

# Trade and Environmental Issues In Forest Production

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# Foreword

The Environment Division, in collaboration with several technical units of the Bank and other international organizations, is preparing several documents on forest development in Latin America and the Caribbean in the context of sustainable management and conservation of renewable natural resources. They analyze, among other things, the impact of alternative macroeconomic and sectoral policies on forest resources, environmental services, the impact of nonwood products, stakeholder participation 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.

This document, written by Markku Simula, analyzes the impact of different measures of market liberalization on environment and forestry development and evaluates possibilities of certifying forest management and implementing eco-labeling of Latin American forest products for improved access to export markets.

Information presented in the document, as well as the conclusions on the environmental impacts of forestry-related trade barriers and policies 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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# Abstract

Trade policy influences the environment directly and indirectly, while environmental policies have an impact on competitiveness. In the past, trade's potential role to contribute to sustainable forest management has been largely unexplored. This paper is aimed at assessing the possible impacts of various policy instruments on trade and the environment.

Although the Latin American and the Caribbean region accounts for only about 4% of the world trade of wood-based products, some of the region's producers are among the world market leaders. The environmental pressures in the marketplace are increasing and already influence exports of such wood products as sawnwood, plywood, pulp and paper, and furniture. Furthermore, the promotion of environmental friendliness is starting to be used as a marketing argument for plantation-based forest products and various non-wood products from natural forests.

Reduction of tariff and non-tariff barriers, together with market liberalization and structural adjustment, have led to trade expansion with some negative effects on forests. These effects could be mitigated by complementary policy provisions. Forestry subsidies have been justified on the basis of environmental objectives, but there is a danger that such subsidies could cause trade disputes. Log export bans, restrictions, and export taxes have a tendency to lead to inefficiency, and cannot be justified on environmental grounds. Eco-taxes on forest products have been ill-conceived, and therefore assessment cannot be properly made. Trading of global environmental services of forests offers possibilities for innovative financial instruments tapping both public and private sources and enhancing the contribution of trade to sustainability.

Certification of forest management and eco-labelling of forest products are receiving much attention as potential instruments for promoting export markets and improving the state of managed forest ecosystems. There are both national and enterprise-level eco-labelling initiatives in the Latin America and the Caribbean. Mutual recognition and harmonization remain key issues of debate, as do the division of potential market shares and green price premiums for certified products. While certification has the potential in the Latin America and the Caribbean region to complement the normative framework of the public sector, effective implementation without adverse impacts on small-scale producers should also be an objective.

# Contents

|  |    |
|--|----|
| <b>Introduction</b>  | 1  |
| Forestry in Trade and Environment Context  | 1  |
| Environment and Trade Policy Linkages  | 1  |
| Objective and Scope of the Analysis  | 2  |
| <b>Trends of Trade of Forest-based Products and Environmental Impacts</b>              | 3  |
| Trade Patterns   | 3  |
| Economic Development, Forest Products Trade and Deforestation                          | 4  |
| Market Shares and Environmental Pressures  | 5  |
| International Competitiveness of Wood Products   | 5  |
| Non-wood Forest Products   | 6  |
| <b>Environmental Impacts of Trade Barriers and Policies Related to Forest Products</b> | 7  |
| Trade Barriers on Imports  | 7  |
| Eco-taxes on Imports   | 9  |
| Quantitative Restrictions and Taxation of Exports                                      | 10 |
| Production Subsidies   | 11 |
| Structural Adjustment and Market Liberalization  | 12 |
| Trading of Global Environmental Benefits   | 14 |
| <b>Multilateral Agreements Influencing Forest Management</b>                           | 15 |
| Conventions on Climate Change and Biological Diversity                                 | 15 |
| CITES  | 16 |
| International Tropical Timber Agreement  | 17 |
| Conclusions  | 17 |
| <b>Certification of Forest Management and Eco-Labeling of Forest Products</b>          | 18 |
| Objectives   | 18 |
| Forest Products in Existing Labelling Schemes  | 18 |
| Criteria of Forest Management Sustainability   | 19 |
| International Harmonization of Certification Criteria                                  | 21 |
| Certification Schemes and Initiatives in the LAC Region                                | 22 |
| Demand and Price Premium for Labelled Products   | 23 |
| Costs and Net Benefits   | 25 |
| Cost Related to Certification of Forest Products                                       | 26 |
| Possible Impacts of Certification on Trade and Production                              | 29 |
| <b>Directions for the Future</b>   | 30 |
| Policy Support   | 30 |
| Development of Certification and Eco-labeling of Forest Products                       | 31 |
| Financing  | 32 |

## **List of Figures**

- Figure 1 Marginal Benefits of Applying Forest Management Criteria
- Figure 2 Operational Costs of Certification and Forest Unit Size

## **List of Boxes**

- Box 1 Potential Gains from Trade of Carbon Sequestration in the Amazon
- Box 2 Export Bank in Costa Rica
- Box 3 Structural Adjustment in Mexico
- Box 4 Structural Adjustment in Chile
- Box 5 Eco-labelling for Paper Products: Some Issues for Latin America
- Box 6 International Criteria Relevant to Forest Management in the LAC Countries
- Box 7 Certified Forests in LAC Region (June 1995)
- Box 8 Brazilian Initiatives in Certification
- Box 9 Small Farms and Certification

## ABBREVIATIONS AND ACRONYMS

|                 |   |
|-----------------|---|
| BOLFOR          | Bolivia Sustainable Forest Management Project                           |
| CBD             | Convention on Biological Diversity                                      |
| CCB-AP          | Central American Council on Forests and Protected Areas                 |
| CSD             | The United Nations Commission on Sustainable Development                |
| CERFLOR         | Certificate of Origin of Forest Raw Material (Brazil)                   |
| CIFOR           | Center for International Forest Research                                |
| CO <sub>2</sub> | carbon dioxide  |
| CSA             | Canadian Standards Association  |
| EU              | European Union  |
| FAO             | Food and Agricultural Organization of the United Nations                |
| FOB             | Free on Board   |
| FSC             | Forest Stewardship Council  |
| GATT            | General Agreement on Trade and Tariffs                                  |
| GDI             | German Development Institute  |
| GDP             | Gross Domestic Product  |
| GEF             | Global Environmental Facility   |
| GSP             | Generalized System of Preferences                                       |
| ha              | hectare   |
| IDB (BID)       | Inter-American Development Bank (Banco Interamericano de Desarrollo)    |
| IMAFLORA        | Instituto de Manejo e Certificação Florestal e Agrícola (Brazil)        |
| INBio           | National Biodiversity Institute (Costa Rica)                            |
| ISO             | International Standardization Organization                              |
| ITTA            | International Tropical Timber Agreement                                 |
| ITTO            | International Tropical Timber Organization                              |
| IUCN            | International Union for Conservation of Nature/World Conservation Union |
| LAC             | Latin America and the Caribbean   |
| LAFN            | Latin America Forest Network  |
| MFN             | Most Favored Nation   |
| m <sup>3</sup>  | cubic meter   |
| NAFTA           | North American Free Trade Agreement                                     |
| NGO             | Non-governmental Organization   |
| NWFP            | non-wood forest product   |
| OECD            | Organization for Economic Cooperation and Development                   |
| SBS             | Sociedade Brasileira de Silvicultura                                    |
| SO <sub>2</sub> | sulphur dioxide   |
| UNCED           | United Nations Conference on Environment and Development                |
| UNCTAD          | United Nations Conference on Trade and Development                      |
| USAID           | United States Agency for International Development                      |
| USD             | United States Dollar  |
| WRI             | World Resources Institute   |
| WTO             | World Trade Organization  |
| WWF             | World Wide Fund for Nature  |

# Introduction

## Forestry in Trade and Environment Context

Trade has both direct and indirect influences on environment. Conversely, environmental policies and regulations have influence on the competitiveness of individual producers, thereby influencing trade flows. Trade has also been considered as an agent affecting sustainable management of natural resources. Trade liberalization and macroeconomic policy reforms have led to expanded exports by developing countries, particularly in commodities. The environmental impacts on natural resources of such policies are not yet fully assessed, but evidence is mounting that negative impacts do exist.

The assessment presented here of the trade and sustainable management of renewable natural resources draws on the case of forests--probably the most complex sector from the viewpoint of land use policy. Forest resources occupy a large share of the world's land area, and their future existence is threatened by conversion of forest land to other uses and by inappropriate harvesting practices. Forests are essential in the maintenance of biological systems, but this role is often fully recognized only when the forests are gone. Because the origins of the deforestation problem lie outside the sector proper, inter-sectoral coordination in policies is necessary. Forests provide habitat for the bulk of the world's biodiversity. Forest products are traded extensively in the world and represent a major source of foreign exchange earnings to many developing countries. Necessary investment in resource management and utilization can be largely financed through the revenue generated by the sector itself. However, the sector is notorious for its policy failures and, in particular, rent capture in developing countries is low. The overall public concern for the future management and conservation of the world's forests is a sign that the problem is being recognized, and the issue is presently subject to intensive public debate in many countries.

## Environment and Trade Policy Linkages

Environmental issues are penetrating increasingly the international agenda on trade, in part because the environment is recognized as a global common. The underlying concerns are related to environmental quality and resource depletion. In spite of cyclical changes in public debate, the environmental concerns are likely to remain in the forefront. As an example, environmental groups have focused on raising the environmental standards of multilateral agreements on trade.

International trade policy has increasingly reflected public concern. Environmental issues were part of the Uruguay Round negotiations of the General Agreement on Tariffs and Trade (GATT), and as a result the World Trade Organization (WTO) established a working program on trade and environment. The environment was also an essential ingredient when the North American Free Trade Agreement (NAFTA) was negotiated. One reason for the increasing prominence regionally and multilaterally stems from the recent reductions in traditional barriers to imports. The resulting extra exposure of national economies to competition from abroad has caused attention to focus more sharply on domestic policies, including cost-raising environmental standards that continue to influence the international competitiveness of firms and industries. This is especially true when new players with lower standards enter the scene (Anderson 1995).

The heart of the environmental trade debate stems from the mixed impacts of policy instruments on competitiveness at national and international levels. This is further complicated by the classical problem of prioritization of economic development and environmental conservation, which can largely be boiled down to the question of time preference and planning horizon.

The question of standards is also relevant in forest management. Deforestation and forest degeneration

are in part related to management rules, regulations and their enforcement. International public concern first focused on tropical forests, where biodiversity is highest and where deforestation rates are also high. More recently, attention has been given to the boreal (and to a lesser extent temperate) forests, where clear-cutting, intensive silviculture and the violation of indigenous peoples' rights have been the main reasons for concern. The simplistic view of achieving sustainable forest management through normative action (forest regulations and their enforcement) risks diverting attention away from more fundamental issues, such as policy failures outside the sector that impede forest management, independent of the legal framework in forestry.

Environmental standards in forestry have been perceived as a typical case for "Processes and Production Methods," and therefore, they are not directly related to product standards. However, environmental effect form is part of product quality. In the long run there will be an increasing need to switch attention from the production process to sustainable consumption patterns. This is likely to further emphasize the role of trade as an appropriate channel for necessary policy changes. In the design of such changes, WTO rules and multilateral environmental agreements have to be taken into account in order to avoid discriminatory and protectionist practices (Andrew 1995).

In the evaluation of trade-related policy instruments three aspects need to be considered: (i) effectiveness in achieving their specific goals and whether the measures proposed are sufficient; (ii) tradeoffs between environmental and economic development effects; and (iii) efficiency. These typical elements of policy analysis are frequently overlooked in the promotion of a particular instrument (e.g. log export ban, certification of forest management). Another complexity arises from the fact that both international and national impacts are included in the analysis.

The theory of comparative advantage has been expanded to incorporate environmental aspects. With growing per capita income and industrial output, the value the public places on the environment increases.

The location of industries is assumed to be influenced by national differences in pollution standards. Relocation of a pollution intensive industry from one country to another may in turn affect the environment in a third country. This generalization may not be fully relevant in forestry because of the immobility of natural resources and long gestation periods of investments. For example, the recent interest of Asian logging firms in Latin America and the Caribbean (LAC) countries is probably guided by shortage of raw material supplies in their own region rather than avoiding national environmental standards. In pulp and paper production clean technology tends to be an international standard, as it is also the most efficient one. In solid wood products, pollution clearly plays a smaller role in industrial decisions than in resource endowment.

### **Objective and Scope of the Analysis**

This paper is an attempt to clarify some of the key issues on trade and environment in the forestry sector. The two main emerging issues in the international trade of forest products from the LAC region to be studied are: (i) implications of the removal of trade barriers for the economic contribution and sustainability of production of the forest sector; and (ii) prospects for "green" markets and eco-labelling of forest products based on improved management and harvesting practices. The possibilities to increase the value of forest resources and environmental sustainability of forest lands through increased production of non-wood forest products (NWFP) will also be considered.

This study draws on previous Inter-American Development Bank (IDB) work in policy development (e.g. López 1994; Laarman 1995) and other available studies related to the subject. The recent trends and patterns of forest products trade are first identified to establish the importance of trade in the LAC forestry sector. A broad perspective on trade-related policy instruments is adopted to provide an adequate framework for analyzing different options.

Four main areas of policy influence can be identified: production; consumption; trade; and environment.



Many individual instruments straddle these areas, and thus their specific impacts are difficult to identify. Only those instruments that have direct implications for trade are reviewed, covering various types of trade barriers, national policy strategies and multilateral environmental and other agreements. Assessment criteria are efficiency and environmental sustainability. In the discussion on trade barriers, their beneficial and harmful secondary effects on forest management and conservation are identified. Trade policy reforms are viewed with regard to their environmental priority and possible action needed to

mitigate negative impacts on the environment.

Special attention is given to certification of forest management and eco-labelling in view of their expected potential to contribute to sustainable forest management due to their current importance in various national and international initiatives, including the LAC region. Finally, it is emphasized that this study focuses on the environmental impacts of policies in the forestry sector and the impact of environmental policies on forest management (see Laarman 1995).

# Trends in Trade of Forest-based Products and Environmental Impacts

## Trade Patterns

Forest-based products are divided into (i) wood and wood-based products and (ii) non-wood products. The value of global trade is estimated at US\$ 128 billion/year,<sup>1</sup> of which non-wood products account for about 7%. The figure does not include the value of traded services such as forest-based ecotourism, which is a significant source of revenue in many countries. Trade patterns are best known for wood-based products. Therefore, only these are analyzed in the following.

Wood-based products are traded as: (a) roundwood or chips, (b) primary processed products (sawnwood, wood-based panels, pulp and paper), or (c) further processed, value-added products (builders' woodwork, wooden furniture, converted paper and paperboard products, etc.). Out of the total industrial roundwood production<sup>2</sup> about 6-7% is estimated to enter the international trade (Barbier 1995). This share, however, varies by product and region, and it tends to increase as a function of product unit value. Trades role has been changing over the last few decades as the export of roundwood has lost importance, mainly due to physical supply limitations, bans and restrictions of exporting countries. In contrast, the trade share of processed products has been increasing.

The total value (FOB/Free on Board) of the world trade in wood and wood-based products is about US\$ 99 billion per year (1993). It is broken down into main products as follows: paper and paperboard

42%; sawnwood 24%; wood-based panels 13%; woodpulp 11%; and roundwood 10%. The LAC accounts for about 4% of the world trade of wood-based forest products. The regional exports generated foreign exchange worth US\$ 4.3 billion in 1993. There was a significant trade surplus of US\$ 0.5 billion as the respective imports were valued only at US\$ 3.8 billion. The regional exports are rather evenly distributed with woodpulp (28% of the total), paper and paperboard (20%) and sawnwood (18%) being the main export items, followed by wood-based panels (13%) and industrial roundwood (10%). More than half (52%) of the regional exports comes from Brazil. Chile is the second largest exporter accounting for 29% of the regional total, followed by Mexico (7%) and Argentina (4%). The rest is distributed over a number of countries, none of whose share exceeds 2%.

The regional import pattern is dominated by paper and paperboard (60%) followed by sawnwood (14%), woodpulp (12%) and panels (8%). The import distribution is more even, with Mexico leading with 33% of the regional total, followed by Argentina (13%), Brazil (9%) and Venezuela (6%). The four countries with positive trade balances in wood-based forest products were Brazil, Chile, Bolivia and Paraguay.

The LAC producers depend extensively on trade in two wood products: plywood and wood pulp. In 1993 about 45% and 43% of plywood and wood pulp production was exported, respectively. About 14% of sawn softwood, paper and paperboard was exported, while in other wood products exports amounted to less than 10% of production. The share of imports in consumption is highest in plywood (38%), paper and paperboard (27%) and woodpulp (19%).

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<sup>1</sup> Excluding converted paper and paperboard products

<sup>2</sup> The other main component in production is fuelwood, which is traded in limited volumes. It is therefore excluded here.

The main trading area in tropical wood-based products is Asia, which accounts for two thirds of the total imports of developing countries. The region's share of the respective exports is even higher, roughly 70%. Asian trade is mostly intra-regional, but Asia dominates the world exports of wood panels. The second largest region for exports of tropical wood-based products is Latin America and the Caribbean, due mostly to trade from Chile and Brazil. Due to poor competitiveness and limited purchasing power makes Africa a minor contributor to trade in this sector, despite its physical potential.

Except Brazil and Chile, most of LAC forest products exports have been based on natural forests. The two main factors forcing an evolution towards plantation forestry are (i) increasingly limited raw material resources for wood, and (ii) environmental pressures related to tropical timber products. The reduction in natural forest-based production has been compensated for through increasing investment in plantations. The characteristics of wood output for these natural forests and plantations are different, resulting in structural changes in timber production patterns. The earlier emphasis on large-sized logs of indigenous species enabled the development of plywood for wood panels and sawmilling industries while the homogenous plantation wood (often exotic species) has been traditionally targeted at the production of pulp, paper, reconstituted panels and low-grade sawnwood. Substitution possibilities between the two types of raw material are far from being explored by the industry but the change has so far been relatively slow, suggesting traditional attitudes in trade. Nevertheless, when the physical availability of natural species becomes scarce, the industry takes action.

### **Economic Development, Forest Products Trade and Deforestation**

Dynamic economies are assumed to be better able to adjust their production and consumption patterns to control adverse environmental impacts (UNCTAD 1995). There appears to be a positive correlation between GDP and export growth. There also tends to be a positive correlation between GDP and sectoral

growth rates within the limits of resource availability and competitiveness, but this depends on the applied macro-economic policies. Such a relationship can be observed in the LAC region. In countries where forest resources have been depleted (e.g. Côte d'Ivoire, Haiti, the Philippines, Thailand), the relationship between economic growth and forestry production is naturally broken.

In LAC countries the share of forest sector exports in total exports appears to be positively correlated with the total export growth, indicating that the forestry sector has a potential role as a strategic option for national development and can respond to macro-economic policies within the resource constraint. In data on developed countries such a relationship appears less apparent, indicating a changing role of the forestry sector in national development with increasing income levels. This change is associated with higher priority given to non-wood roles of the forests.

Lacking other relevant indicators, the deforestation rate is here reviewed with respect to total and sectoral export growth rates to detect a possible relationship between environmental degradation and sectoral trade growth. The results indicate that no significant correlation can be observed in neither case suggesting that the direct trade impact on deforestation could be limited. This preliminary conclusion is subject to more detailed analysis on the relationship that should be carried out case-by-case where the dynamics between underlying socio-economic factors can be considered. Of particular importance are the impacts of structural adjustments on forest conservation (cf. López 1994).

### **Market Shares and Environmental Pressures**

From the policy point of view it is important to establish the extent to which developing countries and the LAC region in particular have suffered from environmental pressures in international markets. Globally, the market shares in forest products have varied in the short run, but no declining trend can be observed between developed and developing countries. The LAC share in the world trade of forest

products has slightly increased in the period from 1980 to 1993.

Sawn hardwood and plywood have been most vulnerable in markets where species and tropical origin are identified to the consumer. Since the mid-1980s there has been a decline in developing countries' share of the world market for sawn hardwoods, while in plywood the trend is reversed. These trends are also observed in LAC exports. The extent to which tropical sawnwood trade has really suffered from environmental pressures should be explored in more detail in individual major markets.

Pressure from environmental groups on tropical timber importers to behave in an environmentally responsible manner has been strongest in Belgium, Denmark, Germany, the Netherlands and the United Kingdom, but pressures have also been felt in other European countries and North America. These markets are particularly important for Latin American and African suppliers of sawn hardwoods and plywood, while the Asian exporters principally depend on their regional markets and are therefore much less vulnerable. It is worthwhile to recall that Latin America and Africa combined account for no more than 13% and 4% of the world exports in sawn hardwoods and plywood, respectively. However, the key European markets the Latin American exporters have increased their market share in hardwood-based products in spite of environmental pressures in the 1990s.

### **International Competitiveness of Wood Products**

Price factors are more important in products with homogenous characteristics while non-price factors limit substitution possibilities in differentiated products. Sawnwood, veneer and plywood are examples of products where the inherent quality of natural tropical timber (visual characteristics, strength, etc.) has led export trade to concentrate on end-use sectors (high-value furniture and joinery, parquet flooring, etc.) where quality factors have enabled effective product differentiation. However, it needs to be emphasized that even for these products substitutes are available (e.g., hardwoods from

temperate regions) and which are used when price disparities are large enough.

Pulp, paper and reconstituted panels are examples of relatively homogenous products where price factors tend to be influential in purchasing decisions when the basic quality requirements have been met. A cost comparison reveals that Latin American countries like Brazil and Chile are the least-cost producers in the world. In general, their competitive advantage is a result of low-cost wood raw material and labor. Those advantages may, however, be partly off-set by lower productivity and higher capital costs, the latter due to the relatively high investment risks associated with developing countries in general.

There is also an intermediate group of forest products where both price and non-price factors are important in defining the competitive position of individual suppliers. Sawnwood is a good example of such a product, as the origin (species and growing conditions) is related to many inherent quality parameters that establish product quality patterns in processing. On the other hand, the consumption patterns of import markets by species are mainly influenced by local traditions which also tend to be reflected in building regulations. This leads to somewhat limited substitution possibilities. If supply availability becomes an enduring constraint, the pattern of the market tends to change. In assessing the impact of trade and environmental policies on the competitiveness in wood-based products, both price and non-price factors need to be considered. Substitution elasticities between sources and products are therefore important.

The trade in further processed products offers an important development potential to LAC exporters, particularly in furniture. In converted paper and paperboard products the trade is limited and mostly intra-regional, as technology is readily available and not very capital intensive. The international trade in further processed wood products was estimated at US\$ 20 billion in 1993 of which US\$ 4.3 billion came from developing countries. The LAC countries generated export earnings of some US\$ 760 million, corresponding to about 4% of the world trade.

As the processing of these products tends to be labor intensive, export growth from the developing countries has been faster than in primary processed products during the last few years, and this trend is expected to continue. The principal exporters of wooden furniture and builders' woodwork are found in Southeast Asia (Malaysia, Thailand, Indonesia, and the Philippines). The Latin American exporters have not been able to fully tap this potential despite an increase in their world market share. Therefore, it is expected that the promotion of further processing of wood products is a policy priority in many Latin American countries.

### **Non-wood Forest Products**

These products cover a wide range of items from medicinal and aromatic plants and their extracts to nuts, fruits, resins, tannins, waxes and artisan products. The FAO (1995) has identified 116 commercial NWFPs. Markets have traditionally been local or regional, but many products also enter international trade.

The development of this sub-sector has experienced a number of obstacles starting with the lack of awareness of the development potential. From the trade point of view, it is important to note that production is labor intensive but products have low value in the forest due to the importance of the intermediaries in the value chain of NWFPs.

Substitutes may be available either in the form of cultivated or synthetic products. Other problems include lack of market transparency and insufficient quality standards (Chandrasekharan 1995). It is common for a plant to be developed for cultivation if it has more market potential than can be met by extractive production.

The data on NWFP trade are not reliable, but suggest that these products are more important than previously assumed. Globally, the value of international trade was estimated at US\$ 7.5-9.0 billion per year (1993). The figure does not include medicines from plants. The world trade in such plants has been estimated at US\$ 24 billion per year (1990), while the trade of medicines based on these plants could amount to US\$ 84 billion (Pearce 1995). It is noted that the above estimates exclude forest-based ecotourism, which is a growing subsector, particularly in the LAC region.

In economic terms, wood and wood-based products continue to be the main output of forests at the global level. NWFPs offer, however, important possibilities for developing multiple objective forest management methods and for generating socio-economic benefits, thereby contributing to sustainability of natural tropical forests (Perez et al. 1993). NWFPs are particularly important at a local level where other economic options may be limited.

# Environmental Impacts of Trade Barriers and Policies Related to Forest Products

## Trade Barriers on Imports

Logs and rough-sawn timber have had low or non-existent tariff levels in most markets (Bourke 1988). Tariff rates have also been declining in processed products, but tariff escalation on the higher value-added products continues. Examples are speciality plywoods, builders' woodwork, furniture and some converted paper and paperboard products. Intra-regional trade is important for many forest products that are bulky or have a low unit value. It is important to note that tariff rates are generally higher in developing countries than in developed countries (Bourke 1992).

The impact of the Uruguay Round of the GATT on forest products was limited due to relatively low starting tariff rates. The tariff differential between Most Favored Nation and Generalized System of Preferences (GSP) rates was also reduced significantly, due mostly to reductions in the former, while the GSP rate (often zero) remained largely unchanged. Although complete elimination of tariffs on forest products was not achieved, the Uruguay Round reduces overall tariff rates and prevents their escalation. In relative terms, the tariff reduction of the Uruguay Round was strongest (65%) in developed countries, while developing countries continue to maintain higher tariffs (Annex 9). In fact 84% of the developed country imports in wood, pulp, paper and furniture is currently duty free (de Paiva 1995). In addition, the establishment of bound rates (ceiling limits on tariff rates) will reduce market risk. Furthermore, major developed country importers committed themselves to completely phase out remaining tariffs on pulp and paper products (Barbier 1995). These changes can be expected to foster exports of forest products from developing countries and, in particular, to encourage plantation-based production.

Nevertheless, the remaining tariffs on high-value products will bias the development of the export-oriented forestry sector towards unprocessed products. *Ceteris paribus*, there is a risk that the relative burden on the environment will increase when the focus is on exploitation, rather than integration of wood production with processing industries. Sustainable management of natural forests is more likely to occur with a diversified industrial pattern than in cases where the best logs are harvested to be sold directly to export markets without further processing. Local conditions vary extensively (structure of the forest, domestic market patterns, labor availability and skills, unit costs of production, etc.) and therefore, environmental preconditions for industrial development and respective impacts also vary, suggesting the need to analyze each case separately.

A classical example of tariffs and quotas for imports has been the case of plywood. Applied in the European Union (EU) for more than 20 years, it was all but eliminated in 1995 (although it continues to limit imports in Japan). The elimination of the system will benefit tropical plywood exporters in Indonesia, Malaysia, Brazil and to a lesser extent African countries. Most of the plywood industry in these areas is based on natural forests and expanded exports could lead to their more extensive use.

Forest products are subject to a range of non-tariff barriers which have been resistant to change. It is difficult to determine how severely these barriers have affected trade, and if they have been used primarily to restrict imports or as legitimate restrictions with important economic functions (Bourke 1992). An additional effect of the Uruguay Round's reductions in tariffs has been to lessen some of the non-tariff import restrictions.

The EU prohibits all imports of green coniferous sawnwood typically used for construction purpose

unless certain phytosanitary standards (restrictions on wood imports designed to prevent the spread of wood pathogens from foreign countries) are met, such as kiln drying or a phytosanitary certification. The restrictions have mostly affected North American exporters, but have also influenced Chilean exporters of plantation-based coniferous sawnwood. The Agreement of Sanitary and Phytosanitary Measures of the Uruguay Round could result in a relaxation of certain inspection criteria, deemed excessive for simply protecting wood supplies from pests and disease.

Countries tend to have their own practices and product characteristics which are reflected in their technical standards. Of particular importance are building codes. Differences between countries stem from traditions in user preferences and established practices. Furthermore, different sheet sizes of wood-based panels in the North American, Western European and Japanese markets act as effective trade barriers to exporters who can only afford to specialize in one of these market areas.

The EU has taken major steps towards harmonizing building codes and standards that would facilitate foreign exporter access to several national markets. Further harmonization would contribute to the gradual elimination of technical barriers. However, when harmonization is done at a regional level, it risks favoring local producers, thereby representing an obstacle for other suppliers (Bourke 1992). In forest products the problem has been mostly observed with sawn softwood.

Many governments have used subsidies in their export markets to allow their producers to flood the market with large quantities of low-priced goods, a practice called dumping. Anti-dumping penalties are used by importing countries as a type of trade barrier, but their frequency appears to have declined with the exception of the USA (Bourke 1992). In forest products these investigations have so far focused on developed countries. An interesting precedent is the ruling of the US International Trade Commission in 1992 which set a countervailing duty of 4.6% for imports from Canada because of alleged subsidies

from artificially low government stumpage and log export restrictions. The dispute has simmered for nearly a decade and remains unsettled, although in 1995 the US returned US\$ 590 million to traders in special duties collected since 1992.

In conclusion, it appears that various non-tariff trade barriers have been established with little or no consideration of their impacts on forest management. Indirect impacts should be expected if the market access of a particular product is impeded. All the barriers that influence competitiveness tend to bias towards inefficiency, which is often linked with negative environmental effects. In forest products such measures tend to reduce the revenue received by forest managers thereby reducing their possibilities to introduce improved management practices.

### **Eco-taxes on Imports**

The purpose of environmental product taxes and charges (eco-taxes) may have two objectives: (i) to raise revenue; and (ii) to discourage the production and consumption on which the tax is levied (UNCTAD 1995b). Eco-taxes have been considered as a potential instrument for importing countries to use to limit imports of products, such as tropical timber or paper that does not contain recycled fiber. Such initiatives have been strongly opposed by exporters as discriminatory policies.

In the case of tropical timber it has been demonstrated that a special tax or levy would not be an effective instrument to reduce trade-related deforestation. Furthermore, such a measure could reduce incentives for sustainable forest management and risk encouraging unsustainable conversion of forest lands to other uses (LEEC 1992).

In 1993 Belgium issued a decree for an eco-tax on paper lacking a minimum content of recycled fiber. The intention was to promote recycling and reduce timber harvesting in the countries that Belgium depends on for its virgin fiber supply. Such a tax, however, disregards the fact that recycled fiber always requires an input of virgin fiber--as fibers

increasingly disintegrate with each successive round of recycling. Furthermore, the tax acts as a trade barrier for external suppliers, penalizing their competitiveness, rather than encouraging sustainable resource management. The tax also favors local paper producers who rely mainly on recycled fiber for raw material. For these reasons the decree has been postponed while the Belgian Government studies other options.

**Box 1 Potential Gains from Trade of Carbon Sequestration in the Amazon**

Value of forest land as a store of carbon is derived from

- global damages avoided by not releasing additional carbon to the atmosphere or the amount of carbon sequestered in the forest
- S** unit value to society of reducing carbon emission (per ton carbon)

Expected value of Amazon forest land in agriculture: US\$ 2.5-30.0/ha (depending on location and soil fertility)

Value of Amazon forest land in carbon sequestration: US\$ 288 - 7200/ ha (depending on the valuation basis)

Main impediments to trading carbon sequestration:

- (i) transaction costs, contract facilitation (bringing buyers and sellers together), and valuation of benefits of different activities;
- (ii) potential risk of a landowner taking retaliatory action in response to not getting a contract.
- (iii) countries perceive a risk to national sovereignty when financing decisions are made by external agents

Source: Schneider 1995.

Initiatives made to introduce environmentally targeted taxes and levies on forest products present a number of problems such as unequal treatment of like products. There is an obvious risk that such measures will lead to protectionism. In view of their apparent inefficiency and counterproductiveness in contributing to environmental objectives (sustainable forest

management), eco-taxation is not proposed here as a feasible instrument unless it can be targeted correctly and designed so that WTO rules (equal treatment of similar domestic and imported products) are followed. Inefficiency limitations can also be expected with trade subsidies in exporting countries that, instead of contributing to sustainable forest management, risk becoming a disguised means of trade promotion. Other national-level measures to correct policy and market failures should be preferred to direct trade subsidies (LEEC 1992).

**Quantitative Restrictions and Taxation of Exports**

Latin American countries have applied log export bans with the dual purpose to curb deforestation and encourage local processing. Some other countries have used various quantitative restrictions tied to the volume of wood produced (sometimes specified by tree species). More recently, similar regulations for exports of rough sawnwood have also been applied. The policy objective has been the promotion of local processing to create value added and employment by ensuring low-cost raw material for the industry.

The economic effects of these measures are, however, varied as, even though the industrialization has taken place, efficiency and distributive effects have often been negative. The inevitable result of isolating a country from international trade is the lowering of the price of roundwood, which often leads to waste in raw material processing (e.g. Constantino 1990). Forest owners or holders of cutting rights have been obvious losers as their political weight is less than that of industry and labor lobby groups (Box 2).

Log prices in Ecuador and Bolivia have been only 15% to 40% of what they would have been without export bans (Stewart and Arias 1995). This has led to substantially reduced competitiveness of forestry as a land use, both in terms of management of natural forest and of plantation forests, contributing in turn to the conversion of forest land to other uses. Export-grade logs represent a small share of the total harvest because of limitations related to log quality and species. Whereas the best grades of high value species can capture prices as high as US\$ 500/m<sup>3</sup> or more,



the local industry structure is rarely geared towards maximizing the value of such logs due to constraints in marketing, technology and skills. When such raw materials are processed into plywood or standard sawnwood, an economic loss of US\$ 320 to 380/m<sup>3</sup> may occur under Bolivian and Ecuadoran conditions. In addition, low log prices act as a disincentive to improve processing efficiency, thus working against the objective of reducing the harvesting volume in the forest.

### **Box 2 Export Bans in Costa Rica**

Log exports were banned in 1986 and sawnwood exports in 1987. As a result the domestic log prices dropped and in 1989-91 they were only 18 to 52% of what they would have been without the ban. Winners of the ban have included the processing industry enterprises and their employees. Losers have been forest owners, forest workers and the Government. In the long run the industry is also a loser as investment in plantation is lagging.

The welfare gains are likely to be negative due to reduced supply and lower prices of unprocessed wood and limited value added gains. Environmental net benefits from the ban can be assumed to be negative due to reduced forest revenue available for sustainable management and logging plantation development.

Sources: Stewart 1992, Stewart-Arias 1995, Kishor & Constantino 1994.

Similar effects can be expected from export taxation of forest products occurring in many developing countries (Gillis 1990). As the taxes are generally scaled according to species, they have been targeted at preventing excessive harvesting of primary species and promoting low-value, lesser-used species. The same efficiency and distributive problems associated with quantitative restrictions have, however, been experienced.

The environmental objectives of these types of measures are of recent origin. In particular, log export bans have been proposed as a measure to control deforestation. If the hypotheses that assigning a correct value to natural resources leads to improved

conservation is accepted, export bans are not likely to be effective in reaching environmental objectives. An appropriate measure would be adjustment of concession terms and royalty fees so that the price of timber corresponds to its economic value.

Export bans and quantitative restrictions appear to work against internalization of environmental effects by distorting the economic value of the resource and its output. However, if such restrictions are removed as isolated measures, there is a risk that increased wood demand would lead to excessive utilization in the short run. Therefore, a broader policy package would be necessary to ensure that increased wood demand could be met from sustainably managed natural forests or new plantations in deforested lands. Through such measures, removing internal trade barriers could lead to improved economic efficiency, environmental net gains, and possibly even to distributional benefits. However, each case has to be analyzed separately, not only to consider market and environmental impacts, but also to seek a politically feasible way to implement policy reform. In such an analysis country-wide reforms should be considered for legal and illegal trade implications.

### **Production Subsidies**

In many countries forest conservation relies on the provision of incentives to rural communities, farmers and forest dwellers. Such incentives may be direct or indirect, and they can take different forms, varying from the establishment of access to resources (secured tenure) to the provision of inputs. Incentives become controversial, especially when they are financial. The justification of subsidies is usually based on market failures resulting in differences between private and public benefits. Forestry provides environmental and social benefits that are important for society, but cannot be captured by the private landowner, as they are not reflected in the price of forest products. The notable difference in the time preferences of society and the individuals can be diminished by the use of subsidies.

Even if financial incentives are available for facilitating environmental conservation, they are

controversial when used to promote industrial forestry, particularly commercial plantations. When using subsidies, the value of the non-market externalities should guide the use of incentives. If financial incentives are justified, they should be targeted and, if possible, temporary. Priority should be given to activities where subsidies cover only the marginal cost of adopting improved practices (IDB 1995). Whereas a country is mainly interested in the generation of benefits at the national and local levels, the willingness of international financing institutions to provide funding depends on global benefits such as carbon sequestration (Keipi 1995). Pooling international resources for comprehensive incentive schemes should be preferred to the development of individual projects with separate management structures (Oksanen et al. 1994). A careful analysis of the distribution of benefits could be useful to determine how much local input should be used, given that a portion of the benefits may be strictly local.

From the trade point of view, incentives such as financial subsidies influence competitiveness of individual producers. Fiscal incentive schemes have enabled such countries as Brazil and Chile to develop large-scale export-oriented industries. The experience on Brazil further indicates that, when the fiscal incentives are removed, the supported activity (tree planting in this case) may collapse.

The aforementioned dispute between the USA and Canada on subsidies and tariffs shows that the issue can be raised in trade negotiations even though forest policies have largely been perceived as a national issue. The USA claimed that Canada subsidized wood production through low royalty fees of forest concessions and that production costs are lower than economically justified. At the same time Canada claimed that production in US forests was also subsidized by Congressional appropriations (Repetto et al. 1992). Subsidies expand the export supply of forest products from the US and Canada. There is a risk that such subsidies are encouraging excess harvesting, resulting in negative environmental impacts (e.g., deforestation and increased CO<sub>2</sub> emissions) (cf. Repetto 1993).

It needs to be pointed out that subsidies in related sectors may have adverse environmental impacts on forests. Agricultural subsidies make crop production or grazing artificially attractive land uses and lead to deforestation (Laarman 1995). Such a conversion has proved to be unsustainable on land with poor soils or where nutrient leaching from soils is a problem.

Subsidies that make domestic prices differ from border prices risk generating external environmental costs. In forestry, subsidies are typically used to correct policy failures in a partial manner, rather than to address fundamental issues such as underpricing. It has been easier politically to establish subsidies than to increase stumpage prices on government lands. Subsidies are not considered to be environmental policy instruments, but they significantly affect the use and management of land resources with environmental consequences.

### **Structural Adjustment and Market Liberalization**

Structural adjustments have macro-economic objectives, but must be assessed for their environmental and social impacts as well. Adjustment programs typically include removal of price distortions, trade constraints, and the promotion of market-based incentives. Common measures to improve the balance of payments have been currency devaluation, reduction of tariffs, removal of non-tariff trade barriers, and other measures to promote trade. In the domestic markets elimination or reduction of price controls and direct subsidies and privatization have been applied to correct market failures. In the public sector budget reductions and improved efficiency in tax collection have been used to reduce fiscal deficits.

Macroeconomic and trade policies are discussed in the sectoral LAC context by Laarman (1995) who points out that monetary and fiscal reform must be accompanied by direct stimulus to raise productivity in key sectors. The experiences of Chile and Mexico are summarized in Boxes 3 and 4. One can assume that increased economic efficiency also leads to environmental gains, as fewer inputs are used for a given output. However, if the policy reform is partial,

leaving sectoral market or other policy failures uncorrected, there is a risk of environmental damage (López 1997). An efficient political mechanism is needed to translate the demand for environmental quality associated with economic development into new regulations that eliminate harmful practices (cf. Copeland and Taghor 1995). At some “optimum level” of trade liberalization for a given nation at a given point in time, social and environmental costs become as important as economic gains.

Market liberalization in a producing country may encourage excessive forest harvesting and deforestation if the resources continue to be underpriced. Indirect effects of structural programs include migration of farmers to new open access areas leading to deforestation, erosion, and destruction of coastal habitats (Repetto & Cruz, 1992). One of the environmental concerns of structural adjustment programs has been the migration of polluting industry to countries with lower standards. This hypothesis has not yet been relevant for forestry. Due to the bulky nature and low unit value of wood, economic factors tend to favor investment near the raw material

resource. The extensive world trade in wood raw material can be taken as an expression of reluctance of the existing producers to move industrial production to new areas, and contradicts the hypotheses that businesses will necessarily move to avoid environmental regulation requirements. The recent interest of Asian forestry companies in the LAC region is probably driven more by their own wood supply constraints than by escaping environmental standards in their own countries.

Evidence of the impacts of structural adjustment and trade liberalization on the forestry sector remains inconclusive. Such effects are mixed and difficult to separate from other factors, such as land tenure or agricultural policies which may have a more fundamental and direct impact on the use of forest land. Only in a few countries does the forestry sector have a clear national priority (e.g., Chile). If structural adjustment does not include the correction of forest resource undervaluation, expanded export activity is likely to contribute to resource deterioration and discourage investment in conservation (López 1995).

### Box 3. Structural Adjustment in Mexico

In July 1985 the Mexican Government initiated a trade liberalization program (apertura comercial) with the purpose of increasing competitiveness in production. In 1986 Mexico joined the GATT and signed various framework agreements with the US, Asian countries and Chile. The program included deregulation of the markets, liberalization of the financial system and measures to promote foreign investment and technology transfer. In 1994 Mexico entered the North American Free Trade Agreement (NAFTA) which included environmental obligations.

The liberalization process was considered successful primarily because the opening up of the markets was accompanied by an integrated program. The change was rapid as the import duties were brought down from 23.5 to 12.5%. In the wood industry the total productivity increased 8% per year, while in the paper industry productivity remained constant. The export value of wood and paper products increased 84% and 105%, respectively from 1985 to 1990. However, at the same time imports expanded 200% and 144%, respectively. In volume terms, the sectoral growth rates were mixed, with -0.7% growth in wood and 2.3% in paper (Kessel & Samaniezo 1992). Rapid changes in sectoral output made the development of environmental by sound forest management difficult, particularly when combined with institutional weakness and budgetary constraints.

The opening of wood product markets did not provoke an increase in the sectoral output for a number of reasons: (i) the sector was not internationally competitive due to high production costs; (ii) the institutional framework was not adequate to attract foreign investment in spite of physical production potential of roundwood; and (iii) the existing capacity could not be utilized fully due to problems of wood supply availability which was coupled with insufficient infrastructure.

The Mexican experience in trade liberalization emphasizes that: (i) in the absence of macro-economic stability and firm sectoral policies it is difficult to improve forest management, (ii) there may be negative impacts on sectoral development if liberalization comes after a long period of protection, and (iii) there are risks of environmental degradation associated with economic inefficiency, but without economic preconditions improved production practices are not likely to occur.

Presently in the LAC region, sustainable forest management requires long-term investment and financing largely from commercial credits which in the past have not had much of a connection to the forestry sector (McGaughey and Gregersen 1988). Economic stabilization and removal of trade barriers are essential preconditions for such investments but not sufficient.

In the planning of macro-economic reforms possible adverse environmental and economic impacts should be considered (cf e.g. Beghin et al. 1995). Within such reforms, natural resource policies should seek to identify and manage tradeoffs among economic,

social and conservation considerations. Environmental goals typically establish the constraints within which maximization of net economic benefits can take place. The situation can be interpreted as a special case of multiple objective planning where tradeoffs between environmental and socio-economic requirements are assessed in monetary terms. Policy packages could include such elements related to the sector as forest tenure and harvesting rights, transparent market pricing of wood and non-wood products, sustainability and biodiversity indicators, and other criteria for forest management.

#### **Box 4. Structural Adjustment in Chile**

Chile's pioneer efforts in trade liberalization were undertaken during a five year period in the 1970s. In addition to lowering import duties to 10%, non-tariff barriers were eliminated. At the same time, there were structural reforms in areas such as privatization, liberalization of prices and capital markets, and fiscal and labor reforms. It is therefore difficult to single out the impacts of trade liberalization. Together with fisheries, the export growth of the forestry sector has been the highest in recent years. As a result the share of forest products in total exports increased from 0.9% in 1970 to 10.1% in 1990. So far in the 1990s, Chile's industrial wood production and sectoral exports have almost doubled. As a result, Chile has emerged as one of the world's leading producers of wood, pulp and paper products, most of which come from industrial plantations (Meller 1992).

There are two main environmental issues to be addressed in the Chilean case: (i) whether the plantations can be considered a sustainable land use; and (ii) whether natural forests were converted on a large scale into plantations. As for the first issue, plantations can be established in a way that facilitates sustainable land use if several species (especially native ones) are used, and natural areas are left as reserves within and around the plantations. Concerning the second issue, such conversion would result in significant biodiversity loss. Fortunately, until now an overwhelming majority of the existing 1.6 million hectares of industrial plantations have been established in previously deforested areas.

#### **Trading of Global Environmental Benefits**

Recognition of the global environmental values of forests could make trade a potential instrument for conservation financing. Such benefits can be derived from carbon sequestration, and biodiversity conservation (existence and option values), but hydrological benefits or other local externalities can also be significant. To compliment public sector mechanisms for international transfer of funds for environmental conservation, new arrangements have been made to tap the resources of the private sector. This is necessary as it has become obvious that the public sector can only meet a fraction of the needs in developing countries.

In carbon offset agreements, carbon emissions in one country are exchanged for carbon sequestration in another country. The potential for such an activity is huge in view of both the current level of CO<sub>2</sub> emissions, and the need to expand tree cover through planting or to sustainably manage existing forests in developing countries. The number of existing carbon offset deals is still limited, and accumulated experience will be needed to improve the design for worldwide promotion. Several issues will have to be addressed such as the sustainability of funding, local land-use conflicts, possible restrictions of the use of

forests created through the mechanism, and organizational and institutional arrangements.

International contracts on the commercial use of biodiversity is another recent trade-related instrument. The first example of these has been the contract established between the INBio (the National Biodiversity Institute) in Costa Rica and the pharmaceutical company Merck. INBio is in charge of classifying and studying the existing species in the country for their possible sustainable utilization. Costa Rica does not have funds to carry out this huge task, and therefore Merck will provide funds in exchange for the exclusive commercial rights to the information generated by INBio. The initial outlay of US\$ 1.1 million may be increased later.

This example of an international biodiversity deal is likely to be one of many. Several issues still need to be addressed to make these deals attractive to local governments and foreign investors such as provisions for biodiversity conservation in perpetuity, and duration, exclusivity and limits of rights.

In addition to trading global environmental benefits, there is also potential and need for regional and local arrangements, particularly in watershed management. The current approaches in critical watersheds are

mostly based on strict regulation which typically suffers from weak enforcement. Equitable sharing of costs and benefits of the hydrological functions of

forests is a complex task, particularly if country-wide impacts are involved (Hueth 1995).

# Multilateral Agreements Influencing Forest Management

Multilateral environmental agreements can be important instruments for environmental management and sustainable development. With few exceptions (e.g. the Montreal Protocol), however, their effects on trade and environment are not clearly established (UNCTAD 1995a). Out of the 180 agreements negotiated, several have indirect or direct influence on forest management and competitiveness. The most important of these are the Conventions on Climate Change and Biological Diversity, and CITES. Among the commodity agreements, the International Tropical Timber Agreement (ITTA) deals only with forestry. Under the UN Commission on Sustainable Development (CSD) an International Panel on Forests has been studying possibilities for an international convention on forests which could integrate most of the sector-specific issues under a single agreement.

## **Conventions on Climate Change and Biological Diversity**

Forests play an important role in the global carbon cycle and serve as a major carbon sink. Forests also provide a major habitat for biodiversity. Therefore, deforestation and excessive exploitation are serious global concerns. The Convention on Biological Diversity (CBD) establishes a framework for sustainable management and utilization of biodiversity with a strong economic dimension.

The Global Environmental Facility (GEF) provides the financing for the two conventions. Financing is based on the rule of incremental costs induced by necessary action to achieve global environmental benefits. The incremental cost principle of GEF, however, represents a constraint for financing biodiversity conservation, as the application of the principle is loaded with ambiguities. It is difficult to separate global benefits from the local ones. Win-win situations are being sought, and the role of the private sector is emphasized. As a spin-off of the two conventions, a number of new financing instruments have emerged where the purpose is often either to

support biodiversity conservation or to increase biomass through reforestation.

From the trade point of view GEF's problem is that direct or indirect subsidies provided to selected producers may increase their competitiveness at the expense of others. Reforested areas for carbon sequestration need to be managed and harvested at the end of the rotation period to increase wood supply in the market. The policy implications of these subsidies have not been analyzed in full, but as long as their main objective is environmental, they may be considered justified (e.g. IDB 1995).

The global environmental values of forests offer possibilities for trade through international transactions. Financing schemes for carbon sequestration and tradeable pollution permits are typical examples, but they may lead to single-objective investments when benefits could be maximized using multiple objective frameworks (e.g. including biodiversity conservation). The forthcoming international convention on forests should be seen as an instrument that could provide the necessary framework for efficiency improvement in a field whose present arrangements (climate change, biodiversity) tend to lead to suboptimization.

## **CITES**

The Convention on International Trade of Endangered Species (CITES) directly regulates commercial trade. Three levels of species vulnerability are recognized:

- C species threatened with extinction and possibly affected by trade; in practice, commercial trade of these species is prohibited;
- C species that are not necessarily threatened now, but may become so unless trade is strictly regulated; and

- C species for which trade is subject to regulation to prevent exploitation, and where cooperation between trade partners is needed to control trade.

In practice, trade of species listed in the second group requires import and export permits by the competent authorities in respective countries.

A review of the CITES lists reveals that the tree species are mostly of tropical origin. Therefore, developing countries have viewed CITES as a trade barrier instrument to reduce their competitiveness in export markets. Having failed to turn the International Tropical Timber Organization (ITTO) into an instrument for restricting trade in timber from poorly managed tropical forests, some conservation groups are focusing their attention on CITES to achieve that goal. Several tree species have recently been nominated for listing in the second group, even though none of these is in direct danger of biological extinction (IUCN 1993). As an example, there has recently been an intensive debate on restricting trade in some of the most valuable tropical timber species, e.g. mahogany (*Swietenia spp.*), on the initiative of some developed countries. Several species of mahogany occur in about 20 countries in the LAC region. The issue is complicated by the fact that mahogany resources vary by country. The trade impacts also vary: in some countries mahogany is a major source of revenue, while in others it plays only a marginal role. In 1994, *Swietenia humilis* and *S. mahogani* were included in CITES, while *S. macrophylla*, the main export species, was excluded. This is a good example of how CITES can vary depending on the species and country.

It appears from the above discussion that the original objectives of CITES could be expanded to restrict forest harvesting and alter management practices. The earlier success in controlling clearly identifiable wildlife products in trade may be difficult to achieve in the trade of timber: where identification of species requires specialized skills; where final products are not necessarily specifically related to the raw material used; and where imitations are easy to produce.

To properly address the type of problems faced in the case of mahogany, CITES lists should be expanded to include the origin—with appropriate verification and labelling systems established to effectively monitor trade from different locations. Such an effort was tried for tropical wildlife, such as elephants, but the CITES parties were unable to reach an agreement (UNCTAD 1995a).

Although CITES can be considered an effective convention, its regulatory approach in forest products does not encourage sustainable management of forests. Economic incentives are not provided to those countries that succeed in increasing the stock of the endangered species to a level that allows sustainable utilization, thereby providing further motivation for conservation efforts. Experience has shown that forests with no value to local people tend to be destroyed or converted into other land uses. CITES should therefore be regarded as a protection measure of last resort to be applied for a minimum necessary period, rather than a major instrument for sustainable development. The unintended effects of CITES on trade and competitiveness should be duly assessed. An increasing shortage of a species tends to be reflected in its price and encourages a search for substitutes. For instance, the emergence of rubberwood as a major raw material for wood industries in Southeast Asia partly derives from the fact that it can, to some extent, replace certain rare or endangered species (cf. ITC 1993). Many of the problems inherent to CITES could be partly eliminated through a credible timber certification and labelling system.

### **International Tropical Timber Agreement**

The International Tropical Timber Agreement, renewed in 1994, was not conceived of as an environmental pact, rather it is a commodity agreement. However, it does affect both development and the environment. It also provides a framework for sustainable management of tropical forests through three areas of intervention: forest management and reforestation; forest industries; and improved market transparency through the provision of economic and market information. Various guidelines have been



developed for sustainable management to provide a common general framework for national action (ITTO 1995). A goal to have tropical timber trade entirely based on sustainably managed forests by year 2000 has been promoted in both producing and consuming countries. Project financing is a major instrument, but the available resources have been grossly insufficient to meet the respective requirements.

ITTA has been valuable in bringing consumers and producers together, both in policy work and development. Common positions have been established on the sustainable development of forests, and the clear targets set have been instrumental in focusing efforts both at international and national levels. Due to different perceived interests and priorities, however, progress in the field has not met the expectations of the parties. Key problems have been related to (i) the limitation of the Agreement to tropical timber only, as regards policy development, and (ii) insufficient financial resources for field activities. Largely for these reasons, the international environmental community has reduced its support of the ITTA. The focus of the environmental movement has turned to other approaches, notably timber certification and CITES. However, ITTA's achievements are significant and, if the parties wish to commit themselves to ratifying the Agreement there is a potential for substantial contributions to the sustainable development of forests.

## **Conclusions**

The main multilateral environmental agreements influencing forest management have had limited impact on trade flows and competitiveness in part because they are relatively recent. The conventions on climate change and biological diversity are likely to result in the provision of additional resources for conservation activities. In forestry, like in other natural resource sectors, it is difficult to separate development and environmental conservation. This calls for a reconsideration of the implementation guidelines of the agreements to ensure that (a) win-win situations between global and local direct and indirect benefits can be maximized, and (b) effectiveness and efficiency in the use of available funds are enhanced.

Ultimately, the parties involved in these agreements will determine their effectiveness. The experience of the ITTA implementation shows that much can be done to develop suitable recommendations based on an international consensus. Enforcement mechanisms are, however, weak. In the case of tropical timber, the problem is related more to the time frame than to the actual principle of sustainable forest management. A broader framework with equal treatment of all types of forests is therefore necessary to ensure improved forest management on a global scale.

# Certification of Forest Management and Eco-Labeling of Forest Products

## Objectives

Certification combined with eco-labelling is a potentially powerful information-based instrument that could make trade contribute to the sustainable management of natural resources. Use of this instrument in the forestry sector is primarily concerned with improving the production process, i.e., the quality of forest management. For this to work, information has to be transferred through the chain-of-custody from the forest to the end use. The producer countries often conceive the requirements to be designed to generate global and not necessarily national environmental benefits (Andrew 1995).

For a producer country there are two objectives to consider: (1) improving forest management, and (2) ensuring market access. It needs to be recognized however that certification is not necessarily sufficient to achieve these objectives (Baharuddin-Simula 1994). Rather, it should complement other tools such as external auditing to monitor the compliance of forest management. With secured market access, it is expected that the incremental costs can be paid for with the anticipated additional revenue ("green premium").

A set of ancillary objectives can also be attached to timber certification which may be achieved by improving the transparency of forestry activities. Such objectives can be set by the government (e.g. better control of forestry operations and land use change, higher recovery of collection of forest fees and taxes) or by firms (e.g. improved total productivity). Some of these ancillary objectives may be particularly important in tropical countries where the present arrangements of law enforcement, supervision and control are inadequate due to insufficient resources of public forest agencies.

## Forest Products in Existing Labelling Schemes

Parallel to timber certification initiatives, paper and wood products have been included in various national or regional eco-labelling schemes, such as in the European Union. Because the processing of these products does not require a life-cycle perspective of the resource, the quality of the raw material source is often ignored. Moreover, the industry has not differentiated among raw material species used for this production, nor has it considered the inherent environmental characteristics of different materials, such as their renewability.

On the other hand, attention has focused on less critical environmental aspects that are more noticeable and easier to measure. The recycled fiber content in paper and board products is a typical example. In particular, the draft criteria of the EU eco-label on tissue paper products have been subject to criticism by such pulp exporters as Brazil for whom this market segment is important (UNCTAD 1995c). Brazilian exporters have alleged that the emphasis on recycling as a criterion for determining renewable resource use discriminates against Brazilian producers who use wood from plantations and not from natural forests. They also allege that the criteria related to SO<sub>2</sub> emissions in the production process and of little or no relevance since acid rain was not a concern in the location of production in Brazil (although it can be in Europe). They also claim that the criteria used to determine production process compliance with renewable energy standards discriminate against Brazilian producers, who depend largely on hydroelectricity (UNCTAD 1995d).

It is apparent that the existing eco-labelling schemes will not be adequate to address all environmental concerns of environmental NGOs and the public at large. The schemes are mostly national and have been developed with little consideration for how they influence the environmental situation or competitiveness of foreign producers. Some developmental issues from the Latin American

perspective are discussed in Box 5.

#### **Box 5. Eco-labelling for Paper Products: Some Issues for Latin America**

Due to favorable conditions of both climate and soil, the productivity of forests in Argentina, Brazil and Chile is very high for both pines (long fibers) and eucalyptus (short fibers).

**Argentina's** leading exporter of paper competes internationally and, according to a case study, is using best environmental practices. For example, the firm has reduced the environmental impacts of its effluent and improved its forest management in response to concerns expressed by foreign clients. Based on a technology developed within the firm, the bleaching process has been modified and the firm is now producing paper that is totally free of chlorine, a potential contaminant.

A study undertaken by the German Development Institute (GDI) indicates that the pulp industry in **Chile** meets stringent international standards and exceeds domestic regulations, in particular with regard to chlorine-free bleaching, effluent treatment, water consumption, energy use and sustainable forest management. The GDI study notes that the Chilean pulp industry has nevertheless opted for a low profile policy in its public relations, rather than trying to take advantage of its achievements in terms of environmental management.

**Brazil's** pulp industry has achieved a high level of vertical integration which is exemplified by several larger firms that possess their own plantations. Fast growing eucalyptus plantations and mastery of forest management technologies provide Brazilian industry with important comparative advantages. The supply of renewable energy resources and economies of scale also constitute comparative advantages.

The environmental effects of plantation forests depend on whether the plantations replace natural forests or are established on degraded lands, and whether native or exotic species are used. In all these countries plantation forests have been mainly established on marginal agricultural land, and most of the pulpwood processed or exported comes from them.

Source: Adapted from UNCTAD (1995d)

#### **Criteria of Forest Management Sustainability**

At a national level, forest legislation, rules and regulations provide the normative framework for assessing forest management performance. Certification is a response to two problems in particular: (i) existing standards that may not be sufficient to promote sustainability; and (ii) supervision and control that are ineffective in preventing inappropriate harvesting practices.

There is an extensive, on-going international attempt to define the principles and criteria of sustainable forest management, both in the tropics and elsewhere. This effort, which gained momentum after the 1992 UNCED Conference, has a total of about 20 organizations or processes working to this end. The effort is intended to lead to a worldwide agreement and form part of an international convention on forests sponsored by the CSD Inter-governmental Panel on Forests.

In 1990, the ITTO drew up guidelines for the sustainable management of natural tropical forests and plantations. These guidelines were followed up with definitions of criteria, and indicators for biodiversity conservation (ITTO 1990, 1992, 1993). The LAC member countries and other ITTO members have agreed to the ITTO initiative. However, the guidelines are not legally binding, and they do not adequately cover the ecological and social aspects of tropical forest management geared toward sustainability.

In February 1995 in Tarapoto, Peru the countries of the Amazon Cooperation Treaty agreed on a proposal that set criteria and indicators for sustainability of Amazonian forests to be adopted by the respective governments. The Tarapoto Proposal attempts to promote the sustainable development of the Amazonian forests to make use of their environmental, economic, cultural and social potential, while recognizing the national sovereignty of the member states. The criteria were established at

three levels; i.e., local forest management unit national, and global. It is the only proposal where the global benefits have been considered explicitly. The Tarapoto proposal includes provisions for broad participation and consultation, especially at the local level. It forms a useful sub-regional instrument for harmonizing the normative framework in the forestry sector. Its effectiveness however, will depend on the adoption and application in the member states.

The various initiatives relevant to the LAC region have a number of common features (Box 6). They broaden the traditional concept of sustainable forest management to include biodiversity, environmental services and socio-economic aspects. Although these initiatives have not been designed for certification purposes they do provide a common basis for normative framework. They also suggest different actions at the local, national and global levels.

| <b>Box 6. International Criteria Relevant to Forest Management in the LAC Countries</b> |   |   |
|---|---|---|
| <b>ITTO (Tropical Forests Worldwide)</b>  | <b>Montreal Process (Temperature Forests in Western Hemisphere)</b>                               | <b>Tarapoto (Amazon Countries)</b>  |
| 1. Secured forest resource base   | 1. Conservation of biological diversity   | 1. Local and national socio-economic benefits                                     |
| 2. Continuity of forest production  | 2. Maintenance of productive capacity of forests  | 2. Policies and legal-institutional framework                                     |
| 3. Level of environmental control and acceptable impact                                 | 3. Maintenance of ecosystem vitality  | 3. Sustainability of forest production  |
| 4. Conservation of flora and fauna  | 4. Conservation and maintenance of soil and water resources                                       | 4. Conservation of forest cover and biological diversity                          |
| 5. Socio-economic benefits  | 5. Maintenance forest contribution to global carbon cycles  | 5. Conservation of integrated management of water and soil resources              |
| 6. Institutional framework  | 6. Maintenance and enhancement of long-term multiple socio-economic benefits                      | 6. Science and technology   |
| 7. Flexibility in criteria application according to experience                          | 7. Legal, institutional and economic framework for forest conservation and sustainable management | 7. Institucional capacity   |
|   |   | 8. Global economic, social and environmental services performed by Amazon forests |

The underlying principle in the existing forest certification schemes (not necessarily always explicit) has been to use forest estate or management unit as the entity of assessment. In small management entities, which are common in LAC countries where private forest ownership dominates, only a limited number of criteria and indicators may be relevant at a given point of time, depending on the prevailing structural characteristics of the management unit. Center for International Forest Research's (CIFOR) on-going work on testing of alternative certification criteria and indicators is therefore necessary to

establish the feasibility of practical assessment.

On the other hand, certification should be based on criteria and indicators which are relevant to improved forest management and thereby sustainability in given a country. A country may be divided into biogeographical vegetation zones, each having its own biological characteristics which also define the specific features of forest types occurring in these zones. At the international level, the Forest Stewardship Council (FSC) has provided a certification framework that has been adapted to local

conditions by accredited certifiers. The FSC principles were developed through a consultative process and approved by the council assembly (see section below). Site-specific forest management standards should be developed based on similar consultative processes to be applied in the assessment of individual management units.

Concerns have been expressed about the human resource requirements for carrying out qualified assessments of the compliance at forest management with the criteria to be established. Forest management is often a complex exercise where understanding of local environmental and social conditions is essential. It can be questioned whether external auditors largely basing their assessment on documentation are able to measure or evaluate a large number of different indicators that may be in conflict with each other.

### **International Harmonization of Certification Criteria**

International harmonization and mutual recognition of certification criteria and indicators are essential for smooth trade in international markets. The inter-governmental processes described above, together with national-level follow-up work, are intended to provide a common framework within which forest management certification can take place.

It has to be emphasized that forest management practices depend on many location-specific factors (species composition, ecosystem, dynamics, socio-economic situation, etc.). It is therefore unlikely for example, that an importing country's specific forest management standards would be directly applicable in an exporting country. For this reason, some importing countries or large buyers of forest products have developed their standards for foreign suppliers (e.g., Initiative Tropenwald in Germany). While these types of initiatives are convenient for specific trading partners, they have structural limitations if they cannot be attached to an appropriate international framework. At present, International Standardization Organization (ISO) and FSC offer the only broad-based, widely-applied international standards.

*International Standardization Organization.* The ISO's on-going work on the environmental management systems standards (14,000-series) provides a basis for international certification of enterprise-level management systems related to environmental issues. Because of the broad participation base and the organization's mandate to assess management processes, the ISO is seen as a potential instrument to provide the necessary common framework for certification of forest management as well. In 1995 the Canadian Standards Association (CSA) made a proposal to ISO to start the development of an international standard for sustainable forest management systems. The proposal did not pass, as it would have established a sector-specific precedent for general management systems. In addition it was opposed by NGOs that saw it as a countermeasure for the FSC where economic interests play a minor role in decision making. The issue is being pursued within ISO through an informal study group with a mandate to develop a method for assessing forest management.

*Forest Stewardship Council.* The FSC, headquartered in Oaxaca, Mexico, was established to promote voluntary, independent certification of forest management. Its highest decision-making body, the general assembly, is divided into two voting chambers: the first, with 75% of the vote, consists of social and environmental interests; and the second, with 25% of the vote, represents economic interests. The imbalance has made industry hesitant to participate in the FSC. This is important as the experience from other eco-labelling programs shows that industry participation is generally necessary to make such schemes successful.

FSC is an accreditation organization for independent certifiers. The Council has a set of principles and criteria for forest management, and a draft manual with rigorous and clearly defined procedures for evaluation and accreditation bodies. The FSC is also actively promoting the establishment of national working groups that are involved in the development of national forest management standards. The World Wildlife Fund (WWF) has been the driving force in setting up and promoting the FSC. Currently, the

FSC, with its rigorous and transparent procedures, is the only international framework with principles and criteria for forest management certification. So far, the FSC has accredited four certifiers, of whom three operate in the LAC region: the Smart Wood scheme by the Rainforest Alliance, a US-based NGO; and two commercial enterprises (Scientific Certification Systems Inc. at the US, and SGS Forestry Ltd. at UK—see Baharaddin and Simula 1994; Upton and Bass 1995).

FSC principles and criteria should apply to all types of forests (tropical, temperate and boreal), all ownership categories, different sizes of forest management units, and various socio-economic conditions. This represents a number of problems due to the way the principles and criteria have been drafted. It is also important that FSC-accredited certifiers develop their own homogeneous assessment criteria and procedures. There appear to be up to four possible level of criteria involved in FSC-accredited certifications: (i) global principles and criteria; (ii) national forest management standards; (iii) the general criteria for selecting certifying organizations; and (iv) site-specific criteria developed by the certifier

for the field assessment. All the four sets have to be compatible with each other. According to some critics FSC standards are too demanding on environmental and social factors and weak on economic viability (Upton and Bass 1995).

### **Certification Schemes and Initiatives in the LAC Region**

As indicated earlier, certification programs are in their nascent stages. While estimates of the current number of certified managed forests vary, at least 17 independently-certified forests existed in June 1995 (Upton and Bass 1995). Seven of them were located in the LAC region covering a total area of 676 000 ha. (Box 7). The aggregate volume of wood affected by the schemes was estimated at less than 100 000 m<sup>3</sup>. This represents 0.1% of the regional production of industrial roundwood. The two driving forces in the LAC initiatives are (i) foreign and local NGOs subscribing to the FSC and receiving donor support, and (ii) industry initiatives as a counter measure to market pressures. There is a clear need for a coherent approach to ensure a wide impact and broad support from all stakeholders.

| <b>Box 7. Certified Forests in LAC Region (June 1995)</b> |                  |   |
|---|------------------|---|
| <b>Name</b>   | <b>Area (ha)</b> | <b>Wood production m<sup>3</sup>/year</b> |
| 1. Amcol Ltd. Portel, Para, Brazil                        | 50 000           | 25 000                                    |
| 2. Broadleaf Forest Development, Project, Honduras        | 25 000           | 1 650                                     |
| 3. Demerara Timber Ltd., Guyana                           | 500 000          | 39 000                                    |
| 4. Plan Piloto Forestal, Quintana Roo, Mexico             | 95 000           | 11 000                                    |
| 5. Portico S.A., Costa Rica                               | 5 000            | 7 700                                     |
| 6. Tropical American Tree Farms, Costa Rica               | 1 336            | --  |
| <b>Total</b>  | <b>676 336</b>   | <b>84 350</b>                             |

Sources: Upton and Bass 1995, Bianchi et al. 1993.

As part of the USAID-funded project on Bolivia Sustainable Forest Management (BOLFOP), a feasibility study was carried out in 1994 with a recommendation to embark on the development of a national certification scheme in the country. The target is to have 25% of all the Bolivia forests certifiable within seven years (Crossley 1995).

In Brazil in 1994, Sociedade Brasileira de Silvicultura

(SBS) started to develop a national scheme for certification, (see Box 8). Through an extensive process, the assessment criteria and a methodology for the certification process have been developed. CERFLOR has two supporting bodies and a secretariat. CERFLOR's main problem has been the limited NGO support it has received. Its credibility may also be challenged because of limited transparency and industry dominance.

Another scheme in Brazil has recently been initiated by the Instituto de Manejo e Certificação Florestal e Agrícola (IMAFLOA) as part of the Smart Wood network. IMAFLORA is apparently the first scheme intending to certify non-wood products, notably Brazil nuts and natural rubber.

In response to the certification used also in other countries, the FSC is laying the ground work for national certification programs in Peru, Ecuador, and Venezuela. Mexico is reportedly developing its own national certification program in conjunction with a non-governmental council (Consejo Civil Mexicano para la Silvicultura Sostenible) directed primarily at the domestic market (Crossley 1995). In addition, Central America has created the Regional Council on Forests and Protected Areas (CCB-AP) and the regional Chamber of Forest Industry which could support the creation of certification schemes in the subregion. Lastly, there is the Latin America Forest Network, comprised of 100 NGO members, which is trying to coordinate a region-wide, FSC-based certification system (Crossley 1995).

**Demand and Price Premiums for Labelled Products**

There are a number of comprehensive studies

underway to determine the demand for “green” forest products which undoubtedly varies by country and timber product. Varangis et al. (1995) concluded that in Europe and the US, 10-20% and 5-10%, of the respective markets for tropical timber are likely to be affected by certification. A team of specialists of the Economic Commission for Europe (1995) proposed two tentative scenarios for the market shares of certified forest products:

| Year | High     | Low      |
|------|----------|----------|
| 2000 | 40 - 50% | 10 - 20% |
| 2010 | 60 - 80% | 10 - 20% |

These scenarios imply different levels of demand and different objectives and implementation strategies for certification. The high scenario assumes that certification will become a basic requirement for market access. Institutional factors may also play an important role in demand. As an example, there is currently a Dutch legislative proposal allows only the imports of tropical forest products that are certified by FSC-accredited certifiers. At present in Europe, the demand for certified forest products cannot be met —constrained by limited certification capacity and reluctance of industry to participate in a program where the rules are not well defined.

## **Box 8. Brazilian Initiatives in Certification**

### **CERFLOR**

Since 1992, the Brazilian forestry sector had been developing a methodology for a certification program that would identify the origin of raw materials used by the forest industry of Brazil. This work resulted in CERFLOR (Certificate of Origin of Forest Raw Material). The CERFLOR regulations are based on the assumption of self-regulation transparency, adaptation to Brazilian conditions, non-discrimination, voluntary application, flexibility and compatibility with international standards.

There are five CERFLOR principles designed to cover planted and natural forests.

1. Care of biodiversity.
2. Sustainability of natural resources and their rational use in the short and long term.
3. Protection of water, soil and air.
4. Environmental protection combined with sustained economic and social development in areas affected by forestry activities.
5. Compliance with national legislation.

The principles and criteria have been developed to take account of regional variation in forestry. CERFLOR will grant the certificate only if there is compliance with all five principles and the related criteria.

### **IMAFLORA**

Recently, IMAFLORA, a Brazilian institute specializing in the eco-labelling of agricultural commodities, has ventured into the certification of forest products, in association with the Rainforest Alliance (USA). Its strategy is to develop criteria and indicators on a local basis, compatible with FSC principles and criteria. At present they are working on two projects: one related to the certification of wooden boxes in the Atlantic forest; and the other concerning Brazil nut and rubber production in the Amazon Basin. With the assistance of MSC, IMAFLORA intends next to develop criteria for the certification of plantations.

Sources: Dubois et al. 1995

In view of the export destinations of Latin American wood-based products and the demand pressures, the following trade flows could be vulnerable, or could benefit from improved market access through certification: (i) Brazilian mahogany and other tropical hardwood exports to the UK; (ii) exports of Brazilian and Chilean pulp and paper to sensitive European markets; and (iii) exports of further processed tropical hardwood-based furniture and joinery to the US and European markets. Exports of wood panels, mainly from Brazil, Chile and Argentina, and softwood lumber, mainly from Chile, are not assumed to be particularly sensitive.

The estimates of the green premium are still tentative and vary by product, country of destination, market and phase of the economic cycle. Industry should be cautioned not to count on excessive price benefits, particularly for roundwood until there is evidence to the contrary (Baharuddin-Simula 1994). If certification becomes a basic requirement in the market (high scenario above), the price differential is likely to disappear.

### **Costs and Net Benefits**

Certification is a policy instrument designed to promote sustainability of forest management and market access (Baharuddin-Simula, 1994). To make



the process work in practice all the various phases of the production and distribution chain should obtain net benefits. Experience on certification of forest products is still limited and the procedures are evolving. The situation does not yet lend itself to a rigorous economic analysis. This section is therefore exploratory, focusing on the identification of relevant issues and the possible benefits and costs involved (see Simula 1995b).

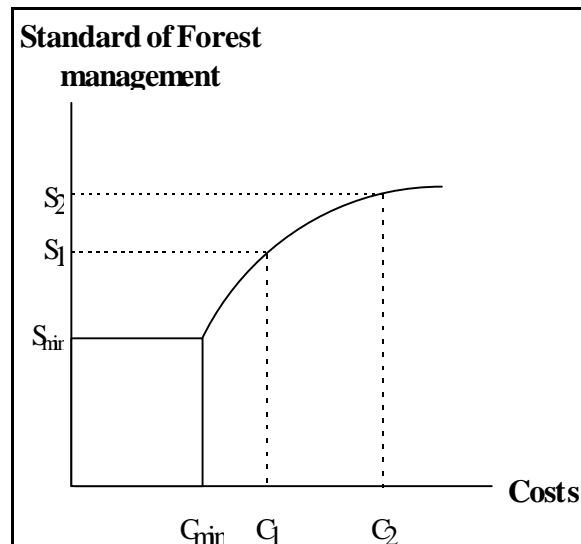
*Economic Issues Related to Certification Criteria and Indicators*

The criteria and indicators used in the assessment of forest management may be expressed in terms of standards that determine the costs of certification. From the economic point of view it is important that the criteria and indicators are goal-oriented and lead to efficiency in implementation. International standards for different types of forests are general by nature. Each country has its own conditions that should be considered when developing national-level criteria and indicators.

The incremental costs of “sustainable” forest management depend on the difference between the standards applied in assessment and the current status of forest management. It is important to distinguish between the certification standards and those defined in the laws and regulations of the country in question. Compliance costs for government laws and regulations are essentially unavoidable production costs. In contrast, certification is a voluntary activity for which the standards are generally set above those defined by the government. However, sustainability in the broad sense of economic and social benefits and maintenance of ecological functions has already been given political recognition by many LAC governments (cf. UNCED forest principles, ITTO guidelines of sustainable forest management). One can therefore predict that in the long run the government norms and certification criteria may converge, and incremental costs due to certification may gradually lose their importance. Nevertheless, in the short and medium term, the question of incremental costs remains.

Figure 1 shows how the marginal costs increase disproportionately compared to the incremental gains associated with meeting higher management standards. This hypothetical curve demonstrates how raising the level of criteria (e.g. from  $S_1$  to  $S_2$ ) may require proportionally a higher increase in costs (from  $C_1$  to  $C_2$ ).  $S_{min}$  should represent the minimum level of government standards while  $S_1$  and  $S_2$  are alternatives for certification standards.

**Figure 1. Marginal Costs of Applying Forest Management Standards**



If information on biodiversity is inadequate, one must take a precautionary approach to management. Especially in the LAC region, biodiversity is extensive and knowledge thereof is a limiting factor. The more information becomes available, the more closely-targeted criteria can be applied. This is likely to lead to lower input requirements and justify investment in biodiversity research.

If certification assessment criteria and indicators are set on the level of bio-geographic zones or other relevant regional units, they are likely to be economically more efficient than national-level or the broader-still international standards. This is due to the fact that such indicators can be based on specific local conditions and they can be related to specific objectives in biodiversity conservation or social development. Nevertheless, location-specific criteria

have to be compatible with the general set of forest management standards that provide a basis for national and international harmonization.

Another issue related to criteria is whether they should be prescriptive. There appears to be a strong preference for a flexible, non-prescriptive approach to promoting the continuous improvement of forest management operations without specifying permanent standards. From the economic point of view, this would mean that incremental costs are likely to change over time in response to assessment criteria.

**Costs Related to Certification of Forest Products**

*Direct costs* cover the actual certification operation and are paid to the certifying organization. *Indirect costs* of certification refer to covering incremental expenses of forest management, and foregone benefits from activities without certification.

*Direct costs*

Setting up certification schemes generally requires significant prior investments in the establishment of institutional framework (accreditation and certification), definition of criteria and indicators, human resource development, development of administrative procedures, etc. These costs can vary extensively depending on local conditions. The existing certification systems are self-financing and profit-seeking, operated by commercial certifiers.

*Direct Costs of Certification*

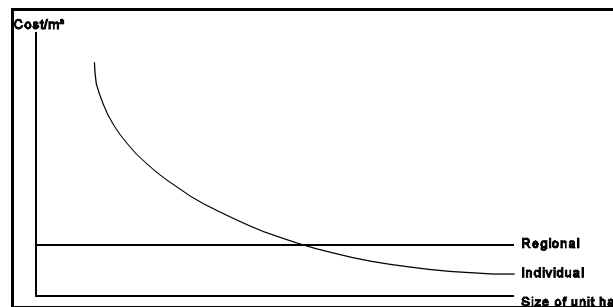
Reliable data on the direct costs of certification are limited and come from a small number of certifiers who have been willing to release such information, which is considered commercial confidential data. The current rates may not be representative for the future if certification becomes a major business activity subject to competition between certifiers. Pricing policies will also be influenced by long-term considerations, particularly if the same company provides services in both certification and consulting to assist clients in implementing the recommendations of the assessment exercises.

The costs of the certification inspection depend on the information available and the kind of team (number of persons, expatriate or local) involved. The existing certifiers are located in the US and the UK, and therefore the fielding of assessment teams outside these countries represents a major cost element. To eliminate this disadvantage at least one certifier, Rainforest Alliance (1993), relies on local specialists as much as possible. Another major factor having influencing the unit costs of inspection is the size of holding--which can be a major obstacle for small holdings. To reduce costs, these lands could be certified using sampling based on a regional unit, such as a cooperative, an association, a municipality or a district.

The theoretical unit cost functions are depicted in Figure 2. Heaton (1994) confirms the form of the assumed cost function in her areal estimates:

| <u>Estate size</u>       | <u>Unit cost US\$/ha</u> |
|--------------------------|--------------------------|
| - 5 000 ha               | 1.30                     |
| - 100 000 ha             | 0.24                     |
| - 600 000 ha             | 0.08                     |
| - several millions of ha | 0.01                     |

**Figure 2. Operational Costs of Certification and Forest Unit Size**



The following average figures on inspection costs are available:

Donovan (1994): US\$ 5,000-75,000/ assessment, depending on consultancy time and travel costs

|                          |  |
|--------------------------|--|
| Heaton (1994):           | US\$ 3,000-4,500/ full-cost assessment   |
| SGS Silviconsult (1994): | US\$ 31,000/annually for a large overseas operation (500,000 ha.)  |
| Upton and Bass (1995):   | US\$ 500 for a small farm near the assessor's office<br>US\$ 130,000 for a 100,000 ha. natural forest concession in the tropics over six years |

Soil Association charges 1% of sales value in large forest operations, but in smaller operations the annual fee varies from about US\$ 225 upwards per estate depending on the forest products sales value.

The current information on these costs may not be representative for the future if certification becomes a major activity. This is due to several factors: (i) there are few experienced certifiers in the world, and the areas and volumes have been more experimental than routine operations, for the most part; (ii) several issues still lack definition as many schemes are still in the planning or initial implementation phase; and (iii) competition between certifiers has not been a major factor influencing costs.

It is possible that future participation in certification schemes may be priced in the same way as the existing eco-labelling programs, which typically have application and annual fees supplemented by a royalty on the value of sales (with a possible ceiling).

#### *Incremental Costs of Forest Management*

The incremental costs (including foregone benefits) of forest management can generally be derived from five

different sources: (i) costs of planning and monitoring; (ii) additional silviculture and harvesting costs; (iii) lower yields and thus higher per-unit costs in harvesting areas; (iv) setting aside areas for protection; and (v) changes in the distribution of costs and benefits in time that alter the net present value of the investment. An accurate assessment of the above costs and foregone benefits would require analyses of current government regulations and the certification criteria applied. The difference between the two could then be attributed to the incremental costs of forest management due to certification.

The additional *costs of planning and monitoring* can be significant, particularly in the initial stage. The necessary activities typically include mapping, inventory, logging preparation, road and trail planning, sample plot establishment, post-harvest inventory, environmental impact studies, etc. In plantation forests, however, the costs are substantially lower. In any case, improved planning generally results in reduced operational costs.

*Silviculture and harvesting costs* increase when non-timber resources are managed for, but there are also savings associated with this type of management. Hendrison (1989) found that the costs did not increase substantially when controlled harvesting was introduced as part of the CELOS management system in Suriname. Nevertheless, in many cases existing market conditions do not provide short-term incentives for management of environmental quality and natural resources.

*Lower harvesting yield* per unit area in natural tropical forests may be due to "low impact logging" to reduce damage on the remaining vegetation. The short-term economic sacrifice could be partially compensated for by higher overall yields of timber in the long run and reduced damage of non-timber resources (Bach-Gram 1993).

The need for *protected areas* of key biotopes or landscape depend mostly on local conditions. The general rules for the amount of land allocated to non-productive use are subject to debate and range from 5 to 50% of the contract area. Among the existing

certifiers, Rainforest Alliance (1993) proposes that 10% of the total area under forest management (excluding stream and roadside buffers) be designated as a “conservation zone.” In Brazil the forest law requires that 20% of the plantation area be set aside as legal reserves of natural vegetation.

In their assessment of incremental forest management costs, Bach and Gram (1993) conclude that *changes in the timing of costs and benefits* associated with sustainable management can be an economic constraint, especially for low-income forest owners. Foregone benefits through alternative, non-certified management may be high in the initial years of sustainable forest management. The problem is aggravated by the fact that part of the additional costs come during the initial period. Longer time horizons required for sustainable forest management cause many managers to consider it a risky endeavor.

In conclusion, incremental costs are unavoidable in most situations where forest management is improved. The main reason is foregone initial benefits and longer investment periods. The prevailing levels of forest management, infrastructure, human resources and information systems vary extensively by country and forest owner, and thus the incremental costs also vary. It is not possible here to make estimates on the incremental costs of certification based on the available information, as the existing studies are not related to the achievement of specific standards.

### *Economic Benefits*

In the long run, improved management can be expected to result in higher yields for forest products. In the cost-benefit assessment the choice of the discount rate will generally have a decisive impact on the result. The marginal impact of certification on the yield will also depend on how national standards and certification criteria differ from one another. The marginal contribution of certification can again be expected to come from the fact that the improved management systems would be adopted by the sector faster when induced by certification.

A potentially important source of economic benefits is the possible elimination of trade intermediaries between producers and final consumers of forest products. While there are a number of reported cases on such examples, it is not yet possible to assess in broad terms the potential economic benefits of shortened distribution channels. In countries where illegal practices are common, the efficiency gains can also be expected from better control of wood flows through certification.

In conclusion, it is still too early to assess the effectiveness of certification in achieving its two main goals: improving forest management and market access. Certification will undoubtedly increase costs, but in many cases the true incremental costs may remain manageable. However, the costs will vary by countries and local conditions. There is a risk that the main benefits will be found in the market access and that the benefits for forest management alone will be marginal.

### **Possible Impacts of Certification on Trade and Production**

Due to the differing degrees of exposure to trade and dependence on environmentally sensitive markets, the impacts of certification on individual producing/exporting countries are likely to vary. This could influence trade flows and accelerate substitution of materials. The patterns in the consumption of forest products could also be influenced, e.g., plywood panels are substituted for solid wood panels as the price for the latter increases.

The possible impacts of certification on the production structure still remain to be duly addressed (Baharuddin-Simula 1994). It is apparent however, that small and medium-sized enterprises are poorly equipped for a certification-based market (Box 9). Of particular relevance is the question of how small forest owners can be effectively certified without excessive costs.

In some cases, eco-labelling in conjunction with technical assistance and other support measures could help establish a niche in the market for

environmentally friendly, non-wood products. Certification is not, however, a prerequisite for using environmental and developmental marketing strategies for non-wood forest products. Public interest in environmentally friendly markets has so far been minimal within the LAC region.

Certification of forest management will be applied as an instrument to provide necessary information on the environmental friendliness of forest products. Focusing only on forest production, however, may effectively penalise these products by favoring commercial substitutes that do not involve similar

consumption patterns. Certification of forest management is therefore only a partial solution and should be accompanied by a broad, integrated package of policy instruments to correct market and other imperfections.

Policy reforms are likely to have a greater impact on the sustainable development of forests than forest management certification and labelling. Of particular importance will be further development of international harmonization of forest sector policies with full support of all the involved stakeholders. Confrontation between parties may be an appropriate

#### **Box 9. Small Firms and Certification**

Small and medium-sized enterprises are expected to encounter particular difficulties complying with certification and eco-labelling requirements. Some of the reasons include:

- (a) lack of access to information, technology and capital;
- (b) economy-of-scale factors may render investments unprofitable;
- (c) inability to ensure that raw materials are actually coming from certified forests, if producers lack their own procurement organization;
- (d) lack of economic power to transfer criteria compliance costs to customers and suppliers;
- (e) the relative costs of verification, including plant inspection, may be higher than for large enterprises.

Source: Adapted from UNCTAD (1995d)

complexities in raw material supply. Therefore, certification assessments should occur at all levels of production in order to lead to sustainable

mechanism to spark reform, but it cannot form a basis for the systematic, comprehensive measures that are needed to improve forestry practices on a global scale.

# Directions for the Future

## Policy Support

Countries in Latin America and the Caribbean are experiencing difficulties in consolidating environmental and trade issues in their national policies. The multi-lateral processes have provided common goals and objectives, but implementation strategies have to come from within the countries themselves and the region. In spite of the significant progress made in policy development, notably through the Tropical Forest Action Programs, most countries are in need of capacity building in policy design. In addition, few countries have been able to effectively address the implications of international obligations and non-binding commitments in their national policies.

On the other hand, regional interests should be promoted in the implementation of multilateral environmental and other forest-related agreements. There has been inadequate coordination in this respect (e.g. *Swietenia - mahogany* listing in CITES). In spite of the sometimes conflicting national interests, regional and subregional consultations could assist in promoting consensus.

Trade in forest products in the LAC region is poorly researched, and the readily available data refer to primary wood products. Therefore, more study and analysis of the effects of trade liberalization on forest trade is needed, especially of non-wood forest products. The development of the non-wood exports is particularly constrained by lack of market transparency.

Improvement in forest management and more aggressive reforestation programs will require adequate policy framework for private sector investment. When important environmental externalities are present, incentives may be necessary to compensate for the lower rates of return associated with conservation forests (which are off-set by improvements in environmental quality). Under

certain conditions incentives could be provided in the form of subsidies, but there is a risk that such subsidies could become a trade issue. This could also influence negatively concessional financing of forest conservation through new emerging financing instruments. Any trade implications should be clarified before implementing new financial incentives for forest production.

National policies related to restricting and promoting trade in forest products are in need of review. Log export bans should be seriously reconsidered in view of their often negative environmental and developmental impacts.

The national LAC policies related to forests have sometimes contradictory goals and are often poorly implemented. Inconsistent enforcement leads to ineffectiveness and even negative impacts. Integrated policy design approaches should be promoted, and there is a particular need to introduce comprehensive policy packages that address relevant extra-sectoral issues affecting forests.

Multilateral lending institutions, international organizations and conventions, industrialized country development assistance and NGOs could work together to provide the following assistance to LAC country efforts in this field:

- (i) Support the trade liberalization process with adequate consideration of possible environmental impacts. National-level monitoring mechanisms should be devised to consider such impacts, as present arrangements do not emphasize environmental policy linkages. Further analysis on the environmental impacts of structural adjustment programs on forest management would be useful for the design of specific adjustment instruments.
- (ii) Improve and update trade data on forest products to facilitate policy design and export

development. Specific information is needed on: (a) direction of trade flows, (b) trade figures of processed industrial forest products, and (c) data on non-wood forest products with a particular emphasis on intra-regional trade. Data collection and processing could be arranged in cooperation with international organizations such as the FAO, ITTO, and UNCTAD.

- (iii) Expand national capacities for policy analysis, design and implementation. This would alleviate a fundamental bottleneck in the effectiveness and efficiency of public forest administration and would strengthen broad-based participatory processes.
- (iv) Support the design of comprehensive policy packages through case studies and workshops. Regional and sub-regional workshops on selected policy issues and specific initiatives would contribute to the transfer of knowledge and policy harmonization, particularly at a subregional level.
- (v) Give priority to the promotion of non-wood forest products and further processed wood products, emphasizing the environmental and developmental benefits to be obtained from their increased trade. Support the removal of unnecessary or harmful trade barriers such as log export bans. Make adequate provisions for transition periods to soften any short-term adverse impacts of such measures.
- (vii) Contribute to policy development and coordination in the LAC region by participating in regional and international policy processes, major policy-oriented conferences, seminars and workshops.

### **Development of Certification and Eco-labeling of Forest Products**

Certification of forest management and eco-labeling of forest products combine to form an instrument that can potentially promote forest conservation through trade, and increase financing by the private sector. Several fundamental issues related to these activities

still need definition. At present, certification is in its initial stage worldwide. In the LAC region, interest has been channeled through NGO-supported initiatives and emerging national schemes in response to external market pressures.

The demand for certified products is still limited and should be promoted to ensure marketability. In some cases certification has led to a price increase that compensates for the higher costs. Certification can also have negative impacts, especially on small-scale producers or communities that lack the resources for establishing the schemes and technical knowledge to implement additional, required forest management. Similarly, the lower costs of certification at large forest areas can inadvertently favor big producers, as well as substitute products. Finally, the problem of local capacity building needs to be addressed to enable the LAC countries themselves to implement their certification schemes in a cost-effective manner.

Strategies in this field could consist of the following elements:

- (i) When production is aimed at export markets, certification alternatives and requirements should be analyzed, and necessary measures to implement certification should be included for improving market access or the competitiveness of LAC producers. In addition, measures should be taken to promote a converging, amenable solution to standardizing certification. Such measures could include regional-level consultations and background studies to identify areas of conflict and common interest.
- (ii) Certification and eco-labelling schemes should be developed with the objective of equity, in mind to avoid possible adverse impacts on small-scale and community producers.
- (iii) Support the development of credible sub-regional and national certification schemes meeting the international harmonization requirements.
- (iv) Support the building of local capacity in: (a) meeting certification requirements of improved

- forest management by producers, and (b) establishing a pool of local certifiers through training and institutional development.
- (v) Study possibilities for providing financial support to national and sub-regional schemes in their initial phase of implementation, avoiding schemes that are not likely to be self-sustaining.
  - (vi) Improve awareness among the countries about the positive and negative aspects of forest management certification; this could be done by including the theme in publications, conferences, seminars and workshops on natural resources.
- (i) Correct policy failures through elimination of inappropriate instruments within and outside the forestry sector. To allow smooth transition without unnecessary adverse effects, actions may be phased in or out accordingly.
  - (ii) Perform detailed analyses on state-of-the-art financing of forest conservation, and mitigation of biodiversity and climate change, considering such instruments as joint venture trust funds, carbon offset deals, and biodiversity prospecting contracts for possible cofinancing arrangements.
  - (iii) In the preparation of forestry projects and programs with forestry related components, the following considerations should be included:
    - C mechanisms for trading forest environmental services at the global, sub-regional or local levels; as for the latter, such possibilities could be integrated, for example, in watershed management projects;
    - C studies of instruments that involve the private sector (both domestic and foreign) in financing forest conservation for commercial ends (e.g., eco-tourism);
    - C careful analysis of incentives for forest conservation, forest management and reforestation to minimize the possibility of such incentives becoming a trade issue.

### **Financing**

It is important to support the expansion of international trade of wood and non-wood forest products. Trade offers many under-utilized opportunities to contribute to development and environmental conservation in the forestry sector.

Emerging new financing instruments offer unexplored potential. These instruments are aimed at increasing the trade of the global environmental services offered by forests. The role of the private sector should be enhanced as it is recognized that public sector funding will fall far short of the financing needs of forestry development and conservation.

The forestry sector's capability for self-financing is significant, but the potential is far from being reached due to the undervaluation of forest resources. Underlying policy and market failures should be corrected. Financed projects need to meet both public and private sector decision-makers' assessment criteria and have the capacity for self-financing.

The following action could improve effectiveness and efficiency of financing strategies:

- (iv) Include in project budgets the inputs necessary for local capacity building and institutional strengthening to ensure policy implementation, and to build up the technical ability of private sector organisations necessary for the development of such instruments as national certification schemes.



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