GOVERNMENT POLICIES AFFECTING FORESTS IN LATIN AMERICA

An Agenda for Discussion

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The views and opinions expressed herein are those of the author and do not represent the official positon of the Inter-American Development Bank.

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CONTENTS

LIST OF BOXES

EXECUTIVE SUMMARY

Through its lending portfolio and policy recommendations, the Inter-American Develop-ment Bank (IDB) affects forests both directly and indirectly. For decades, the Bank has been engaged in lending for afforestation and reforestation. More recently, it has included forest-related components in structural adjustment loans for agriculture (Honduras, Nicaragua, and Peru). The Bank's projects for hydroelectric reservoirs, highways, mineral exploration, and urban expansion generally involve removing or adding forest cover. Additionally, the Bank's advisory role in macroeconomic policymaking affects the condition of forests through increases or decreases in public spending, investment, foreign trade, and other economic shifts.

The Bank and its client governments are working to develop national capacities to analyze and debate forest tradeoffs. In addition, the Bank has the opportunity to work with national coalitions to transcend symbolic but ineffective legislative and regulatory forest instruments. This requires strategies to more effectively apply land-use zoning, tenure reform, forest concession contracts, forest management plans, pricing policies, and taxes and subsidies.

Understanding the nature and types of policies that would have a favorable impact on forests poses a special challenge because of the characteristics of the resource. Forests have public good[1] and externality aspects that are not necessarily promoted by strengthening the private sector and liberalizing markets. Moreover, much forest conversion, especially on land frontiers, is driven by policies and actions outside of the forestry sector. Our understanding of the tradeoffs between the distributional and environmental consequences of economic policies on forests is incomplete and unreliable. The impact of policies on forests is difficult to predict since it is often not evident until decades later. Finally, the use of quantitative analysis to simulate alternative policy impacts on forests is severely limited by the weaknesses of existing models.

The IDB can respond by evaluating the quality of national planning and monitoring frameworks for forests. Bank resources can help fill gaps in forest inventories, valuation studies, mapping projects, community profiles, and analyses of land-use tradeoffs. Depending on context, the Bank may be justified in asking for acceptable forest planning and monitoring as a condition for agricultural and infrastructure lending. Through loan covenants and grant funds, the Bank can assist the development and maturation of intersectoral public/private coordinating bodies on forests. These can be a prominent forum where real and potential land-use conflicts are heard and addressed. The Bank is well positioned to leverage backing for national parks, reserves, and other protected areas. Through support for land-use planning and the definition of a permanent forest estate, the Bank can help client governments define and discuss protection priorities. As a lending institution, the Bank has a special responsibility to assist client governments to set fees and adjust other revenue instruments to make protected areas increasingly self-financing. Moreover, Bank conditionalities or grants to consolidate indigenous land claims help retain significant forest tracts under sustainable management.

The Bank should use its influence with governments to press for limiting the number and area of forest concessions to a manageable quantity, and for awarding concessions through an open and fair administrative process. The adequacy of forest management plans, and compliance with them, should be a discussion point and possible conditionality of Bank loans for agriculture and rural infrastructure. The Bank also has the opportunity to promote partnerships between governments and nongovernmental organizations (NGOs) regarding oversight of forest concessions.

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1 Public goods are valuable for society as a whole, but do not yield sufficient profit for private producers to engage in their provision.

The Bank should carefully monitor trends and developments in Latin America's recent experiments with forest privatization. Based on this experience and attention to general principles, the Bank could adopt practical guidelines for supporting or opposing the privatization of forests. With few exceptions, the Bank should discourage land titling inside forest boundaries except where directed colonization is backed by reliable impact assessments. Concurrently, the Bank should make every effort to strengthen land titling in settled and semi-settled areas.

The repeal of agricultural subsidies that benefit frontier zones offers a potentially powerful intervention to slow the conversion of forests. At the same time, strengthening agricultural subsidies in settled areas may help raise output and employment on existing farms and ranches. The Bank could attach conditionalities to its agricultural loans to induce borrowing governments to re-specify the biogeographical zones and agri-pastoral activities eligible for government subsidies.
The Bank should argue against outdated policies that consider forest clearing a land improvement and the basis for granting land titles.
Although many governments subsidize tree planting on private lands with the intent of providing public benefits, these benefits should not be assumed. Instead, clear public benefits must be demonstrated if subsidies are to be rational.

The Bank should promote policy discussions of the influence of land taxes on land use. In principle, the land tax favors forest conservation if croplands and pastures are taxed more heavily than forests; if newly cleared lands are taxed more heavily than established ones; and so on.

The Bank should monitor the impact of reduced public spending on the capacity of forestry agencies to carry out their mandates.
Additionally, the Bank should encourage public interest groups to observe the effects of liberalized trade on the environmental aspects of forest harvesting. Lastly, the Bank should cooperate with client governments in the development of investment codes and incentives to make foreign participation in forestry consistent with national socioeconomic and environmental objectives.

INTRODUCTION

Purpose and Context

This paper identifies policy issues that affect the extent, distribution, and condition of forests in Latin America. It is intended to stimulate discussion among government policymakers, donor agencies, and interest groups in Latin America. The analysis expands upon existing policy taxonomies and assessments, including Repetto and Gillis (1988), Ascher and Healy (1990), Grainger (1993), and Abt Associates (1992).

The Bank's most recent lending for forests was integrated with agricultural structural adjustment loans (AGSALs) in Honduras, Nicaragua, and Peru. While this paper considers policy issues of relevance to the entire region, examples will be drawn from these three countries to illustrate issues of direct relevance to the Bank.

Forest management policies are only one element in the framework. On lands of low agronomic productivity and in remote locations, most forests are a residual land use. As a consequence, policies related to agricultural development and land tenure can have potentially negative consequences for forests. Mineral exploration, hydroelectric reservoirs, highway projects, and urban expansion also have impacts on forest conversion. Finally, macroeconomic policies affect forests through their impact on investment, public spending, foreign trade, and other economic variables that have consequences for land use.

Thus, forests and forestry are generally affected by external factors. This explains why evaluations of "forestry sector" policies are inadequate and often misleading. Instead, an assessment of forest policy must consider a complex web of intersectoral and cross-cutting relationships. Previous policy work on forests (Repetto and Gillis 1988) has established this fact.

A policy is a law, guideline, or pronouncement intended to lead in the direction of particular explicit or implicit goals. Sometimes these goals are revealed by inaction and choices not made rather than by action. Appropriate natural resources policies seek to identify and manage tradeoffs among economic, social, and conservation considerations (DeCamino and Müller 1993).

The mix of economic policies for forest management and other land uses should be guided by strategies that raise national income. Moreover, the goods, services, and values produced by forests should increasingly be distributed to indigenous peoples, low-income populations, women and children, and other socially disadvantaged groups. Finally, policies for the protection and management of natural resources should make the country at least as well off in the future as in the present.

These are not the criteria that governed traditional forestry in previous decades. Their complexity and tradeoffs pose considerable difficulties for the development of suitable policy frameworks and indicators. Moreover, the pursuit of multiple complex objectives is problematic: "Few things are more difficult for policymakers to do than to pursue multiple objectives simultaneously."[2]

A Changing Policy Agenda for Forests

According to Clawson (1975), the central policy question about forests is almost always: "Forests for whom and for what?"[3] The question is complex because forests produce a wide range of products and services, many of which are not marketed and, therefore, are unpriced. Moreover, many are public goods or result as externalities of other activities. Finally, forested land has alternative uses for cropping, grazing, mineral production, infrastructure, and urbanization. Hence the central policy question is answered differently by timber industries, livestock and agricultural producers, petroleum and mining companies,

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2 William Ascher and Robert Healy, *Natural Resource Policymaking in Developing Countries*, Durham: Duke University Press, 1990, p. 181.

3 Marion Clawson, *Forests for Whom and for What?*, Washington, D.C.: Resources for the Future, 1975.

indigenous peoples, environmental groups, and others. The competing claims on Latin America's forests are many and politically volatile.

Historically, many of Latin America's forests were treated as "empty lands" to be penetrated and colonized (Nelson 1973). Although this legacy persists, often without justification, new voices call attention to the overlooked or ignored value of forests. In virtually every country, environmental and social activists are expressing a revised set of priorities for forest protection and management. Their ideas emphasize forest sustainability, the rights of indigenous peoples to forested homelands, and forests as suppliers of critical ecological and environmental services. Traditional pressures to open and settle forests now coexist, usually uncomfortably, with this newer collection of answers to the question of forests for whom and for what.

For the most part, governments have addressed these competing claims on forests by attempting to increase controls and expand regulations within centralized agencies. This explains regulated timber concessions on public lands, mandatory reforestation requirements, and government controls on trade in forest products.

Most of the public authority to oversee forests and forestry rests with Public Forest Administrations (PFAs). Depending on the country, PFAs could be forestry agencies or directorates, departments within ministries of agriculture, or divisions within institutes of environment and natural resources. As with other public bureaucracies in the region, the performance of Latin America's PFAs has suffered from two sorts of failures.

"Failure by commission" is the government's production and control of goods and services which private enterprises are able to supply more efficiently (Krueger 1990). Traditionally, various PFAs have engaged in one or more phases of seedling production and distribution, afforestation and reforestation, wood processing, export marketing, and other activities that overlap with private activity. [4]

The opposite policy error is "failure by omission." This occurs when governments do not provide an adequate legal and institutional framework (e.g. property rights), public infrastructure, and public goods (e.g. information services). Many PFAs have been unable to enforce the terms of forest concessions, publish reliable forestry statistics and analyses, or offer an attractive investment climate for long-term forest management. These failures are generally more difficult to correct than the often simpler matter of withdrawing government participation in and control of production.

The new institutional context for forests increasingly recognizes these issues (Morell and Anziani 1994). The revised agenda features changing objectives, organizational structure, and policy means. For example, the previous focus on industrial timber is now joined by two types of pressures. One is for management of natural forests through approaches consistent with environmental protection. The other is forest and tree management by peasant and indigenous communities (social forestry), often focused on nonindustrial objectives and nontimber outputs.

4 The recent privatization of industrial, commercial, and financial enterprises in Latin America was undertaken to resolve fiscal and efficiency problems resulting from state ownership of the means of production (Sanchez and Corona 1993). Yet privatization and deregulation have extended well beyond industry to also include agriculture and forestry. Honduras, Nicaragua, and Peru offer prime examples, as will be discussed.

Additionally, pressures for decentralized and participatory policymaking have been building steadily in several countries. Many critics want the PFAs transformed from closed, centralized bureaucracies to open, responsive organizations in touch with local problems. Implied is greater decentralization. Greater openness to consultations and partnerships between PFAs and grassroots social, environmental, and business groups are also desired. Contacts among these groups are presently few and often antagonistic.
Finally, the current ideological trend is towards privatization of production, with governments acting as facilitator rather than producer. Yet because forests (particularly natural forests) provide important externalities and public goods, forest ownership and management cannot be left entirely to the will of the private owner. The division and control of forests and forest industries between private and public hands is understandably one of the most controversial of all policy issues for forests.

Institutional Constraints

Because much of the impetus for change did not originate within the PFAs, the transition from the old to the new agenda cannot move far or fast until policy shifts are internalized. Forest policy commands attention precisely because of contrasting hope and skepticism over whether the PFAs will succeed in internalizing the new prescriptions. Several years ago, Llaurado and Speidel (1981) identified numerous administrative obstacles in the way of PFA effectiveness. Many of these obstacles persist (Box 1).

Many PFAs continue to experience inadequate institutional capacity, often despite many years of efforts to strengthen them. Most have been the object of frequent and sweeping reorganizations, partly in response to changing ideas of the correct relationship of forestry to agriculture, the environment, and other natural resources (wildlife, watershed management, and others). In summary, the identification of leading policy issues affecting forests must simultaneously consider how governments will implement them.

Scope of the Analysis

This paper identifies key issues affecting

***Box 1*: Obstacles to the Effectiveness of PFAs**

- Isolation of PFA directors and from top executive and legislative decisionmal and from key ministries in charge of fina budgeting, and economic planning.

- Control of policy issues powerful and influential special interests (compa in wood products, petroleum and mining, agribusiness).

- Functional overloading of F authorities with ineffective regulatory duties excessive paperwork.

- PFA policies that conflict policies in other units of government (colonization, agriculture, minerals and petrole roads and public works, energy).

- Insufficient number of PFA with education and skills in the resource managen disciplines, management sciences, and social scien

- Unrealistic forestry la regulations, and mission statements that are accompanied by operational plans and budgets.

- Too much PFA emphasis implementing reforestation and other governm projects rather than building a national po consensus and facilitating the activities and goal its various constituencies (stakeholders).

- Deficient data on forest inventor production, environmental indicators, etc., and capacity to collect and manage information.

- Poor conditions of F employment (low salaries, small operational budg negative image of forestry) that contribute to morale among PFA staff.

forests, starting from the published literature and drawing on internal Bank reports. Although the configuration of these problems is unique in each setting, the paper attempts to point out cross-cutting relationships where they seem to be relatively clear.

Policy choices typically produce tradeoffs between distributional and environmental objectives. Also, short-term and long-term interests conflict when forests are exploited heavily in the present, leaving behind a changed (and often inferior) asset for the future. Sustainability issues are especially difficult to discuss in view of the various potential future directions for Latin American forests and forestry.

In the discussions of sustainability, some words have extraordinary power. "Deforestation," for example, is a negative or even derisive term, implying unquestioned loss or sacrifice. The term "forest conversion" is more neutral, implying change or transformation. In several forested subregions of Latin America, some amount of forest conversion is considered a legitimate and desirable goal, especially on a regional and local perspective. A dynamic and growing society cannot be expected to live with a static land-use pattern. "Forest degradation" implies destruction, even though some species of birds and wildlife respond favorably to various kinds of forest disturbances (forest alteration). Finally, the point has been made many times that "sustainability" is not a useful term until we know more about what it implies (see Johnson and Cabarle 1993).

MANAGEMENT OF FORESTS AND WILDLANDS

The distribution of Latin America's forests is highly uneven between and within countries (McGaughey and Gregersen 1983). They span an enormous variation in elevation and climate, from sea level to the Andean highlands, and from thorny woodlands to rain forests. The range of climatic conditions, soil types, and past and present human impacts account for the huge diversity of forest conditions. The context of forest management is very much determined by these variations.

Imposed on this biogeographic mosaic are

varying cultural, economic, and political responses to the question of "forests for whom and for what." Despite this heterogeneity, forest policy concerns are common to many settings.

Forest Concessions

In most Latin American countries, forests are largely or even exclusively in state ownership (*de jure* property rights). In many of these forests, indigenous groups and other local residents earn all or part of their livelihood through the exercise of customary use rights (*de facto* property rights). The PFAs are under considerable pressure to define and coordinate policies to protect and manage state forests for economic development (that is, to serve as a source of new jobs and income) and environmental services (genetic resources, carbon storage, watershed protection, wildlife habitat, and many others). At the same time, the PFAs are expected to establish a policy framework that more broadly respects and protects customary use rights and the sociocultural values of local populations.

Regarding the production objective, the government has three alternatives. First, forest resources (logs, nontimber products, ecotourism sites, etc.) may be used by the government itself in parastatal operations. Second, it may transfer property rights to forests and their resources to private or communal owners through sales or grants. Third, the government may issue forest concessions retaining ownership of the land, but allowing specified individuals the right (or privilege) to obtain specified forest resources through utilization contracts (FAO 1971).

The terms of a forest concession spell out its duration, harvest amounts and methods, responsibilities for forest protection and management, and payments for use rights. A large body of evidence indicates that policies on forest concessions require far-reaching reforms (Repetto and Gillis 1988; Johnson and Cabarle 1993). This paper recognizes three principal policy areas; namely, answering wisely the "forests for whom and for what" question, controlling forest damage and encouraging active forest management, and assessing and collecting revenues.

For Whom and for What

Forest concessions are a source of new jobs, thus raising national income. However, they also risk imposing social, environmental, and political costs on society. Some concessions have been allocated on lands otherwise occupied or used by indigenous and other local residents (social costs). Improper road construction and forest harvesting can damage residual forests and leave them vulnerable to post-extraction degradation (environmental costs). The awarding of forest concessions opens a government to accusations of favoritism and corrupt behavior if the concessions are obtained by mainly powerful and wealthy interests (political costs).

As a result, policy should try to define concession types and locations that favor local populations, minimize risks of environmental disturbances, and are awarded through open (transparent) administrative processes in accord with well-established criteria. These are not separate issues, but have to be considered jointly. In recent years, several governments (among them the governments of Bolivia, Costa Rica, Honduras, and Guatemala) have declared temporary moratoriums on timber cutting. While this is highly disruptive to industries that require a steady supply of forest raw materials, it provides a potentially valuable opportunity to review and debate pertinent issues.

Locating concessions only where no prior claims on the land exist is a passive and naive strategy that may be impossible to effectuate if most desirable lands are claimed by one or more *de facto* user groups. A more active approach is when governments transfer an increasing share of forest property rights to indigenous and local users (Clay 1988). In some countries, there may be increasing social and political support to legally recognize all indigenous homelands and areas of customary forest use prior to the issuance or renewal of concessions. Implied is an enormous political battle demanding exceptional cooperation among diverse partners (Poole 1989).

The contemporary social and political foundations for community-based forestry date from the late 1970s (FAO 1978). The interest in community-based management is paralleled by interest in nontimber forest products. Proponents explicitly or implicitly assert that the harvesting of nontimber

products is less environmentally disruptive, and hence more sustainable than logging (Fearnside 1989; Peters et. al. 1989). Moreover, it is assumed that harvesting nontimber products provides more jobs and income for local communities than the more capital-intensive timber harvesting.

Yet, some recent critics challenge these ideas (Browder 1992; Richards 1993). Biological sustainability comes into question if there is a sudden surge in the demand for nontimber products that are produced in low volumes. Frequently, the infrastructure for nontimber products (mainly transportation services) is poor. Sellers of nontimber products are vulnerable to buyer manipulation when markets are specialized, small, and volatile. Individuals who earn their livelihood from nontimber products are often among the poorest of the rural poor, so that it may be difficult to argue that nontimber products lift the economic status of those engaged in it. To allow local people harvesting rights to nontimber products but not to timber, minerals, and other key resources may deny them opportunities for development and wealth (Dove 1993). With reference to Amazonia, Browder (1992) contends that policymakers must encourage tenure and land-use strategies that integrate nontimber forest products with commercial activities on farms, ranches, and in timber harvesting.

For PFAs, policy questions begin with defining the criteria and administrative process for allocating forest concessions to communities versus other (industrial) contractual users. Related questions concern the share of PFA resources committed in support of assisting community-based concessions, and whether and how production will be subsidized. For example, should community concessions pay fees equivalent to those required of large industrial concessions? Additionally, community concessions are no different from others in that agreements must specify extraction quantities and methods, controls to lessen forest damage, and terms of forest management and regeneration. Especially for nontimber products, much of the silvicultural knowledge for sustainable management is still lacking. Finally, it must be determined whether community forest concessions require new contract formats, or whether they should be issued under existing legal and administrative arrangements.

Incentives and Controls

Global interest in sustainable forest management has generated several sets of guidelines for defining a permanent forest estate, awarding and supervising forest concessions, maintaining biological diversity, and certifying "good performance" (Johnson and Cabarle 1993). The various strategies depend on sound policies for forest management in an integrated framework (Dourojeanni 1993). Leading issues such as the duration of concessions, the award process, forest management plans, and the regulatory approach are defined in Box 2.

In most practical cases, extending the concession duration is a necessary but not sufficient condition for concession holders to engage in forest management. Extending the length of the concession is unlikely to have a positive influence on forest management if entrepreneurial behavior
is governed chiefly by rent seeking. To the extent that resource rents (pure profits) are high, short-term profiteers compete with companies and communities that take long-term management more seriously.[5] Moreover, insecurity of tenure is explained at least as much by political vagaries as by concession length. Investment in forest management is discouraged wherever it is perceived that government policies on forests are volatile or unpredictable (Giroldo 1987; Deacon 1994).

5 Profiteers are the subset of concession holders who risk penalties and concession cancellation by ignoring their contractual obligations regarding forest management. They regard these risks as worth taking if the public sector's monitoring and enforcement are ineffective, penalties are light, or government officials can be bribed to ignore infractions. These conditions exist in a number of cases in Latin America.

Open bidding for forest concessions, such as through auctions, may be attractive to the extent that PFAs can administer it competently. The aim is to increase transparency so that concessions are awarded according to well-defined criteria. A second objective is to increase revenues for public treasuries by allocating forest commodities to users able to pay the most for them. In principle, this favors bidders positioned to obtain the highest and best use of the raw materials (because of location, value-added, and other economic factors).[6] However, potential problems may arise and should be addressed. At issue is whether community-based entities should bid in competition with industrial timber companies which are generally assumed to enjoy financial and other advantages. Overcoming collusion among bidders should also be considered, given that the number of competing buyers for forest commodities easily reduces to an oligopsony.[7]

In theory, the formulation and application of forest management plans leads to sound silvicultural and harvesting activities. In practice, many of these plans are poorly prepared (inadequate inventory data and unrealistic regeneration assumptions). Moreover, many are poorly monitored and enforced by the PFAs. Potential policy corrections include limiting the size and number of concessions to the supervisory capacity of the PFA, and opening the process of plan submission and approval to public review and comment.

The ability of a PFA to monitor and enforce forest concessions is determined by its field presence and supporting infrastructure (vehicles and boats, travel budgets, legal staff and counsel). Some governments have assigned many more concessions than they can realistically monitor and enforce.[8] Oversight of concessions is particularly problematic where structural adjustments have reduced PFA staff and operating budgets. This suggests that revised policies should consider new approaches in which PFAs seek NGO partners and community-based reporting systems to assist with concession oversight.

Box 2: Leading Issues in Incentives and Control

Concession Duration: The length of time for which a concession is awarded should be sufficiently long to interest concession holders in forest regeneration, proper road planning, and other investments for the future.

Award Process: To counteract corruption and special influences, forest concessions should be allocated through open and transparent administrative procedures, including competitive bidding.

Forest Management Plans: The quality and realism of management plans need improvement, and PFAs must have the capacity to monitor and supervise them. Administrative processes to terminate or sanction concession holders who violate forest management criteria must be open and fair.

Regulatory Approach: Governments are encouraged to review the effectiveness of their regulatory strategies. Traditional command and control policies should be reconsidered.

The opening of concession management plans to public review is consistent with the larger tendency towards democratic and participatory decisionmaking (Bradford 1994). The main

6 This is an important cross-policy link with resource pricing (see pricing discussion that follows).

7 This is explained by barriers to entry (capitalization and regulatory), the wide dispersion of commercially valuable forest resources, and high unit transportation costs of forest commodities. These conditions limit the commercial enterprises competing for the extractable resources in a given forest tract. However, the extent of actual and potential oligopsony in Latin America's forest industries has not been sufficiently investigated.

8 Suriname has 150 concessions over two million hectares of production forest. In Bolivia, 21 million hectares under forest concessions overlap lands titled under colonization projects.

issue is the extent of informed, pluralistic, and balanced comment that can be obtained and used. As noted previously, the subject of forests (particularly tropical forests) stirs deep emotional responses. Often, a few vocal and highly influential environmentalists confront equally few but influential industrialists for the attention of the PFA, news media, and top political leaders. The PFA is charged with making public review workable in a polarized setting of a few strong voices and personalities. At present, most PFAs apparently do not have the skills and capacity to do this.

Pricing and Revenues

Governments assess fees and collect revenues from concession holders. These revenues derive from a variety of actual and potential license fees, charges on commodities harvested (post-harvest), charges on resources in the forest (pre-harvest), area fees (per hectare of concession), profit-based royalties, export taxes, and others (Gray 1983). In principle, policies on fees and charges should strive to generate adequate revenue, promote sound forest management, and contribute to social equity. In practice, it is not clear that PFAs adhere to this framework, or that they understand the implications of the fees they administer. This is particularly evident where governments apply several types of charges simultaneously.

Low fees and royalties reduce government revenues to the benefit of concession holders. This is neither just nor efficient, and it exacerbates speculative behavior. Furthermore, low charges for forest commodities extracted from public lands reduce incentives to manage trees and forests on private lands, at least in the short run. For these reasons, a few widely cited analyses (Repetto and Gillis 1988) argue that the prices charged for publicly-owned forest resources should reflect true resource rents (i.e. market selling prices minus private costs of production, adjusted for environmental and other social costs).

The revision of revenue systems to assess resource rent ("stumpage pricing") implies substantial budgets and skills for forest inventory and appraisal. This conflicts with pricing simplification. In light of the limitations of PFA budgets and technical capacity, some proposals to capture full resource rent are academic and unrealistic. Thus, Richardson (1992) advocates greater use of area fees ("ground rents") because they are easy to compute, difficult to avoid, and highly transparent. Ground rents may also discourage companies from trying to obtain concessions on huge forest tracts, since concession holders make annual payments on every hectare. Without too much administrative cost, area fees can be set to reflect broad variations in forest accessibility, stocks, and markets.

Yet, while the area fee is easy to administer, it cannot provide the pricing differentiation resulting from stand-level forest appraisal. Hence difficult tradeoffs are inherent in the choice of approaches. The needed conceptual framework is maximization of social net revenue, where transaction costs are subtracted from the additional rent gains resulting from the increasing sophistication of resource appraisal.

A controversial question is whether PFAs should retain the forest revenues they collect, and allocate them to forest management. There are two main arguments against this. First, it pressures PFAs to focus heavily on revenue generation, perhaps to the detriment of forest protection. Second, it hurts less forested areas to the extent that revenues are retained by or returned to those areas that generate them. More broadly, the redistribution of forest revenues is an issue in countries where governments are moving towards greater decentralization.

Public and Private Ownership

Since the early 1980s, the trend toward reducing the size of the public sector in favor of private ownership and management has recast the development strategies and policy assumptions of past decades. Privatization is widely seen as the main strategy to reduce government participation and control. The most important forms of privatization for the purposes of the present study are the sale or transfer of government assets to private interests, liberalization of regulatory controls over the activities of private enterprises, and competitive tendering of services to private contractors.

PFAs typically are expected to meet extra-enterprise objectives, even if these objectives lessen financial and economic performance. Ramanadham (1991) enumerates several extra-enterprise objectives, including some that are critical for forests and forest industries. The most important are environmental protection, favoring of socially meritorious groups in forest concessions, PFA employment, and retaining central control over the type and amount of foreign investment in natural resources. In this framework, some national objectives are traded off against others because social efficiencies are more encompassing than financial ones.

Forest Industries

State-owned forest industries which have been closed or divested include *Demerara Woods* in Guyana, *Celulosa Arauco y Constitución* in Chile, and *CORFINO* and five other companies in Honduras. Additionally, the governments of Guyana and Honduras have disbanded the marketing boards for the export of wood products.

The Honduran experience is a classic illustration of divestiture to cut unresolvable financial losses (Box 3). This contrasts with *Arauco* in Chile, which was sold primarily to generate revenue. Not researched is the number, size, and financial condition of state-owned forest products companies, tree nurseries, and other enterprises that continue to operate in Latin America.

The analytical framework for policy discussions of privatization options should rigorously take into account the precise nature of privatization, exposure to market forces, incentives for managerial performance, and whether or not owner control will be directed toward financial objectives (Ramanadham 1991). These are briefly discussed below:

Precise Purposes of Privatization: This is a fundamental question. Policymakers should clearly understand the reasons for undertaking a privatization. Such purposes could include: to raise revenues, reduce fiscal losses, avoid political embarrassment, reduce government payrolls, create ideological symbols, resolve a labor dispute, or increase exports.

***Box 3*: Government Divestiture in Honduras**

Honduras established a public forest administration (COHDEFOR) in 1974, and gave the agency a manufacturing role as well as a virtual monopoly over marketing and exports. COHDEFOR's manufacturing losses have been large. The public companies (*CORFINO*, *Casisa*, *Fiafsa*, *Locomapa*, *Semsa*, and *Promagua*) lost 50 million lempiras charged against accounts receivable in 1990 alone. In addition, they lost another 19 million lempiras charged against the asset value of investments. By 1991, the accumulated losses of *CORFINO* alone were 122 million lempiras. Debt servicing may be about four million lempiras per year. These figures may understate the real situation, since the auditor refused to approve COHDEFOR's financial statements because of inadequate data and inappropriate accounting methods. As of 1992, these public companies ceased to operate and are being sold or closed.

***Source**: IDB internal documents*

Exposure to Market Forces: Will privatization stimulate market competition, or merely shift ownership of a monopoly enterprise from the public to the private sector?

Incentives for Managerial Performance: What are the determinants of higher managerial performance after an enterprise is privatized? Two areas to be examined are higher compensation, and freedom from government controls. Yet even private companies will be regulated, and some governments pay compensation incentives similar to those paid by private companies.

Owner Control Directed Towards Financial Objectives: Will privatization be of the kind in which owners keep management alert to profitable operation? A focus on financial returns is not necessarily paramount if an enterprise's managers and workers are among its principal owners.

Because of the foregoing, most studies

***Box 4*: Forest Privatization in Honduras**

The circumstances of forest privatization in Honduras illustrate a number of practical issues. In 1974, the Honduran government nationalized forests on private lands (free-hold title), which make up an estimated half of the country's pine forests and a tenth of its broadleaf forests. In 1992, the Agricultural Modernization and Development Law reinstated private property rights in these forests. The objective is to allow private landowners to obtain higher prices for their forest commodities, and to allow and encourage them to practice forest management. For the communal groups living in or near the forests, the overriding issue is retaining customary tenure or obtaining formal tenure in the face of privatization.

The new policy raises several issues, including the following: (1) Compensating or assimilating persons who had been engaged in resin collection and pitsawing on private lands. (2) Winning the support of displaced persons and other community groups by increasing their opportunities to earn income from forests on public lands. (3) Preventing land grabbing because of the poor cadastral system and unclear landownership. (4) Granting land titles to all forest occupants on public lands, if that should become necessary to head off social unrest. (5) Controlling the public costs of relocating forest occupants. (6) Implementing a system of forest management plans to induce private forest owners to retain forest cover. (7) Controlling the negative environmental impacts of forest harvesting by attempting to balance incentives and sanctions.

Source: Inter-American Development Bank

conclude that the form of ownership is insufficient to explain financial or economic efficiency. Market structure (competition) and managerial freedom (discretion in decisionmaking) are at least as important (Hartley and Parker 1991). On this point, the forest products industries should be no different from others.

Forests

A very large share of Latin America's forests, particularly its natural forests, are nominally state-owned (*de jure* basis). This is consistent with the pattern of forest ownership in most of the world. Public ownership of forests is generally justified on the basis of the failure of markets to achieve social efficiency in forest allocation and production. With few exceptions, markets do not effectively allocate or lead to investment in the production of biological diversity, carbon fixation, wildlife habitat, watershed protection, opportunities for science and education, and other unpriced forest outputs (Loomis 1993). Moreover, many of these goods and services are generated as spillovers, or positive and negative externalities not incident upon forest owners (Hyde and Newman 1991).

In the absence of other incentives or controls, the actions of private holders are governed by profit motives. The private holder of a forested tract has reasons to guard it against encroachment from the outside, and may be more effective at policing than the public sector. However, this is not the same as acting in the public interest. In responding to market signals, the private owner rationally maximizes the net present value of the asset. Where future financial returns from the forest are unprofitable or uncertain, deforestation without investment in future forest management may ensue. In addition, such a situation could also result in practices that control only private costs, ignoring public costs. From the private owner's perspective, the principal factor in forest management is profitability rather than property rights.

However, political conservatives argue that market failure is not a satisfactory justification for government ownership and management (Baden and Stroup 1981; Anderson and Leal 1991). The arguments for transferring forests from public to private owners are several. Researchers have noted the difficulties in carrying out the analytical tasks required, the existence of perverse incentives, and unlimited special interests, as well as cross-country experiences and issues of multiple use.

Impossible Analytical Tasks: Even if nonmarket values and social (distributive) weights could be fully identified and quantified, it cannot be assumed that a PFA or other public agency can effectively use the information for decisionmaking. Even the world's most sophisticated and expensive models to quantify forest tradeoffs have been found inadequate (for a critique of the USA's FORPLAN model, see O'Toole 1988).

Perverse Incentives: PFAs, like other bureaucracies, are vulnerable to political interference, patronage, and ambiguous and contradictory objectives (Cook and Kirkpatrick 1988).

Unlimited Special Interests: Forest products companies, environmental NGOs, social NGOs, peasant associations, indigenous groups, and international agencies are among the special interests that place expectations and demands on PFAs. These expectations and demands are unlimited and often internally inconsistent. Collective action to address conflicts is not always in the interest of the PFA. Instead, individuals who control public agencies manipulate competing claims in order to appropriate favors for themselves. Wealthy and powerful interests have the advantage in the competition for attention. Thus, public control of contested resources such as state-owned forests does not reduce social inequities, but actually reinforces them (Brett 1988).

Cross-Country Experiences: Worldwide data on public and private forests should be reviewed for lessons on actual performance. New Zealand recently sold off extensive state forest holdings, mainly plantations, premised on the superior efficiency of private management (Kirkland 1988). In Latin America, there are examples of the successful private operation of a variety of nature reserves, ecotourism sites, and forests for science and education (Alderman 1990; Castner 1990). Deforestation and forest degradation in boreal regions (Barr and Braden 1988) and the tropics (Stewart 1985) have been linked to state ownership. There is thus considerable support for the argument that private ownership is not necessarily predatory, nor public ownership always protective.

***Box 5*: Property Rights to Forests in Peru**

Bank analysis of an agricultural sector loan for Peru reflects competing proposals to establish revised property rights to forests. Among the debated approaches are forest management contracts, the outright sale of forests and wildlife areas to private owners, extension of forest concessions to 60 years, and sale of state-owned forest commodities through auctions. Accompanying the debate are contested issues regarding alternative types of forest management plans, recognition of the property rights of native and *campesino* communities, the ability to transfer forest property rights, and strategies for public oversight of private ownership.

***Source**: Internal IDB documents.*

Multiple Use Through Dominant Uses: True multiple-use forest management on every hectare is virtually impossible from a technical standpoint. Instead, public forests usually are zoned into production and protection areas of various classes and sizes. In theory, the same result may be achieved, with greater potential for enforcement of property rights, if forests are transferred to a mix of private and communal owners. The new owners need not be solely private timber companies, but may also comprise indigenous groups, peasant associations, environmental NGOs, and other entities. Within the privatization framework, the PFA retains responsibility for a permanent forest estate scaled down to a size compatible with its management capacity. Other forestlands are transferred to private and communal owners in phased steps backed by land-use mapping, forest inventories, social surveys, and other supporting information.

These arguments, however, do not address all the issues. Practical questions on forest privatization are complex (Boxes 4 and 5) beginning with defining which forests to divest, and for what reason(s). The criteria for considering the mix of forest buyers and grantees are contentious because PFAs may try to favor or exclude groups because of foreign

capital, ethnicity, and other reasons. The timing and sequence of divestiture, and the valuation and pricing of forest assets, can be expected to attract political attention. Finally, a government must have a sound policy and workable strategy to compensate individuals and groups who perceive that they incur losses because of privatization.

The observations advanced here lead to the conclusion that forest privatization should not to be entered into lightly. It has substantial budgetary implications; its economic benefits are mainly distant and uncertain rather than immediate and concrete; and it may entail significant political costs. Private ownership is unable to produce the socially desired amount of nonmarket goods and services from forests except through the government's regulatory and fiscal interventions (Loomis 1993), but these interventions are sadly ineffective in Latin America (e.g., Guess 1991; Gottfried et. al. 1994). Hence forest privatization policy should not be rushed. The process should entail a high degree of consultation, and should focus continuously on the question "Forests for whom and for what?"

Public Assistance for Private Forests

Private forests in Latin America encompass industrial plantations, and farm and community trees on private, *ejidal*, and communal lands. Latin America's industrial tree plantations include some of the world's most productive planted forests (Zobel et. al. 1987). Trees on farms and on communal lands furnish a wide range of market and nonmarket goods and services (Tschinkel 1987).

Government policy on private forestry is currently in transition. In part, this reflects considerable criticism of past efforts. Several Latin American governments have granted large financial subsidies to industrial plantations, but often without a satisfactory *ex ante* or *ex post* accounting of benefits and costs. Government assistance for farm and community forestry has been far less generous, but is similarly short on program evaluation. Various NGOs, environmental groups, and biologists urge greater attention to planting with native species. They also endorse government assistance for natural forest management, not just tree planting. Yet this is only beginning to find its way into policy. Finally, governments can easily over-regulate private forests, and possible corrections are needed in this area.

Industrial and Farm Forestry[9]

Progress in plantation forestry in various Latin American countries has been considerable, especially since the late 1960s. For the region as a whole, tree planting (by area and expenditure) is dominated by medium and large private companies. However, private tree planting requires the indirect, and often direct, policy support of public authorities. Several governments have provided subsidies for reforestation in the form of tax incentives, cost reimbursements, and other mechanisms. Subsidized private reforestation has been considered in virtually all countries in the region, and put into practice in Brazil, Chile, Colombia, Ecuador, and Costa Rica.
Indeed, the reforestation and afforestation of large areas in Latin America has been made possible by the availability of public financial incentives. Government subsidies for planting trees make sense if they benefit others as well as the landowners receiving the subsidies. Examples of such benefits are improved water quality through sedimentation control, the preservation or expansion of wildlife habitat, improved subsistence gathering for non-landowners, improved air quality, and the provision of amenities and aesthetic benefits. Some of these are public goods (non-rival in consumption). In addition, the plantations serve as a source of new employment. The provision of plantation-related employment is possibly an external economy if social gains from this extend beyond private wages and salaries.

In the orthodox framework of market imperfections, each of these contributions may qualify as a positive externality under the right circumstances. Yet they must be demonstrated to exist in each case, not merely assumed just because spillovers are plausible. Critics argue that forest plantations often decrease rather than increase environmental amenities (Sargent and Bass 1992), implying that

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9 See: Inter-American Development Bank, SDS/ENV. *Proceedings of the Workshop on Financial Incentives for Industrial Forest Plantations.*

governments should tax rather than subsidize them. Moreover, social efficiency requires that public payments to landowners not simply substitute for private capital that would otherwise be invested. The substitution question has been examined in North America (Mills 1976), but apparently not in Latin America.

In Brazil, and more recently in Costa Rica, numerous reforestation projects have been motivated more by tax considerations than by future long-term return on investment. Consequently, the public objectives of subsidization have been compromised by suboptimal planting practices, unfavorable plantation locations, and other technical deficiencies (Gottfried et. al. 1994). Early studies indicate that private financial returns from these programs are exceptionally attractive, even if social returns (i.e. over the sum of public and private inputs) are not (Beattie and Ferreira 1978; Berger 1980). In comparison, some observers believe that Chile's public-private cost sharing has been successful from both the private and social perspective (McGaughey and Gregersen 1983; Amacher et. al. 1994).

Given these results, governments are advised to prudently consider whether and how to subsidize tree planting. To date, key questions remain unanswered, including the following:

- Which government programs to subsidize tree planting are supported with acceptable information regarding types and quantities of positive externalities? Is this confirmed by field studies?

- Who are the recipients of these external benefits? More specifically, can it be shown that they flow to relatively disadvantaged populations living in or near the areas where tree planting occurs?

- What is the evidence for and against positive environmental amenities from planted trees in different contexts? This has to be approached through case studies varying in relation to tree species being planted, type and condition of vegetative cover prior to planting, size and configuration of planted areas, and so on.

Only limited analysis is available to address these issues. Initiatives to provide new or continuing public subsidies for private afforestation and reforestation should be supported by a rigorous study of financial, economic, social (equity), and environmental benefits and costs.

Additionally, few studies assess the impact on private nurseries of subsidized production and distribution of tree seedlings by government nurseries. Seedling subsidies imply tradeoffs between production efficiency and distributional equity. Substantially greater analytical and policy sophistication are desperately needed to address this.

Large and medium companies have historically received most of the available public financial assistance for reforestation. Yet hundreds of community-based reforestation projects on farms and communal lands are taking place throughout the region (FAO 1992). Many if not most of these projects receive no financial or technical support from the government.

It is also true, however, that community-based programs in some countries are well-served by extensionists, and receive free or subsidized seedlings and other inputs. Costa Rica's subsidies for reforestation, for instance, include a separate component for farm and community forestry. Chile is reducing its subsidies for industrial plantations, but is proposing a new program to benefit farmers and other nonindustrial landowners (Wünder 1994). Conceivably, other governments may also be increasing direct assistance for small-scale tree planting. In so doing, governments should take into account the importance of holding down transactions costs (approvals and paperwork), delivering needed technical inputs, and insuring that clearly defined goals are being met. Public funds are easily dissipated when the benefits of tree planting are vague or undetermined. Moreover, the design of programs for smallholder forestry has to consider tree management (thinning, protection, etc.), not just planting. This has been a weak point in the past (Belaunde and Rivas 1993).

In principle, industrial plantations and farm-based and community forestry should be considered jointly in land-use policy and public spending. In practice, however, they

are frequently separated. Recent calls to re-examine the social and environmental aspects of industrial plantations may bring theory and practice together.

Most financial and policy support for reforestation and tree planting has gone to large enterprises. The PFAs, in consultation with communities and grassroots NGOs, should review the extent to which small-scale tree planting and management are helped or hindered by existing legislation, administrative procedures, and PFA structure. Where the efficiency of small projects can be increased, PFA support should be extended through incentives such as demonstration projects, extension, and training (McGaughey and Gregersen 1988), rather than taxation and other fiscal measures. Additionally, smallholder tree management demands species research, agroforestry trials, and other infrastructural support which, in turn, depends on close inter-institutional coordination (another historically weak link).

Although subsidies for agriculture and livestock are seriously questioned (cross-policy link with land markets and infrastructural development), virtually no current analysis explores similar issues for subsidized tree plantations, seedlings, and other public inputs to tree growing and management on private and communal lands. The provision of subsidies for private forests and trees needs rethinking, especially in view of pressures to contain public spending. The economic effectiveness of subsidized forestry demands conceptual work and the generation of reliable data.

Native Species and Natural Forests

Policies on species choices for tree planting are highly controversial. Most afforestation and reforestation in Latin America comprises industrial plantings of pine, eucalyptus, gmelina, and other timber species grown primarily in plantations. Foresters in Chile have been criticized for planting radiata pine over large areas without diversifying to other species, and for removing native forests to make room for plantations (Castilleja 1993).[10]

10 Critics also point to Jari Florestal as an example of large-scale clearing of native forests to make room for block plantations (Fearnside 1988).

Yet removal of natural forests is the exception (Evans 1992), and the Bank has been very careful to avoid this when financing plantations (Keipi 1991).

Evidence for and against plantations of individual species is varied, complex, and often distorted. For example, various myths about eucalyptus should be clarified (Sargent and Bass 1992), including allegations that it dries the soil, and diminishes the yields of adjacent crops and forage. Evidence of these effects is inconsistent and site-dependent (Poore and Fries 1985). Moreover, contrary to popular belief, single-species plantations do not necessarily have a narrow genetic base (Zobel et. al. 1987).

Importantly, evaluations of successes and failures with mixed-species plantations are now becoming available (Wormald 1992). Field trials with planted native species are beginning to generate useful data on survival and early growth compared to traditional plantation timbers (Butterfield and Fisher 1994). In light of these reports and field demonstrations, Latin American PFAs are now in a position to re-examine assumptions and policies regarding species choices for reforestation and other tree planting.

A philosophically related but separate technical issue is policy support for natural forest management. To date, government programs for both industrial and farm forestry have been largely synonymous with planted trees. However, this has not gone unquestioned (Johnson and Cabarle 1993). The government of Chile is debating a proposed Law of Native Forests, which would help subsidize the costs of managing natural forests (Wünder 1994). Costa Rica recently established financial subsidies for natural forest management, subject to caveats on size of holding and security of land title. However, observers question whether subsidies can be sustainable in light of budget constraints, and whether forest management will continue if subsidies are removed (Gottfried et. al. 1994).

Regulatory Setting

Like other Latin American government agencies, PFAs rely heavily on command and control management. Forest laws and regulations tend to be highly prescriptive.

***Box 6*: Regulating Forest Management—Costa Rica**

Private natural forest management in Costa Rica is heavily regulated. Landowners are required to have management plans, and must also apply to the forestry directorate (DGF) to obtain permits to cut the trees specified in their plans. However, the DGF has been unable to perform its duties of issuing, verifying, and monitoring plans and permits. In response, landowners obtain fraudulent plans and cutting permits, mainly from loggers. Under pressure from landowners, the DGF changed its policy to allow a family to cut up to ten trees with a simple permit and no management plan. However, this encouraged farmers to divide land holdings in order to obtain multiple permits. In response, the DGF returned to requiring management plans for even small forest parcels, and added a new requirement of complete (100 percent) forest inventory. The new inventory requirement substantially increased the costs of management plans.

The documentation, management plans, advance tax payments, and constant revision of DGF permits has made the process very expensive for landowners. At many sites where permits are given, additional trees are taken illegally. The case of Costa Rica shows unworkable command and control for forests on private lands in a nation famed for forest protection in national parks.

***Source**: Gottfried et al. (1994); Barrau (1992); Lutz et al. (1993).*

Excessive regulation hinders the ability of forest operations to adapt to local circumstances, thus sacrificing growth prospects (employment and income), and adding to transactions costs (bureaucratic red tape).

Regulation is deeply embedded historically and culturally, and departures from it are unfamiliar. Moreover because forests generate important public goods, purely free-market approaches are not tenable (Laarman 1986). Rather, the correct posture typically will be more market-oriented and pragmatic than in the past, but will not give up all regulatory intervention.

The regulation of private forests poses questions similar to those for forest concessions on state-owned lands. Property rights in "private" forests are divided among state, individual, and communal claimants. Governments are charged with defining whether there is a divergence between private and social net benefits in the way forests on private lands are managed or not managed. If there is evidence of divergence, then the intervention costs of changing private (or communal) practices must be weighed against the estimated environmental and social benefits to be obtained.

The appropriate conceptual framework is minimizing the sum of transactions costs (time and money for government effort and for landowner response) plus damage costs (environmental and equity problems of purely private action). Increased forest regulation normally is expected to reduce environmental and social costs resulting from the way forests on private lands are managed or not managed. However, increased regulation drives up the transactions costs for governments and landowners (for inspections, legal costs, compliance costs, and the like). Considering the minimum sum of damages plus transactions costs, there is a certain amount of forest mismanagement that should not be corrected in order to arrive at a social optimum.

Government over-regulation of private forest management has two consequences.When regulations are followed, as in Europe, they lead to too much investment in forests, i.e., beyond the margin of social efficiency (Turner and Wibe 1992). When regulations are not followed, as in many parts of Latin America, they lead to avoidance, fraud, and injustice (Box 6).

On the matter of reviewing PFA regulations on

private forest management, analysis must begin with the goals that regulation is to achieve in relation to the costs that it will impose (Box 7). This should not become a theoretical exercise. Rather, it has to be grounded in well-defined notions of what to measure, and why. In the absence of this social cost-benefit framework, regulatory policy is not necessarily better than a *laissez faire* approach. On the contrary, regulatory policy can easily generate negative net benefits.

***Box 7*: Forest Regulation in Honduras**

For regulation of private forest management in Honduras, the Bank recommends that the government focus on goals ("output") rather than formulas ("input"). That is, landowners should be allowed flexibility to meet management objectives in least-cost ways. This implies a range of approaches in silviculture, harvesting methods, regeneration strategies, and the like. Forest management plans should look quite different across different ownerships and ecosystem settings. Moreover, the government's approval process needs to be expeditious, possibly including automatic approval in case of bureaucratic delay or default.

***Source**: Internal IDB documents.*

It may be possible to enhance the transparency and impartiality of plan approval (or rejection) by opening the administrative process to public review and comment. The same type of oversight may be useful in processes to sanction violators of forest regulations. Without effective public oversight, forest owners have incentives to engage in covert bargaining with the PFA. The context is not much different than for concession holders on government lands. Importantly, the social and environmental implications of public versus private ownership may be small or even irrelevant if forests are privatized but then put under heavy regulation.

Protected Areas

Latin America's protected areas include scientific reserves, national parks, wildlife sanctuaries, protected landscapes and seascapes, natural biotic areas, and other conservation areas (IUCN classification, MacKinnon et. al. 1986). Since 1970, the number of such areas has expanded dramatically. Data presented in Caracas for the Fourth World Congress on National Parks and Protected Areas indicate that there are 218 protected areas in the Caribbean, 162 in Central America and Panama, between 61 and 67 in Mexico (debated figures), and 667 in South America (Barzetti 1993).

Yet, there are many problems surrounding these areas (Machlis and Tichnell 1985; Ledec and Goodland 1988). Many protected areas were not set aside through a process of comprehensive planning. As a result, they are less than ideally situated (in size, shape, life zones, etc.) with respect to protecting wildlife, conserving biological diversity, and meeting other scientific and conservation objectives. At the same time, various ecological types are underrepresented in protected area systems. Many protected areas exist only on paper. Partly for this reason, governments have difficulty controlling logging, tourism, hunting, petroleum exploration, land colonization, shifting agriculture, livestock grazing, and other encroachments and incursions.

In several countries, legislation to strengthen the legal status of protected areas is recent and largely untested. Legal (*de jure*) protection often conflicts with the customary rights (*de facto* use) of indigenous and peasant communities. While in recent years administrators and managers of protected areas have been sensitized to the "people issue," awareness is not in itself always sufficient to resolve fundamental conflicts.

Increased funding for protected areas is enthusiastically endorsed by influential NGOs,

international banks, and numerous assistance agencies. Yet in practice, national governments often lack strategies for revenue generation and investment planning. Management of protected areas depends on cooperation among various government agencies; among governments, businesses, and NGOs; between governments and international programs; and among several international organizations. In view of the many organizational links which are desired, institutional coordination poses significant challenges.

Box 8: Private Funding of Protected Areas in Peru

The administration of protected areas in Peru is the responsibility of the National System of Protected Areas (SINANPE), in the Ministry of Agriculture. In 1991, SINANPE was budgeted for only $73,400 in government support. Of this, 80 percent was allocated to salaries, leaving only $15,000 for operations. In that same year, inflation reached 134 percent, drastically reducing the effective budget. Earnings from Peru's protected areas are only $15,000 a year. The hypothetical "needed" budget is $1.8 million annually.

Private donors and NGOs represent a far larger source of funding than the government. In 1990, private sources contributed $390,000 for the management of 10 conservation units, and another $260,000 for training and the development of management plans. Thus, private sources account for roughly 90 percent of Peru's spending on protected areas.

***Source**: Barzetti (1993).*

Given these many constraints, the policy framework to enhance the social contribution of protected areas is exceptionally multi-faceted. For the purposes of this discussion, policy aspects are consolidated into three clusters of issues: (1) policies to win political support for protected areas, (2) policies to link conservation with development, and (3) policies to improve financing of protected areas. This is not a comprehensive listing, but focuses on leading concerns.

Political Support

Politicians who run for public office and win on a "green" platform are still few in Latin America. In fact, support for protected areas can pose significant political risk. First, protected areas are typically difficult to defend in economic terms. Second, their establishment may result in the physical or economic displacement of local people. Third, they attract the participation of NGOs and international groups in ways that may be perceived as weakening national sovereignty.

The role of protected areas in biodiversity conservation, carbon storage, and the provision of other ecological and environmental services is well established (Dixon and Sherman 1990). However, these benefits are not necessarily a political advantage unless they can be converted into financial compensation. Studies showing the "high value" of protected areas are largely academic unless they supply pragmatic information for policy decisions. Valuation studies directed to the compensation question, for example, are likely to be highly attractive from national and local perspectives.

Policymakers are keenly aware of the political risk inherent in supporting the establishment of protected areas if these displace local residents. This topic is supported by a wealth of case studies (Wells and Brandon 1992). Approaches to reducing conflicts include compensating displaced persons for restricting or eliminating their use rights; developing income-generating opportunities in buffer zones; and distributing a share of park

revenues to adjacent communities (McNeely 1988). Each strategy implies transaction costs for governments, and no strategy is effective without strong legal sanctions and capable enforcement (Wells and Brandon 1992). Consequently, policies to expand the number and size of protected areas have to consider their impact on recurrent costs. Also, policy must reckon with the possible emergencies forced on a government if squatters invade protected areas in order to be compensated for leaving.

A third type of political cost refers to the real and perceived dilution of government authority on issues of protected areas. Severe constraints on government funding, in combination with the high profile of NGO activity in conservation projects, results in the quasi-privatization of the funding for protected areas (Box 8).

The elevated position of the NGOs usually is interpreted favorably (Carroll 1992), but in the long run incurs certain risks. Policy recommendations from outside Latin America, such as on protecting Amazonian reserves, are easily interpreted as interference with national sovereignty. The assertive role of NGOs, often backed by external funding, means that much financial and decisionmaking power is effectively in their hands. Many NGOs have favored implementing projects rather than working with governments as partners. While NGO project activity is broadly consistent with privatization trends, governments must be capable of formulating and coordinating national policies on protected areas. This may require a redirection of future efforts.

Conservation through Development

Integrated conservation-development projects (ICDPs) attempt to strengthen the management of protected areas by working to improve the standard of living of adjacent residents. ICDPs aim to reduce encroachment and poaching inside protected areas by improving socioeconomic conditions outside them. This strategy encourages certain forms of low-impact development in buffer zones (Oldfield 1988; Sayer 1991). However, a recent review of ICDPs concludes that this linkage may be more perceived than real. Many assumptions about community behavior in relation to protected areas have been erroneous and naive, and functional buffer zones are rare (Wells and Brandon 1992).

Most importantly, the ICDP approach is unworkable without a supportive policy framework. For the most part, ICDPs cannot change unfavorable land markets, poorly defined property rights, inadequately planned road projects, and other adverse circumstances. Wells and Brandon recommend that ICDPs be restricted to settings that meet certain preconditions regarding political commitment, legislative reforms, institutional arrangements, regional development initiatives, land ownership and access rights, and participatory decisionmaking. The absence of these conditions should result in a reduction or redirection of project activity until corrections are made.

Revenue and Finance

Most of Latin America's protected areas lack adequate financing for personnel and operations. The protection and conservation of nature is sometimes considered an unaffordable luxury, and it must compete for public financing with other pressing priorities. However, the lack of adequate financing is also explained by inadequate policy frameworks for finance and investment.

The mix of financial resources for protected areas includes an array of components. As noted, private funding through NGOs is believed to be a major source of financing in many countries. Governments traditionally provide budget allocations from central treasuries, and some countries permit protected areas to retain all or part of the revenues they generate from entrance, concession, and user fees. External assistance, in the form of debt restructuring, international conventions and facilities (for example, the Global Environment Facility), and loans and grants from
bilateral and multilateral organizations, also benefits protected areas. Thus, the IDB has helped finance protected areas in Brazil, Bolivia, Ecuador, Peru, and Costa Rica (Keipi 1991).

In a normative framework, the funding for protected areas should be evaluated in relation to adequacy, distributional fairness, administrative efficiency, and continuity (sustainability). The prominent position of

NGOs and international organizations raises questions about dependency (neocolonialism in nature protection) and discontinuity (funds end with project termination). Additionally, many governments have not defined and instituted sound pricing policies in nature tourism, implying substantial distortions for revenue and visitation (Lindberg 1991).

Hence while the search for "innovative" funding mechanisms continues, it is not clear that user charges and other traditional revenue sources are effectively assessed and collected (Laarman and Gregersen 1994). Meanwhile, the attention focused on instruments such as debt swaps (Conservation International 1989) has been disproportionate to the modest funding it has generated, with the possible exception of Costa Rica (Barzetti 1993).

The larger problem is the scarcity of investment frameworks and financial plans to indicate where and how funding should be allocated. Despite intense academic and policy interest in the economics of protected areas, basic financial and economic analysis to attract and allocate financial resources is too often missing.

LAND POLICY AND INFRASTRUCTURE DEVELOPMENT

Pressures on Latin America's forests stemming from agricultural policies and infrastructure projects are described in a large body of reports, articles, and books too numerous to cite here. The demand to convert forests to other uses is explained by the skewed distribution of arable lands, together with a chronic landlessness reinforced by the macroeconomic stresses of the 1980s. A second explanation is competing claims over

forestlands as open-access resources. Tenure insecurity discourages permanent investment in any particular property, thus perpetuating low-input agricultural extensification. In many countries, extensification is fostered by an open land frontier that encourages land speculation. In traditional Latin American law, lands are claimed by clearing them of trees. Each of these aspects is negative for retaining forest cover.

Government interventions in agriculture have both direct and indirect consequences for forests. Subsidies and price supports for products such as beef, bananas, coffee, and citrus fruits increase the demand for new lands to produce them. Additionally, credit programs and extension services have been developed mainly for livestock and cropping, and only much less so for forest management and agroforestry. Yet the production biases for agriculture are countered by other (mainly market) biases against it, particularly in macroeconomic and trade policies (Bautista and Valdes 1993). Removal of production biases which favor agriculture should generally reduce the demand for forest clearing, while removal of market biases against agriculture could be expected to have the opposite effect.

Forests are residual land frontiers increasingly opened by roads, mining, petroleum exploration, and hydroelectric and resettlement projects (Schneider 1994). These projects often complement each other, and also link synergistically with logging and extensification of agriculture. Due to these interactions, causality in land-use change is difficult to define and isolate. However, several analyses conclude that the aggregate impact of agricultural policies and infrastructural development is far more significant for forest conversion than mismanaged policies within forestry itself (e.g., see Leonard 1987 for Central America; Mahar 1989 for Brazil).

The environmental implications of land markets and infrastructure projects are reasonably well known, as are policy approaches to address the issues:

- To guide normative land-use decisions, policy instruments are land-use planning and zoning at a regional scale, often combined with social cost-benefit analysis and environmental impact assessment at the project scale.

- To reduce disputes over open-access forestlands and the negative consequences this has for forests, the principal policy approach is formal recognition of tenure rights, including customary (*de facto*) rights of indigenous groups and peasant forestry organizations.

- To reduce the demand for new lands in cropping and grazing, governments have opportunities to evaluate and revise policies on agricultural subsidies, taxes, prices, and productivity investments.

Zoning and Project Impact Assessment

Governments can apply several instruments to guide land-use decisions and the siting and design of projects. Regionally, land-use planning and master planning are important tools for the formulation of strategies as to which activities should be encouraged or discouraged in specific geographic zones (Dourojeanni 1990). Sometimes land-use planning can be framed in terms of regional carrying capacity (Daly 1990). Within this regional scheme, the probable impacts of specific projects are assessed (*ex ante*) using cost-benefit, social impact, and environmental impact analysis. These tools are not costless, and moreover, all are to some extent philosophically inconsistent with the current trend toward government deregulation.

In principle, governments want their policy and technical approaches for land-use zoning and project assessment to be suitable for large and small activities. The first category includes major roads, plantation agribusinesses, mining and petroleum projects, hydroelectric projects, and directed resettlement projects. Policies to guide the siting and design of big projects have multiplier implications for in-migration by colonists, construction workers, transport workers, retail shops, and other service suppliers.[11] The second category refers to

11 Thus Brazil's President Castelo Branco (1964-67) foresaw that "growth poles" could be established in

peasant colonizers, small-scale miners (such as Brazil's *garimpeiros*), and other largely spontaneous movements of persons into forested areas. Governments have few policy strategies to address this second category of incursions other than through policies on population planning, macroeconomic management, and other indirect means.

Regional Planning and Zoning

For much of Latin America, efforts to continue opening land frontiers are virtually inevitable. Moving people into frontier zones has been politically attractive as an alternative to land reform, as a symbol of economic development, and as a means to establish national presence in remote regions. Despite the recent rise of environmentalism, these political advantages will not disappear quickly. Ideally, governments should focus on reforming and intensifying agriculture rather than colonizing forests for new lands. In reality both are taking place. Therefore, if policies cannot stop frontier expansion, they should at least seek to accommodate it at least cost.

Past exercises to plan integrated regional development, such as those financed by the Organization of American States (OAS 1984; 1987), offer a number of lessons. OAS experience shows that regional planning must be compatible with the national system of project generation. It has to be an integral activity within the ministries and agencies that define priority policies and projects. In addition, it must be goal-oriented rather than an expensive and time-consuming collection of unfocused data. Effective regional planning proceeds from overviews of large areas to more detailed investigations of limited areas having the greatest potential for the successful implementation of specific projects. It requires broad-based popular and political support, which has to be built into the process of plan preparation and debate. It is too late to win advocates at the point when final documents are being submitted.

Several states in Amazonian Brazil recently approved zoning legislation, and efforts to conduct land-use planning are underway in the area known as Legal Amazonia. Brazil recently used this framework to designate numerous extractive and indigenous reserves, forest research areas, and forest production areas (for timber harvest). The IDB and other multilateral banks are increasingly insisting upon the existence of regional land-use plans as a precondition for financing highways and settlement projects (ACT/IDB/UNDP 1992).

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frontier areas through tax breaks, land concessions, credits and loans, road building, and other government interventions (Hecht and Cockburn 1990). Subsequent critics of the Transamazon Highway, Polonoroeste, Grande Carajas, Jari Florestal, and the Tucuruí and Balbina dams have not doubted that human settlement can be increased in "underdeveloped" areas. However, they question the net benefit or cost of such projects in financial, economic, social, political, and environmental terms, and the appropriate mix of policies to guide frontier development in the future.

***Box 9*: Planning for Land Settlement:**

In the 1970s, the government of **Nicaragua** set out to settle farmers into four million hectares in the Atlantic zone, which covered 25 percent of the country. The planning team overestimated the availability of arable land, underestimated the resident population, and recommended the wrong crops. Although intended to promote ecologically sustainable production, the project was notable for its ambitious goals and its lack of concern for technical limitations.

The government of **Honduras** has attempted to design new communities and promote certain crops (cotton, banana, oil palm) in agroindustrial cooperatives in several river valleys. This attracted many more migrants than anticipated, swelling the area's population and threatening the watersheds.

The master plan for the Darien isthmus of **Panama** designates a strip of land along the Inter-American Highway that is to be carefully managed. Provisions include road frontage, maximum size of holdings, and controls over land use. Plan implementation has been paralyzed by the government's institutional fragmentation over issues of legal authority. As a result, farmers have simply appropriated lands and taken advantage of government disarray to illegally cut and sell timber. On several occasions, government agencies formally discussed the lack of coordination on the Darien, but no effort has proved successful.

***Source**: Jones (1989).*

In a World Bank publication, Mahar (1989) argues that the success or failure of land-use zoning will depend on the technical quality of the plans, the strength and depth of political support for the concept, and the existence of a policy framework consistent with rational land use. The key policy issues are the legal and regulatory aspects that define the scope of planning analysis, determine planning costs, and impose sanctions for noncompliance and violations. It should be noted that proposals for agroecological zoning of the Brazilian Amazon date from the 1970s, but early versions failed to win political support because of their strong preservationist tone.

Regional planning based on land-use capability is impossible to oppose in principle. However, examples of planning for land settlement in Central America and Panama illustrate the fertile ground for unintended negative consequences (Box 9). Governments, colonists, and developers tend to fall back into familiar and routine patterns of land settlement in the general chaos and high expectations created by the access to new resources. Publicly endorsed land-use plans are overlooked as the social, legal, and political conditions of the past reproduce themselves in the frontier zones (Jones 1989).

This tendency to avoid innovation is reinforced by the scarcity of funds, errors in planning and administration, and utopian visions that ignore technical feasibility. The unsurprising conclusion is that land-use planning is only as good as the technical, financial, administrative, and policy support behind it. Until improvements are realized in each of these dimensions, it is possible for land-use planning to have negative consequences when it raises expectations that cannot be met (political and social costs), or imposes "solutions" inconsistent with reality (financial and economic costs).

Predicting Project Impacts

Since about 1980, governments and international organizations have begun to more frequently require that cost-benefit analyses (CBA), social impact analyses (SIA), and environmental impact assessments (EIA) be carried out before sizable projects are undertaken. In theory, these tools can assist in project redesign to promote efficiency. This includes positive and negative project impacts in relation to forests and other natural resources (Laarman 1993). A second purpose of multi-dimensional project analysis is to educate government officials, private businesses, and the general public on the many repercussions of development projects (Zimmermann 1982).

Because the techniques of project analysis are largely borrowed from industrialized countries,

***Box 10*: Impacts of Development Projects on Forests**

•***Coca-Cola* in Belize**: In 1985, the *Coca-Cola Company* purchased 82,000 hectares of forests in Belize to grow oranges for a subsidiary operation. *Coca-Cola* regarded the lands as transitional forest between subtropical moist and tropical dry forest, and claimed the lands had been logged for more than 100 years. It intended to plant citrus trees on only 10,000 to 12,000 hectares. Environmental groups denounced the project and urged a boycott, even though *Coca-Cola* insisted it was not going to clear tropical rain forest. *Coca-Cola* cancelled the project to protect its image. Ironically, it sold the bulk of its holdings to a Belizean logging company and a group of Mennonites, who are reported to have cleared significant portions for farming. Question: Would *ex ante* project analysis have been able to predict what would happen with and without the *Coca-Cola* project?

•***Geest* in Costa Rica**: *Geest* is a British company cited by Costa Rica's Ministry of Natural Resources and Mines (MIRENEM) in 1992 for illegally cutting trees along creeks and streams to create a banana plantation. Although it has been widely ignored for years, Costa Rican law prohibits tree cutting within 100 meters of stream banks. *Geest* claimed that it did not violate the law because the water was in a depression and not flowing. However, MIRENEM prevailed, in part because of the political climate created by NGOs hostile to banana companies. Question: Would an *ex ante* EIA of the *Geest* operation be able to anticipate that a dispute would arise over the definition of a stream?

•**Grande Carajas in Brazil**: Several billion dollars have been invested in the mining, smelting, and railroad operations in the Grande Carajas project in the Amazon forest. The state-owned CVRD, which manages the project, conducted baseline studies of the climate, flora, and fauna of areas proposed for mining before operations began. It spent $54 million on land reclamation, protected areas, erosion control, and other environmental activities. However, this was insufficient to offset criticism of the company's forest cutting to provide fuel for its ore smelters, as well as of the violent social conflicts that resulted from large migration into the area. Question: Is project analysis possible for a project of this magnitude, and who provides the oversight on EIA for a government enterprise?

***Source**: MacKerron and Cogon (1993).*

two principal challenges stand in the way of their effective use elsewhere (Biswas and Geping 1987). First, governments must genuinely want to use these techniques for decision making rather than merely meet the institutional requirements of multilateral banks and donor agencies. Methods of project analysis have become expensive and data-intensive, even while structural adjustment obligates governments to cut spending. Thus, they must find a way of conducting increasingly costly project analysis for less time and money, or depend on external assistance to provide it.

Much recent opinion asserts that project analysis for roads, especially penetration roads, demands far greater attention now than it did in the past. Road projects have allowed millions of settlers into Amazonia (Moran 1989b). The expansion of roads is also a policy concern in Central America, particularly in Panama (Leonard 1987). Road expansion or improvement (paving) may add to population growth in remote areas, accelerating forest alteration and conversion. Yet in the long run, roads help improve rural-urban terms of trade, raising rural incomes and decreasing pressures on forested frontiers.

Biswas and Geping (1987) contend that analytical frameworks conceived in the North cannot be transferred uncritically. For instance, EIA manuals for roads in

industrialized countries (e.g. OECD 1994) give little attention to induced development, instead concentrating mainly on how to reduce the erosion potential of the roads themselves (direct rather than induced effects). World Bank environmental assessment manuals cover "induced development" in relation to roads and highways in only two paragraphs (World Bank 1991, Volume II, p. 169). Given the harsh criticisms directed at development banks for their funding of highways through tropical forests, EIA guidelines may require adjustment.

Predicting project impacts becomes technically difficult and politically sensitive when projects are very large. Big projects produce supra-marginal impacts, are redesigned frequently, and generate large but generally unpredictable secondary impacts. The huge Jari Florestal investment in Amazonia is a good example: Jari's technical design, enterprise mix, and operating procedures were modified many times through 25 years of learning and adaptation (McNabb et. al. 1994). It is doubtful that *ex ante* analysis could have foreseen either the problems the company would encounter, or the adjustments it made in the face of them. Box 10 presents other examples to illustrate what are often political obstacles confronting *ex ante* project analysis, particularly if the projects include foreign participation.

In the future, Latin American governments are obligated to conduct more rather than less project analysis. The environmental NGOs, in particular, ask for more and better *ex ante* analysis to avoid the problems and perceived problems of the past. However, the examples point to the limits of what can be expected. Some potential projects are rejected outright because of interest group pressures even before proposals can be screened. Ironically, many of the groups that insist that more EIAs and environmental CBAs should be conducted do not allow project proposals to reach that stage. This surely reflects deeply held suspicions that governments will be pressured into approving even the most offending investments.

Therefore, an important step forward would be to reform legal and administrative frameworks to make them favorable to project analysis as a decisionmaking tool. The process of implementing and reviewing project analysis has to be opened to the NGOs, industries, news media, academia, and the general public as a means of educating them. Not incidentally, this helps diminish the potential for corruption. Public participation will not necessarily resolve conflicts, but at least it reduces the volatile repercussions of closed negotiations between top government officials and company executives.

Land Tenure

Land tenure refers to the multiple social rules and understandings about who has access and rights to different parcels of land and the resources on them. These rules and understandings help determine incentives and disincentives for maintaining or removing forests and trees. This is the subject of extensive policy inquiry (Fortmann and Riddell 1985; Bromley 1989; Thiesenhusen 1991). Different social settings generate pressures to remove or add tree cover.

Land division or re-division in settled regions: Typically this entails the large agricultural estate that is parceled into smaller holdings as a result, for instance, of agrarian reform. The small holders initially intensify land use. In some cases they might also clear forests or woodlands which had been retained intact by the previous large landowner. In the long run, however, the small
farmers may invest in agroforestry and other efforts to re-establish tree cover to fit the new land-use configuration. This assumes that land reform leads to tenure security, which is not assured (see Stanfield 1992 on Nicaragua).

Directed agricultural colonization in frontier regions: This government strategy involves purposely extending grazing and cropping into new lands with obvious consequences for forest displacement.

Undirected ("spontaneous") land settlement in frontier regions: In this case, the claimant, whether a *campesino* or large company, clears all or part of the forest to demonstrate presence and avoid expropriation. Such actions are within prescribed legal requirements for obtaining and holding land titles.

Illegal land occupation in frontier regions includes two classes of occupation. In the first class, are illegal loggers, wildlife collectors, gold miners, and others who take advantage of the open-access character of unprotected public forests to make their living. Their illicit presence is usually believed to have negative implications for the resources, even though it may temporarily lessen social and political problems elsewhere. In the second class are temporary speculators who occupy and clear forest parcels in order to transfer the cleared or semi-cleared land to cattle ranchers, agribusinesses, forest products companies, and other land developers. Attempts are also made to sell timber from the land.

Legal forest concessions, mainly in frontier regions: The threat or evidence of encroachment by illegal occupants, plus unpredictable shifts in government policies on forests and forestry, contribute to tenure insecurity for concession holders. The result is pressure to "cut and run."

The welfare framework which connects tenure and trees is complex. Tenure insecurity is usually cited as the reason for cutting forests and taking resources in an unsustainable manner. However, environmentalists and government officials are equally wary of certain forms of tenure security (for example, free-hold land titles) to the extent that private land use decisions do not coincide with the public interest (cross-policy link with forest privatization).

Policies that have the effect of reducing tree cover in the short term may be helpful and even ideal for increasing it later. Examples are agrarian reform, forest privatization, and agricultural colonization. Many such activities convert natural forests and subsequently establish planted ones, but often not on the same sites or serving the same functions as the natural forests they displace. Thus analysis must expect a changing composition and quantity of forest cover as tenure arrangements are shifted. To be judged harshly are reports which note a reduction in the area of tree cover, and uncritically interpret this as a social loss.

The policy measures to make land tenure serve forest protection and management are reasonably clear. However, the political costs of tenure reform are equally apparent following centuries of conservative land policy in Latin America. A principal strategy to conserve forests is to reduce the open-access character of public lands. If governments cannot enforce property rights in forested frontiers, then the forests should be transferred from public to alternative (communal and private) hands. This policy should be complemented by agrarian reform in settled areasto assimilate rural residents. This dual strategy has been distinctly unpopular with governments. The first policy reduces the "safety valve" option of political administrations, affronts PFAs by ceding away the public forest estate, and risks short-run deforestation. The second policy confronts the power of the large landowners, and produces uncertainty regarding agricultural production.

Most tenure reforms have, therefore, been cautious and experimental. Yet, the Bank and its member governments should be able to agree on several policy directions which push but do not break the limits of political acceptability. These include:

- reviewing government policies on methods of obtaining land titles, particularly with respect to forest clearing and the granting of informal land rights to squatters;

***Box 11*: Tenure Insecurity and Forests—Nicaragua**

An estimated 40 percent of Nicaragua's households have real or perceived conflicts over land tenure. The problem stems from competing land claims following the actions of the FSLN (Sandinista) and UNO (Chamorro) governments to revoke prior land titles and issue new ones.

In addition, squatters (*precaristas*) can demonstrate possession of land by working it, mainly through forest clearing. This follows a long-standing Nicaraguan tradition of allowing unemployed and landless people to convert forested lands for agriculture as a means of resolving unemployment and landlessness. As a result of the Agrarian Reform Law (as amended in 1986), which permits the titling of such holdings, nearly 53,000 persons received land titles. This policy is now questioned in light of the 1991 designation of two new large protected reserves (Si-a-Paz and BOSAWAS), both of which have squatters and titled lands within their boundaries. Conflicts are also erupting between squatters and indigenous groups in the Atlantic coastal region.

In Waslala, the settling of several hundred migrants led to extensive illegal forest cutting, including cutting within an adjacent protected area. Complicating the disputes over land ownership, the property registry in Matagalpa was burned in 1979, and much of the information it contained has not been recovered. Moreover, the property registration records are incomplete and disorganized.

In the Guasimo area of San Carlos, the National Institute of Agrarian Reform (INRA) is facing the challenge of settling ex-members of the resistance, relocating individuals from the Indio-Maiz biological reserve, and stabilizing the buffer zone of the Si-a-Paz reserve. Colonists lacking legal titles nevertheless claim land rights in the protected areas. To address the issues, INRA has issued titles and organized land exchanges so that families can be relocated in a planned settlement area. But, to complicate matters, the lay-out for the new settlement was undertaken without regard for natural land features, leading to several problems that are now becoming apparent. Moreover, INRA has had to contend with 12 cooperatives and 15 colonists whose land claims predate the agrarian reform. These individuals returned to Guasimo in 1990 following the election of Mrs. Chamorro, demanding that their lands be returned.

***Source**: Stanfield (1992).*

- demarcating and granting formal protection to indigenous reserves and homelands, as well as peasant forestry communities;
- examining feasibility analysis, selection of settlers, infrastructural support, and land speculation in relation to frontier colonization; and
- working to design and apply land taxes which tax forested lands less heavily than other lands.

Land Titling

For modern governments, land titles are the recognized legal documents that define use rights for any given parcel of land. Secure tenure is possession of a clear and uncontested title to a particular property with known and observed boundaries. Conversely, tenure insecurity is defined by several conditions, including multiple titles for the same parcel of land, contested definitions of property boundaries, absence of titles

for customary (*de facto*) land uses, and inability or inefficiency of governments and land users to enforce property claims.

Tenure insecurity is an obvious disincentive for managing trees and forests. Given the uncertainty of future claims, lack of tenure favors short-term liquidation of forest assets (Kelly 1994). Without the security of title, land users ("owners") generally cannot transfer rights through inheritance or sale. This further undermines any rationale to increase a property's value. A land claimant's ability to obtain bank loans and participate in government programs is often dependent upon demonstrating a clear legal title. Finally, a system of valid land titles helps separate private from public holdings, an important matter in cases where private interests attempt to fraudulently take public (often forested) lands.

However, even if it is accepted that the strengthening of land titling systems is generally conducive to forest protection and management, past methods of establishing and demonstrating land titles have important shortcomings. In particular, in several countries forested lands have been regarded as idle (nonproductive) land. Thus, only by totally or partially clearing a forested area does a prospective landowner demonstrate active possession and use from a legal perspective. In addition, some governments recognize informal claims on forested lands occupied and "improved" illegally. This tends to foster additional squatting (cross-policy link with land colonization).

The elimination of forest cutting as a requirement for obtaining land titles would result in environmental and efficiency gains. Presumably, repeal of the requirement gives land claimants increased flexibility over when and where to retain forest cover. However, this may increase disputes over property boundaries in the absence of fences, plow furrows, permanent markers, and other boundary demarcations.

Several problems surround current government policies regarding informal land claims (Box 11). First, the eviction of *campesino* families from public lands risks adverse political reaction in societies that view squatting as the poor family's hope for a better future. Secondly, while some private landowners may feel threatened by encroachment on their property, other private interests conspire with squatters to acquire new lands, mainly from the public estate. This second group can be expected to oppose, generally unofficially, proposals that would eliminate informal land claims. Finally, it can become very expensive for governments to expel and resettle squatters, and this could further strain public budgets. Even though the activities of squatters have adverse implications for forests, the typical response of governments in the past—that is, to do nothing—is readily understandable in light of the financial and political costs of action. In some countries, pressure from environmentalists and indigenous communities may be changing this.

Indigenous and Peasant Reserves

Over the years, governments in the region have taken sharply differing positions on the issue of recognizing the rights of indigenous and peasant communities to the lands they occupy. For instance, in 1979 the government of Chile declared that communal lands held by indigenous groups were illegal, and required that they be converted to individually held parcels (Altieri and Farrell 1984). In contrast, in 1988 the Colombian government granted full legal title to indigenous groups, and by 1989 had transferred 18 million hectares to 50 tribal groups (Grainger 1993). In some regions, indigenous groups are working with NGOs to map the lands they use in order to influence central governments to grant them title (Box 12).

***Box 12*: Mapping Indigenous Lands—Mosquitia Region of Honduras**

The largely forested Mosquitia region of eastern Honduras supports 35,000 Miskito, Garifuna, Tawahka, and Pech peoples. The arrival, during the last decade, of many ladino farmers has swelled the area's population. Indigenous groups, worried about the perceived crowding, want to put an end to continued migration. However, Honduran law does not recognize indigenous land claims.

With financial help from Cultural Survival, a U.S.-based NGO, a local NGO (MOPAWI) conducted surveys (using indigenous interviewers) to document the areas where indigenous and nonindigenous residents farm, hunt, fish, pan for gold, gather construction materials, and collect medicinal plants. Despite the understandable reluctance of some respondents to discuss these matters, more than 200 separate communities were contacted, many in very remote areas. The surveys resulted in the creation of a composite land-use map for the entire Mosquitia region.

In 1992, the map was presented to the Honduran vice president, government ministers, and military officials at the First Congress on Indigenous Lands of the Mosquitia. In the months following the Congress, the military has been increasingly active in the defense of indigenous groups to the extent of assisting in curtailing the expansion of a logging operation in the region. This was regarded as an unusually positive response.

***Source**: Swenarski de Herrera (1993).*

If governments are to demarcate and give formal recognition to indigenous homelands and peasant cooperatives, they may have to disregard economic considerations and justify their actions on social and humanitarian grounds. The policy risks and tradeoffs of this center on three issues: opportunity costs, subsidies and outside assistance, and transfer of land and resources.

In most settings, the titling of lands to indigenous and peasant communities presents significant *opportunity costs* in foregone national income from devoting large tracts to support a relatively small population, as required to support forest-based communities. For example, Mexico's Plan Piloto Forestal supports only 14,000 people on 300,000 hectares of land (Galletti and Arguelles 1987). The Brazilian rubber tapper settlement studied by Schwartzman in 1989 consists of 420 people on 25,000 hectares of land. As a result, industrial and agricultural interests, fearing that they may lose present or future income-earning opportunities, are likely to oppose the titling of land to indigenous and peasant communities. Thus, it is up to NGOs to provide estimates of nonmarket benefits and damages avoided to counteract this opposition.

Providing *external assistance* to groups that have traditionally been autonomous and independent presents a particularly peculiar policy paradox. For instance, the U.S. Agency for International Development spent $22 million on a project in Peru's Palcazu Valley to benefit 3,500 people belonging to the Amuesha indigenous group (Hartshorn 1990). This assistance amounted to $6,300 per person, a significant multiple of Peru's annual per capita income. Before Brazil changed its policies, rubber tappers were protected by a tariff that allowed the price of domestic rubber to rise to three times the world price (Fearnside 1989). Now that the tariff has been removed, rubber tappers are increasingly turning to farming to make a living (Browder 1992).

The *transfer of property rights* over forests from governments to communities does not ensure that communities will choose to manage the forests in the public interest. Indigenous groups in Ecuador's Amazon region, for example, have been selling timber to logging contractors. Yet many NGOs and government officials assume that indigenous groups will protect the forests placed under their stewardship. To what extent should governments attempt to control land and resource use on indigenous and peasant reserves, and how should policies there be different (if at all) from policies for protected areas and forest concessions?

***Box 13*: Determining the Feasibility of Land Colonization**

Government decisions about investing in land settlement should be based on a staged, sequential approach for obtaining information. In the figure below the investment **OA** provides data to point **X**, which is sufficient to indicate that the area warrants additional investigation. Thus, a second expenditure, **AB**, is made to obtain more data. This is considered an indivisible sum, meaning that there is no improvement in the decision framework without incurring all of **AB**. At **Y**, an additional investment must be weighed if **Z** is to be achieved, and this may be another step-type increment or possibly a divisible series of lower-cost fine adjustments.

***Source**: Nelson (1973).*

Land Colonization

Latin American governments have pursued land colonization policies for years; the modern era of colonization in the region spans the last four or five decades. These policies were controversial long before the environmental era that began in the 1970s (Loomis 1938). Part of the controversy stems from the significant amount of public spending devoted to the achievement of highly variable results. In Latin America, the vast majority of new land settlement is spontaneous; government settlement projects have accounted for a modest number of people relative to both the total population and its rate of growth (Schumann and Partridge 1989; ACT/IDB/UNDP 1992). This suggests that other policies, such as land-use, agricultural markets, and infrastructure policies, are more important for forest clearing than colonization projects.

Directed colonization has been costly and prone to a high incidence of failure because it has been used to serve objectives other than agricultural production. In a detailed study undertaken about twenty years ago, Nelson (1973) observed that land colonization projects were selected (1) without regard to alternative sites or designs, (2) as side effects of other projects such as highway construction, (3) because of national security considerations to settle remote zones, (4) to use "unoccupied" tracts of public lands, and (5) because completed resource surveys were available for the particular area.

Many governments have expected too much too quickly from land settlement. Critics attribute failed settlement to an assumption that the humid tropics have inherently low agricultural potential (Goodland 1975). However, this explanation stems from an often mistaken view of land productivity which reflects various misconceptions about laterite formation, soil organic matter, and nutrient recycling in tropical soils (United States National Research Council 1993). In practice, low productivity is often due to poor policy choices regarding the location and design of highways and settlement projects. Soil scientists and agronomists are quick to point out that if past projects were not designed in relation to good and bad land productivity, then it is misleading to draw broad conclusions from these cases.

The policy framework for land colonization turns on four topics: feasibility analysis and information costs, selection of settlers, infrastructural support, and land speculation.

Feasibility Analysis and the Cost of Information: Governments are charged with defining the optimal spending of domestic and external funds for the design of land settlement, both directed and spontaneous (along roads). The probability of a successful settlement is greater the larger the base of supporting information, obtained at increasingly higher marginal costs. As

spending for information increases, authorities are under pressure to go ahead with land settlement or risk being criticized for wasting public funds. No amount of prefeasibility and feasibility analysis can anticipate the weather, unplanned migration, and other stochastic determinants of settlement success or failure. In view of what can and cannot be learned from feasibility analysis, Nelson (1973) compared overspending by Peru with underspending by Bolivia in preparing for land colonization. Neither government employed a staged, sequential approach to information acquisition and analysis (Box 13).

Selection of Settlers: Governments usually want land settlement to meet social and production objectives simultaneously. However, experience indicates that the families and enterprises that are most able to successfully farm the frontier are in least need of new land. Conversely, socially disadvantaged families have the least prospect of successful adaptation in the new setting (Moran 1989a). From the perspective of retaining forests, this tradeoff is answered in the direction of production over equity to the extent that failed farmers repeat their mistakes on one forested parcel after another. However, it is conceivable that high rates of technical failure in the short run may discourage governments from pursuing settlement policies in the long run. This leads to the perverse conclusion that forests will be retained if current settlement efforts are allowed to fail. That possibility poses difficult moral dilemmas.

Infrastructural Support: Governments have considerable discretion regarding how much infrastructure to provide in support of land settlement (Schneider 1994). This represents a strong cross-policy link with regional and land-use planning. As noted previously, a principal consideration is policy on highways and roads. Other important policy areas are procedures and public resources for land titling, health and education, agricultural extension services, and agricultural storage and marketing. In principle, these variables can be manipulated to affect where settlements will occur, sizes and configurations of land holdings, and mixes of agricultural technologies. Each of these has implications for tree and forest cover, although it is not clear that governments view them in that light.

Land Speculation: Environmentalists and others often regard frontier land speculation as destructive for forests. This refers to frontier forest penetration by smallholders, followed by the subsequent sale or barter of these holdings to companies or large landowners. Another school of thought regards the process in a more positive light as a form of small-scale capital accumulation by peasant families willing to risk a difficult frontier existence. That is, speculation serves a social good. Thus Moran (1989a) contends that governments should refrain from interfering, especially since land markets adjust for speculation and ultimately help dissolve large speculative holdings. This is perhaps a minority perspective, but one worthy of wider debate.

Land Taxes

In rural economies, land is the most significant form of wealth and the source of most income. To date, taxation has been underutilized as a means of influencing land use and possibly also land ownership. In most of Latin America, land taxes are low, eroded by inflation, and not enforced. Yet in principle, proponents of imposing significant land taxes (Dorner 1992; Strasma and Celis 1992) contend that they would encourage landowners to use their land productively, or sell or lease it to others who will. In theory, this helps dampen land speculation and control the size of land holdings. Moreover, a land tax could be differentiated to tax croplands and pastures more heavily than forested lands. Given a sufficiently large tax gradient by land use (or potential use), a differentiated structure may help discourage further forest clearing. This is precisely the opposite of past policies that taxed "idle" forested lands more heavily than others.

The difficulty in using property taxes as a policy instrument rests in the multiple results expected of it. Property taxes are usually expected to raise revenue, provide incentives for increased productivity, and possibly redistribute land and income. Adding forest (environmental) protection as a fourth objective increases the conceptual and administrative difficulty of designing a workable tax. Also, property taxes cannot limit forest clearing without other supporting policies in areas such as forest privatization,

land-use zoning, and agricultural markets.

With few exceptions, Latin American governments have not employed land taxation as a policy tool (Shearer et al. 1990). To apply land taxes effectively implies considerable public expenditure to improve land titling, registration, and valuation methods. More importantly, land taxes are opposed by both large and small landowners. As noted by Dorner (1992), land taxation has no political constituency, especially when compared with other types of tenure reforms (e.g., land redistribution). An exception may be local governments to the extent they are allowed to assess and collect property taxes without interference from central governments.

Strasma and Celis (1992) present useful guidelines for reforming land taxes in order to achieve social and environmental goals. The problems addressed are mainly political and administrative rather than technical. The usual criteria for supporting a tax are that it stimulates economic efficiency, is relatively inexpensive to administer, and fosters administrative fairness. Because of previous disinterest and current informational gaps, most governments probably cannot meet these criteria without major philosophical, policy, and fiscal shifts.

Agricultural Markets

Agriculture and livestock displace forests by competing for the existing land. Conversely, forests are favored by policies, technologies, and market trends that reduce the demand for cropping and grazing land. From this simple proposition flow several complex ideas about the interactions between agriculture and forests:

Bias in Favor of Agriculture: From the perspective of traditional agriculture ministries, forested lands are free goods to be brought under cropping and grazing when the profit margin permits. Thus, Latin American governments have promoted agricultural and livestock output at the producer level through tax breaks, subsidized inputs (credit, fertilizers, equipment, fuel, crop storage facilities), and programs of technical assistance, media support, and the like. Also favoring agricultural producers are policies that keep rural labor prices low; improve roads, electricity, and other infrastructure in the countryside; and restrict imports of agricultural products.

Bias Against Agriculture: Although governments subsidize agricultural production, other policies often discriminate against it. Such is the effect of domestic price controls on milk, meat, and basic foodstuffs, and direct and indirect taxes (for instance, through overvalued exchange rates). Also harmful to agriculture are badly managed parastatal companies and excessive regulatory burdens on the sector. Moreover, Latin America's development strategy through the 1970s favored the Prebish doctrine of self-sufficient industrial growth at the expense of agriculture (Stewart and Gibson 1994).

Biases for and against agriculture yield inconclusive consequences for the demand for land, particularly when considering interactions with other macroeconomic policies, tenure policies, and policies on forest management and protection. On the one hand, stagnation in agriculture increases pressure on forests as landless and unemployed *campesinos* migrate to frontier zones (and the cities) in search of work. On the other hand, agricultural booms threaten forests since high producer incomes increase incentives for placing more land under cultivation.

This poses an empirical puzzle, since studies more often relate forest area to agricultural technologies (output per hectare) than to sectoral growth (change in number of hectares as determined by profitability). For example, sufficient work has been done in Mexico to suggest how productivity per hectare can be raised in cattle ranching and maize cultivation, suggesting that forest conversion can be slowed. However, productivity comparisons have not translated well into implications for land use. Cattle ranching has expanded extensively by an amount that could not have been anticipated, while productivity gains in maize farming have been held back by less than full adoption of recommended techniques (Gomez-Pompa et. al. 1993).

Various substitutions and complementarities add further complications. Market agriculture interacts with subsistence (*colono*) agriculture

in terms of inputs (supply of land and labor) and outputs (types and prices of products). Government policies influence this composition. Within agricultural markets, a shifting mix of export products and domestic food crops can change the demand for land. Likewise, the production of nontraditional products (flowers, melons, nuts, spices) rises or falls in relation to plantation crops and basic food crops. These complexities imply a need for caution in relating agricultural policies to the area and condition of forests.

Livestock Production

Beginning in the 1960s, several Latin American governments extended generous policy support for cattle production. This was regarded as a strategy to develop large areas of land with little labor, and to promote biological and economic flexibility in production systems. More importantly, livestock ranching afforded exceptional opportunities for producers to speculate in land and to capture attractive government subsidies and credits (Hecht 1992). Estimates of the amount of forest cleared for beef production are sketchy. Toledo (1992) estimates that in Amazonia, Central America, and Mexico, over 30 million hectares of forest had been converted to pasture by the late 1980s.

There are several misconceptions surrounding the transformation of forests into pastures, including the so-called "hamburger connection" and subsidized ranching.

The hamburger connection directed attention to international demand for cheap beef as the driving force behind turning forests into pastures (Nations and Komer 1987). While that model had considerable validity for Central America, it was irrelevant for Amazonia (Hecht 1992). In contrast to the conventional wisdom that pastures displace rain forests, data comparing vegetative maps with areas of cattle production indicate that most Central American and Mexican livestock production is located in regions of dry forests. For example, the ratio of pastures in areas of dry forest compared with humid forest is nine to one in Honduras and six to one in Nicaragua (Toledo 1992). Nevertheless, today, new pastures in Panama, Nicaragua, Honduras, and Guatemala are being established in wetter zones than in the past (Kaimowitz 1994).

The huge size of cattle ranches in Brazilian Amazonia gives the impression that this is the source of most deforestation. By the late 1980s, ranches receiving government tax breaks numbered 631 and covered a total of 8.4 million hectares, or an average of 24,000 hectares each.
While subsidized ranching has been perhaps the single most important source of forest clearing in southern Para and northern Mato Grosso, its contribution to overall deforestation in the Amazon is probably less than 10 percent (Mahar 1989).

The conversion of forests to pastures is sometimes portrayed as a path to destruction (Downing et. al. 1992). Yet it is likely that at least some areas of pasture abandoned because of declining profit

***Box 14*: Effects of Agricultural Policy Changes on Forests—Honduras**

The Bank has supported efforts to eliminate controls on retail food prices, reduce government intervention in grain marketing and rural finance, devalue the lempira, and phase out export taxes. The effect of these policies on selected agricultural subsectors are described below.

Traditional Export Crops: The devaluation of the currency and removal of export taxes should favor traditional plantation crops such as bananas, coffee, sugar, cotton, and tobacco. Traditional crops occupy comparatively large areas in Honduras, possibly implying new pressures on the forest frontier. However, the supply response may be constrained by world commodity prices, trade policy in the industrialized countries, and other factors.

Nontraditional Export Crops: Honduran nontraditional exports comprise shrimp, lobster, pineapple, and melon. Key provisions of the Agricultural Modernization and Development Law allow land rental and joint ventures intended to accelerate investment and expand production capacity. Activities such as shrimp farming can have negative consequences on mangrove forests. According to the Tropical Conservation Newsbureau (San Jose, Costa Rica), a major controversy is whether shrimp farming is hurting mangroves and fishing in the Gulf of Fonseca.

Basic Grains: The basic grains consist mainly of maize, along with lesser quantities of sorghum, rice, and beans. Devaluation of the lempira reduced the quantity of maize imports and increased demand for domestic production. Prices have risen at the consumer level, with an expected shift in real incomes from urban consumers to rural producers. The impact on forests is unclear, since farming of basic grains only occupies 15 percent of cultivated land.

Livestock: Cattle ranching and exports in the 1990s are well below levels of the 1970s and early 1980s. Low world market prices for beef and contraband exports of cattle have resulted in some domestic shortages. In addition, domestic consumption of meat is shifting away from beef towards chicken. However, the government of Honduras has embarked on a policy to rebuild the cattle herd. This should make consumption of beef relatively more attractive once more. Given the land-intensive character of cattle production, the consequences for forests are potentially significant.

***Source**: Internal IDB documents for descriptive narrative; author's interpretation of consequences for forests.*

ability, reduced credit, and other factors are regenerating into secondary forests (see Lutz et al. 1993 for Costa Rica).

In the past decade, conditions for livestock production have become less attractive. Growth in the domestic demand for meat and milk has been held back by falling or stagnant real incomes in Latin America (Sere and Jarvis 1992). Concomitantly, partly under pressure from environmentalists and partly because of budget constraints, governments have reduced cattle subsidies. In 1990, Brazil suspended tax allowances and subsidized credit for cattle ranching in Amazonia (Levin 1991). In Central America, chicken is increasingly being substituted for red

Box 15: Effects of Agricultural Policy Changes on Forests—Nicaragua

Institutional Framework: The planning, coordination, and policymaking capabilities of the Ministry of Agriculture and Livestock (MAG), the National Agrarian Institute (INRA), and the Natural Resources Institute (IRENA) are to be strengthened. In principle, institutional strengthening will help control the expansion of agriculture into new areas.

Technology Generation and Transfer: An important element in the generation and transfer of technology is the creation of private bodies for research and technology transfer in coffee, cotton, and livestock to replace inefficient public agencies. Concurrently, the government will develop an entity for agricultural extension to serve small and medium landowners. Conceivably, short-run supply will increase on the existing pastures and cropland, and long-run increases in agricultural income will stimulate the demand for new lands. However, supply responses are highly speculative in view of tenure problems, world commodity prices, and other possible constraints.

Land Tenure: IDB financial assistance supports legislation to consolidate and guarantee land property rights, measures to title lands and compensate displaced land owners, and instruments to establish criteria for land ownership and agrarian reform. On the whole, tenure reform should be one of the most positive elements for forest protection.

Trade and Prices: In order to stimulate Nicaragua's agricultural exports, tariffs on agricultural inputs will be reduced and agricultural exporters will be exempted from certain taxes. In addition, foodstuffs received from foreign donors will be sold at prices approximating market opportunity costs so as not to drive out domestic producers. Restrictions on the export of timber, beans, and live cattle will be gradually lifted. These measures should help raise agricultural income, subject to social and macroeconomic constraints on supply response. The impact for forests is likely positive in the short run, but less certain in the long run if it results in an increase in domestic agricultural production.

Rural Finance: After years of virtually costless credit, access to financing is presently constrained by the requirements of economic stabilization. Reforms call for a thorough restructuring of the National Development Bank, including incentive mechanisms for increasing financial services to small farmers. As long as credit remains difficult to obtain, agricultural producers will be constrained from investing and applying intensive technologies. Thus, improved credit availability will raise short-run agricultural output and potentially expand the long-run demand for new land.

Source: *Internal IDB documents for descriptive narrative; author's interpretation of consequences for forests.*

meat, and donated powdered milk from food aid programs has lowered milk prices. Central American cattle producers have been hurt by unfavorable price policies and exchange rates, diminishing credit availability, and rural violence. Central America's cattle herd was slightly smaller in 1992 than in 1979, even though pasture area had expanded modestly (Kaimowitz 1994).

Hecht (1992) and Kaimowitz (1994) contend that the removal of credit subsidies and price distortions is insufficient to halt the continued expansion of pastures in forested areas. Producers do not engage in cattle ranching as a productive activity so much as speculate in land and establish a hedge against inflation and taxation. As a result, the creation of pastures may remain attractive even when raising cattle becomes unprofitable. This may explain why the elasticity of supply of livestock products with respect to prices and subsidies is higher in settled zones than in frontier zones (Kaimowitz 1994). To the extent that forest clearing is driven by land acquisition rather than cattle production, policy prescriptions are to be found in tenure, road construction, land-usezoning, and similar strategies. In this case, the emphasis on getting the prices right is not the most appropriate one.

Agricultural Revitalization

Latin America's past policies to promote industrialization through import substitution at the expense of agriculture may partly account for the region's debt crisis and structural imbalances. Thus, it is not surprising that current assistance for stabilization and adjustment is associated with attempts to rediscover agriculture's potential for national economic growth. While agricultural reforms are far from complete, agricultural output has generally outperformed GDP growth since 1980 for the region as a whole (Goldin and van der Mensbrugghe 1992).

Current approaches to agricultural reform present two practical problems for forests and forestry. First, diagnosis and prescriptions often consider policy shifts separately for each farm product (plantation crops, basic food crops, nontraditional crops, cattle, and sometimes forestry). Without top-down coordination it is not evident how reform policies in agriculture lead to internally consistent implications for determining the area to be devoted to cropping and grazing. Second, it seems likely that many efforts to reform agriculture only indirectly consider the interface with forested lands. That is, we can hypothesize that policymakers are focused on

Box 16: Effects of Agricultural Policy Changes on Forests-Peru

The Bank's proposed agricultural sector loan to Peru comprises nine elements. The most important of these for forests are institutional strengthening of the Natural Resources Institute (INRENA), deregulation of land transfers, privatization of agricultural research and technology transfer, and transfer of property rights in water and forests to private entities. Policy proposals for water markets and land markets may have considerable consequence for forests in the Amazon frontier, even if most water and land transfers take place in the coast and in the highlands.

Water Markets: A proposed water law will grant transferrable water rights to current users, who will pay an annual fee to the government. Short-run effects may include an overall reduction in water consumption, along with sales of water rights to those best positioned to acquire them. To the extent that small users are displaced, the policy has the potential to increase migration to forests and cities.

Land Markets: Pending legislation will liberalize current laws which restrict land sales among private owners, and will expedite land titling and registration. This may have the effect of allocating land to its highest productivity use. Agricultural output would rise, but the impact on employment will depend on the technologies used on the new consolidated holdings. A policy risk is that smallholders who sell their lands may move to the forested frontier.

***Source**: Internal IDB documents for descriptive narrative; author's interpretation of consequences for forests.*

income and social consequences, and that the extensive margin of land use is of lower priority. Alternatively, defensive policies to protect forests are contemplated only after agricultural policies are already determined.

These circumstances are not inevitable, but describe what can happen if forest issues are not integrated into the overall decisionmaking process affecting agriculture. Boxes 14, 15, and 16 illustrate selected agricultural policy reforms in Honduras, Nicaragua, and Peru and their impact on forests. As suggested by these illustrations, the analysis of the impact of agricultural revitalization on forests is difficult in a partial equilibrium framework because the long-run elasticity of agricultural supply is affected by dynamic and induced effects in land markets, labor markets, and production technologies. Thus, Coxhead and Jayasuriya (1994) use a general equilibrium model of the links between upland and lowland agricultural sectors and find that improved productivity (or higher prices) in upland crops does not slow land degradation, but rather increases it. Productivity gains in lowland food crops maintain upland forest cover by shifting the relative profitability of upland food and trees in favor of the latter.

Improvements in rural-urban terms of trade may help stimulate agricultural investments that reduce the incidence of low-input extensive practices. This would seem to favor reduced forest clearing. However, rural investments that take the form of labor-displacing technologies will increase migration to forests and cities. Additionally, rural-urban migration is a function of income differentials between the two areas which, in turn, depends on the relative price of agricultural products. Case studies in Bautista and Valdes (1993) show that the analysis of the impact of policy changes on agriculture requires linking agricultural production patterns with domestic prices and income distribution. Thus, a partial analysis performed to predict the impact on forests can easily be wrong because of indirect and induced effects.

MACROECONOMIC AND TRADE POLICIES

The causes and consequences of Latin America's economic crisis have been reviewed many times. Opinions vary widely about whether past problems are now being corrected. As commonly understood, the symptoms of macroeconomic imbalance in the 1980s were hyperinflation, large budget and trade deficits, and falling levels of savings and investment. The goal of policy-based structural adjustment is the improvement of the balance of payments through currency devaluation, the removal of trade barriers, and other measures that promote trade. Other adjustment concerns include reducing price controls and credit subsidies, improving tax collection, and closing or selling off money-losing state enterprises. Finally, structural adjustment attempts to hold down public expenditures to service high levels of accumulated debt, and to stimulate the return of private capital by paring back government bureaucracies.

Many of these issues are reflected at the sectoral level in the discussion of forest concessions, public and private forest ownership, government assistance for private forests, revenue generation from protected areas, land taxes, and agricultural markets. This sectoral examination is consistent with a new series of structural adjustments to include both policy reform and expansion of productive capacity in a sectoral framework. The shift to sectoral and hybrid lending posits that improvement in macroeconomic performance is inadequate to stimulate seriously weakened economies. Instead, it is argued that monetary and fiscal reform must be accompanied by direct stimulus to raise productivity in key sectors.

The net impact of macroeconomic and trade policies on forests is unclear. A few studies attempt to link deforestation with debt servicing, but even the World Wildlife Fund is unable to find objective evidence of this (Reed 1992). Rather, adjustments in macroeconomic and trade policies seem to have mixed and

ambiguous impacts on forests in a manner similar to the mixed impacts of agricultural policies already discussed.
Nevertheless, several points can be made about the effect of overall macroeconomic policies on forests. For instance, it goes without saying that severe macroeconomic imbalances have a negative effect on forests because, to the extent that forests are open-access areas, they will absorb displaced persons. Pressure to trim public spending limits PFA programs and projects, lessening the ability of these agencies to protect and manage forests. Forests and associated natural resources are not a direct focus of macroeconomic or even sectoral reforms, so it is logical that impacts on forests are neither all positive nor all negative but rather random. Finally, macroeconomic imbalances in countries like Peru and Nicaragua have been so debilitating that policy changes for forest management (that is, within the sector) are relatively inconsequential for influencing the behavior and decisions of private agents (concession holders, forest industries, farmers).

The influence of macroeconomic conditions is particularly important. De Vylder (1992) has found a pronounced but unfounded optimistic bias in Nicaragua's forestry program that is detached from the reality of macroeconomic distress. In Peru, rural production very closely tracks macroeconomic performance, so that the post-1987 collapse of the country's economy had immediate recessionary consequences for rural producers (Hopkins 1991). In contrast, Chile's efforts to depreciate the currency and liberalize direct foreign investment help account for rapid export growth, including exports of products from pine plantations (Sanfuentes 1987). In sum, macroeconomic conditions determine sectoral performance possibilities through rising or falling aggregate demand and supply.

The impact of macroeconomic and trade policies on forest protection and management are mainly indirect and diffuse. This section examines the partial consequences of inflation, interest rates, public spending, investment, and trade. The amount of comment which can be provided is necessarily modest in view of both analytical and empirical voids.

Monetary and Fiscal Policies

On balance, the crisis of the 1980s was probably unfavorable for forest management because forest management requires continuous long-term investment. Where inflation is high or out of control, short-term defensive and speculative action can be expected to take precedence over long-term commitments of capital. Moreover, Agosin and Ffrench-Davis (1993) contend that instability in exchange and interest rates stimulates profit-taking over production, and sends mixed signals to decisionmakers regarding the allocation of resources. If forestry taxes and fees paid by forest concessionaires, forest products industries, and others were indexed to inflation, the incentive to liquidate the standing capital in forests would be dampened. However, because forestry taxes and fees in Latin America have always been modest, any profit-taking behavior should be ascribed to reasons more important than inflation.

An unstable domestic currency normally results in an increase in the demand for dollars and other hard currencies. This might prompt increased forest cutting to raise export revenues. However, the export response is easily limited by production constraints in faltering domestic economies, and by weak external demand.[12]

Another effect of high or hyperinflation is the tendency of central banks to maintain high real interest rates to prevent sudden new surges in inflation (Batista 1993). High interest rates discourage investment in forest management because the payback period is typically decades into the future. Instead, private capital can be expected to flow away from real property into short-term and liquid financial instruments. The significance of this for forests is unclear, since only a few large pulp and paper companies have invested in forestry, and then mainly in plantations. Investments in natural forests have been constrained for other reasons (tenure insecurity) unaffected by high interest rates. Except for perhaps the largest companies, commercial credit has not been a

12 Demand weakness may have been exacerbated in recent years by a reluctance to buy tropical woods among "green" consumers in many industrialized countries. This is less important for plantation-grown products, which comprise a large share of regional exports.

major input in Latin American forestry (McGaughey and Gregersen 1988).

More important, perhaps, are policies to hold down the size of government by reducing subsidies, payrolls, and government programs. If past production subsidies greatly favored agriculture over forests (Stewart and Gibson 1994), then current pressures to cut subsidies should reduce the demand for land in cropping and livestock. That is, a proportionate withdrawal of government from rural production hurts private profitability in agriculture more than in forestry. In practice, this result is far from certain because subsidy programs are never scaled back uniformly, but only in proportion to the weakness of the private interests which seek them.

Payroll reductions in the public sector may be lessening the ability of governments to manage forests. For example, the staff of Peru's Ministry of Agriculture was reduced to less than 4,000 in 1993 from 45,000 prior to 1990. Similarly, the number of permanent employees in COHDEFOR (Honduras) is being reduced by half, and employment uncertainty has slowed or stopped work in the forest districts.

The impact of reducing civil service employment may not necessarily be negative. Critics consistently challenge the effectiveness of PFAs, meaning that a reduction in their size may have negligible effects on forests. Countries like New Zealand drastically cut their PFA payrolls, while sectoral output rose dramatically (Brown and Valentine 1994; Trummel 1994). To the extent that the PFAs are staffed by persons whose employment resulted from political patronage, their work does not affect forest protection and management because they tend to be redundant employees. Their dismissal is a welfare problem, but not a production problem. Redundancy is a useful hypothesis, but fails if the demoralization effect (as noted above for Honduras) is large and pervasive.

Investment and Trade

Like other protected industries, many of Latin America's plywood plants, sawmills, and other wood-processing establishments are highly inefficient by world standards. According to estimates by Stewart and Gibson (1994) for three countries (Costa Rica, Ecuador, and Bolivia), domestic log processing does not add economic value, but rather subtracts it. The three countries lose economic surplus by processing logs rather than purchasing imported products and exporting logs. These conclusions are, to some extent, weakened by sparse data, and by positive social (employment) objectives served by domestic processing.

Nevertheless, if the figures by Stewart and Gibson are approximately correct, they indicate that reluctance to open markets to external competition results in the inefficient use of forest raw materials. Employment is provided, but at a high social cost per job. Equity suffers when inefficient domestic processing increases the prices paid by domestic consumers. Stewart and Gibson, therefore, assert that the policy tends to be regressive. This, however, overlooks the fact that many producers are microentrepreneurs (Prestemon and Laarman 1989). Also, the consumers of domestic wood products include wealthy and middle-class homeowners and businesses, meaning that the equity question is far from resolved.

In the short run, the removal of import barriers lessens forest cutting if increased imports of finished or semi-finished products substitute for domestic processing of logs. This favors consumers, but displaces processing workers. Often, import liberalization generates a demand for new processing technology to compete with the inflow of imports (Agosin and Ffrench-Davis 1993). New technology may utilize logs more efficiently than existing mills, but often also implies an increase in the capacity to process logs. Thus the opening of a previously protected wood products market to world competition can result in several types of adjustments, some of which have negative implications for forests.

Removal of export barriers, including bans on the export of logs, is at least as complicated because it has both immediate and long term effects on forest cutting and investments. This may be the case in Ecuador, where policy changes now permit the export of eucalyptus logs. Landowners in the highlands have responded quickly to the export opportunity. However, domestic sawmills that use eucalyptus logs now face higher prices as

***Box 17*: Rejected Foreign Investments in Honduras and Nicaragua**

Stone Container Corporation in Honduras: In 1991, *Stone* announced plans to harvest an area of pine forest in the Mosquitia region. The company claimed that it planned to reforest at a level that would more than replace its harvest. However, Honduran environmental groups complained that the terms of reforestation were not in the contract with the Honduran government. Also, even though no broadleaved forests (rainforests) were in *Stone*'s harvesting plan, the environmental groups contended that broadleaved forests would be harmed by cutting in the nearby pine forests. In 1992, *Stone* and the Honduran government suspended their agreement, even though *Stone* asserted that it would have provided an estimated 3,000 jobs and $20 million in revenues to the Honduran economy.

Equipe Enterprises in Nicaragua: In 1992, this Taiwanese company was close to signing a 20-year timber concession with the Nicaraguan government. The proposal was opposed by environmental and human rights groups, who claimed that it would displace thousands of people from the Sumo and Miskito indigenous groups and damage the forests of the country's northeastern coast. *Equipe* was to build and operate processing plants in Nicaragua that would have generated an estimated 5,000 jobs and an investment of $100 million. It also was to reforest 200,000 hectares of degraded pineland. The transaction was stopped not on the basis of project analysis, but because the U.S. State Department believed that former Sandinista military officers would benefit from it. Reportedly, the State Department held back a loan until the "environmental dispute" could be resolved. Other critics charged that the Nicaraguan government was under pressure to grant the agreement in exchange for debt relief from Taiwan.

***Source**: MacKerron and Cogan (1993).*

increased competition reduces their supply. It is not clear whether an increase in the price of eucalyptus logs will stimulate increased investment in eucalyptus plantations, as other factors may act in the opposite direction.

Environmentalists favor a certification process to ensure that forest-based exports are from "sustainable sources." As a result, several certification programs have been put in place since 1990. To date, these programs, covering only two percent to three percent of the traded volume, are too small to affect mainstream trade in tropical timbers (Johnson and Cabarle 1993). Certification programs operate mainly between certifying agents and individual producer companies, largely bypassing governments. Thus from the viewpoint of national governments, policy implications are unclear. In the future, it is conceivable that governments that liberalize forest-based exports will be pressured into setting up environmental certification programs. To the extent that certification requires time and money, it can be construed as imposing another impediment to trade. However, certification of forest-based exports appears to conform with international trade law so long as certification is voluntary (OTA 1992).

Latin American governments constantly readjust their foreign investment policies (see Gregersen and Contreras (1975) for the impact of these policy shifts on the forest products industries). Since the late 1980s, the flow of foreign capital to Latin America has increased markedly, although it has largely taken the form of short-term portfolio investment in a few large countries (Claessens and Gooptu 1994). Relatively recent direct foreign investment in forest-based industries is represented on a small scale by companies such as *Simpson Reforestadora* in Guatemala, and *Ston Forestal* in Costa Rica. Chile's more ambitious structural adjustment policies have attracted considerable foreign participation in its forest industries since the mid-1980s.

Foreign investment represents an important source of capital, new jobs, and access to export markets. Large forest products companies, many of them wholly or partly foreign in origin, have been shown to be good forest managers because of their long-term need for raw materials and their economies of scale (Blake and Driscoll 1976; FAO 1986).

Yet as suggested in Box 17, foreign investment remains problematic.

Legitimate objections should be raised to proposed investments which are inadequately thought out, and which run contrary to social and environmental ideology and policy. However, such judgements cannot be made in a highly politicized setting where articulate minorities claim to speak for less articulate majorities. In terms of policy process, governments must position themselves to promote an open and balanced *ex ante* review of the positive and negative repercussions of the proposed investments as a precondition for decisionmaking. Here there is an obvious and direct cross-policy link with project-level environmental and social assessment.

CONCLUSIONS: ELEMENTS OF A POLICY FRAMEWORK

To sort out the complicated policy matrix for forests requires a return to fundamentals. Forests, especially natural forests, are generally considered a residual land use of comparatively low commercial value. While public forest authorities (PFAs) make policies for forests, other public and private agents do not. Yet, nonsectoral policies and activities can have a dominant impact on forests (Repetto and Gillis 1988; Abt Associates 1992; DeCamino and Barcena 1994). Consequently, forest boundaries contract and expand in unplanned and unintended ways because of policies and activities exogenous to public forestry administrations.

It is now widely accepted that state-owned forests are frequently affected by larger events, larger policies, and larger economic and political forces. Effects on forests can be accidental and offsetting unless policies and actions across sectors happen to be consistent.

Forests are an open-access resources for two reasons. First, many governments have been too weak or too unwilling to establish and enforce workable property rights. As a result, forests are "empty lands" to be taken and used. Second, because forests provide numerous goods and services on a given parcel of land, there are multiple and conflicting claims. Few governments have been able to settle the "for whom and for what" issue in an unambiguous manner, and indeed some may have concluded that it is politically unwise to attempt to do so.

Ordinarily, the public goods dimension of forests should justify strong government intervention. Yet public policy in much of Latin America has been moving toward deregulation. The policy fit between economic liberalization and mixed public-private forest resources is debatable, and contending arguments on the subject are more speculative than factual. The unfortunate choice at the moment has, on one side, public management which in principle protects nonmarket values, but is often deficient in terms of its managerial abilities. On the other side is private management which acts in response to focused objectives and goals, even if they are not always in the public interest.

Policy Challenges

The setting just described translates into an exceptionally difficult one for protecting and managing forests. Given the current relation of low-income populations to extensive areas of forest, the Bank and many of its client governments will contend with deforestation for a prolonged period because of dynamics already in motion (Schneider 1994). No policy prescription, however dramatic, will quickly end net forest displacement. The Bank and its members are therefore left to define what amounts to "intelligent deforestation," or policies that minimize opportunity costs and achieve the highest possible land use from some amount of forest conversion. Governments cannot openly use this terminology because it will provoke sharp reactions. Instead, public authorities will continue to propose programs to stop deforestation, even as forest clearing advances. This duality seems unavoidable in forested but relatively low-income countries such as Honduras, Nicaragua, and Peru.

Unlike reforms in other sectors, forests have

public goods and externality aspects that are not necessarily promoted by strengthening private enterprise and liberalizing markets. A prominent role for government intervention is philosophically and pragmatically appropriate, even if current public capacity to protect and manage forests is generally weak. The challenge is to test and ultimately implement interventions superior to failed "command and control" laws and regulations, but not to discard the principles of intervention.

Forest conversion, especially on land frontiers, is driven by policies and actions outside of the forestry sector. Much deforestation is a side effect of nonforestry activity. Consequently, policy approaches have to rely on cross-sectoral and cross-agency efforts if they are to have a chance of being effective. This makes the managerial and institutional aspects of forestry strategies far more difficult to achieve than if policy changes could be confined to one or two specific agencies. Our understanding of the tradeoffs between distributional and environmental consequences is incomplete and unreliable because strong philosophical positions (environmental vs. developmental interests) often stand in the way of dispassionate analysis.

Long-term responses to policies relating to regeneration and growth of natural forests are difficult to predict, adding an element of uncertainty to policies such as export liberalization and forest privatization. Short-run forest cutting is easy to visualize, but the investment response may be slow, small, or even nil if any area of uncertainty (technical, political, tenurial) seems large.

The ability to use quantitative models to address policy tradeoffs on forests is severely constrained. Reed (1992) reports on the attempted use of input-output models, less restrictive general equilibrium models, and approaches based on more limited macroeconomic models to link macroeconomies (of Mexico, Thailand, and Côte d'Ivoire) with the environment. These efforts proved difficult due to lack of data. Even more importantly, the models could not be made to address the links of interest. In the end, the modeling team had to be satisfied with simple partial analysis models to answer specific questions.

Actions for the Bank

Some previous examinations linking policies and forests conclude with a "do everything" recommendation: extend the duration of concessions, price forest goods and services on the basis of residual value (land rent), re-examine strategies for protected areas, conduct social and environmental impact assessments of infrastructure projects, reform land tenure, remove agricultural subsidies, stabilize inflation and interest rates, and liberalize investment and trade. Conceptually, policies must be internally consistent, and the impact of one may not be realized except in the presence of another.

Yet such a comprehensive approach can be an unrealistic guide to action. Instead, the Bank and its client governments should establish priorities with regard to forest policies. The policies of highest priority are: (1) interventions that more fully develop national capacities to analyze and debate forest tradeoffs, (2) interventions that correct for market failures by internalizing externalities, and (3) interventions that transcend symbolic but ineffective legislative and regulatory measures. The remainder of this section recommends Bank actions consistent with these three criteria.

Forest Planning and Monitoring

The Bank should evaluate the quality of planning and monitoring frameworks for forests. In certain circumstances, Bank resources can help fill gaps in forest inventories, valuation studies, mapping projects, community profiling, and analyses of land-use tradeoffs. Improvements in the information base are a public good, especially if the Bank can exert pressures and offer incentives so that governments will make the information readily available to all who seek it.

Depending on the context, the Bank may be justified in asking for acceptable forest planning and monitoring frameworks as a condition of agricultural and infrastructural lending, particularly if Bank funds are used to help finance the activity. This should not raise controversies except to the extent that governments may claim that frameworks are already adequate, even if external reviews indicate the contrary. If there are contentious

issues, they are likely to center on the quality of what is already in place. Negotiating points between the Bank and client governments include the purpose, scope, implementation strategy, quality standards, dissemination strategy, and revision process for strengthened frameworks.

The Bank and its member governments should make sure that investments in data gathering on forests are guided by important policy questions, not by information gathering for its own sake. Perhaps the most prominent question is the definition and delineation of a permanent public forest estate. Inevitable controversies will arise about criteria, methods, and prices for allocating lands to protected areas, peasant and indigenous reserves, commodity production, and other uses. However, it is difficult to imagine that these issues can be avoided, even if governments prefer not to face them.

A related objective is building participatory strategies into the efforts, such as by expanding upon the work of indigenous and peasant communities to map homelands and forest uses. Another objective is institutional strengthening with respect to field inventories, data management, decision analysis, cross-agency cooperation, and public outreach. A government's success or failure in these tasks is a test of its competence for larger responsibilities on forests. The Bank should examine these performance indicators as it considers the direction and content of future lending for agriculture, rural infrastructure, and forestry itself.

Intersectoral Coordination on Forests

As noted, much seemingly irrational activity in forests is explained by absent or faulty coordination among different government agencies and programs. Through loan covenants and grant funds, the Bank can assist the development and maturation of intersectoral public-private coordinating bodies on forests. This can be a main forum where real and potential land-use conflicts are heard and addressed.

The appropriate model for this has to be debated within the institutional context of each country. One possible example is Ecuador, where INEFAN (the public forestry administration) has established a "*Directorio*" comprising INEFAN's executive director plus one representative each from the Ministry of Agriculture, the Ministry of Energy and Mines, the Armed Forces, the Corporation for Tourism, an NGO representing the environment, and an NGO representing the wood products industries. This panel communicates viewpoints on trends and events which affect the country's forests, anticipates impending issues, and advises INEFAN on policy directions. The size and structure of these coordinating bodies will vary from one country to another, but their functions are likely to be broadly similar.

Land and Forest Tenure

As discussed, land titling for landless agriculturalists is debatable as a strategy to slow deforestation in open-access forest frontiers. Similarly, tenure security is insufficient in itself to encourage tree planting and forest management. Nothing prevents land users who have secure property rights from behaving in ways that impose social costs on others (Kelly 1994). At the same time, the Bank cannot ignore the property rights approach in relation to forests. There are four specific policy areas that would benefit from Bank support.

Strengthening Indigenous Land Claims: Many of these are *de facto* claims over large forest areas. Bank conditionalities or grants to consolidate and strengthen recognition of indigenous land claims work in the direction of retaining significant forest tracts under sustainable treatment.

Granting Land Titles in Cases Where Forest Clearing is Considered a Land Improvement: There is no reason for the Bank to support these outdated policies.

Expediting Land Titles in Settled Areas, Opposing Them in Frontier Zones: This is the political question of determining where land titles are to be given. In general, the Bank should withhold its participation from land titling inside forest borders except where directed colonization is backed by reliable impact assessments. Concurrently, the Bank should make every effort to strengthen titling in settled and semi-settled areas. In some cases, policy on this may be suitably governed

by land-use maps and biogeographical zoning.

Guidelines on Privatizing Forests: The Bank should carefully monitor trends and developments in Latin America's recent experiments with forest privatization (for example, in Honduras and Peru). Based on this experience and attention to general principles, the Bank could usefully adopt guidelines for its role in forest privatization. For example, the theory of collective goods suggests a stronger case for privatizing plantations than natural forests. Within each category, additional decision structure is warranted. Thus lands not designated for a permanent forest estate can be privatized. Whether planted or natural, ownership of forests in critical watersheds should be public in most circumstances. These are examples of the types of criteria which need development and debate.

Protected Areas

The Bank's actions to enhance the social contribution of protected areas are both direct and indirect. Through support for land-use planning and the definition of a permanent forest estate, the Bank is able to help client governments define and discuss priorities for protected areas (location, configuration, protection needs, budgets). More directly, the Bank can play the role of facilitator to bring together environmental NGOs and government agencies to exchange perspectives and debate issues.

The Bank is well positioned to leverage backing for protected areas in countries where efforts to establish and manage them have been inadequate to date. It can build on its past experience in making protected areas a part of lending operations or conditionalities attached to larger loans. As a lending institution, the Bank has a special responsibility to assist client governments to set fees and adjust other revenue instruments to make protected areas increasingly self-financing.

Forest Concessions

Recommendations on forest concessions are relatively straightforward. First, the Bank should use its influence with governments to press for limiting the number and area of concessions to a manageable quantity. Concession locations and configurations should be determined within national land-use planning frameworks. Governments must be encouraged to award concessions through an open administrative process and according to well-defined criteria which take social fairness into account.

Forest management plans have to be improved in terms of realism and quality. Countries must build greater capacity to monitor and supervise them. The adequacy of forest management plans, and compliance with them, should be made a central discussion point and possible conditionality in Bank loans for agriculture and rural infrastructure. In this respect, the Bank has the opportunity to endorse current efforts in "green certification" in order to raise prices, improve market access, or both. The Bank also has the opportunity to promote partnerships between governments and NGOs regarding oversight of activities on forest concessions.

Other types of policy recommendations are less trustworthy. For example, extending the duration of concessions is possibly helpful but not sufficient to insure that concession holders will engage in forest management. Competitive bidding produces desirable results for pricing and revenue only where market competition for forest commodities is strong, and thus cannot be relied upon as a general instrument. Moreover, competitive bidding is not a strategy that unambiguously advances social and environmental objectives.

Fiscal Measures for Agriculture and Forests

Subsidies and taxes in most of Latin America have discriminated against forests in favor of grazing, cropping, and other non-forest development. This implies that fiscal measures can be modified to correct the bias. However, fiscal reform is a highly challenging policy area for achieving socially optimal land uses.

Government subsidies for tree planting on private lands do not necessarily reduce deforestation (see Peuker 1992 for Costa Rica). However, subsidies may be justified as a self-financing investment (Amacher et. al. 1994 for Chile), or as providing positive

externalities (Gregersen et. al. 1987 for watershed projects). The Bank cannot take these positive effects for granted, but rather should determine, through expanded cost-benefit analysis, whether they are demonstrable in each case. Critics of subsidies for industrial timber plantations want government support shifted to native species, natural forests, and smallholders. This can be good or bad policy, depending on answers to the same issues noted above.

The removal of agricultural subsidies from frontier zones offers a potentially powerful intervention to slow forest conversion. This refers to reducing tax breaks, credit, subsidized inputs, and extension services. At the same time, the strengthening of agricultural subsidies in settled areas (for instance, in populated highlands) may help raise output and employment on existing farms and ranches. The strategy is relatively unambiguous for land use, but faces the constraint that government officials have pursued the opposite policy for as long as anyone can remember. In its agricultural lending, the Bank may choose to apply conditionalities which induce governments to reformulate the biogeographical zones and agri-pastoral activities eligible for government subsidies.

Finally, the Bank should stimulate discussion of the land tax. Although politically unpopular, land taxes have potentially important implications for land uses, as discussed earlier. The tax structure in principle favors forest conservation if croplands and pastures are taxed more heavily than forests; if newly cleared lands are taxed more heavily than long-established ones; and so on. However, the land tax is unlikely to work well without internally complementary policies on tenure, land-use planning, and agricultural subsidies.

Macroeconomy, Trade, and Investment Issues

Latin America's policy adjustment process has had a mixed impact on forests. This refers principally to the consequences of currency devaluation, fiscal restraint, and liberalized trade and investment. Forests are not a focus of macroeconomic or even sectoral reforms. Yet, economic conditions determine what happens in forests through numerous indirect influences.

It can be argued that macroeconomic distress puts pressure on forested frontiers to accommodate the overflow of marginalized persons, although this has not been systematically documented. If this hypothesis is correct, then the Bank's contribution to macroeconomic stabilization has to be judged as generally helpful for forests.

At the same time, a few specific policy areas deserve close attention for potentially adverse effects. The Bank should monitor the impact of reductions in government spending on the capacity of PFAs to carry out their mission. Additionally, it should encourage public interest groups to monitor the impacts of liberalized trade on the scale and environmental aspects of forest harvesting. Lastly, it should cooperate with client governments on investment codes and incentives to make foreign participation in the forestry sector consistent with national socioeconomic and environmental objectives.

Prospects for Policy Changes

As observed by DeCamino and Barcena (1994), efforts to change policies affecting forests proceed from a weak starting point.

- Few are the uncontested policy successes in or affecting Latin American forestry and forests. To date, most experience comprises policy weaknesses. This does not bode well for assisting policy teams to identify proven approaches.

- Utopian ideas and grand goals often dominate the rhetoric about saving forests. Many political figures and government officials are devoting considerable time to "sustainable development" without knowing what it means in operational terms. They are reluctant or politically unable to abandon abstractions and embrace specifics.

- Policy recommendations are being put forward in forms that are insufficiently flexible for the reality of particular countries. Proposals to stop all logging in tropical primary forests perhaps fit into this category. More broadly, the

policy environment for forestry and forests is characterized by a number of North-South differences in perspectives and values. Various high-level international efforts have been disappointing, some pessimism has been expressed about many national exercises with the Tropical Forestry Action Program, and understandable confusion exists about newer initiatives (National Environmental Action Plans, Global Environmental Facility). Moreover, financial transfers from the industrialized countries are well below target levels of commitment.

- Measures to make policy changes on forests more self-financing are mainly in the discussion stage. Strategies to finance forest protection and management are improving,but are still immature and untested (Spears 1994).
- Even if the perfect policy package could be designed for forests and forestry, the ability of governments to implement these policies lags far behind.

Countries such as Peru, Nicaragua, and Honduras should give priority to land tenure and infrastructure projects ahead of forest products trade, debt swaps, and timber pricing. Many observers agree with De Vylder (1992) in contending that forest protection and management in Nicaragua may not be feasible until basic macroeconomic indicators improve substantially. However, even when they improve, the risk of slipping back into instability, a risk faced by several fragile economies in the region, do not favor long-term planning. While these limitations are serious, there are examples of positive developments in the region which have yet to be thoroughly evaluated. Just as Repetto (1985) used gap analysis to suggest the Global Possible, a similar exercise may prove useful for examining policies in relation to forests. Who are the leaders in policy achievements, and what factors explain their successes? Possible illustrations are protected areas in Costa Rica, industrial forestry in Chile and Brazil, and community forestry in Mexico.

The basis for these accomplishments dates to before 1970, and they were the work of visionary individuals. However, the policy programs and adjustments which carried these efforts forward over the last 20 to 30 years are imperfectly understood. Also not widely known are the mistakes and costs, and how policies had to be reformulated as lessons were learned. A study of positive experiences calls attention to comparative advantages and minimum requirements, with implications for assessing success prospects in policy-based lending.

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