

Sustainable Forest Management in Latin America: Relevant Actors and Policies

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Foreword

The Environment Division, in collaboration with several technical units of the Bank and other international organizations, is preparing a guideline document on forest development in Latin America and the Caribbean in the context of sustainable management and conservation of renewable natural resources. The document will examine several topics. It will analyze, among other things, the impact of alternative macroeconomic and sectoral policies on forest resources, environmental services, the impact of nonwood products, certifying forest management in designing strategies for sustainable forest management with special emphasis on land tenure issues of indigenous peoples, and the roles of privatization, use of incentives and forest resources utilization contracts in sustainable development.

The concepts and findings in the present document on relevant actors and policies in sustainable forest management, written by Ronnie de Camino, are essential elements for the preparation of the guidelines. The document analyzes the role of social and economic actors in the forest sector and the impact of alternative policies in forest resources in Latin American and the Caribbean.

Information presented in the document, as well as the conclusions on possible strategic lines of action with the participation of affected actors provide a good basis for discussion and will contribute to the improvement of the quality of the Bank's investment projects in this area.

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Executive Summary

Despite efforts to curb deforestation in Latin America it continues largely unabated. A coordinated effort to formulate policies that can help achieve sustainable uses of forest resources has yet to emerge. Such an effort is vital because many countries in the region possess significant forest resources that should be utilized and managed not only for their development potential, but also for the environmental benefits they generate for the entire global community.

This paper analyzes the role of particular social and economic actors in the forest sector, and the impact of existing policies in the region. The aim is to visualize the options that are available to improve forest policies and practices that will in turn generate income and ensure sustainability with the active participation of the actors.

It is necessary to engage all interest groups involved in forestry activities in order to facilitate sustainable forest management. At the same time, it is necessary to craft macro-economic and extra-sectoral policies that support healthy development through the elimination of perverse incentives and other measures that cause the conversion of forests to other land uses. Illustrations of promising experiences are identified,

confirming the need to duplicate these efforts and to disseminate sustainable forest management information to more of Latin America.

Until now, the utilization of forest resources has focused on the extraction of wood and non-timber forest products, with little attention to the potential income from environmental services (stabilization of climate, watershed protection, carbon sequestration, and recreation, among others). Thus, it will be necessary to create both national and international policies and instruments that will permit key actors to capture income and the society in general to benefit from the environmental services provided by forests.

Equal opportunity of various actors to participate in policy making and in various aspects of forest management is a prerequisite to ensure the sustainable development of forest resources. With this basic principle in mind, the document presents a framework for changes in practices in the sector. Lastly, it identifies a set of measures that could support the sustainable use of forest resources in Latin America.

Acronyms and Abbreviations

ACT	Amazon Cooperation Treaty
CANAFOR	National Forestry Council of Costa Rica
CATIE	Center for Research and Learning in Tropical Agronomy
CCAB-AP	Central American Commission for Forests and Protected Areas
CCF	Costa Rican Forestry Council
CCT	Tropical Sciences Center (Costa Rica)
CGIAR	Consultative Group for International Agricultural Research
CNF	National Forestry Council (Bolivia)
CNS	National Council of Rubber Troppers (Brazil)
COHDEFOR	Honduran Corporation for Forest Development
CONAMA	National Environment Commission
CORMA	National Timber Corporation of Chile
ECLAC	Economic Commission for Latin America and the Caribbean
FAO	United Nations Food and Agriculture Organization
FAG	Forestry Advisory Group (see TFAP)
FONDOSILVA	National Reforestation Fund (Nicaragua)
FSR	Forest Sector Reforms
FUNDECOR	Foundation for the Development of the Central Volcanic Range (Costa Rica)
IDB	Inter-American Development Bank
IFAD	International Fund for Agricultural Development
IICA	Inter-American Institute for Agricultural Cooperation
ITTA	International Tropical Timber Agreement
IUCN	International Union for the Conservation of Nature
LACR	Legislative Assembly of Costa Rica
LMDA	Agricultural Sector Modernization and Development Law (Honduras)
MAN	Nicaraguan Environmental Movement
NEAP	National Environmental Action Plan
NSC	National Conservation Strategy
NSDS	National Sustainable Development Strategy
NGO	Non-Governmental Organization
NPV	Net Present Value
RECA	Economic Reforestation with Agricultural Cultivation Program (Brazil)
TFAP	Tropical Forest Action Programme by the FAO
UNDP	United Nations Development Program
WCED	World Commission on Environment and Development:
WCFSD	World Commission on Forestry and Sustainable Development
WRI	World Resources Institute
WWF	Worldwide Fund for Nature

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Introduction

Natural forests constitute a valuable environmental and economic resource in Latin America. Nevertheless, the inadequate utilization of forest products, mining activities, colonization of humid tropical forests, conversion of forests to grazing pastures, cultivation of coca and export crops, and other uses are accelerating the devastation of extensive forested areas in Latin America.

This document considers options available to reduce deforestation in Latin America within the framework of sustainable development and also examines the role that diverse actors can play in this process. The first chapter discusses sustainable development as the context for developing new policies and management practices, defines what is meant by sustainable forestry, presents a taxonomy of actors involved in forest management, and introduces ways with the potential to move forestry policy in Latin America in a more positive direction. The following chapter characterizes the actors defined above, identifies their various interests and objectives, as well as areas of conflict and complementarity, and their positions on the use of forest resources. The next chapter lays out opportunities for a new direction in forest policy that are based on an analysis of problems that have impeded sustainable development of forest resources. In the last chapter, the basic components of a forest policy reform within the context of sustainable development are detailed, including a discussion of the criteria to be applied, the direction to be followed and the objectives of reform. In addition, the role to be played by different actors under these new conditions is considered. The appendix provides a case study examining the experience of Mexico in the development of forest policy.

This paper focuses specifically on naturally forested areas, although mention is made of plantations and industrial forestry when relevant. Information for the study was gathered through bibliographic searches, consultations with representatives from the various groups of actors with impacts on forest management

in the region, and on the author's professional experience.

Sustainability

The concept of sustainable development has gained increasing acceptance worldwide as the framework for the definition of economic policies. As defined by the Brundtland report, "sustainable development seeks to satisfy the necessities of present generations without compromising the ability of future generations to attain their own development needs" (WCED, 1987). In operational terms, "sustainable development is a process of change in which the exploitation of resources, the flows of investments and technological development, as well as institutional change, work in harmony and improve the current and future potential to satisfy human needs. The concept considers the limits imposed by natural resources, the present state of technology and social organizations, as well as the capacity of the biosphere to absorb the impacts generated by human activity; it also assumes that improvements and advances in both technology and social organizations can open the way for a new era of economic growth" (WCED, 1987).

Sustainable forest management considers the socio-economic feasibility of administration and utilization of forest resources, the preservation of ecosystems, over time and the ability of various stakeholders to participate in the formulation and implementation of related policies, and programs. In this context, the sustainable use of forest resources is valued as a permanent activity that accepts intervention in the forest to utilize products and services in a way that:

- * occurs within the limits of an ecosystem's sustained productivity over time;
- * is economically viable for the stakeholders involved in forest management;
- * the stakeholders impacted by these activities have an opportunity to participate in the design,

implementation, and evaluation of forest policies and programs, as well as sharing in the distribution of associated costs and benefits; and

- * forestry activities are viewed as connected to other sectors within the national economy, and within the framework of sustainable development of a country.

Classification of Actors

There are many actors involved in the design, planning, formulation, implementation and evaluation of forestry programs and policies. Some actors play an active role--whether permanent or intermittent--while others are passive, either because they are unaware of the impact of specific programs and policies, or because of disinterest due to a lack of a voice in the process. This paper examines the various of actors objectives with the aim of developing new ways to incorporate their input into a policy dialogue on forest development (Cortés, 1995).

For the purposes of this study, the following categories are used to classify the private sector actors (IDB, 1995b). This taxonomy is discussed in more detail in the next chapter of this paper.

Conservationists: seek to minimize any intervention in natural forests in order to protect ecosystems, habitats, and biodiversity.

Traditional Inhabitants: seek an equilibrium of activities within the forest, in order to maintain a living environment while also ensuring a permanent livelihood.

Producers: seek to utilize forest resources on a commercial basis in order to gain maximum productivity from timber and non timber products. They accept the fundamental change in the composition and structure of the resource that results from their intervention.

Converters: seek primarily to eliminate forest cover. They are only interested in the forest as a temporary source of income during the process of conversion to

other land uses.

Although a divergence of positions among the actors as well as a difference in the values they assign to forests is recognized, a general consensus exists on the need to return the management of natural resources in general, and forests in particular, to the communities that inhabit them, the NGOs that participate in their management, and to the private sector. This argument takes into account two important considerations. The first is a focus on greater participation by landless groups or those losing land tenure. The second is a recognition that in many instances the state cannot exert territorial control over forested areas, due to the weakness of its institutions. Consequently, there is a need for a new framework of coordinated policies that permits the above-mentioned actors to participate in a healthy utilization and conservation of forest resources. This framework will require the definition of property rights and the development of institutional mechanisms that permit the actors to participate actively in the management and oversight of resources.

Nevertheless, the State could seek alternatives to improve the management of public forests through direct administration or by contracting out the planning and management of forest resources to the communities that inhabit forests, NGOs or private companies. Doubtless, there will continue to exist situations where the state must maintain direct control over forest resources. These situations occur when the above-mentioned actors are the principal sources of deforestation and degradation of forest resources, or when there are no communities to participate in forest management.

External Factors

Reform within the forestry sector that seeks to establish sustainable uses of the resource must consider the interrelationships with other sectors, and decisions within these in order to achieve stated objectives. Thus, the formulation of forestry policies should examine measures related to agriculture and livestock husbandry, and to the management of water

quality and watersheds, coastal zones, forests, biodiversity and energy resources (Keipi and Laarman, 1995). The same consideration should be given to macro-economic policies and corresponding legislation--all of which affect the forestry sector. This is true for fiscal, trade, monetary, infrastructure, transportation and institutional policies (Keipi and Laarman, 1995; Gregersen et al., 1994).

While many authors have examined external policies affecting the forestry sector (Stewart and Gibson, 1995; Gregersen et al, 1994; Pascó- Font, 1994; Alfaro, 1994; Contreras, 1995; IDB/ UNDP/ACT, 1992), few have adequately analyzed the interrelationships, these, often contradicting policies.

One recent effort analyzes forestry policies in Central America and the limitations encountered in the sustainable development of forest resources (CCAB-AP, 1996).

During the last two decades, development efforts in Latin America have been directed primarily toward ensuring fiscal stability and economic growth. The focus on human development and environmental improvement and protection often appears to come as an afterthought. Nevertheless, if people accept that the goal is to achieve economically, socially and environmentally sustainable development, then it will be necessary to pursue economic and quality of life improvements simultaneously.

The Actors: Their Interests and Objectives

There are various actors that play direct or indirect roles in defining forest sector policies. These actors include the following groups: the government through its various sectoral agencies; international organizations that supply financial and technical assistance; private interests such as timber companies, ranchers and farmers; national and international environmental groups; and forest inhabitants, among them indigenous communities, colonists relying on subsistence agriculture and extractivist groups (Astorga, 1996). The amount of influence each group can exert will determine which interests will be favored and which will be limited in the formulation and implementation of forest policies and programs (de Franco et al, 1995). Also, it is difficult to establish a consensus between groups that pursue short-term economic interests and those favoring long-term preservation of the resource (Cortés, 1995). Even so, the emergence of sustainable development as the guiding principle for economic development implies that this principle will be incorporated into the general framework of forest policies.

Originally, forest policies were designed to serve the interests of timber companies and associated industries. With the publication in 1987 of the Brundtland report and the Earth Summit results in Rio de Janeiro in 1992, the issues and interests of national and international environmental groups began to gain political force. Simultaneously, this development favored the interests of indigenous communities inhabiting the forests, as governments began to recognize not only their role as stewards of the resource, but also the need to grant them property rights over these lands if that stewardship were to continue. Furthermore, financing and technical assistance institutions are now incorporating environmental factors into their policies and projects in response to pressure from environmental advocacy groups that promote sustainable natural resource use and the conservation of biodiversity. Thus, both the

scope of interest and the zone of influence of conservation groups has been increasing, as have the number of other institutions taking a stake in these issues.

This study focuses on the actors with direct interests in forest resources--whether these are to preserve the forest and obtain income from environmental services, or to extract short-term benefits while converting forests to other land uses--and on the role of the government in these activities. These groups are thus classified respectively as conservationists, traditional inhabitants, producers and transformers. Because it has direct interactions with all of these groups, the State is discussed in the context of its relations with these groups rather than as a separate actor competing for resource use. Furthermore, the State is supposed to support a range of societal interests in natural resource exploitation, as well as the interests of future generations (WCFSD, 1996a).

The Actors in Relation to Forest Resources

The following divisions of interest groups into actors and the respective descriptions are based on those developed by Hans Gregersen for the World Commission on Forests and Sustainable Development (WCFSD, 1996b). While the actors have been chosen for their relative importance and impact on forest resources, the number chosen has been limited to simplify discussion. As a result, the actors have been classified into four broad categories. The author understands that a wide range of opinions and viewpoints may exist within a single category and accepts the risks of generalizing about any one group of actors.

Conservationists

Naturalist, aesthetic, scientific, and even economic motivations lead people to take a conservationist stand. Generally, the conservationist category

represents those groups advocating the conservation of forests in their most pristine state. The principal group consists of national and international non-governmental organizations (NGOs) dedicated to the preservation of flora and fauna (among them IUCN, WWF, The Nature Conservancy, Conservation International and their national analogs). The introduction of sustainable development as a concept has led these organizations to recognize the need for cooperation with groups whose forest use will also protect biodiversity and the various functions and services provided by forests.

Conservationists view the environment as a central factor within the framework of development (Pascó-Font, 1994). They have focused their efforts primarily on pressuring governments to establish and maintain protected areas, national parks and buffer zones as a means of protecting ecosystems or areas with high biological diversity. A related conservation objective is the fight against “paper parks,” or those protected areas that exist solely on paper and enjoy little actual protection. Such parks lack appropriate border demarcation, park design and management plans, or the funds to develop these elements--putting the areas at risk of becoming “land reserves” that fuel the continued expansion of the agricultural frontier.

A secondary conservation objective is the undertaking of scientific, conservation or economic programs together with public sector agencies, local communities or both. In this way, conservationists try to combine their goals with the objectives of rural development. For example, conservationists have promoted agricultural development projects that emphasize soil conservation, agroforestry, organic farming and reforestation (de Franco et al., 1995). Similarly, they often frame their efforts in the context of protecting the global commons against threats such as global warming and loss of biodiversity. International conservation NGOs argue that the costs and benefits associated with the use of the atmosphere and oceans transcend national boundaries, and that the exploitation of these resources generates global externalities that require negotiated international solutions (Reis, 1991).

Traditional Inhabitants

This category includes communities that have traditionally lived in the forest and currently derive their livelihood from forest products without changing the fundamental character of their environment. These groups harvest animals and plants, and carry out subsistence agriculture and animal husbandry. They tend to generate few disruptions to the ecological equilibrium of their environment as a result of low-impact survival strategies, limited population size, or minimal access to technology.

Traditional inhabitants include: (a) indigenous populations of humid tropical forests, and (b) traditional resource extractors, encompassing indigenous groups and colonists that have settled in the jungle and that dedicate themselves individually or in organized form to the harvest of forest products using methods that support conservation objectives (Cortés, 1995).

Historically, indigenous populations have seen their territories invaded by other actors as a direct or indirect result of government policies. Consequently, their numbers have decreased, endangering the survival of their cultures and knowledge of the land. In 1970, the population of indigenous peoples in Latin America was estimated at 40 million. In 1980, this number was estimated at only 34 million--a decline of 1.3% per annum (Psacharopolous and Patrinos, 1994). During the same period the population growth rate in the region was 2.6% (Winograd, 1995). According to the World Bank (1993d), the contact of indigenous groups with non-indigenous groups is largely destroying the former's capacity to improve its standard of living while maintaining its cultural traditions.

Nevertheless, there seems to be an increasing public awareness of indigenous issues and their relevance to the environment. In many cases, ethnic groups have benefited from efforts to regain their traditional lands, strengthening their organizations at the national and international levels. Many of these communities--often isolated for centuries in what remained of their territories--have now established

associations with counterparts in other countries, thus gaining international attention for the defense of their rights. For example, the Second Inter-American Indigenous Peoples Conference on the Environment and Natural Resources in Beni, Bolivia, defined as fundamental the issues of land, land use and traditional technologies, education, cultural values and the environment, legislation, indigenous peoples' rights and identity (CIIRNMA, 1991). In response to pressure from these groups, and from other supporting organizations, regional and international institutions such as the IDB, IFAD, ILO, and World Bank have designed special programs for indigenous peoples (World Bank, 1993d).

Compared to intensive agriculture and large-scale livestock production, extractivist activities pursued by indigenous and other social groups have minimal impact on forest functions (Foster et al., 1992). Traditional extractivists harvest non-cultivated products that they must search for throughout the forest. Therefore, they require large tracts of intact forests for their livelihood. Throughout Latin America these groups have slowly been acquiring user rights to forested areas from the State (Ruiz-Péres et al., 1992).

Producers

This group includes owners of forested lands, timber companies, concession holders, managers of state-owned reserves, forest industries dependent on supplies of round wood, and indigenous and local communities that depend on the extraction of wood and intensive exploitation of forest products. Although all of these groups depend on a steady timber supply, there are few examples of firms or land owners that undertake their operations through sustainable forest management.

The principal objective of producers is to obtain sufficient profits from the use of the forest. They accept the need to change the structure of the forest in order to achieve their objectives. While some producers fight conservationists, others try to incorporate environmental remediation and reclamation measures in order to market themselves

as "green". Conversely, some property owners and concession holders harvest the forest cover and timber and then abandon these areas, which are subject to colonization, commercial agriculture, and livestock production. The justification for permitting such deforestation is that forestry in these areas is not economically profitable because of long time periods between harvests. This situation may be due in part to the lack of incentives for forest management in contrast to the incentives available for alternative land uses.

Development pressures have contributed to a resurgence in forest timber concessions. In particular, Venezuela, Guyana, Suriname, Nicaragua have been granting or are exploring the granting of large timber concessions. The fact that these concessions are being granted companies with poor environmental track record (especially from Korea, Malaysia and Indonesia) has generated tremendous controversy nationally and internationally. These companies are seen as a threat to Latin American forests, lacking any vested interest in preserving the ecological integrity of the resource.

Converters

This group includes cattle ranchers, farmers, builders of dams and airports, oil and mining companies, and informal miners, as well as public sector agencies responsible for land reform, rural development and colonization programs--all of which generate a demand for land best suited to forest cover but used for other ends. Converters are not interested in forestry, but wish to transfer the land to uses such as agriculture, pasture, roads, housing, among others--all for economic gain.

The following policies or conditions have been responsible for much of the forest conversion that has occurred.

- * Public lands are often considered *de facto* open access resources (Johnson et al, 1995).
- * Some policies encourage conversion through perverse incentives leading to the degradation of

forests and soil quality (Cortés, 1995).

- * Land titles are granted to settlers and colonizers for land “improvements,” i.e., clearing and burning trees to permit farming and animal husbandry. This stimulates farmers to land clearing and holding their capital in the form of livestock (Cortés, 1995).
- * Subsidies to the agricultural sector indirectly promote deforestation by reducing the relative value of forest resources compared with agricultural users.

The population of Latin America is expected to grow by 70% between 1990 and 2030 (Winograd, 1995). There will be a consequent need to increase food production, and expand the infrastructure base. As a result, the number of converters is likely to increase, as are deforestation rates.

In the area of rural development, a few experiences demonstrate the feasibility of integrating traditional agriculture with forestry and agroforestry components that support the sustainable management of soils, water and forests. One example is found among the indigenous communities of Saraguro in Ecuador that includes forestry and agroforestry activities as integral parts of traditional agriculture (IICA and IFAD, 1992). The second case is the RECA (economic reforestation with agricultural cultivation) project in Brazil, underway with the Nova California community that is made up of immigrants living along the border between the states of Acre and Rondonia. RECA began as a traditional rural development project with legal authority to cut 50% of the area’s forest cover. However, the project was changed to include also agroforestry investments and management of primary forest. This change permitted members of RECA to diversify their production and to begin managing the remaining forest sustainably (de Camino, 1992).

Conflicts and Complementarities Among Actors

A basic assumption of sustainable development is that different stakeholders should have the opportunity to participate in negotiations regarding the utilization, designation and distribution of resources (Zazueta, 1996). The inclusion of groups affected by policy decisions will lead to planning and management based on mutual interests and responsibilities. To ensure constructive participation among the various groups with differing objectives, it is first necessary to identify the following:

- * potential or existing conflicts among the different actors;
- * common objectives among the groups that might serve as the basis for agreement and consensus; and
- * sources of information or management tools that can support sustainable forestry.

Once this information is gathered, mediators and/or the actors themselves can start to look for common ground. It is by concentrating on the shared objectives that groups can begin to build consensus. The following sections seek to provide the reader with a basic understanding of the principal objectives and conflicts that dominate the agenda of each of the four actor groups. In this way, the reader can focus on the issues that are likely to unite actors, as well as those that will require the most effort to achieve a consensus.

Conservationists

Conservationists have primarily targeted commercial timber interests as the foremost threat to forest preservation. As a result of their efforts, environmental NGOs in 1993 managed to convince the Austrian government to approve a regulation limiting tropical timber imports to those sources that manage the resource sustainably. In Honduras, environmentalists blocked the company Stone Forestal from obtaining concessions and exerted enough pressure to stop the development of

monoculture plantations of *Gmelina arborea* by the same company in Costa Rica. More recently, conservationists have substituted boycotts and public pressure with efforts to work jointly with other actors. For example, the governments of the Benelux Countries, the Timber Trade Association, the Federation of Trade Unions, IUCN and WWF signed an agreement stipulating that after January 1996 all tropical timber imports to those countries would come only from sources with certified management practices. This is an attempt to advance progress on international trade at timber from managed forests by the International Tropical Timber Agreement (ITTA) that will go into effect in the year 2000 (Centeno, 1995).

Conservation activists have also lobbied to change existing laws that devalue intact forests compared to other land uses. They have confronted commercial farmers, ranchers, engineering companies, immigrant groups and others on specific projects. However, in some instances they have substituted direct pressure with efforts to inform the public and decision makers about the implications of certain policy decisions. In this manner, conservationists have expanded the public debate to include perspectives from a variety of interest groups (Repetto and Gillis, 1988; CCT/WRI, 1991).

All in all, there appear to be complementary interests between conservationists and other actors. This is particularly true for indigenous groups who typically enjoy the support of conservation organizations. It is important to note, however, that conservationist and

indigenous group ideologies do not overlap completely, as the latter tends to be much more pragmatic and use oriented than the former. Nevertheless, these actors have worked together to advance their often-complementary objectives. Conservationists have also connected communities to private firms that utilize forest resources through the exchange of experiences and viewpoints aimed at solving concrete problems (WWF, 1991). In addition, conservationists have supported producer groups, in order to generate financing for their forest management (see Box 1); and they have worked with governments to improve environmental awareness and education.

Traditional Inhabitants

The most consistent source of conflict between forest inhabitants and the other actors is infringements on their traditional lands due to undefined or unenforced property rights. Government policies to encourage colonization of jungle areas by landless peasants has created conflicts with indigenous groups. The same is true for migrants attracted to tropical forested areas by mining. Moreover, commercial farmers and ranchers, whether as individuals or as organized groups, seek to obtain lands that are also claimed by indigenous tribes and other communities. Lastly, there is conflict within this group in cases where different tribes or communities dispute the ownership or rights to land. Similarly, some groups have obtained political representation at the expense of smaller, less organized communities.

The Power of Alliances

FUNDECOR (Foundation for the Development of the Central Volcanic Range of Costa Rica) is an NGO created to manage the FORESTA Project financed by USAID. The objective of the project is to promote the conservation and sustainable use of the natural and cultural resources in the area.

Some of FUNDECOR's achievements include the following:

- * Support for an association of 312 land owners that together control 16,000 hectares of forest and are initiating sustainable management of forest resources.
- * Negotiation of prices for producers and efficient organization of the local timber marketing.
- * Development of innovative financing schemes via the sale of forest products and environmental services. FUNDECOR is developing a market for timber futures on the basis of management plans with financing from the International Finance Corporation associated with the World Bank. It is also linking the sale of carbon sequestration (through accords for Joint Implementation) to the certification of management practices and forest conservation as a way to channel funds to private owners of forests.
- * Negotiating certification of forest management in an associative form as a way to ensure that it is economically feasible also for medium and small producers.
- * Developing an environmental education and ecotourism program in order to generate support for sustainable forest management, and generate income for private farmers and land owners.

Source: Alfaro, 1996.

Box 1

In cases where cooperation between forest inhabitants and timber companies has taken place, economic interests have occasionally generated internal conflicts within indigenous communities. Nonetheless, the potential for cooperation between inhabitants and all the other actors is significant. The deep understanding that many indigenous tribes have of their surrounding natural environment and its ecological functions should make them a valuable partner for all other actors.

To the extent that traditional inhabitants use shared channels of communication, organize themselves, and acquire training, they will be able to defend their common interests and to improve their negotiating power. The Maya Forest Action Plan, for example, has unified indigenous communities throughout Guatemala and achieved important concessions from the government (Brenes, 1995). Another important experience is Brazil's National Council of Rubber Tappers (CNS)--the entity that represents communities from extractive reserves around the

country. Through this organization, communities that derive their livelihood from non-timber forest products have made important gains in the area of forest and environmental policies. These gains have permitted them to carry out projects that involve development and processing of their products, thus raising the value added to their economic activities (Ruiz-Pérez, 1992).

Despite the problems that arise, the potential for structuring collaborative associations between forest inhabitants and timber companies appears promising. Communities control land, supply labor, and have a knowledge of the local environment, while companies have capital and knowledge of extractive and processing technologies. Such cooperation is occurring in Nicaragua where some companies have established contracts with Sumu communities to manage hardwood and pine forests (see Box 2). The success of these contracts will depend in large measure on reducing perceived threats to the forest communities, and in creating opportunities for an

expanded number of economic activities that can raise incomes while maintaining sustainable and equitable use of forest resources (de Camino, 1996a).

Inhabitants as Producers

The behavior of diverse actors toward forest resources changes over time as a result of new perceived needs or policy changes. This is the case of the Awastigni community that belongs to the Sumu ethnic group in the Atlantic region of Nicaragua. Originally, this group supported itself through fishing, hunting and swidden agriculture. With the passage of the Law of Autonomy of the Atlantic Region recognition was granted for community land rights. Simultaneously, the government granted the private timber company, MADENSA, a forest concession within the territory claimed by the Sumus. The potential conflict was defused when the community and the company negotiated an agreement in which MADENSA promised to pay the community logging fees and to employ members of the Community Forestry Cooperative in its commercial activities. Thus, the community earned their income through the sale of logging rights and the generation of jobs. In this way the community, which previously assumed an exclusively traditional role as forest inhabitants, now uses timber resources and continues their traditional practices of fishing, hunting, and harvesting herbs.

Source: Author's analysis.

Box 2

Producers

Producers see conservationists as a serious obstacle to forest resource use because of the public criticism conservationists foment, and pressures they put on policy makers. With respect to the other actors, producers compete with converters for forested areas, and are increasingly required to acknowledge the territorial rights of indigenous peoples and other rural communities. Such is the case of the forest cooperatives of Quintana Roo, Mexico (Janka and Lobato, 1995) where rural communities implement their own forest conservation plans, as well as manage logging and commercialization of these resources with the support of government agencies and international cooperation. The same situation arose at San Miguel in the Petén of Guatemala, where for the first time the government granted a rural community a forest concession on public lands (CATIE, 1994).

Competition among producers has led some companies with insufficient land holdings or forest concessions to illegally acquiring annual logging permits from government lands, or cutting trees not authorized for harvesting. Corruption may be prevalent under such circumstances. Timber operators themselves are willing to risk discovery

because the public sector has generally been unable to enforce the laws. An example of unwanted behavior in countries where the law requires wood to be processed in its province of origin, are the payments of bribes to guarantee supply of forest products to the mills of timber industries in provinces that have already exhausted their forest resources. (Solórzano, 1994).

In many cases, producers have managed to establish associations or lobbying groups to obtain political advantages and to defend industry positions, thus, mobilizing powerful economic interests. Good examples of this phenomenon include the National Forestry Council (CNF) of Bolivia, the Forest Council of Costa Rica (CCF), the National Forest Council (CANAFOR) also of Costa Rica, The National Timber Corporation (CORMA) in Chile, and the Forestry Association of Guatemala, among others. Initially, the timber industry organized with the purpose of promoting legal and regulatory initiatives to favor their interests. They have since expanded their activities to the development of markets, technology transfer and a few other initiatives that support more sustainable uses of forest resources.

Converters

Converters, like producers, see conservationists and traditional inhabitants as their principal opponents. Governments, via sectoral agencies responsible for agrarian reform and rural development, often promote the conversion of forests to other land uses. This process of land conversion generates conflict between converters and other government entities responsible for managing forested lands, as well as with traditional inhabitants. The latter conflict often leads to tragic consequences for the communities involved.

Similar conflicts occur when migrants invade private property illegally and immediately clear cut the land to demonstrate possession. Colonists repeat the process of invasion and land clearing as soon as the initial fertility of recently deforested land is exhausted. In some cases, these lands are returned to their original owners and reconverted to secondary forest (CCT/WRI, 1991; Utting, 1993). In other cases, such as Brazil, small-scale converters invade government property, or they receive land parcels from the government that they may resell to commercial farmers or ranchers after a few years of cultivation (Schneider, 1995).

The fact that converters have only a short-term or transitory interest in forest resources does not mean that they should not participate in the political debate regarding forests. On the contrary, it is important for this group to understand the impact of its activities and to offer alternatives that encourage sustainable economic activities that do not threaten forest survival.

Moving from Interests to Practices

The formulation of new forest sector policies that seek sustainable use of forest resources requires an understanding of the perspectives of the actors involved. This includes their outlooks on the degree of forest conversion, change and preservation that are permissible or necessary, and who should benefit from the forests and how. Recent developments in Latin America suggest that there is already some consensus among actors on the need to design and

implement national land use plans to clearly establish which areas should be preserved, dedicated to forest production, and assigned to agriculture and livestock uses (Brenes, 1995).

For the most part, the actors competing for land are not being realistic about the requests they are making. Conservationists seek to protect large areas whose physical and territorial integrity they cannot guarantee. Forest inhabitants hope to receive large extensions of territory that will permit them to hunt, fish and carry out swidden agriculture, even though they often do not possess the necessary capacities to exert territorial control over land adjudicated to them. Producers seek to acquire permits and concessions for the exploitation of the best forests, but rather than managing these sustainably they wish to move on after harvesting to exploit other undeveloped areas. The converters push to acquire new areas for ranching or they finance improvements to their pastures by logging and selling wood from adjacent forested areas.

Clear land use zoning, identification of permissible activities in these zones, as well as the development of the necessary political, legal and technical tools, are essential to guaranteeing the effective operation of land use plans. Land use plans should remain flexible enough to allow more than one actor to pursue activities within an area, as long as the interests of the primary users are not harmed. In areas where indigenous groups have land use rights, some uses by other actors may be compatible. Similarly, extractivist activities may be compatible with private forestry activities. In order to avoid conflicts, however, it is necessary to establish formal agreements between groups pursuing different activities. It is also essential to take into account situations where there is *de facto* utilization of forests (i.e., non-sanctioned squatter and migrant use) and where lands best suited for forestry have been converted to other land uses. Although these areas are not used sustainably, it is unrealistic to reassign them to forest uses when they are controlled by colonists who do not intend to change their practices and do not have other sources of income (Janka and Lobato, 1995). Table 1 below summarizes the

positions and interests of relevant actors within the context of land use planning and design.

Table 1: Possible Stakeholder Interests and Criteria in Land Use Planning

Actor	Objective	Interests and Policy Positions	Possible policy responses
Conservationists	<p>Ensure that the majority of land area with forest cover gains some type of protective status.</p> <p>Protect biological corridors connecting ecosystems to allow migration of wildlife and preservation of genetic resources.</p>	<p>Conserve primary forests.</p> <p>Capture the economic value of forests by developing a market for environmental services they provide.</p> <p>Share costs of maintaining the global environmental benefits with int'l community.</p>	<p>Establishment of national biodiversity strategies and land use plans.</p> <p>Development of market mechanisms to capture and distribute economic rents from the forest's environmental services.</p>
Traditional inhabitants	<p>Maintain controls over traditional lands without outside intervention.</p>	<p>Conserve and manage primary forests within indigenous territories and in extractive reserves.</p> <p>Other actors should focus on raising productivity of their existing and under-utilized holdings.</p>	<p>Enforcement of land management and land use plans.</p> <p>Demarcation of traditional lands and extractive reserves, and recognition of indigenous people's and extractivist communities' rights.</p>
Producers	<p>Ensure that areas with the most valuable timber species and greatest productive potential are used primarily for the harvest of timber.</p>	<p>Set aside large tracts of forests exclusively for forest production activities.</p> <p>Limit agriculture and ranching to areas where they presently occur.</p> <p>Grant new short- and long-term concessions in productive forests.</p> <p>Designate incentives to restore degraded forest.</p>	<p>A forest program that accommodates increased production to meet internal and external demand for forest products.</p> <p>Classification of forests according to their productive potential and use, and demarcation of areas for forestry activities.</p> <p>Policies to support reforestation of areas with degraded land and forest cover.</p>
Converters	<p>Ensure that forested areas with suitable agricultural soils are designated for farming and livestock production.</p>	<p>Growing national and international demand for food requires new areas to come under cultivation and animal husbandry.</p>	<p>A national policy that permits the conversion of all necessary land to sustainable agriculture and livestock production.</p> <p>Rehabilitation of degraded areas to agriculture.</p> <p>Improvement of agricultural technologies for intensive use of converted land.</p>

Actor	Objective	Interests and Policy Positions	Possible policy responses
Public sector forestry officials	<p>Capture the income potential of forests for the government and affected actors.</p> <p>Provide associated social benefits and environmental services.</p>	Prevent deforestation of remaining primary forests owned by the state.	<p>A national land use plan. Classification of forests according to their productive and ecological potential.</p> <p>Policies that permit the state to capture income from the forest and that support management of the resource.</p> <p>Negotiation of the sale of environmental services, such as biodiversity and carbon sequestration.</p>
Public sector agricultural agents	Encourage the development of sustainable agriculture and livestock production.	Clear forest from remaining areas that are suitable for agricultural production.	A national land use plan that considers the conversion of forests to sustainable agriculture and livestock production.

Source: Author's analysis.

Towards Sustainable Forest Management: Problems and Opportunities

Despite efforts to reduce deforestation in Latin America, it continues largely unabated (CGIAR, 1996). The principal causes include population growth, poverty, road construction in remote areas, development of border regions, contradictory forest policies, inadequate forest management practices, and weak and inefficient institutions. Developing a set of positive policy initiatives for the forest sector would allow the resource base to recover and would generate development opportunities for the future (Dourojeanni, 1996; Pascó-Font, 1994; Reis, 1991; Riihinen, 1986; De Camino 1993a; IDB, 1995a; Centeno, 1995; Johnston and Lorraine, 1995; Cortés, 1995). This chapter analyzes the existing opportunities to establish a new direction for forest sector policies, and discusses these in light of the problems that have impeded the sector's sound development to date.

Forest Potential and Economic Development

Forests cover 63% of Latin America's surface area. In global terms this region has the greatest area under forest cover, with 956 million hectares, or 26.7% of the world's total. Productive forests for plantation forestry, agroforestry and natural vegetative cover (ECLAC, 1993). Latin American forests account for

41% of the total biomass contained in the world's forests (FAO, 1995).

This enormous resource offers significant development opportunities (ECLAC, 1993). In a context of increasingly globalized economies, Latin American countries should support sectors, such as the forest sector, that provide a comparative advantage in the global economy. Furthermore, considering the magnitude of the resource, it is clear that Latin America is not harnessing the economic potential of its forests. At this time, the region participates in the global market with 6.9% of industrial round wood production, 2.8% of forest exports, and 2.2% of forest imports. Historically, Latin America has been a net importer of forest products; positive commercial balances were first registered in the early 1990s due to small scale exports mostly by Brazil and Chile. Although the volume of forest growth in Latin America is twice that of the Asia-Pacific region, in 1980 the value of its forest exports was only one-fifth that of Asia-Pacific (Castilleja, 1993). The contribution of the occupy 450 million hectares, while an additional 200 million hectares are not forested but are suited forest sector to the region's national economies is still low, as illustrated below.

Forest Cover and Contribution of the Forest Sector to GDP for Selected Countries

Argentina: Forests cover 23% of the territory; but contributed less than 2% to GDP in 1989 (World Bank, 1993b).

Costa Rica: Forests cover 40% of the territory; but accounted for 1.8% of GDP in 1978 and 1.5% of GDP in 1987 (CCT/WRI, 1991).

Mexico: Forests cover 24% of the territory; the forest sector's contribution to GDP fell from 0.8% between 1950 and 1958 to 0.4% in 1992 (World Bank, 1994).

Andean Nations (Bolivia, Colombia, Ecuador, Peru and Venezuela): Forests cover close to 50% of their territories; the forest sector accounts for only 1.5% of their GDPs (Razzeto, 1995).

Chile: Forests cover 44.6% of its territory; the forest sector's contribution to GDP has risen from 2.4% in 1960 to 3.1% in 1993; forest exports increased from US \$27.6 million in 1968 to US \$1,126 million in 1992 (Cortés and Cerda, 1994; de Camino, 1972).

Box 3

Adverse Policy Impacts on the Forest Sector

FAO, 1993	7.4	0.8
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Incentives and Forest Conversion

Land use is conditioned by the value it presents to the occupants or owners. Land values depend on the markets and government policies that affect land use decisions. Few forest and agricultural policies in Latin America force land owners to internalize the costs of forest conversion. That is, following conversion of a forested area to, say, an agricultural use, the negative externalities associated with the conversion--such as decreased water quality, erosion, and loss of biodiversity--are borne by society, rather than by the land owner. Since the land owner is able to capture the financial benefits of land conversion (e.g., from agriculture or cattle production) without paying for the costs, it is not surprising that conversion continues to occur.

The case of ranching in Brazil provides a basis for understanding the above phenomenon. A socio-economic analysis of an average 10,500 hectares ranch at peak production, including subsidies, produced a negative net present value (NPV) of US \$2.8 million (assuming a 5% discount rate). A financial analysis using the same discount rate, however, produced a positive NPV of US \$1.8 million. Without state subsidies livestock production was not profitable; these subsidies not only required the state to absorb the sector's losses, but also transferred substantial net profit to private investors. In this case, government policy provided clear support to economic activities that led to forest conversion (Repetto and Gillis, 1988).

Table 2: Annual Deforestation Rates in Latin America and the Caribbean, 1980-1989.

Source	Deforestation in millions of ha.	Percentage
WRI, 1990	12.3	1.3
WRI, 1992	8.5	0.9
Winograd, 1995	6.9	0.7

In Latin America, net forest loss is estimated to be between 0.7% and 1.3% per year, varying by country from 0.02% in Surinam to 3.5% in El Salvador (see Table 2; Winograd, 1995).

Between 1950 and 1989, the surface area under cultivation and in pasture increased by 155.9 million hectares, at an average annual rate of 3.9 million hectares. This increase occurred in areas suited only for forestry (WRI, 1992; Repetto, 1988). Between 1980 and 1989, the livestock load on pastures rose from 0.58 to 0.60 head per hectare, while annual meat production fell from 14 to 13 kg per hectare. The decrease in productivity of the livestock sector is not surprising in light of severe soil degradation in over 306 million hectares--equivalent to 15.4% of the region's vegetative cover (WRI, 1992). Alfaro (1994) documents the following changes in land uses:

- * In 1985, the ratio of head of cattle to population in Latin America was 1.42, as compared to a 0.82 average for the rest of the world.
- * In Central America from 1955 to 1975, the surface area used for livestock production increased from 3.9 million to 9.4 million hectares.
- * In Costa Rica from 1950 to 1984 the proportion of land dedicated to agriculture increased from 16.3% to 44.4%, while the area remaining in forests fell from 47% to 26%.

Only relatively few soils are suited for permanent agricultural and livestock production (i.e., soil quality does not deteriorate markedly under this use regime) in Latin America. In those soils the conversion from forestry does not produce negative environmental externalities (Gregersen et al, 1994). Thus, policy reform should try to eliminate subsidies and other incentives in those areas where forest conversion brings net negative externalities to the society.

The Effect of Macro-economic Policies

Analyses by Stewart and Gibson (1995) and Toledo (1994), demonstrate how macro-economic policies in the majority of Latin American countries have produced negative impacts on the forest sector. The import substitution policies of the 1970s and early 1980s protected and subsidized industrial development activities at the expense of agriculture (Fulginiti and Perrin, 1990). Simultaneously, policies within the agricultural sector had an adverse effect on the forestry sector's development potential. Table 3, above, lists a set of commonly applied policies in the region that have raised the economic returns of agriculture relative to forestry and thus provided incentives for conversion.

During the period when import substitution policies were in place, the region suffered inflationary spirals, fiscal deficits and high real interest rates. In

response, countries turned to foreign financing to cover their deficits. During the 1980s, a global economic recession intensified the severity of the region's debt crisis, while it lowered the prices for primary agricultural commodities and increased real interest rates. The crisis led to radical policies and structural adjustments that sought to reduce external and fiscal deficits, improve the balance of payments, and reduce inflation. Even in cases where policies were meant to favor the forest sector, the real results of stabilization and structural adjustments had only limited positive impact.

The shift from an import substitution to an export oriented model--in Latin America's case an agro-export model--in conjunction with economic stabilization measures has had a mixed effect on the forest sector's potential development. Table 4 summarizes the potential impacts of these new policies on the sector.

Table 3: Sectoral Policies Favoring Agricultural Production and Forest Clearing.

Measures/Policies	Impact on Agriculture
Agricultural colonization programs(land titles linked to land clearing or improvements).	Generate a supply of inexpensive land. Improve agricultural land tenure security. Agricultural Credits available for mortgages. Generate higher prices for deforested land relative to forest land.
Fuel subsidies.	Reduce the cost of mechanized agriculture. Reduce the cost of transporting inputs and agricultural products.
Agricultural input subsidies.	Reduce direct costs of production. Increase agricultural productivity.
Investments in roads, irrigation and warehouse infrastructure.	Open forested areas to immigration and colonization. Increase agricultural productivity, and reduce loss of harvested products. Reduce transportation costs.
Trade restrictions on food imports.	Create a secure market for products even when domestic production is inefficient.
Agricultural research.	Increases productivity and reduces risks.
Technical assistance and agricultural extension services (soil sciences, phytopathology, seeds, etc.).	Support technology transfer and increase agricultural productivity.
Subsidies for agricultural credits.	Increase expansion of area under agricultural cultivation.
State run agricultural markets.	Guarantee markets for products. Provide guaranteed commodity prices.

Source: Author's analysis

Table 4: Impacts of Stabilization and Structural Adjustment Policies on Forests and Environmental Resources.

Measures/Policies	Potential Impacts on Forests and Environmental Resources
Dismantling incentives for agricultural and livestock production (elimination of tax breaks, input subsidies, etc.).	Reduced incentives for deforestation. Lower financial returns from agricultural production relative to forestry.
Elimination of taxes on exports of forest sector products.	Stimulation of commercial forestry for products in export demand.
Construction of new roads.	Higher real estate prices. Conversion of forests to agricultural production. Reduced costs for sustainable forest management.
Reductions in the size of government bureaucracies, lower subsidies to formerly privileged industrial sectors.	Rise in unemployment. Increased pressure on natural resources.

Measures/Policies	Potential Impacts on Forests and Environmental Resources
Cuts in public sector forest agencies without compensatory measures or delegation of responsibilities.	Decreased control of state-owned and privately held forests. Destructive exploitation of the resource rather than sustainable management.

Source: Author's analysis.

Public Forests, Private Concessions

During the 1990s, land tenure patterns in Latin America have started to change, with a growing trend toward the transfer of land and forests to the private sector (ECLAC, 1993).

Although the majority of natural forests in the region are technically the property of governments, the public sector forest agencies are weak and incapable of controlling access to state-owned lands. As a result, many governments are turning the management of these lands over to the private sector in the form of timber and non-timber concessions. Unfortunately, few governments have the managerial agencies or established enforcement mechanisms available to ensure concessionaire adherence to long-term management goals.

The area under concessions has increased. In Venezuela, for example, of the 11.5 million hectares

In Bolivia, forests and forested territory are the property of the State. Until 1991, timber companies were able to exploit forest resources through negotiation of exclusive annual contracts. In 1990, approximately 155 firms were operating with annual logging permits on 393,000 hectares (Stewart et al, 1993). Beginning in 1991, the "ecological interim" law mandated 20-year forestry contracts and created other exclusive contracts to encourage the rehabilitation of degraded lands for agricultural purposes (CNF, 1995).

While private sector management and use of national forests is not inherently a disastrous proposition, control mechanisms must be in place to ensure responsible management and resource extraction. Lengthening the time horizon that concessionaires have to pay for and manage the lands is a first step. The development and enforcement of management

of state-owned forest reserves, almost 2.7 million hectares are under concession to private interests (Centeno, 1990). Nicaragua has begun to grant foreign interests concessions for 120,000 hectares in its Atlantic region. Since 1947, Surinam has transferred 2.4 million hectares to 150 local concessionaires. The Surinamese government has also considered granting concessions for 3.45 million hectares to foreigners, which would account for 39.5% of the country's forests (Sizer and Rice, 1995). In the Petén of Guatemala, 1.3 million hectares have been under short-term concessions (de Camino, 1990). In the Brazilian Amazon, the government has transferred large forested areas to private owners for agricultural, ranching and forestry development--although no areas have been designated for permanent management as forests (Brack, 1991). At the same time, the government has granted 2.9 million hectares in concessions to extractivist reserves and settlements that provide a livelihood for 9,000 families (Clüsener and Sachs, 1994).

plans is a complementary mechanism, as is the imposition of monetary retainers and performance audits (Hardner and Rice, 1997). The basic goal of these strategies is to integrate accountability in the forest concession process, and to ensure that the appropriate valuation of forest resources is reflected in the management practices of the concessionaires.

Inefficiencies in Industrial Forestry

Many countries in the region support inefficient timber industries either through direct subsidies, tax breaks, or by undercharging for forestry concessions. The result of these economic distortions is that timber companies have little incentive to manage the resource efficiently or for long-term productivity. Costa Rica's new forestry law (see p.36 LACR, 1996) provides a classic example of support to

inefficient industry. This law prohibits the export of round and square-cut wood harvested from natural

**The Impacts of Structural Adjustment Measures on Forest Sector Policy:
The Case of Honduras**

With the implementation of the Agricultural Sector Modernization and Development Law (LMDA), between 1990-93, Honduras began to put into place a series of structural adjustment policies. Under this law land titling was initiated. Adverse impacts on forested areas caused by agrarian reform measures of the 1970s were reduced. At the same time ownership of forest stands were privatized, and prices for timber from state-owned forests are determined by the market, increasing the value of standing timber. The Honduran Corporation for Forest Development (COHDEFOR) continued monitoring forest management with funds from the national treasury. Private commercialization of wood was permitted with prior approval of forest management plans.

Nonetheless, these adjustments have encountered various problems. Because COHDEFOR did not participate in drafting the LMDA its sources of fiscal support and functions were not clearly defined. This weakened the public sector's capacity for forest management. The immediate consequence was a 20% increase in forest fires from 1991 to 1992, and a marked transfer of forest lands to sawmill owners. In the meantime, small farmers who harvested resins on public lands were impacted by changes in the tenure rights. The LMDA could have negative consequences for deciduous forests where deforestation is greatest, because no technological or commercial model exists to support the management of these kinds of forests. In addition, the widespread effort to title lands, their subsequent sale, and reconcentration of ownership could fuel future migrations into forests by landless peasants.

If privatization functions as planned under the LMDA, and if private forest owners will prepare and execute management plans, already the law will have a positive impact, especially for pine forests. The privatization of tree holdings has already helped to increase the value of forests to their owners. The number of private land owners interested in forestry, however, is still low; with many preferring to sell their forests for conversion to agriculture and emigrate to urban areas.

Some of the existing problems could be corrected if a national land use plan is developed with the participation of COHDEFOR and the National Agrarian Institute, which is responsible for agrarian reforms, and if the plan defines and demarcates permanent forest areas.

Source: Walker et al, 1994.

Box 4

forests, eliminating the need to be efficient enough to compete in global markets. Conversely, imports of round, square-cut, or sawed timber is permitted with a maximum tariff of 11%. This means that Costa Rica's forest industry can take advantage of cheap raw material either from natural forests that have no alternative markets or plantations. Stewart and Gibson (1995) estimated that in 1992-93 economic transfers from owners of natural forests to the owners of Costa Rican plywood factories reached US \$69 million as a result of market distortions. The authors also calculated a nominal protection rate for Costa Rica and for Ecuador (i.e., the relation between the market price and the undistorted border price), obtaining a nominal protection rate of 50% for Costa Rica and 70% for Ecuador.

These studies bring to light two important facts: (1) more capital is attracted to protected activities than is

socio-economically desirable; and (2) the majority of the increase in profits benefits capital rather than labor, since timber processing is a capital-intensive industry. One could also argue that it results in socially undesirable allocation of resources since it may be furthering the already unequal distribution of income.

The Economic Value of Forest Benefits and Services

Forests in Latin America are undervalued by both the government and the private sector because a shortage of information hinders resource use and management. For example, incomplete knowledge on the whereabouts of marketable species could prevent a forest company from harvesting valuable products from a concession. Similarly, a government might put a section of forest rich in biodiversity up for

timber bidding, simply because it was unaware of the biological resources or did not have the manpower to make a species inventory. Even where species inventories and infrastructure exist, the market value of a forest is unlikely to represent its true total economic value. This is because the marketable goods and services generated by forests represent only a fraction of the forest's value. Forests generate a variety of services at local and global levels that society enjoys, but for which it does not pay. Interest in the long-term preservation of the resource would increase significantly if its total value was determined and if the currently non-market goods and services were tradeable. Thus, the challenge is to develop a market for, and a societal recognition of, the value of the goods and services provided by intact forests. Some of the non-market ecological benefits produced by forests include carbon storage and fixation from the atmosphere, protection of water resources and watersheds, protection of species with pharmaceutical value, and regulation of climate (Pascó-Font, 1994).

Examples of calculations of total economic value are well documented (Pierce, 1993; During, 1993; World Bank 1993c; IICA, 1994). Adger et al. (1995) calculate that owners of private forests in Mexico are losing a minimum of US \$4 billion every year from the non-market components of the forest's total economic value. If traded, these goods would produce an estimated US \$80 per hectare annually. Förster (1994) estimates that the Noh Bec cooperative that manages a permanently forested area of 19,500 hectares in Quintana Roo, Mexico could generate annual benefits in addition to timber of US \$1.6 million--equal to US \$7,480 for each of the cooperative's 204 families. Estimates of the total economic value for Costa Rican forests (Table 5) show that owners of forested areas (including the State) fail to receive approximately 82% of the value of all forests (including protected areas), and 72% of the value per hectare from productive forests (World Bank, 1993a). Thus, the State, the private sector and local communities could all benefit from expanded market demands for forest goods and services.

Table 5: Estimates of the Total Economic Value of Costa Rican Forests (World Bank, 1993a)

Item	Value in Millions of US\$ (a)	Value in US\$ per ha. (b)	Value in US\$ per ha./yr. (with an 8% discount rate)
Market Values	403	620	50
Non-Market Values	1851	1605	128
Total Economic Value	2254	2225	179

(a) Includes production forests and protected areas; (b) includes only production forests.

Indigenous Populations and Sustainable Forest Management

Up until the latter half of this century numerous Latin American governments have distributed land belonging to indigenous populations to other groups of the population. These transgressions most commonly occurred in the form of concessions granted to companies for the exploitation of renewable and non-renewable natural resources located in traditional indigenous forest land. Although the indigenous response has typically been

to retreat into more remote areas of the forest, today these groups are increasingly well-equipped to stand their ground. With the help of organizations such as indigenous associations, national and international NGOs, and state agencies and institutions responsible for policy towards indigenous populations, indigenous people are able to partially stem this practice of marginalization.

The struggle continues, however. Around 1980, roughly 80% of all dense tropical forests in Latin America were in the hands of governments, including

territories traditionally inhabited by indigenous communities. Furthermore, whereas the countries of the Amazon basin have slated some 177 million hectares for protection, they are not equipped to manage such an area (IDB/ UNDP/ACT, 1992). While many people see indigenous peoples as appropriate resource managers and stewards of these lands, forest authorities have been largely ineffective in gaining the acceptance and cooperation of resident communities, or in enforcing forestry laws (Repetto, 1988). Not only do forest agencies have a mandate to consider and protect traditional land use rights, socio-cultural values, and the economic activities of forest inhabitants, it is in the agencies' best interest to do so.

The fact that indigenous communities frequently have difficulty adapting to a market economy and Western ways of life complicates the search for satisfactory settlements when negotiating with these groups. Despite this difficulty, these communities need to determine the appropriate activities and uses of their land, which may in some cases require selling forest products and services (e.g., labor as park guards, or eco-tourism guides) in the market economy. Fortunately, international aid agencies are increasingly supportive of indigenous groups and extractivist activities (see Box 5).

Extractivist Populations and Non Timber Forest Products

Peters et al. (1989) estimated that non-timber forest products in a hectare of Amazon forest could generate annual revenues of up to US \$698, while timber harvests from that same hectare only generate US \$1,000 over a 60 year period. These calculations create the impression that it is better to extract only non-timber forest products exclusively and not to harvest wood. In response, bilateral and multilateral organizations have channeled an increasing portion of their assistance to extractivist projects.

It should be clear, however, that if each hectare of Amazon forest were harvested in the manner suggested by Peters and his colleagues, the price for non-timber forest products would approach zero. It is also true that most firms specializing in the development of non-timber products purchase only minimally processed goods at low prices so that they can add value to these products and capture the majority of the products' market value. Ruiz et al (1992) report the following relationship between the prices received by those that harvest and by those that export non-timber products from the Petén of Guatemala.

Palm Hearts: exporters receive 7.4 times the price of harvesters.
Pepper: exporters receive 3.2 times the price of harvesters.
Gum Resins: exporters receive 2.4 times the price of harvesters.

These examples demonstrate that in order to benefit from greater equity of access, extractivist groups must connect themselves to processing activities or carry them out directly if they are to capture a substantial part of the revenues the products can generate. Yet, even when local value added processing is successful, the lifetime of a non-timber forest product as a viable market good is limited. This is because manufacturers are often able to cultivate or produce synthetically the non-timber forest products, lowering their costs and eliminating the demand for raw materials from the natural forest.

Homa (1993) refers to extractivist activities in the following terms: "It represents a moribund economy that will continue to disappear as the market for these goods grows . . . No housewife is buying bananas, oranges, lettuce, mangos, coffee or cotton of extractivist origin. What will put an end to extractivist activities is not assassinations [referring to Chico Mendes in Brazil], but the market economy. . . . The 'Indian strategy' of living in harmony with nature will also be sold as an ideal option for the Amazon, forgetting the fact that when the indigenous economy comes into contact with the market economy it tends to disintegrate." Given this context, it is unjust to impose external decisions about indigenous lands and permissible activities there that simply condemn indigenous peoples to ever greater poverty and marginalization based on such simplistic conclusions as are presented in the Peters et al. (1989) article.

Source: Author's analysis.

Box 5

Toward Wider Adoption of Sustainable Forest Management

While many countries in Latin America require the submission of management plans for timber activity on private and State forest lands, few have management systems that function effectively. Instead, requirements have evolved into mere legal procedures for resource users to navigate without having much impact on actual forest management. Part of the problem is that public sector forestry agencies pursue goals and objectives that overwhelm their personnel and budgetary capacities, and create bureaucratic requirements they are unable to enforce. This reality is reflected in the high rates of illegal logging.

Although some authors contend that sustainable management of tropical forests in Latin America has failed (Johnson and Cabarle, 1993; WRI, 1991;

Goodland et al, 1990), one can argue that it is yet to be tested in any systematic way (de Camino and Barcena, 1995). A few significant cases suggest strategies for a wider and more systematic adoption of sustainable management practices. Various authors (WWF, 1991; Kirmse et al, 1993; Janka and Lobato, 1995; de Camino, 1996a; Arias, 1996 and Alfaro, 1996) document examples in different stages of development under different conditions. To date, the estimated forest area under actual management represents only 0.3% of all dense forests in Latin America. However, experiments underway like Precious Woods (Amazonas, Brazil), Nordvisk (Pará, Brazil) and BARAMA (Guyana) have the potential to double the area under sustainable management. As shown in Table 6, these initiatives have emerged from all types of actors: rural communities; private enterprises; NGOs; and governments.

Table 6: Experiments in Sustainable Forest Management within the Region

Country and Actor	Project	Area in hectares
Trinidad and Tobago (government)	Open Range System Periodic Block System	40,000 10,000
Peru (local communities)	Yanesha	75,000
French Guyana (government)	ONF	122,500
Mexico (communities)	Pilot Forest Plan, Quintana Roo	400,000
Chile (private sector)	Magellan Forests	483,000
Costa Rica (private sector)	PORTICO	6,000
Costa Rica (NGO/private sector)	FUNDECOR (CAFMA)	13,000
Costa Rica (private sector)	CAFMA (various organizations)	11,000
Costa Rica (private sector)	CODEFORSA (CAFMA)	16,000
Colombia (private sector)	Cartón de Colombia	24,000
Bolivia (government, private sector, NGO)	Chimanes	600,000
Bolivia (concession)	Santa Cruz MACA/IDB	57,000
Brazil (government)	FUNTAC/ANTIMARI	66,000
Brazil (private sector)	Mil Madeiras(Precious Woods)	80,000
Brazil (government)	Tapajos	132,000
Dominican Republic (NGO/communities)	Plan Sierra	130,000
Total		2,265,500

Source: Author's analysis.

A Conceptual Framework for Changes in Forest Practices in Latin America

As demonstrated in the previous chapter, the conditions necessary for sustainable and equitable forest management do not yet exist in Latin America. Nonetheless, sustainable development depends on the construction of a framework capable of redirecting forestry policies toward this goal. This new framework assumes that: (a) the objectives of individual actors are compatible with sustainable development; and (b) the capacity of forests to accommodate a variety of uses will determine the range of solutions and how the different actors interact.

Clearly, reform of the forest sector requires time--requiring experimentation, flexibility and maturation at each stage in the process. Even so, environmental, economic, and social pressures make it urgent to initiate these changes. Bilateral and multilateral

agencies expect rapid reforms because their own success is measured not only by the impacts of their activities, but also by the pace and volume of the financial resources they are able to allocate among their clients. Cost recovery mechanisms have to be in place in order to facilitate the repayment of the debt.

Authorities have to develop the institutional and technical capacities to formulate policy, to interact with various actors, acquire the necessary scientific and technical knowledge, and to absorb the changes they initiate (see box belows). Because financial, temporal and institutional obstacles for policy reform and implementation persist, countries must work with multilateral and bilateral agencies to establish priorities, define the pace of reform, and ensure that reform strategies correspond with technical and institutional capacities.

Capacities to Manage Financial Resources and Duplicate Positive Experiences

The Law of Autonomy for the North and South Atlantic Regions of Nicaragua introduced changes in the ways that local communities could capture forest income. An indigenous community with a timber concession operating on its territory collects logging fees annually of about US \$100,000. But this community group is not reinvesting these funds in forest management--its principal source of revenue. Thus, it is necessary to train the community and introduce participatory planning methodologies that--with an eye to the future--will permit them to optimize the distribution of resources to investments of an economic and social nature.

In Honduras, integrated management areas were first established in the Zambrano forest management zone. This zone has experienced success integrating rural communities into the sustainable management of pine forests. A rapid attempt to extend this experience to other parts of the country produced disappointing results, and demonstrated the government forest agency's incapacity to provide efficient support to this process. A less rapid expansion and better planned dissemination of this experience might have produced better results.

Source: Author's analysis.

Box 6

Necessary Conditions for Change

Stakeholder Participation

Sustainable development requires the participation of all interest groups in the formulation and implementation of new policies. This implies participation in policy diagnosis, design, evaluation,

and implementation. Through participation not only will the actors involved advance their interests, but they will also be forced to consider the interests of others in order to achieve a consensus (see following box). Governments' have the following responsibilities in this arena:

- * Create transparent consultation mechanisms that encourage participation of all parties, especially those traditionally excluded from decision making processes (Cortés, 1995);
- * Recognize and address the legitimacy of diverse objectives, e.g., obtaining profits, protecting biodiversity, and increasing family incomes;
- * Redirect state institutions to serve a wider spectrum of actors (de Camino, 1993); and
- * Promote and facilitate coordination and consensus building among stakeholders.

Popular Participation in the Design of an Environmental Law

The approval and adoption of Nicaragua's environmental law was the result of an open and participatory process supported by the Nicaraguan Environmental Movement (MAN)--a network of non-governmental organizations unified by the shared desire to protect the environment and the country's natural resources. The consultation process began within some of the MAN chapters organized by sectoral and professional fields, followed by a wider consultation effort in different regions. The legislative proposal--which integrates development and environment objectives--was presented to the Legislative Assembly together with 50,000 signatures of support.

Source: Brenes, 1995.

Box 7

Stakeholders should understand their role as active participant in the policy making process. Conversely, the government should not regard itself as the center of gravity for the development of forestry policy. It should rather facilitate agreement among diverse non-governmental groups (FAG, 1995). Nevertheless, these groups need to take the initiative in looking for joint opportunities that favor mutual interests.

As discussed earlier, conflicts exist among the different actors. The purpose of public consultations prior to decision making is to air similarities and differences and work toward consensus. The availability of reliable and objective information on the topic of debate, the use of conflict resolution methodologies, and the participation of facilitators in the consultation process all contribute to developing a positive dialogue aimed at achieving agreement (FAG, 1995).

Equitable Distribution of Costs and Benefits

Given that equity is one of the objectives of sustainable development, it will be necessary to institute reforms in the distribution of costs and benefits of sustainable forest management. To

achieve this it is necessary to consider the following points.

- i) Although a country's forests may be the property of particular actors, the environmental services they supply also benefit society in general. The costs associated with these services should be assumed by those who receive the benefits.
- ii) Traditional forest inhabitants should receive a portion of the income generated from third party economic activity on their land. This requires the recognition of traditional inhabitant property rights, and the subsequent development of appropriate fee or royalty systems.
- iii) Private sector industrial forestry interests have the right to capture income from the difference between their product's sale price and their costs of production. The production costs should internalize the externality costs of ecological protection and possible social improvements in the territories where they work.
- iv) Private owners should receive undistorted benefits from their forests. Otherwise, the

resource has little value, and forest conversion becomes attractive.

- v) Exporting countries should consider vertical integration strategies for the production of timber and other products, and participate more actively in their commercialization in order to capture a greater proportion of forest-generated income. To date, 90% of the income generated in the market for tropical timber is received by the importers and only 10% by the countries of origin (Centeno, 1995; ITTO, 1991).

Integrated Policy Making

The change in forest practices should be based on a careful analysis of the interdependencies between sector-specific policies and those related specifically to agricultural and livestock production. The same is true with regard to the impacts of macro-economic measures on the forest sector in general, as well as their impact on specific projects (FAG, 1995; World Bank, 1993c; Cortés, 1995). With regard to policies outside the sector, it will be necessary to correct, mitigate or avoid the adverse economic, social and environmental impacts they might pose for the forestry field.

National and International Coordination

Various plans have been designed to try to stop global deforestation: Tropical Forestry Action Plans (TFAP) sponsored by FAO; Forest Master Plans supported by the Asian Development Bank; Forest Sector Reviews (FSR) promoted by the World Bank; and National Conservation Strategies (NCS), National Environmental Action Plans (NEAP), and National Sustainable Development Strategies (NSDS) developed by individual countries (FAG, 1995). Some of these plans are complementary, while others represent a duplication of effort. Duplication reflects the conflicts between national institutions with jurisdiction over the sector, or between bilateral agencies and other international organizations trying to forward their respective agendas.

Countries must take the lead in planning, programming and implementing the development of the forest sector. The agencies responsible for national planning and forest services should retake the initiative and adopt the planning framework they deem most useful (TFAP, FSR, NEAP, or others) to carry out the necessary reforms, and to achieve consensus among the actors on specific sectoral reforms.

International agencies and multilateral banks should examine the options for financial and technical support in an objective, pragmatic and visionary manner. These organizations have the right to participate in a dialogue about the efficient and effective uses of their financial resources, while also recognizing the autonomy of each country to define the alternatives under consideration. Many countries are pro-active and formulate concrete proposals for sustainable and equitable forest management. The donor institutions can help in the process, and work with one another and the target countries to promote coherent, sustainable policies (Ocampo, 1996).

Principles and Direction of Change

In each country the criteria and the direction of reform in the forest sector will vary depending on the importance of forest resources to the national economy, the pace of resource degradation, and the needs of different actors. Nonetheless, all actors should be working toward the general goal of achieving environmentally, economically, and socially sustainable forest management. The following is a list of principles to consider and work towards during the consensus building process among actors.

- * Target degraded lands best suited for forests through a forestation programs (Pascó-Font, 1994); conversely, limit deforestation to land suitable for long-term agriculture and livestock production.
- * Maximize income from forests' total economic value, including the value of environmental services that generate national and global benefits

(Dourojeanni, 1996; MacKinnon, 1990).

- * Identify the capacity of different actors to undertake sustainable forest management. Design an efficient and transparent system that regulates access to the resource and recognizes the rights of traditional groups in areas where resources are being extracted (de Camino, 1993a). Support the development of forest stewardship programs involving indigenous communities (Pascó-Font, 1994).
- * Utilize the future and current potential of the forest resources to optimize the sector's contribution to national development. Efforts should target internal consumption or exports depending on each country's possibilities and needs (Pascó-Font, 1994, MacKinnon, 1990).
- * Adopt measures to mitigate any adverse impacts of macro-economic and sectoral policies on the development of forests (de Camino, 1993a), and design policies that promote sustainable forest management (de Camino, 1993b; Gligo, 1994).
- * Formulate policies that favor economically competitive value-added processing of the resource so that those with usufruct rights over the forests, its owners and the forestry industry, receive the appropriate benefits of sustainable resource utilization.
- * Design mechanisms that promote equitable income distribution based on the actors' participation in forestry activities and the provision of environmental services support the above with the design of transparent mechanisms that make forest activities economically more attractive (Pascó-Font, 1994).

Managing Forest Sector Financing

To guarantee coherent development of the forest sector, resources from different sources should be integrated into a single fund rather than being assigned to a large number of individual projects. Individual projects tend to reflect the priorities of donors rather than those of the beneficiary country. A unified fund establishes common rules to regulate the access of all actors, as well as conditions for receiving funds, thus adding predictability and transparency to the functioning of the system. An example of such a funding scheme is Costa Rica's Forest Development Fund that combines resources from the Central Bank with funds generated by debt-for-nature swaps negotiated with the Dutch and the Finnish governments. The fund supports reforestation efforts on degraded lands held by organized groups of small land owners. The fund's administrative costs are low because they are managed under a trust fund operated by a bank belonging to the national financial system. Part of the fund is also used to strengthen associations of small farmers. The fund, which originated in a local reforestation project, has grown and has been implemented in other parts of the country.

A similar effort is now underway in Nicaragua. The joining of the resources of FONDOSILVA (a reforestation fund financed by the Swedish government) with IDB funds for Nicaragua (intended to support a socio-economic and forest development program) was carried out to increase coordination and reduce costs. This is because FONDOSILVA resources were not enough to ensure national coverage, inducing the fund's managers to join with the IDB project to increase their reach.

Source: Author's analysis, IDB 1996.

Box 8

Components of Change

In the following, several aspects contributing to possible changes in forest practices are discussed.

They include land use and tenure especially in agricultural frontier zones, forest concession policies, use of incentives, international certification of forest management and ways to finance conservation and

forest protection.

Land Use and Tenure

Changes in the forest sector require adequate land use and tenure decisions. It is important to formulate realistic land use plans that recognize the difficulty of reversing already consolidated processes (Janka and Lobato, 1995). Priority should be given to the management of forested lands, as well as to the rehabilitation of degraded areas. These plans should also define criteria for forest areas intended for production and preservation purposes.

Agricultural frontiers pose particular challenges for land management. Land use ordinances should be enforced by the lowest administrative units, taking into account prevailing conditions in these areas. General land use zoning requirements, and the adoption of norms restricting forest uses are not very effective in these areas (Cortés, 1995).

The measures outlined above should be accompanied by activities to increase land tenure security, particularly for traditional inhabitants and producers—giving both groups a reason to believe that they will be the ones to benefit from long-term investment and sustainable management. The first step in land tenure regulation would be to collect information on land use and property registries. (World Bank, 1993c). Properties with titles, occupied lands, and areas claimed by indigenous communities should then be demarcated. Integrated land use plans should consider forestry activities together with agricultural land uses that correspond specifically with local economic, social, cultural, political and ecological potential (Papanastasis, 1986). Rural development proposals should take into account an area's carrying capacity, population growth, and the potential for generating economic opportunities off the farm, such as agro-industry or rural forest industries, among others.

Forest Concessions

As discussed above, traditional forest concessions have in many cases failed to prevent the degradation

of forests associated with productive uses, while permitting legal and illegal colonizers to penetrate these areas. To function appropriately forest concessions should operate under the conditions discussed below.

- * Facilitate broad access to concessions bidding and offer temporal and spatial guarantees to users who adequately manage the resource (TFAP-CA, 1992). Historically, concessions have been granted to timber companies and not to rural communities. The concession system should encourage community activities and collaborative efforts that bring together different resource users.
- * Base calculations of fees on a system with a high degree of vertical integration in order to favor greater economic efficiency. Vertical integration can be encouraged with policies that favor value added activities. Concession fees should not be based exclusively on volume harvested, but also on the area under concession. This combination provides the state with a fixed and a variable source of income.
- * Allow concession holders to receive their share of income derived from the sale of environmental services produced by the forest, once these are negotiated in national and international markets.
- * Consider transferring ownership of areas under concession to concession holders that demonstrate good forest management practices under international certification (Razetto, 1995).

Possible use of Incentives

The use of incentives may be justified as a compensation to the land owner due to possible positive environmental externalities (Haltia and Keipi 1997).

Incentives may take various forms, from providing clear and timely information about available technologies, and simple and transparent mechanisms to access credit, to financial subsidies in support of particular activities. If an incentive system is to

encourage sustainable development of the sector it should incorporate the elements enumerated below.

- * Define the goals of the incentive system. The system's purpose should be clearly defined in order to prevent these resources from promoting undesired activities. The potential benefits for sustainable development through ex-ante economic, social and environmental analyses should be demonstrated.
- * A possible use of incentives within the forest sector should be accompanied by a reduction or elimination of incentives that encourage conversion of forests to pasture and cultivated lands. These measures will increase the value of forest conservation and forest management relative to competing land uses.
- * Keep incentives in line with the forest's economic value. They should reflect the value society assigns to the goods and services from forests. However, they should be just high enough to cover the marginal cost of adopting forested land users.
- * Favor financing of incentives with funds returned to the forest sector from trading the forest's associated environmental services on the market. The system should be based on the principle of co-investment. Some of the resources should be generated by the beneficiaries.
- * Tailor incentives to particular actors to ensure that the investment of resources is effective and efficient. Rent-seeking behaviour should be minimized. Encouragement of the efficiency of forestry activities, may mean that incentives should decrease over time.

- * Instruments developed should not be permanent or indefinite. The duration of incentives, as well as the funds available, should be clearly defined and any changing conditions clearly communicated to the beneficiaries. Central banks should determine the amount to be invested by the state for the entire period that incentives are in effect.
- * Introduce indirect stimuli such as technical assistance, training, land tenure security and infrastructure. Land owners and rural communities may have difficulty maintaining the profitability of their forestry operations if they must finance technical assistance and research costs.
- * Establish monitoring and control mechanisms. These activities can be delegated to NGOs or grass root organizations, and they can be supported with some of the funds intended to finance incentives. Monitoring and control mechanisms will permit periodic evaluation of the impacts of incentives on forest management. Evaluation of results will determine continuation of incentives.

International Certification of Forest Management

The International Tropical Timber Agreement (ITTA) establishes that by the year 2000 the market for tropical timber (representing 14 to 15% of the global timber market) should be supplied solely by sustainably managed forests. To achieve this goal adequate certification tools will be needed. In the case of Latin America, however, certification has yet to develop into an effective management tool because most of the region's timber commerce is for domestic markets (de Camino et al., 1994). In addition, certification cannot totally substitute other measures because the majority of producers do not participate in certification programs (Keipi, 1996).

Innovative Forestry and Information Availability

Forest Management in the Brazilian Amazon confronts shortages of technical personnel and labor trained in new planning and forest management methodologies. IMAZON, NGO located in the City of Belem, within the State of Pará, has focused its efforts on developing extraction techniques different from those used by traditional loggers. The advantages of the techniques developed by IMAZON is that they substantially improve production processes without significantly raising capital requirements. Nevertheless, IMAZON, which is preparing a manual on this topic, requires assistance to disseminate these new technologies not only in Pará, but in all of Amazonia, since the entire region could benefit from this know-how and innovation.

In Costa Rica, the Center for Tropical Sciences has developed a manual on measuring soil capacity at the farm level. Unfortunately, the availability of this manual is limited, although there is a real need to inform and train personnel in the application of these techniques for the zoning and land use planning throughout Central America (CCT, 1995).

Box 9

The cost of certification is high; costs of the initial process ranges between US \$0.5 and US \$0.10 per hectare, and thereafter between US \$0.5 and US \$1.60 per hectare per year. It is difficult to calculate these costs per cubic meter of round wood, but the initial costs and subsequent monitoring costs over a five year period range between US \$0.2 and US \$1.5 per m³ (De Camino, 1996b). This cost can and should be absorbed by private firms. The cost of certification to local and indigenous communities could be absorbed by international assistance funds. Alternatively, companies that obtain timber from forests managed by rural communities should absorb the cost of certifying the raw materials they use.

To ensure a wide use of certification in the region it will be necessary to adopt the following measures:

- * Establish national requirements that all forestry concessions in state-owned forests, and all timber- and forest-products exporters obtain international certification for sustainable forest management. This measure will also increase the credibility of international certification and monitoring efforts. Such certification should be carried out by entities accredited by the Forest Stewardship Council. If countries that are members of the Amazon Cooperation Treaty consider adopting these certification requirements, then it would be possible to place the majority of the region's

forests under sustainable management.

- * Tie failure to comply with sustainability criteria and indicators to an immediate revocation of concession licenses without recourse to indemnity. Elements of indicators should be included in national forestry legislation (CCAD/CCAB-AP 1996).
- * Encourage exchanges among national specialists who participate in certification teams so they can learn about local realities, acquire experience in monitoring forest management projects, and subsequently develop certification procedures for products sold on domestic markets.
- * Condition payments for environmental services to private forest owners on certification
- * Require the evaluation of the ecological, social and environmental aspects of a sustainable management regime. Include a monitoring component to ensure compliance and system adaptability.

Conservation and Protection

The value of environmental services supplied by forests must be recognized, particularly in areas with unique biodiversity or fragile ecosystems (Castilleja, 1993). Land use policy makers should recognize all

alternative uses and the associated restrictions they may impose on owners. Possible restrictions should be accompanied by a valuation of the environmental services the restrictions are supposed to guarantee. In this manner, the owners and occupants can be duly compensated. There is little possibility of preserving forest land where environmental externality benefits are great, but where forestry is financially unprofitable. When the occupant does not value the forest it is highly probable it will be cleared.

Just as concessions are granted for productive uses of the forest, they may also be created for conservation and protection of the forest. Eco-tourism and parks or reserves with user fees can generate revenue for concession holders. These operations can be run by the private commercial sector, local communities, or traditional inhabitants. National and international conservation groups can co-manage these operations or simply provide technical support. In cases where the establishment of protected areas coincides with the provision of nearby forest for industrial use, it may be possible to obtain some funding from these producers. For example, a timber company might contribute to a protected area in exchange for being allowed to promote itself within the park as an ecologically friendly business.

Another way to provide funding for protected areas is by using economic instruments to internalize the positive environmental benefits provided by these areas. Governments can assign prices to environmental services and incorporate these prices into a variety of economic instruments such as user fees (e.g., a watershed protection charge added to the price of water, or a right-of-access fee paid to local communities); refundable deposits or performance bonds to guarantee specific actions; payments based on carbon stored or maintained (Pascó-Font, 1994); and payment for bioprospecting rights, among others. If a government or a region has or can develop adequate institutional support and information availability, it can then make these environmental services tradeable on the market. The market created will then set the price for such services, and begin to internalize environmental externalities on a more economy-wide scale. The arrangement could also

allow groups involved in the management of the area to obtain additional income from ecotourism or other services.

International efforts to obtain compensation for global environmental services resulting from forest conservation are critically important. Countries will demonstrate greater interest in preserving biologically important areas if preservation provides concrete benefits. In some cases, however, creating a market for these services may weaken national management and control over these areas, so countries must decide what degree of external economic interference they are willing to tolerate (Adger et al, 1995).

Conclusion

Latin American forests have global importance due to their size: one fourth of the world's total forests and one half of the tropical forests lie in the region. They provide important global and national environmental services. Forestry sector has economic potential in many countries. Latin American deforestation can be curbed with an improvement of forest policies and practices that could generate income and ensure sustainability. The changes can be achieved only through active participation of actors: conservationists, traditional inhabitants, forest producers, and those who want to convert forest lands to other uses. Forestry has traditionally been a sector with a notorious lack of consensus among the different affected interest groups. However, the recent democratization process has made possible establish dialogue between various sectors of civil society in Latin America. It may also facilitate consensus building needed for sustainable forestry development.

Governments should support the conservation and management of natural forest for the ecological services and natural products they generate. The creation of new extractive reserves and adjacent protected areas should be encouraged. The establishment of joint ventures between rural and indigenous owners of forest, and private companies should be facilitated. Through them sustainable harvesting and extrativist activities may become common place. The possible vertical integration of

the production processes may increase income of rural communities. Accords need to be established between indigenous groups and other local communities to guarantee their land use rights and practices.

Countries' specific objectives could include institutional development and strengthening; management and conservation of natural forests and tree plantations for multiple uses, support of agroforestry; modernization of forest industries; and mobilization and development of forestry extension services, among others. In response to a growing trend toward the transfer of land and forest to the

private sector noticed during the 1990s a system of market based incentives and regulatory mechanisms should be put to place to facilitate responsible management, and use of forest products and services. These changes require the participation of the affected interested groups. Stakeholders' active role in the formulation and implementation of new policies needs to be promoted. Costs associated with reforms and services should be assumed by those who receive the benefits. On the other hand, the weak parties should become beneficiaries --e.g. traditional forest inhabitants must receive income generated by economic activities on their lands.

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Appendix

Mexico: The Pilot Forest Plan for Quintana Roo

This case study illustrates how formulation of a policy to manage Mexico's southern tropical forests at a local level and its implementation via a demonstration project consolidated remaining areas of forest, stopped deforestation, and permitted rural communities to take on management responsibilities.

Initial Conditions

The Pilot Forest Plan for Quintana Roo and the management of southern Mexico's forests have been the subject to various studies and analyses, because of the positive economic, social and environmental benefits resulting from forest management in the region.

The majority of Mexico's forests (70%) are within community or communally held lands know as "ejidos." Beginning in 1945 the government began to create and grant concessions from land under its control, incorporating ejidos and forest dependent communities into this new system. The majority of concessions were granted to forestry industries, many of them parastatal companies with virtual monopolies/monopsonies over entire regions. In the 1960s and 1970s, state intervention in forested areas, especially in tropical zones and marginal areas produced an expansion of the agricultural frontier, but left no forest reserves. By the 1980s the country suffered from widespread deforestation (Galleti, 1994).

Forest use in the state of Quintana Roo followed this pattern. At the turn of the century, forestry activities were the pillars of the state's rural economy. The basis of this economy was the exploitation of mahogany and natural gum by foreign and national companies. At the end of the 1950s, 500,000 hectares of the State's southern end were transferred

as a concession to a parastatal firm. This firm paid ejidos logging fees that were far below the local market price for the wood extracted (Janka and Lobato, 1995). In addition, these payments did not go directly to communities but passed through government coffers, that would issue payments to ejidos from the funds collected. Communities exercised no control over the forest resource, and acted merely as sources of labor or subcontractors to the concession.

The colonization wave that hit Quintana Roo in the late 1970s produced drastic changes in the rural economy. Rural farmers excluded from forestry activities contributed to the expansion of agricultural frontier supported by official programs. In this process large areas of forest, which also formed part of the parastatal concession, were cleared. The company continued to cut the same volumes permitted by the concession agreement from a shrinking area of forest. The State forest service limited its oversight efforts to controlling the overall volume of the concession holders timber harvests, and did not concern itself with the effects of these practices on the ejidos or rural farmers (Janka and Lobato, 1995; de Camino, 1987).

In summary, the initial situation is characterized by a process of colonization based on precarious agriculture and unsustainable exploitation of forest resources. This situation produced the following consequences: rapid deforestation; degradation of remaining forests; rural poverty resulting from unsustainable agricultural practices; little or no utilization of forest resources by small farmers; and a weak forest authority unable to control the situation. With respect to the role of the various actors, forest inhabitants did not make sufficient use of rich forest resources and were pressured to convert forests to other land uses by government colonization policies. Forest converters, in this case the parastatal concession holder, MIQRO, and other industries supplied with timber from deforestation only took

action to ensure a constant flows of wood for their industrial activities. Even when the company saw the forest significantly diminished, it continued to extract the volumes necessary for short-term uses without concerns of sustainability for the entire 25-year concession period (Förster, 1995).

Characterization of the Policy Changes

Between 1980 and 1983 serious conflicts arose between the various social groups with an interest in the forest in Quintana Roo. The parastatal's forest concession was scheduled to end in 1983 and various actors began to exert pressure for a decision about its ultimate end. One side consisted of MIQRO, small industrialists and the forest service who saw their interests and power base threatened. The other side consisted of members of the ejidos who had worked many years for MIQRO and received only symbolic payments for conceding logging rights on their lands. The latter group demanded usufructuary rights to the forest products.

To resolve this conflict the governor of Quintana Roo solicited the help of a technical group under the Mexico-Germany Agreement (SARH/GTZ). This action marked a change from a normal policy reform process, recognizing that the process of forest destruction is not incidental, but evolves from a prevailing set of economic, political and social conditions. The strategy assumed that significant reductions in deforestation would not be possible if efforts were only directed at helping government agencies.

The Quintana Roo pilot forest plan was created as part of an effort to support rural communities with direct interests in the long-term management of a tropical forest. The plan attempted to give these communities control over the forest so they could defend it from conversion to other uses. One reason authorities tried to give this power to the communities is because they, themselves, had been unable to impose such controls and had no expectations of doing so in the future. Because the plan represented a pilot program, it allowed interaction with official institutions in developing a radical reorientation of

forestry practices.

The Quintana Roo pilot plan developed in three phases: an information gathering and decision making stage; an established phase; and a consolidation phase (Janka and Lobato, 1995; de Camino, 1987; Förster, 1994). During the information gathering and decision making stage the concession was first transferred from MIQRO to an association of ejidos. As a demonstration of political commitment, the association received a loan, on the basis of a verbal agreement, to help complete the forest harvest plan for 1983. The group of ejidos was then organized to form a civil corporation that could negotiate timber sales with MIQRO and other industries. Commercial logging rights were returned directly to the ejidos and a technical forestry unit was created within the association to carry out inventories, forest management plans, and make initial recommendations on silvicultural practices. The ejido was then designated as the basic forest management unit (previously, the unit of management consisted of the entire concession), and members voluntarily defined and demarcated areas to remain permanently forested. Each ejido's permanent forest area was divided into 25 annual management parcels, and a system of data collection and monitoring was initiated to serve as the basis for future forest management and silvicultural decisions. The combined effect of these decisions transformed the forest from a "no man's land" into a clear and well administered common property resource (Janka and Lobato, 1995).

During the establishment phase the corporation's technical forestry unit was consolidated, and steps were taken toward improving timber industrialization. Members then completed the first systematic forest inventory and developed a computerized database with inventory results for management decision making. Pilot forestry research projects were initiated to facilitate the drafting of management plans at the ejido level. Lastly, the corporation consolidated its powers in order to negotiate with timber purchasers both inside and outside the government.

The consolidation phase resulted in making ejidos pursue forestry in a permanent manner to safeguard this activity as a stable source of employment, community income and individual income. The corporation was expanded from the original 14 ejidos with 120,000 hectares to 50 ejidos with 400,000 hectares of permanent forests within Quintana Roo. The neighboring state of Campeche now has some 30 communities operating in a similar manner. The pilot forest plan has greatly reduced deforestation within Quintana Roo, stabilized forest cover, and made sustainable forestry a principal component of rural development.

Sustainability

The Quintana Roo case provides important lessons for the sustainable management of communal forests in Latin America with the participation of relevant actors.

Sustained Yield Forest Management

Kirmse et al. (1995) confirm that total forest coverage in Quintana Roo has remained constant. It should be noted that sustainable forest management is a goal, and progress toward this goal occurs initially by avoiding unsustainable uses and then continues via the refinement of achievements made in social, economic and environmental components. Within this context, clear indicators of progress toward sustainability can be found, including:

- * The permanently forested area within the ejidos has remained unchanged over the last 14 years. This indicates that deforestation has stopped. The forest now constitutes a clear economic alternative for members of ejidos and is valued as a steady source of income that is protected and conserved as a legitimate land use. Between 1978 and 1991 the area that was voluntarily designated for permanent forestry increased from 461,000 to 502,000 hectares (Förster, 1994).
- * Logging has remained below authorized volumes. For example, in the ejido Manuel Avila Camacho, in 1992 only 77% of the total authorized volume

and 87% of the authorized mahogany volume were harvested. In the same year the ejido Noh Bec extracted only 43% of authorized total volumes and 97% of authorized mahogany volumes. In a group of four ejidos mahogany harvests decreased from 4,408 cubic meters per annum extracted during 1957-1969 to 2,567 cubic meters annually between 1989 and 1994. This reflects a better logging distribution among a greater number of species, and a clear reduction in the intensity of mahogany exploitation, which is the forest's most valuable species (Förster, 1994).

- * Forest inventories for the Noh Bec ejido demonstrate that the total volume of mahogany trees with diameter at breast height (DBH) greater than 20 centimeters rose from 5.4 to 5.9 cubic meters per hectare from 1968 to 1992. During the same period, logging volume (includes trees with DBH greater than 55 centimeter diameter base height) fell from 3.5 to 2.9 cubic meters per hectare while the commercial timber volume reserve for the next harvest rose from 1.9 to 3.1 cubic meters per hectare. It is possible to confirm that more careful management today has ensured these good results (Förster, 1994).

In summary, it appears that sustainable forest production can be confirmed for the case of Quintana Roo. The statistics demonstrate that there has been strict compliance with authorized logging volumes, reduced exploitation of mahogany, a rise in the volume of tree reserves, and greater replacement of precious tropical woods.

Private Profitability and Economic Sustainability

The financial analysis for a typical ejido indicates that forestry activities provide a real internal economic return of 8.0% if labor costs correspond to the regional average. If the salary is doubled (which constitutes an advance on profits for members of the ejido), a 7.3% return is obtained. This may still be satisfactory for the conditions of southern Mexico. The model employed does not consider any vertical integration or industrialization of forestry production, the harvest of non-timber products or hunting

activities; it only takes into account primary production of wood.

The analysis also demonstrates that if an ejido must pay per-unit costs for technical assistance--which have been covered by the Mexico-Germany agreement--the rate of return falls to 5.2% at current regional wage levels, which is not considered acceptable by local banking standards. Therefore, the sustainable use of forests within Quintana Roo is profitable only when ejidos receive incentives to finance the technical assistance and research that are now provided by foreign assistance organizations. It is also important to note that the potential environmental externalities that may justify such a subsidy have not yet been quantified.

Social Sustainability

In social terms there has been clear progress since:

- * The communities are now responsible for managing its natural resources. This has been achieved by developing participative organization for managing forest resources incorporating more than 80 communities in Quintana Roo and Campeche.
- * The communities devote a greater number of work days to forestry activities and receive higher pay, increasing the median family income. The average family now receives more income from forestry than from the cultivation of maize, beans and vegetables (Förster, 1994).
- * Investments in forest management have been made to maintain the productivity of the forest. The increased incomes of communities have resulted in new financing of public works such as schools,

community centers and road repairs.

- * Organization of the community has improved their negotiating position vis-a-vis power bases in government and the private sector.
- * Forests have come to constitute a new alternative within rural development programs in southern Mexico.

In summary, the pilot plan and the associated management model demonstrate that significant changes in forest management require gradual learning, strengthening organizational capacities to absorb changes, and a process of consolidation. Likewise, this experience has shown it is possible to transfer forest oversight and control, traditionally managed by governments, to the hands of communities. The forest's value as a permanent source of income and the profitability of forestry activities can lead the community members of ejidos to protect the integrity of the resource from conversion to other uses.

It should be noted, however, that the fundamental changes occurring in Mexico as a result of structural adjustment and privatization measures threaten the integrity of this community forestry model. Special measures will be required to create incentives that can ensure the economic, social and environmental sustainability of this system. As noted, technical assistance and research may require outside support in order to maintain reasonable financial profitability. Since these forests provide positive externalities in the form of environmental services, it is possible that future market developments may make such services tradeable, thereby boosting the rates of return to acceptable long-term levels without subsidies.