imminent extinction spots" (see map 1.8) are covered by GSM cell phones.[1]

Weak State Institutions Can Be Aided by Better Checks and Balances and Transparency

Institutions charged with enforcing forest laws are often ineffective. Even worse, they may be captured by the interests they're supposed to regulate. This is a grave risk when large amounts of money are at stake—as when state agencies allocate land or forest concessions or are charged with ensuring that industrial loggers and large landowners comply with environmental regulations. Corrupt officials, legislators, and military officers can form alliances with large actors (including timber companies, pulp mills, ranchers, and plantation owners) to allocate land and forests for exploitation. The result is private appropriation of wealth that belongs to the public or local communities, conflict with forest dwellers, and unregulated forest destruction.

In response, an efflorescence of institutional innovations have been created to bolster the performance and accountability of government agencies and the interests they oversee. It is possible to strengthen a system from within. Akella and Cannon (2004) explain why forest law enforcement often fails. Landowners are deterred from illegal deforestation or logging only if they perceive a significant probability of a significant penalty. In a system that relies on

criminal penalties, a long chain of events must occur before a miscreant is punished: detection of the legal violation, citation, prosecution, conviction, and execution of the penalty. If landholders perceive low probabilities of progressing from any link in this chain to the next, the level of deterrence is low.

Links may be weak by design or for lack of capacity. Palmer (2005) describes how Indonesian logging regulations motivate enforcers to seek bribes from log smugglers, rather than prosecute them. On the other hand, Brito, Barreto, and Rothman (2005), in a review of Brazilian environmental crime law enforcement, identify fixable logistical problems as an impediment to prosecution.

Against a global backdrop of failed systems of internal checks and balances, Brazil's Public Ministry provides an interesting model for a possible solution. The ministry, which exists at both state and federal levels, is a prosecutorial agency charged with ensuring legal compliance by both citizens and the executive branch. A meritocratic institution, its staff are selected through competitive exams that only a few percentage of applicants pass. As a result it attracts extremely qualified and idealistic staff, many of whom are interested in environmental issues. Prosecutors have considerable autonomy in choosing cases to pursue. This promotes independence but impedes focus. Typically the ministry seeks to resolve problems through negotiations, holding the threat of prosecution in reserve. Brito, Barreto, and Rothman (2005) call the Public Ministry the most powerful institutional force for environmental protection in Brazil.

A new institution of independent monitors stands at the boundary between strengthening internal controls and enabling external ones. The governments of Cambodia and Cameroon, under international and domestic pressure to strengthen oversight of forest resources, have employed donor-funded independent monitors of forest law enforcement. A concern in both cases was that timber wealth was being nontransparently and inequitably allocated, and that loggers were not adequately supporting the sustainability of forest resources.

In Cameroon a monitor observed the conduct of concession auctions, spurring an increase in bids and better application of technical standards for prequalifying bidders. In both countries monitors examined logging operations and enforcement actions. A review of these and similar experiments by Brown (2004) found strong positive impacts on transparency, but questioned the sustainability of the monitoring institutions. The fundamental issue is whether there

is a domestic constituency that values and demands the information provided by the monitors.

A variant of public disclosure policies from the field of industrial pollution control may offer lessons. Indonesia's PROPER program rates the pollution control efforts of industrial firms. The program was set up by the country's environmental protection agency in response to difficulties in enforcing pollution laws. Based on audited self-reports, it classifies firms on a five-point scale: completely non-compliant and making no effort to comply, some environmental effort but inadequate to meet standards, minimally compliant, good practice, and best practice. These ratings are easily understood by the public and have induced firms to improve their performance. The ratings' interesting feature, relative to current practice in forest law, is the recognition that PROPER gives to better-performing firms. This may help defuse opposition to the program.

Voluntary certification systems share similarities with public disclosure systems. From a policy perspective, certification systems are appealing because they can encourage better forest management even where local institutions are ineffective at enforcing regulations. Like public disclosure systems, they seek to reward good performers—though usually only on a pass/fail basis, without the finer distinctions made by PROPER. The best-known examples are for forest management, where the Forest Stewardship Council and other standards-setting organizations have developed standards for responsible, sustainable forest management. These standards include compliance with national laws, respect for indigenous rights, conservation of biodiversity, and establishment of and compliance with a management plan. Systems have also been proposed to certify that commodities such as beef and soybeans are produced without illegal deforestation. Certification is conducted under contract by accredited private, third-party certifiers. The integrity of the certification process rests on the desire of the certifiers to maintain their reputations.

Can certification make a big difference in forest management? The main question is whether forest owners will find it worthwhile to seek certification. Certification imposes substantial direct and indirect costs. Because there are direct fixed costs associated with filling out paperwork and paying for a certifier's visit, community forests and other small producers are at a serious disadvantage.

Indirect costs are those associated with compliant behaviors—such as refraining from cutting timber on slopes. These costs can

be substantial, depending on the stringency of regulations and the nature of the forest. The most widely cited benefit for forest owners is increased access to export markets, possibly with a price premium for certified products. Skeptics doubt whether this benefit is wide enough and deep enough to motivate widespread change in forest management. Demand for certified products is only a small (but rapidly growing) portion of export markets, accounting for 12 percent of wood production in Africa and 18 percent in Asia.

Moreover, it is controversial whether there is any price premium for certified wood. A survey in the U.K. market finds price premiums of 2–3 percent for some tropical woods—and premiums of 20 percent in thin markets where demand at such prices may be lacking (Robinson 2006). But if passed back to the producer, even a small retail or wholesale premium can translate into a large stumpage premium, and certification may be important for certain markets. Still, questions remain on whether certification can be expected to influence producer behavior on a large scale.

But certification may change firms' behavior through another mechanism. Because certification criteria are consistent with risk and liability reduction and with the existence of good internal management controls, certified loggers and landowners may find it easier to obtain insurance and financing. For the same reason certification—seen as a proxy for good management and low risks—may increase the value of a forest concession or property, or of a logging company. This avenue may prove to be a stronger incentive than a consumer price premium. And there could be indirect effects through local politics, as certified companies seek to ensure that uncertified competitors also comply with local regulations.[2]

Finally, anti–money laundering laws are beginning to attract attention as a tool against illegal logging and forest conversion. Intergovernmental bodies—the Financial Action Task Force and associated regional bodies—have offered recommendations on these laws, which designate certain crimes as "predicate" crimes. Disguising the movement of gains from predicate crimes is a money laundering offense.

Indonesia has explicitly designated illegal logging as a predicate crime; in many other countries violations of forest or land use laws could be interpreted as predicate crimes. What this might mean is that a much broader net can be cast for violators of forest law. Domestic law enforcement agencies have another tool at their disposal: money laundering crimes may be easier to detect and pros-

ecute than forest law violations. Money laundering crimes require domestic banks to exert closer scrutiny of their clients, deterring crime. Foreign banks must scrutinize their correspondent banks as well as deposits by offshore clients. But application of money laundering laws to forest law enforcement is still at an early, speculative stage.

Summary

This chapter looked upstream of the policy process. If societies are to maintain environmental services in the face of strong pressures for forest degradation, there must be vocal and effective constituencies for such services. And if societies are to fairly allocate and defend rights to forest resources, they must prevent powerful elites from seizing them. New institutions and technologies for transparency, monitoring, and incentives can help address these challenges. With this context, the next chapter examines successes and failures of policies affecting forest management and protection.

Endnotes

1. Authors' calculation based on 2005 coverage data.

2. The contrary is also possible. As pressures for certification increase on large companies, they may transfer forest assets to small companies that evade certification or are subject to laxer standards.

Road building and agricultural development projects triggered forest clearance in Santa Cruz, Bolivia.

UNEP / GRID-Sioux Falls.