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**Workshop:  
Forest  
Policies and  
Sustainable  
Development  
in the Amazon**

Rio de Janeiro  
Brazil  
14 - 16 July  
1997



# Workshop: Forest Policies and Sustainable Development in the Amazon

Rio de Janeiro - Brazil, 14 - 16 July, 1997



UNITED NATIONS DEVELOPMENT PROGRAMME



FUNDAÇÃO BRASILEIRA PARA O DESENVOLVIMENTO SUSTENTÁVEL



# Preface

There can be no question of the importance of the subject of this workshop. Forests have become a sustainable development issue of highest priority for many countries. The Amazon is the largest tropical forest covering almost five (5) million Km<sup>2</sup>, is home to seventeen (17) million people and harbors the greatest biological diversity on the planet.

Since the Earth Summit in Rio economic globalisation and a rapid increase in transnational corporate operations and investments as well as in the development and transfer of technology have transformed global demand for and markets and trade in forest products, especially timber.

Brazil has been a leader in the extensive international dialogue on all types of forests which has been carried out during the Earth Summit and since then within the Intergovernmental Panel on Forests (IPF). Brazil is expected to continue its active participation in the Intergovernmental Forum on Forests (IFF) during the next three years.

At present there is increased recognition of a close relationship between the national forest policy and international events. There is full realisation and acceptance in Brazil that sustainable development and conservation of its Amazon forest is a pivotal issue for the country. At the same time the international community has agreed upon a detailed programme of work towards sustainable forest management which is to be carried forward within each national situation.

Recognising this crucial point in time, the Brazilian Foundation for Sustainable Development, a civil society organisation, with the full backing of the Government of Brazil, conceptualised this workshop and requested UNDP to collaborate in co-sponsoring it. The idea was to assemble a diverse group of the most knowledgeable national and international experts representing the natural and social sciences, the private sector and civil society. The experts were asked to focus on economic, biological and institutional aspects of policies which affect forests in the Brazil Amazon and to formulate recommendations taking into consideration IPF's proposals for action, particularly those related to "national forest programmes", "the underlying causes of deforestation", "traditional forest knowledge" and "trade and environment".

Discussions of sustainable forest management anywhere, and particularly in the Amazon, involve sensitive issues where strong ideological positions exist. The Workshop discussions were open, wide-ranging and unrestricted. We believe that the participants developed some very useful and practical recommendations which can serve to advance the science and art of sustainable forest management in the Amazon. These recommendations are set out in the Report of the Working Groups and in the Executive Summary of the Workshop Results.

The Workshop was based on the premise that large areas of the Amazon can and should be dedicated to the protection of natural resources. The Government of Brazil has made an impressive start on this, and everyone involved realizes that great efforts and advances in building the capacity to manage protected areas are urgently needed.

In addition to a protected area system, sustainable forest management involving harvesting of timber and other products and services is appropriate over extensive areas. There is however a great deal to be done to reach this goal. Following the right steps could place Brazil in a leadership position in this crucial area of sustainable development.

The ingenuity and efficiency of the private sector will be required to manage such operations. The government must be involved to protect public benefits and services and to ensure that local communities including indigenous people receive equitable benefits. This will require new kinds of public-private partnerships that need to be piloted and replicated.

An equally significant challenge will be to develop viable ways so that all those who benefit from the ecological services of the Amazon can contribute equitably for its sustainable management. The harsh reality is that existing market forces will lead the local user to liquidate the resource. The paltry benefits this provides are minimal compared to the full value of the forest. This is an urgent agenda for the international community.

Any event, project or meeting on an issue as complex and intractable as this one can only make a small contribution toward progress to sustainable development. The Brazilian Foundation for Sustainable Development and UNDP will continue to collaborate with the Brazil Government on the work that must go forward from here, especially the great need for capacity building in many sectors and at several levels.

***Israel Klabin***

President  
Brazilian Foundation  
for Sustainable Development

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# Executive Summary

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## 1. Introduction

### 1.1 Aspects of the Problem

Since most of the African forests are extinct and the remaining rain forests are seriously endangered by the large contingents of populations seeking new land for settlement, the abundant African tropical rain forests of yesterday have now only a small share in the international timber market.

In recent decades, Southeast Asia has played the role of supplier to the world tropical hardwood market, adopting an exploitation policy which has led to the exhaustion of its forest reserves and seriously endangering this region with such megabiodiversity. After depleting their own forest reserves, the exporting and importing countries of Southeast Asia adopted a policy to boycott the predatory exploitation of the forests in that region.

The constant demand for timber on the international market forced the countries operating in that part of the world to seek new sources of raw material and the target moved to the Amazon. Over the past few months, the Brazilian press has had headlines on the increased presence of international timber companies in the Amazon. Independent research institutes have shown that the onslaught on the Amazon has already started via Surinam and Guyana.

The international tropical hardwood market is not the predominant reason for deforestation. There are only a few species which are marketed but the exploitation itself and opening up of roads to allochthonous populations are the main reason for the impact on forest degradation. Brazil does not yet have an institutional public policy framework which can stand against the mass destruction associated with this heavily predatory industry. The Amazon rain forest, the last large forested area on the planet, has never been so endangered as at this moment.

The Amazon forest sector has only a tiny share in the international timber market and domestic economy, but contributes significantly at a regional level. This economic importance confronts the fact that forest harvesting in the region occurs on a predatory basis; activity which repeats the history of the Atlantic rain forest exploitation, as all Brazilians know too well.

The predatory use of forest resources has various reasons, among which are included: not enough public areas for sustainable forest production, distorted policies (transport, energy, farming, etc.), lack of loan incentives to the sector, deficient forest monitoring, low timber value due to the abundance of stockpiling and low economic and social return for the local populations in the use of such resources.

In order to draw up a new development model according to the international agreements signed at UNCED 92, environmental preservation and economic success must go together.



## 2. General Principles Conclusions And Recommendations

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As a general principle of this seminar, much emphasis was given to the Amazon forest's representing an environmental priority for Brazil and the rest of the planet. A suitable strategy must be drawn up for the use of the region's natural resources, at two fundamental levels, in order to be feasible:

- Design for use of timber potential
- Associate this use with sustainability criteria.

With regard to defining public policies, the aspects which were discussed during the debates and which require close co-operation from the government and civil society as a whole in order to help bring them about, are:

- The region's need for sustainable economic development, adopting the criteria defined by economic-ecological zoning.
- The inclusion of other economic sectors, that is, industry, sustainable farming, mining and any activity which can increase the local income, distributing it properly to benefit the region and, consequently, provide socio-economic alternatives to preserve the forest resources.

The overall recommendation of the seminar is:

- carry out a socio-economic and ecological zoning on proper scales. This zoning will be the basis for locating areas to implement Sustainable Forest Management.
- install technologically advanced monitoring systems which provide real time data to the overseeing institutions.
- implement a transparent and independent monitoring of public and private activities as a fundamental tool for democratising the supervision system. The objective is to involve civil society as a major partner in this supervision, in order to help society, in practice, to be taught and participate in understanding the concepts of sustainability.
- create a set of simple rules in order to control the timber trade.
- create clear and consistent principles (for all parties) to guide the negotiations for agreements between public and private institutions.
- include in the forest management agreements NTFP - no timber forest products and also eco-tourism.
- grant certificates to Sustainable Forest Management operations as a potential tool for

its adoption. Independent assessments of resources and operations must be made.

- integrate the forest policy with other sectors (joining intersectoral policy).
- transparency in operations and decisions.
- create a program for capacity building at federal, state and community levels aiming at implementing appropriate sustainable development projects.
- introduce the variable – environmental services – when formulating a sustainable development strategy for the Amazon. The most important environmental services provided by the forest in relation to the balanced regional and global climate are the maintenance of water cycles, carbon retention, soil conservation and biodiversity.
- implement environmental accounting to add the high value of the forest's environmental services.
- extend the international cooperation to enhance the capacity building and develop new markets for forest services.

It was evident that the institutional and juridical-legal instruments to ensure successful sustainable forest management are inadequate. The recommended priorities are:

The seminar delegates made comments that:

- with regard to fair and proper compensation systems, the climate and biodiversity agreements approved express articles containing the plan for mechanisms which add value to the environmental services. Approval of such mechanisms has encouraged Brazil, and other tropical rain forest countries, to expect incoming foreign funds which are required to implement sustainable development. It is worth mentioning that what has been established in the Agreements is guaranteed as an International Treaty by the signatory countries.
- There is the need for a strategic sustainable development project in the deforested and already degraded areas in the southern Amazon basin, spreading as far as the *cerrado*, for which the government would find foreign public and private funds.
- The clearest policy imperative is to continue to reduce and eliminate public subsidies for unsustainable development.

Where ecological economic zoning defines a land use as unsustainable, government programmes should not promote it. Publicly funded road building can represent such a subsidy.

- Land ownership and markets have a fundamental influence over forest management. Where land ownership is unclear, as it is in many areas of the Brazil Amazon, there is a strong disincentive to sustain forest (or any other) resources. There is still a strong tendency to more easily recognise title on land that has been cleared. (See section on law and institutions for more on this).

- Due to technology developments the international timber trade is becoming more of a commodity trade, demanding an increasingly high number of species (instead of the very specialised traditional market concentrating on very few species). This could drastically alter harvesting in the Amazon toward clear cutting; the Government must monitor and control this situation with great care. It can be noted however that if there is a deliberate land conversion policy, then clear cutting is a rational use of forest resources on those sites.



### 3. Work Group Conclusions

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#### 3.1. Group 1 Conclusions: Economic Aspects Of The Forest Issue

International investment in tropical logging is shifting toward Latin America, after several decades during which Southeast Asian countries like Malaysia, Indonesia and the Philippines attracted the bulk of investment and produced an overwhelming share of the tropical timber entering international markets. This is a historic shift, analogous to the shift from West Africa to Southeast Asia after World War II. It is driven by the same two factors. The first is the depletion of readily available, low-cost supplies of old-growth timber in the currently dominant region (Southeast Asia today, West Africa after World War II). This has induced the logging industry to look for the next cheapest source of tropical timber, which turns out to be the forests of Latin America. The second factor is technological developments that have generated uses for trees of previously unmarketable species and size classes. After World War II, the key development was technology for making low-cost plywood from Southeast Asian dipterocarps. Today, the key development is milling technologies that permit the use of small-diameter logs in making solid-wood products and mixed species in making fibre products.

While the first factor may be viewed as increasing logging pressure in Latin America on an extensive scale (the area logged), the second increases the intensity of logging (the volume of timber extracted per hectare). Together, the two factors signal an increasing commoditisation of the Latin American logging industry. The industry will continue to shift from selective extraction of large trees of a few, high-value species (notably, mahogany) toward heavier harvesting of a broader range of species with end uses in construction and other utility purposes. This represents a shift from a quality orientation to a quantity orientation.

The increase in logging activity in Latin America is unlikely to be accompanied by sub-

stantially higher international log prices. There is simply not much evidence that projected global demands for timber will outstrip prospective supplies and put significant upward pressure on prices. Forest areas and timber stocks in temperate countries dominate the global timber economy and they are stable or rising. Moreover, logs from natural forests face competition from plantation timber and a variety of nonwood substitutes. The emerging international market opportunity facing Latin America is therefore one of a gradually rising share of the tropical timber trade as production in Southeast Asia declines, with international log prices remaining approximately constant in inflation-adjusted terms. It will not be a bonanza of rapidly rising prices stemming from the inability of the world to cope with mounting tropical timber scarcity.

The long-run stability of international log prices does not mean, however, that the timber value of Latin American forests

will not rise. It will, as the prices of species that previously were not exported rise from their current levels in the domestic market toward prevailing international prices. Log prices will also rise for species that are not exported. In recent years, most countries in Latin America have abandoned their statist orientation and liberalised their economies. Market reforms have already raised economic growth rates dramatically in several countries. This growth can be expected to raise domestic demand for wood and thus put upward pressure on domestic prices.

In combination with the increased intensity of logging, higher prices for exported and domestic logs will cause the aggregate stumpage value – logging revenue minus logging cost – of accessible forests to rise significantly. Stumpage values to the order of US\$ 10,000-20,000 per hectare are today not uncommon in mature tropical logging regions like Malaysia. This is apparently 1-2 orders of magnitude larger than current stumpage values in Latin American forests.

**Rather than sustainable development, tropical logging has tended to be associated with boom-and-bust development, in many cases leaving impoverished societies and degraded forests in its wake.**

Superficially, the rising stumpage value of Latin American forests would seem to bode well for both economic development and conservation. Logging will generate greater revenue for the government and greater profits for industry, which can be used to finance higher levels of public and private investments in support of development objectives. The rising value also means that forests should be better able to outcompete alternative land uses (particularly agriculture) and that investments in forest management should be financially more viable.

Unfortunately, experience in regions that have preceded Latin America as the new frontier of tropical logging indicates that these positive outcomes have historically been more the exception than the rule. Rather than sustainable development, tropical logging has tended to be associated with boom-and-bust development, in many cases leaving impoverished societies and degraded forests in its wake. The reasons include a variety of market and policy failures, which are discussed in detail in numerous books and reports.

**With reference to commercial and industrial policies**, the delegates suggest the following as fields for defining public policies:

- Increase in research, development and training investments, especially to technically and commercially facilitate the exploitation of a larger number of species. Since these investments are of a public nature, they depend on government or private initiatives and funding;
- Creation of incentives for secondary timber processing activities in the region. They shall be performed using suitable instruments to minimise the degradation of forest resources;
- Imposing commercial restrictions on exporting untreated products tends to be inefficient because of the importance of the home market and the resulting monitoring and supervising difficulties;
- Foreign capital policies shall be proactive and not restrictive since foreign capital may come to play a major role in the scale-up by introducing the foreign markets' own new extraction technologies. To prevent profit spread and loss of regional added value, a tax policy is required to encourage industrial verticalisation.
- Transportation policies shall be adopted with caution, since opening up highways is known to be one of the main causes of

the deforestation process. Thus, highway investment shall be consistent with preservation objectives and must, therefore, be adapted to and facilitate ecological zoning and forest concession policies.

### ***3.2. Group 2 Conclusions - Techno-scientific Aspects Of Forest Management***

On the basis of theoretical ideas and the support principally of the results of experimental projects undertaken in the Amazon, the seminar delegates strongly maintain that:

#### **Sustainable Management of the Amazon rain forest is possible since:**

- the forest which survives forest exploitation responds positively to the reduction in its original density;
- it is possible to advise on tree-cutting and control the size of the clearing and, consequently, the micro-climatic conditions;
- it is possible to identify the species which require vital nutrients for their growth and development, by forest succession control;
- the diameter increase of managed trees is double that of virgin forest;
- it is possible to increase the volume of commercial species by using appropriate forestry methods;
- managed forest accumulates more carbon than virgin forest.

The delegates also suggest the following as areas for defining public policies, without which management programmes would be seriously prejudiced with regard to their sustainability:

- Establish general guidelines, criteria and sustainability indicators of forest management for the Amazon.
- Review and update the supervision system, including personnel training, independent in-house audit, access to new equipment, technologies and methodologies.
- Guarantee forest research funding, on competitive bases (invitations to bid), along the lines defined by the scientific community, public authorities and productive sector.
- Encourage integrated and co-operative co-ordination among the institutions which work with environmental monitoring using remote sensing.
- Organise advanced forestry courses, including personnel training at all levels, preparing educational material on forest

management and support for demonstration projects (industry, government, and teaching and research institutions).

- Recover any existing information on forest management and basic and applied research considered as a pre-requisite for management.
- Co-ordinate with SIVAM/SIPAM - Amazonian Survey System - to access monitoring data.

### **3.3. Group 3 Conclusions - Institutional Aspects And Concessions**

First, this group identified two guidelines for formulating policies as orientation for the debates on this subject:

- The increase and consolidation of public forest areas (federal, state, municipal) for timber production, and goods and services unrelated to timber.
- The organisation of SFM (Sustainable Foreign Management) in the Amazon as a key item in the region's sustainable development.

#### **■ Land Ownership and SFM**

The group spent considerable time on the question of land ownership, as well as on economic matters. Land ownership is in a chaotic state in many areas of the Amazon, and this leads to several negative and serious consequences for SFM. The fundamental points in the relationship between the land ownership and management question are as follows<sup>4</sup>:

- in cases where land ownership is uncertain, individuals and companies find it hard to make long term investments in forests and have little or no incentive to maintain or protect the resources;
- the primary requirement to legalise SFM is the land ownership deed;
- where land ownership is uncertain, governments do not, then, have solid ground to negotiate agreements with private organisations for forest management;
- uncertain land ownership leads to deforestation without any economic objectives whatsoever, other than that of claiming ownership;
- uncertain land ownership causes generalised conflict and an out-law system, and encourages criminal activity;
- institutional debility and uncertainties regarding land ownership and use, the pro-

posed solution for which is a policy of land concessions based on the previous ecological zoning of the region, whose basic features would be:

- long term contracts;
- availability of large areas;
- management restrictions and minimised government monitoring;
- contracts with agents whose responsibility and legal guarantees are clearly defined;
- clear definition of penalties and commercial law courts;
- transparency in rules for bidding;
- agreement with the adopted transportation policy;
- need to create an agency primarily focusing on forest management either within or outside IBAMA's - Brazilian Environment Agency - scope.

Also on the question of land ownership and SFM, the group emphasised the difficulty in reaching SFM in unregulated private land. This is closely related to the work of the Group on Economic Aspects of the Forest Question, which assumes that, from the strictly economic viewpoint, without taking into account external factors, it is currently more profitable to liquidate the forest resources than manage them and conserve them for extraction in the distant future.

This underlies the principle, recommended by the seminar, that public land should be extended to being used as productive forests.

Partnerships could, then, be formed between the public and private sectors, based on forest management agreements aiming at SFM.

It is also acknowledged that the Brazilian government has substantial powers to regulate private forested land. Although SFM on unregulated private land has been considered a difficult task, there may be cases in the future in which a large private property can make agreements with the government, based on approved management plans which may result in SFM. (See, however, the discussion in the economic section on payment for forest services in benefit of the public.)

#### **■ Land Ownership and Economic-Ecological Zoning**

A lot of work has been done on ecological-economic zoning in the Brazilian Amazon. Nevertheless, this is a very complex area and requires an increasing understanding of the

ecosystems and human ecology in the Amazon. A major research programme must be undertaken.

Land use zoning is not only a technical exercise. There may be overlapping and conflicting issues. These conflicting issues may be supported by different groups of interests. A land use zoning programme needs to include conflict solving and mediation mechanisms.

The spread of the public forest land will require the basis of knowledge of an ecological-economic land use zoning plan. Based on an SIG, this would identify future areas of sustainable farming potential; it would identify the most important areas for biodiversity or watershed preservation; it would consider the protected indigenous reserves and identify any new appropriate areas; it would identify potential mining areas; it would identify forest management areas for various management levels, such as tourism, non-timber extractivism and timber production.

### ■ Legal and Institutional Aspects of Land Ownership and SFM

To organise its discussion on legal and institutional issues, the group created an operating matrix. For each field indicated, the group pointed out areas where state mediation is necessary to create public policies.

#### *Public Forest Land*

Public Forest Land is the most promising in achieving sustainable management of natural forests.

- a) Public/Legal
  - Development of a legal structure for forest management agreement policy (concessions).
  - Seeking authority for long term contracts (with performance-based annual renewal or rescission).
- b) Public/Economic Policy
  - Development of forest management agreement models for timber and non-tim-

ber products.

- Establishing monitoring procedures by government (federal and state) and non-government organisations.
- c) Public/Institutional
  - Decentralised administration at state and community levels.
  - Setting up dynamic institutional capacity building programmes at federal, state, municipal and community grass root levels.
  - Independent monitoring, transparent and accessible to groups of interests. (May provide a basis for future certificate concession to forest products.)

#### *Private Forest Land*

- d) Private/Legal
  - Clarify land possession in order to remove uncertainties and clearly define land which can be used for the public forest system.
  - Define and adopt SFM criteria and indicators.
  - Simplify and streamline the regulations on forest management for private land owners.
- e) Private/Economic Policy
  - Regulate extraction (quantity of trees per ha; interval between cutting cycles; width of fire prevention corridors).
  - Implement SFM-supportive tax provisions (for instance, territorial tax - ITR).
  - Include local communities in the monitoring systems.
  - Grant medium-size subsidies to anyone interested in developing non-profit community management systems.
- f) Private/Institutional (see Appendix II: Private Land Implementation Plan)
  - Develop a partnership between public and private organisations to evaluate the forest resources.
  - Set up financial lending mechanisms (low interest for approved SFM operators).
  - Set up partnerships between public and private organisations for SFM on large scale private properties.

### Structure for Legal and Institutional Considerations

LAND OWNERSHIP	ISSUES		
	Legal	Economic Policy	Institutional
Public	1*	2	3
Private	4	5	6
Indigenous & Community	7	8	9

\* the figures listed in these columns correspond to the numbers of the following sub-items.

Grant subsidies and other support for community-based SFM.

#### *Indigenous and Community Land*

- g) Indigenous-Community/Legal
- Clarify the legal structure to make it compatible with SFM.
  - Clarify the communal ownership system by developing innovative mechanisms.
- h) Indigenous-Community/Economic Policy
- Undertake government supervision on land use and forest extraction practices.
  - Develop a policy to create jobs in SFM for the poor rural population.
  - Draw up a policy to use public forest revenue in benefit of the community, such as schools and medical clinics.
- i) Indigenous-Community/Institutional
- Strengthen the capacity to assess procedures, negotiate agreements and manage forest resources.
  - Ensure full participation of the indigenous peoples.
  - Reinforce co-operation between FUNAI - Brazilian Agency for Native Americans and IBAMA - Brazilian Environmental Agency.
  - Develop intensive work programmes for fibre production and charcoal stockpiling in degraded land where there are signs of a competitive edge.

#### ■ General Principles For Creating A Public Concession Policy

The term “Forest Concession” may have the unfortunate connotation of assigning public resources or referring to non-renewable re-

sources. The group suggested the term “forest management agreement” to emphasise that this must be an agreement in which the government needs to retain substantial control and ongoing responsibility.

#### **The “concessions” may be for timber or non-timber products or for ecotourism.**

- Establish standards for environmental/ecological projections and sustainable development.
- Tax project which gives the government a fair value for its timber and other resources.
- Conceive agreements where there may be as much self-imposition as possible to reduce the administration bureaucracy in government departments.
- Include insurance-performance and penalties to ensure compliance of contracts.
- Periodical reports and assessments regarding company performance.
- Monitoring committee involving local communities.
- Transfer regulations – only with government permission.
- Technical assistance to local communities.
- Define the size (and time) of agreement concession with growth and increase in the managed Amazon rain forest.
- Establish different concessions for different Amazon ecosystems.
- Consider the unusable tree species.
- Assess the regulation process of timber exploitation.
- Stipulate limits on use of forest property.
- Link transfer of concession to forest certification.



#### Notes

- 1 Coordinator For External Affairs - Fundação Brasileira para o Desenvolvimento Sustentável (Brazil)
- 2 Forest Capacity Programme Advisor - SEED/BPPS - United Nations Development Programme (USA)
- 3 Technical Director - Fundação Brasileira para o Desenvolvimento Sustentável (Brazil)
- 4 The group is aware that they had not been invited because of their specialised knowledge on matters of land ownership and possession, but does recognise the vital importance of such matters. This may be an area for follow-up work.

# Economic Considerations Pertaining to the Expansion of Logging in the Amazon

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*Jeffrey R. Vincent*<sup>1</sup>

## *1. Background: changing conditions in international and domestic markets*

International investment in tropical logging is shifting toward Latin America, after several decades during which Southeast Asian countries like Malaysia, Indonesia, and the Philippines attracted the bulk of investment and produced an overwhelming share of the tropical timber entering international markets. This is a historic shift, analogous to the shift from West Africa to Southeast Asia after World War II (Laarman 1988). It is driven by the same two factors. The first is the depletion of readily available, low-cost supplies of old-growth timber in the currently dominant region (Southeast Asia today, West Africa after World War II). This has induced the logging industry to look for the next cheapest source of tropical timber, which turns out to be the forests of Latin America. The second factor is technological developments that have generated uses for trees of previously unmarketable species and size classes. After World War II, the key development was technology for making low-cost plywood from Southeast Asian dipterocarps. Today, the key development is milling technologies that permit the use of small-diameter logs in making solid-wood products and mixed species in making fiber products.

While the first factor may be viewed as increasing logging pressure in Latin America on an extensive scale (the area logged), the second increases the intensity of logging (the volume of timber extracted per hectare). Together, the two factors signal an increasing commoditization of the Latin American logging industry. The industry will continue to shift from selective extraction of large trees of a few, high-value species (notably, mahogany) toward heavier harvesting of a broader range of species with end uses in construction and other utility purposes. This represents a shift from a quality orientation to a quantity orientation.

The increase in logging activity in Latin America is unlikely to be accompanied by substantially higher international log prices. There is simply not much evidence that projected global demands for timber will outstrip prospective supplies and put significant upward pressure on prices (Sedjo and Lyon 1990, FAO 1997a). Forest areas and timber stocks in temperate countries dominate the global timber economy, and they are stable or rising (FAO 1997b). Moreover, logs from natural forests face competition from plantation timber and a variety of nonwood substitutes.

The emerging international market opportunity facing Latin America is therefore one of a gradually rising share of the tropical timber trade as production in Southeast Asia declines, with international log prices remaining approximately constant in inflation-adjusted terms. It will not

be a bonanza of rapidly rising prices stemming from the inability of the world to cope with mounting tropical timber scarcity.

The long-run stability of international log prices does not mean, however, that the timber value of Latin American forests will not rise. It will, as the prices of species that become exportable rise from their currently lower levels in the domestic market toward prevailing international prices. Log prices will also rise for species that are not exported. In recent years, most countries in Latin America have abandoned their statist orientation and liberalized their economies. Market reforms have already raised economic growth rates dramatically in several countries. This growth can be expected to raise domestic demand for wood and thus put upward pressure on domestic log prices.

In combination with the increased intensity of logging, higher prices for exported and domestic logs will cause the aggregate stumpage value – logging revenue minus logging cost – of accessible forests to rise significantly. Stumpage values on the order of US\$10,000-20,000 per hectare are today not uncommon in mature tropical logging regions like Malaysia.<sup>2</sup> This is apparently 1-2 orders of magnitude larger than current stumpage values in Latin American forests.

Superficially, the rising stumpage value of Latin American forests would seem to bode well for both economic development and conservation. It means that logging will generate greater revenue for the government and greater profits for industry, which can be used to finance higher levels of public and private investments in support of development objectives. It also means that forests should be bet-

ter able to outcompete alternative land uses, particularly agriculture, and that investments in forest management should be financially more viable.

Unfortunately, experience in regions that have preceded Latin America at the frontier of tropical logging indicates that these positive outcomes have historically been more the exception than the rule. Rather than sustainable development, tropical logging has tended to be associated with boom-and-bust development (Vincent 1992b). In many cases, it has left impoverished societies and degraded forests in its wake. The reasons include a variety of market and policy failures, which have been discussed in detail in numerous books and reports (see especially Repetto and Gillis 1988).

My purpose here is not to review this literature, but rather to highlight four policy objectives that Brazilian decisionmakers should focus

**My purpose here is not to review this literature, but rather to highlight four policy objectives that Brazilian decisionmakers should focus on to increase the chances that Brazil as a nation, and not just the Brazilian forestry industry...**

on to increase the chances that Brazil as a nation, and not just the Brazilian forestry industry, will reap long-run benefits from increased logging in the Amazon. I take as given that logging will indeed increase in the Amazon, without passing judgment on the desirability or undesirability of that development. The

policy recommendations in this paper are intentionally at a rather general level. My aim is the “big picture,” which often gets lost in forestry policy discussions due to the complexity of forest resources and the diverse array of demands placed on them. Moreover, Gray (1997) has already covered many of the “micro” issues related to timber pricing and timber concession agreements that this paper might otherwise have addressed.



## 2. *First objective:* *pursue sound economic policies outside the forest sector*

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Tropical deforestation is not an unprecedented phenomenon. Large-scale deforestation occurred at rapid rates during the pre-industrial era in most countries that are currently considered developed. In many cases, the conversion of forests to alternative uses makes economic sense: the benefits outweigh the costs, even after factoring in nonmarket environmental benefits and costs (e.g., watershed protection, carbon sequestration, biodiversity protection, etc.). When land allocation is determined solely by market decisions, however – which appears to be the case in the Amazon today – typically too much forest is converted. There are two reasons for this. The first is that land markets typically ignore some or all of the environmental benefits of forests. The benefits have social value, but they are externalities from the point of view of buyers and sellers in land markets. That is, they do not affect private returns from use of the land.

The second reason is that policies in many countries favor forest conversion, through the provision of various subsidies and other incentives. This exacerbates market failures related to the first reason. The case of tax breaks and subsidized rural credit for ranching in the Amazon is well-known (Browder 1988, Mahar 1989, Binswanger 1991). Although the Brazilian government has apparently reduced ranching subsidies, other explicit and implicit subsidies favoring agriculture probably still exist, as they do in virtually every country. Removing these subsidies is a first step toward ensuring that increased logging in the Amazon does not stimulate excessive deforestation as logging roads improve access to currently remote areas. It also makes sense economically: subsidies impose costs on the overall economy, in the form of inefficient use of available labor and capital resources, that typically exceed the benefits reaped by the favored industries. Economic reform programs typically involve the politically difficult task of removing or reducing such subsidies. In this way, the pursuit of good economic policies outside the forest sector is a key ingredient in minimizing deforestation.

Good economic policies contribute in another way as well. Developed countries have succeeded in stabilizing their forest areas not so much because they have established forest reserves that they have zealously and successfully protected from encroachment, but rather because they have developed their economies and thereby generated off-farm sources of employment for the rural population. Successful economic diversification into manufacturing and services siphons labor out of agriculture and thus reduces pressures to encroach on forestland. For example, much of the public forest area in the United States consists of “lands that nobody wanted”: although it might have been physically capable of supporting some form of agricultural use,<sup>3</sup> the cost of converting the land exceeded the prospective returns from the standpoint of private individuals and companies. They preferred to invest their time and resources in other economic pursuits.

U.S. evidence indicates that economic development can do more than simply slow the rate of agricultural expansion. It can actually reverse it. Forestry is less labor-intensive than agriculture and thus is favored, in relative terms, by rising labor costs. Much of the private forest area in the U.S. consists of lands that were formerly in agriculture but went out of production as industrialization and urbanization drove up the cost of rural labor (Clawson 1979). A similar process of a receding agricultural frontier can be observed today in some of the most rapidly industrializing developing countries, such as Malaysia (Vincent, Rozali, and Associates 1997).

The Brazilian government should therefore carefully examine policies in sectors that might compete with forests for use of land in the Amazon, to ensure that those policies do not discriminate in favor of nonforest sectors. It should also continue to pursue economic reforms that liberalize the economy and promote sustained economic growth. These actions on their own are not sufficient for ensuring the proper level of forest protection, but they are essential preconditions. They help ensure that the sector-specific policies described in the next three sections will succeed.



### 3. *Second objective: clarify and strengthen forest property rights*

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The conversion of agricultural lands back to forests as the U.S. developed was due not only to rising labor costs, but also to rising stumpage values. The latter reflected depletion of old-growth timber stocks, a process that is in its final stages today.<sup>4</sup> Available historical evidence indicates that stumpage markets were quite efficient in signaling rising scarcity even in frontier areas during the 19<sup>th</sup> century (Johnson and Libecap 1980). In response to rising stumpage values, private forest owners in the U.S. not only expanded the area under their control but also intensified their management of those lands. Similar adjustments have occurred on private forestlands in Western Europe and Japan during this century.

On the surface, two characteristics of Amazonian forestry suggest that similar market-driven adjustments might occur there. First, although precise estimates are difficult to obtain, much of the forestland in the Amazon is under some form of private ownership. Second, and as noted at the beginning of this paper, stump-

age values are likely to rise in the Amazon. Unfortunately, a key ingredient is missing in the Amazon: clear and secure forest property rights. Many land claims in the Amazon are vaguely defined or overlapping. They are not backed up by legally enforceable land titles. Such weak property rights discourage investors from making the types of investments in forest management that have occurred on private lands in temperate developed countries during this century.

By clarifying and strengthening forest property rights, the Brazilian government can boost private forest owners' incentive to keep their lands in forestry on a permanent basis. This is obviously more easily said than done. It is difficult to imagine a more politically charged issue in Latin America than land reform. In the absence of such reform, however, many forests under the control of private parties will be converted inappropriately to agriculture, harvested too rapidly, or left unmanaged after logging.



#### 4. *Third objective:* *zone public forests for dominant uses*

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The Brazilian government recently announced plans to open 2.2 million hectares of public forests in the Amazon for logging (Schemo 1997). This marks the first time that logging has been allowed on public lands in the Amazon. Many environmentalists have criticized the decision on the grounds that it will accelerate losses of important nontimber values, both through the direct impacts of logging and indirectly through improved access provided by logging roads.

That forests provide multiple values is widely recognized both inside and outside Brazil. One way to provide those values is through multiple-use forestry: stand-level management aimed at producing the optimal mix of timber and nontimber values.<sup>5</sup> This is the approach that is presented in most forestry textbooks (e.g., Pearse 1990). It is consistent with so-called “new forestry” (Franklin 1989) and with many definitions of sustainable forestry. It assumes that the best way to manage tradeoffs between timber and nontimber values, and thereby ensure that the forest generates the greatest possible contribution to society, is through modification of stand-level forest management practices. For example, rotations might be lengthened and logging intensity reduced in order to reduce the negative impacts of logging on nontimber values.

The alternative approach is dominant-use management: zoning the forest estate into areas managed more or less exclusively for single uses. Under this approach, the forest estate generates both timber and nontimber values, but individual stands do not necessarily, except perhaps incidentally. The key step in dominant-use management is the allocation of stands among alternative uses. Some stands are managed intensively for timber production, without altering the management regime significantly to take into account nontimber values. By and large, those values enter timber management decisions only insofar as they

influence timber production. Nontimber values are the focus of management activities in other stands, typically ones with steep slopes prone to erosion, with unique habitat, or with other environmentally sensitive features.

Neither approach is economically superior in all forest types. The choice approach is an empirical matter, which depends on administrative and ecological considerations. In the Amazon, I would wager that further analysis would reveal dominant use to be superior to multiple use for both administrative and ecological reasons. Dominant-use management tends to be simpler to implement and administer, because it involves fewer objectives at the

operational level (the stand). In areas zoned for timber production, the system is basically straightforward timber management; in areas zoned for nontimber values, it tends toward complete protection. Simplicity is an attractive characteristic in a frontier region like the Amazon, where monitoring is difficult. Infra-

structure decisions would be a principal means of passively enforcing zoning decisions, by keeping roads and railroads out of and far from areas not zoned for logging.

Dominant use tends to be superior to multiple use when ecological conditions are such that the tradeoffs between timber and nontimber values are sharp, i.e. when there are strong negative externalities between the two.<sup>6</sup> Then, spatially separating the two uses can generate greater outputs of both than attempting to produce both in the same stand. Compared to multiple use, dominant use involves opening a smaller area for logging, but managing that area more intensively for timber production. The consequence is that any reduction in the output of nontimber values in areas zoned for timber production is more than compensated for by the increased area set aside purely for nontimber values. In a study of U.S. national forests, Bowes and Krutilla (1989) found that dominant-use management

**Infrastructure decisions would be a principal means of passively enforcing zoning decisions, by keeping roads and railroads out of and far from areas not zoned for logging.**

usually generated a higher aggregate value of forest-related values than multiple-use management, even in relatively uniform forests. Similar results and rationale are presented in Swallow, Parks, and Wear (1990), Swallow and Wear (1993), Vincent and Binkley (1993, 1994), and Helfand and Whitney (1994).

If Amazonian forests are indeed as ecologically sensitive as most accounts suggest, then dominant-use management is even more

likely to be superior in them than in temperate forests. As the Brazilian government proceeds with the development of policies for public forests in the Amazon, it should therefore carefully consider which areas to zone for timber production and which to zone for protection of nontimber values. Dominant use should enable it to generate higher levels of both timber and nontimber values from Amazonian forests than the multiple-use alternative.



## 5. Fourth objective: *regulate logging to ensure forest regeneration*

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Definitions of sustainable forestry usually emphasize regulating harvests to produce an even flow of timber over time. The standard recommendation for achieving this is to calculate an annual allowable cut (AAC) and then to open for logging an annual area (coupe) consistent with the AAC. For example, if the timber rotation – the length of time from regeneration to harvest – is 50 years, then the annual coupe is 1/50<sup>th</sup> of the total forest area.

Like multiple-use management, although this approach appears sensible and sound, in practice it might not be desirable. One reason is simple economics. If all the timber in a forest is currently mature, and stumpage values are unlikely to rise significantly in the future,<sup>7</sup> then a country or region loses by not harvesting the timber as quickly as possible. In that case, rapid harvesting – a timber boom – generates a much higher net present value than even-flow harvesting. Consider the case of 100,000 hectares of mature forest, where the optimal rotation age is 50 years and the discount rate is 10 percent. Under even-flow harvesting, 2,000 hectares (1/50<sup>th</sup> of the forest) are harvested every year. The net present value of the current and future stream of timber harvests is then 20,000 times the stumpage value of a single hectare.<sup>8</sup> An alternative is *pulse harvesting*: harvesting all 100,000 hectares immediately, and subsequently harvesting them again at 50-year intervals. Under this approach, the net present value is 100,859 times the stumpage value of a single hectare.<sup>9</sup> Even-flow management thus reduces the capital value of the forest for timber production by more than four-fifths. This is a heavy cost for any country to bear, especially a developing country.

As noted earlier, however, stumpage values probably will rise in the Amazon. This indicates one reason for not taking pulse harvesting to the extreme: a sufficiently rapid increase in stumpage values might make it worthwhile to delay harvesting some mature stands. This point does not necessarily imply, however, that the opposite extreme of even-flow harvesting is superior. Instead, it suggests that the optimal harvest schedule lies somewhere between the two extremes. Similarly, two other objections to pulse harvesting most

likely point toward an intermediate solution rather than even flow. These are that pulse harvesting: (i) can have severe environmental impacts due the large-scale logging it implies, and (ii) affords little opportunity to learn about the impacts of logging and make adjustments along the way. In the example above, even-flow harvesting is superior to pulse harvesting only if it provides incremental benefits in the form of either nontimber values or improved information that offset at least the four-fifths loss in timber value. While this might be the case in some forests, there is no reason to believe that it would be the case in all. Moreover, in situations where dominant-use is the superior strategy for managing the forest estate, provision of nontimber values is not the main objective in timber-production forests anyway.

The most fundamental reason for not attaching too much importance to even-flow harvesting is that, despite its appearance, it is not a sufficient condition for ensuring the permanent production of forest-related goods and services. Ensuring that requires regeneration of the forest following logging. Even-flow harvesting only ensures that timber production is constant during the first cycle of harvesting in the forest. Without adequate regeneration, even-flow harvesting is no more than forest mining, albeit mining at a uniform and predictable rate. Once all the forest has been logged once, if none of it regenerates successfully, then further logging will not be possible.

Adequate regeneration is thus the most fundamental sustainability criterion. In designing forestry policies and regulations for the Amazon, the Brazilian government should emphasize this condition first and foremost. It should treat annual allowable cuts, which represent no more than the façade of sustainability, as a second-order criterion. In a situation of limited capacity to monitor logging and to enforce associated laws and regulations, the government would be well-advised to concentrate its efforts on ensuring that logging is performed in such a way that the forest grows back. Effort expended on calculating and enforcing annual allowable cuts is effort drawn away from the design and enforcement of regulations aimed at promoting regeneration.

Moreover, in a situation where the standing forest has substantial timber value, as will increasingly be the case in the Amazon, any attempt to enforce rigid annual allowable cuts will encounter an increasing incidence of illegal logging. Illegal logging is already widespread in the Amazon, accounting for 80 percent of the timber harvest according to a recent government study (Schemo 1997). Combatting illegal logging is one reason the government decided to open public forests for logging.

Allowing market demand to determine the annual area harvested is a more pragmatic approach than even-flow harvest scheduling. It is more likely to succeed on administrative and economic grounds. It removes an artificial supply constraint, the annual allowable cut, which artificially causes logging activities to be classified as illegal and thus pushes them outside the ambit of government regulation. To the extent that, as argued above, pulse harvesting or some intermediate approach is economically superior to even-flow harvesting, a demand-driven approach also raises the present value of timber production.

This approach is not synonymous with uncontrolled logging. The government would need to solicit and evaluate logging proposals from domestic and foreign firms. In evaluating those proposals, it would need to confirm that: (i) the area proposed for logging is in forests zoned for timber production; (ii) those forests are economically mature from the standpoint of timber production; (iii) the logging companies will pay fair market value for the timber harvesting rights (on this, see Gray (1997) and the references therein); and (iv) the companies have the technical capability to log the forest in a manner consistent with silvicultural principles. The company's past performance would be the best source of information on this last point.

Three final economic considerations related to forest regeneration are worth noting. First, as an activity involving a long time horizon, forest management is particularly sensitive to risk and uncertainty. Even-flow harvesting restrictions exacerbate price fluctuations, by preventing increases in production when markets are strong (hence, prices escalate un-

necessarily) and by preventing decreases when markets are weak (hence, prices collapse unnecessarily). The cost of predictable harvest levels is increased price volatility, which raises the risks facing investments in forest regeneration and management, as well as in logging and processing.

Second, economic instruments like performance bonds can be used to induce loggers to abide by regulations critical for the achievement of regeneration objectives. In a performance bond system, operators are required to buy a bond of specified value that in effect insures their performance. The value is usually linked to the cost of prospective damage that might result from poor logging practices, or to the cost of remedial activity to offset such damage. The government retains some or all of the face value of the bond if the operator violates certain regulations. To en-

sure neutrality, the bond can be held by a third party (not the government) from the time it is purchased until any disputes related to its ultimate disposition are settled. The Brazilian government should consider introducing a bonding system for logging companies in the Amazon and elsewhere in

**The government would need to solicit and evaluate logging proposals from domestic and foreign firms.**

the country.

Finally, in addition to phasing out subsidies and other incentives that unduly favor nonforestry activities, the government should take care not to offer implicit or explicit subsidies to the wood-processing industry that reduce the returns to investments in forest regeneration. The prime example is log-export restrictions, which many countries have adopted in order to promote local wood processing. While this policy often achieves its stated aim, it typically has two unintended and often overlooked negative consequences. First, by removing the competitive pressure on the wood-processing industry, it reduces the incentive for the industry to use wood efficiently. The case of the Indonesian plywood industry is well-known in this regard (Gillis 1988). The consequence is that the cost of each job created in processing is often enormous. In Peninsular Malaysia, each US\$2,200 per year sawmill job created by log-export restrictions actually cost the economy about

US\$6,100 after accounting for wastage in processing and forgone revenue from log exports (Vincent 1992a).

Second, and more to the point of this section, log-export restrictions reduce log prices and thus stumpage values. Stumpage values directly influence the return on forestry investments made by public and private forest owners. The log-export restrictions in Peninsular Malaysia reduced domestic log prices by about 25 percent compared to international prices. With logging costs accounting for about half of international log prices, the impact was to cut stumpage values in half. Logging costs are probably even higher relative to log prices in the Amazon, due to the great distances involved and the limited development of roads and other infrastructure. The relative impact of any reduction in log prices upon stumpage values would consequently be even greater than in Peninsular Malaysia.

The Brazilian government would therefore be well-advised to refrain from restricting log exports as a means of promoting local processing of timber from the Amazon. It should either not intervene in the processing sector at all, or it should identify specific impediments to processing and address them directly. The principal impediment cannot be the price of Amazonian logs, which is much lower for Brazilian processors than for processors in importing countries, who must pay international shipping costs on top of the Brazilian price.

## Conclusions

The Brazilian government faces great challenges in the Amazon with regard to increased logging activity on both public and private forestlands. This paper has attempted to highlight the most important policy objectives the government should emphasize in addressing those challenges. It ignores many issues that are important to one or more groups of Brazilian stakeholders, and it does not discuss institutional and other issues critical to the implementation of the recommendations it presents. Hopefully, however, it provides a useful perspective on the economic context for these issues. The vast size, unique attributes, and complexity of the Amazon make it the preeminent example of a forest region where seeing the forest for the trees is essential in formulating successful development policies.

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#### Notes

- 1 Fellow of the Institute, Harvard Institute for International Development (USA)
- 2 Personal communication from Prof. Awang Noor Abdul Ghani, Faculty of Forestry, University, Pertanian Malaysia (December 17, 1996).
- 3 Of course, some of the land was not even technically capable of agricultural production, e.g. large stretches of arid and mountainous lands in western states.
- 4 Consequently, stumpage values in the U.S. are unlikely to rise as rapidly in the future as in the past (Binkley and Vincent 1987).
- 5 This is a narrow definition of multiple-use forestry, as it pertains to the stand rather than the forest estate.
- 6 This statement is a bit imprecise, but it serves to make the point. Technically, dominant use tends to be superior when the forestry production set is nonconvex, i.e. when the second-order conditions for maximizing the social profits of forestry are violated.
- 7 Specifically, if they are unlikely to rise as rapidly as the discount rate.
- 8 The formula is:  $100,000 / T / i$ .
- 9 The formula is:  $100,000 \text{ ha} / [1 - (1+i)^{-T}]$ , where  $i$  is the discount rate and  $T$  the optimal rotation age.

# Impact of International Tropical Timber Trade on the Amazon Rainforest

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*M. L. Joshi<sup>1</sup>*

## *1. Introduction*

The unabated depletion and degradation of tropical forests has become a serious global issue. Growing populations put pressure on forests for more land to be converted to cropland and other uses while demands for products from existing forests continue to rise. Concerns about tropical deforestation have drawn attention to examine the role of timber production and trade on tropical deforestation (Barbier et al 1990).

According to latest estimates from the Food and Agriculture Organization (FAO), Brazil contains about 5.5 million square kilometers of tropical forests (FAO 1997). Almost all of Brazil's tropical forests, most of which are tropical rainforests, are in the Amazon basin, a region commonly known as Amazonia (Mahar 1989). Brazil alone contains nearly one-third (31.8%) of the world's tropical forests (FAO 1997).

Asia has been the leading producer and exporter of tropical forest products in world market for many years. But Asian exports have started declining, due to among other things, increasing domestic consumption and reduced harvest levels. In the meanwhile, production and exports from South America, particularly from Brazil are rising. The dynamics of production, trade and resource potentials have attracted the attention of international timber corporations, particularly Asian corporations to exploit Brazil's tropical forests. This development raises an international dimension to the issue of environmental sustainability; how will increasing international timber trade impact the Amazon forest conservation? This paper describes present trends in production, consumption and international trade of tropical forest products, and identifies major player countries, and possible impacts of increased timber production in the Brazilian Amazonia. This paper helps provide a basis for planning sustainable forest management and economic development in the Amazon region.



## 2. Tropical forests

Tropical forests make up one half of the total forest areas of the world (1.7 billion ha). More than 44 percent of tropical forests are located within three countries, namely Brazil, Zaire and Indonesia. Between 1980 and 1995, approximately 200 million ha of tropical forests were lost (FAO 1997). Most of the deforestation has occurred in developing countries of the tropical region. The annual rate of forest loss is highest in Asia-Oceania (1.0%), but

actual annual loss of natural tropical forest area was highest in South America (5.7 million ha). Among the nations, Brazil is losing its forests at the highest amount of 2.55 million ha a year, followed by Indonesia at the rate of 1.08 million hectares.

Studies indicate that commercial logging is not a dominant factor in deforestation but neither is it blameless. In aggregate, it is responsible for only 6 to 15 percent of tropical

**Table 1.** World production of forest products, 1970-94

	1970		1990		1994		1970-1994
	quantity	percent	quantity	percent	quantity	percent	1970=100
<b>Total roundwood (mn m<sup>3</sup>)</b>							
world	2463	100	3499	100	3358	100	136
developed	1257	51	1559	45	1318	39	105
developing	1206	49	1947	55	2122	61	176
<b>Fuelwood &amp; charcoal (mn m<sup>3</sup>)</b>							
world	1185	100	1780	100	1891	100	160
developed	187	16	234	13	191	10	105
developing	998	84	1546	87	1700	90	170
<b>Industrial roundwood (mn m<sup>3</sup>)</b>							
world	1278	100	1718	100	1467	100	115
developed	1070	51	1318	77	1051	72	98
developing	208	49	401	23	417	28	200
<b>Sawnwood (mn m<sup>3</sup>)</b>							
world	415	100	505	100	413	100	100
developed	361	87	395	78	303	73	84
developing	54	13	110	22	110	27	204
<b>Wood-based panels (mn m<sup>3</sup>)</b>							
world	70	100	124	100	127	100	180
developed	63	91	100	81	92	73	144
developing	6	9	24	19	36	27	567
<b>Wood pulp (mn ton)</b>							
world	103	100	166	100	172	100	167
developed	96	93	141	85	137	80	143
developing	7	7	25	15	35	20	520
<b>Paper &amp; paperboard (mn tons)</b>							
world	126	100	240	100	269	100	213
developed	118	93	200	83	213	79	180
developing	9	7	40	17	57	21	633

Source: FAO 1997

deforestation worldwide, yet its impact could be significant in a few specific regions and countries (Bowyer 1997, Burgess 1993). About 8 percent of tropical hardwood timber enter the international market. Thus, the role of international trade on deforestation looks insignificant (Barbier et al. 1994), but even this

translates into an extensive loss of forests. In addition, logging practices generally result in significant damage even when deforestation is not the immediate outcome. Logging roads open up interior areas once inaccessible to humans, thus paving a way to mass immigration, squatting and land conversions.



**Table 2.** Volume of world production and trade in forest products in 1970 and 1994

	1970	1994	percentage change
industrial roundwood (mn m <sup>3</sup> )			
production	1,278.0	1,467.0	14.8
exports	93.6	113.4	21.2
exports as a % of production	7.3	7.7	—
sawnwood and sleepers (mn m <sup>3</sup> )			
production	4,15.0	413.0	—
exports	57.4	107.3	86.9
exports as a % of production	13.8	26.1	89.1
wood-based panels (mn m <sup>3</sup> )			
production	70.0	127.0	81.4
exports	9.7	38.2	293.8
exports as a % of production	13.8	26.9	94.9
wood pulp (mn ton)			
production	103.0	172.0	67.0
exports	16.9	31.6	87.0
exports as a % of production	16.6	20.4	22.9
paper and paperboards (mn ton)			
production	126.0	269.0	113.5
exports	23.4	72.7	210.7
exports as a % of production	18.6	27.0	45.1

Sources: FAO 1997

**Table 3.** Exports of forest products, 1970 and 1994

	1970			1994			%change in world exports	%change in tropical exports
	world total	tropical total	% from tropical	world total	tropical total	% from tropical		
industrial roundwood (mn m <sup>3</sup> )	93.6	39.5	41.0	113.4	24.3	21.4	21.2	-38.5
sawnwood (mn m <sup>3</sup> )	57.4	5.4	9.4	107.6	10.3	9.6	89.1	90.7
wood-based panels (mn m <sup>3</sup> )	9.7	1.2	12.4	38.2	14.9	39.0	293.8	1141.7
plywood (mn m <sup>3</sup> )	4.8	0.7	14.5	17.7	12.6	71.2	268.8	1700.0
woodpulp (mn ton)	16.9	0.04	0.2	31.6	2.6	8.2	87.0	6400.0
paper & paperboards (mn ton)	23.4	0.09	0.4	72.7	4.4	6.1	210.7	4788.9

Source: FAO 1997

### 3. Production, consumption and trade of forest products

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Industrial roundwood production worldwide has been growing steadily for several decades. In 1994 total global production of roundwood was 3,358 million m<sup>3</sup>, of which industrial roundwood made up about 1,467 million m<sup>3</sup> and fuelwood and charcoal accounted for 1,891 million m<sup>3</sup>. Out of 1467 million m<sup>3</sup>, about 113 million m<sup>3</sup> roundwood (7.7%) entered the international market (Table 1). Industrial roundwood entering the international market accounts for 6-8 percent of the total world industrial roundwood production (Table 2). The value of global consumption of wood and wood products is estimated to be around \$400 billion (FAO 1997). Out of this, the world trade in forest products in 1994 was estimated to be about \$114 billion.

Table 1 shows a general upward trend in the production of all wood products since 1970. Between 1970 and 1994 the production growth rates in paper and paperboards for developed countries were substantial. The rates for developing countries were significantly higher. However, most output expansion in developing countries went to meet fuelwood demands, and developed countries lead developing countries by a large margin in production of processed higher value products. Production and consumption of forest products declined slightly from the historical trend after 1990, mainly because of lingering effects of the political and economic restructuring in the former USSR (FAO 1997).

Consumption of forest products increase with increases in both population and income. The latest FAO statistics indicate that global population increased by 50 percent and consumption of wood increased by 36 percent between 1970 and 1994. World income measured as real Gross Domestic Products (GDP) increased by 103 percent in the same period (FAO 1997). Most of the population growth occurs in developing countries. As a result, consumption of forest products in developing countries is growing at much higher rates than that of developed nations (FAO 1997).

Although all regions saw increases in consumption, the increase in Asia was dramatic. It increased its roundwood consumption from 15 percent of world consumption in 1970 to 21 percent in 1994, surpassing that of Europe, and its paper and paperboards consumption from 15 to 30 percent (FAO 1997).

Production of industrial roundwood in South America is quite significant, approaching one-tenth of the world total. Africa has limited production at present. Both regions have the resource potential to increase the supply of forest products from natural forests, but many large forest areas in Africa and South America are inaccessible, both physically and economically. However, wood availability from plantations in Oceania, South America and the southern United States will increase supply of forest products.

#### 3.1. International trade

International trade in forest products has been rising both in volume and value of exports (Table 2). Exports of industrial roundwood increased by 21 percent between 1970 and 1994, although its share in total roundwood production has remained the same at 7.3 percent. Exports of other processed products also rose substantially. For example, sawnwood exports have doubled to 107 million m<sup>3</sup>, panels increased almost fourfold to 38 million m<sup>3</sup>, pulpwood almost doubled to 32 million tons and paper and paperboards tripled to 73 million tons during this period (FAO 1997).

Industrialized nations dominate world trade in forest products, accounting for about 80 percent of the value of both exports and imports (FAO 1997, Barbier et al. 1994). Their dominance in 1994 was greatest in pulp, paper and packaging. Canada and the USA alone accounted for almost one third of exports. Similarly the USA and Japan accounted for 30 percent of all imports (FAO 1997).

#### ■ Tropical forests and international trade

Estimates of the share of tropical industrial roundwood in total world production range from 15 percent (FAO 1997) to 30 percent (Barbier et al. 1994). Tropical countries increased their share of international trade during the 1970-94 period substantially, particularly in wood-based panels, plywood, wood-pulp and paper products. (Table 3). In 1994, only industrial roundwood exports declined from their 1970 level.

The growth in wood-based panel exports, especially plywood, by tropical countries is spectacular. A list of major producers,

exporters and consumer countries in tropical forest products is included in Table 4. Today, tropical plywood exports account for more than 71 percent of the world plywood trade. Indonesia leads the world in plywood export, with 46 percent of the market. Malaysia and Brazil follow with 17 and 4 percent of the international market share.

Many South American and Asian countries have also become important exporters in wood pulp and paper products. Tropical timber trade accounted for about \$12.1 billion each in 1994 and 1995, about 10.6 percent share in world timber trade (Pleydell and Johnson 1996).

A few developing countries, particularly from Asia and South America are emerging as important participants in the world tropical timber trade by importing tropical timbers and exporting secondary processed forest products. China, Taiwan, South Korea, the Philippines and Thailand have emerged as leading importers of tropical industrial roundwood and semi finished wood-products.

Tropical countries accounted for 75 percent of the production and consumption of fuelwood and charcoal in 1994. In contrast, they accounted for only 17 percent of production and 20 percent of consumption of world industrial roundwood. Paper and paperboard consumption raised sharply in developing countries, mostly in Asia, which raised its share from 15 to 30 percent in the period 1970-94. On a per capita basis, consumption of all commodities including sawnwood and newsprint has continued to grow since 1970. Per capita consumption in developing countries increased from 2 to 6 percent of developed country levels in 1970 to 10 percent or more in 1994 (FAO 1997).

Asia and Oceania lead in tropical timber production and exports, followed by Africa, while Central and South American countries' share in timber production and exports are modest (Barbier et al. 1994). However, Africa and South America have been able to increase their share in the past decade. Asia's share of exports of tropical forest products declined from 87 percent in 1987 to 80 percent in 1996 (Pleydell and Johnson 1997).

Tropical timber trade is mostly directed

to Europe and Japan. Major importers of tropical timber products are Japan (37%), European union (26%), China (21%) and S. Korea (9%) (ITTO 1996). European markets have traditionally relied on African producers for their tropical wood products. Except for Cote d'Ivoire and Ghana, Africa still exports unprocessed logs. Indonesia, Malaysia, the Philippines have imposed partial to full bans on unprocessed log exports in response to past excessive harvesting and environmental concerns, and also to promote value added domestic processing. Papua New Guinea and other Asian sources (Solomon Islands, Indochina) have increased exports dramatically in response to the decline in Malaysian exports, but none have the resources or infrastructure to make an equivalent impact on overall supply situation. Brazil is the main exporter from Latin America but Chile and Argentina are also increasing their exports. Some Southeast Asian countries such as Cambodia, Laos and Vietnam are future potential producers of tropical timber.

While the production of tropical roundwood has been steadily increasing over the past few decades, domestic consumption of forest products has been growing at an even faster rate due to population and income growth. The rapid growth in timber demand in many tropical countries coupled with declining forest resources has led to reduced timber exports and increased timber imports. As a result, many tropical timber producing countries such as Thailand and the Philippines are becoming net timber importers.

Despite the decline in production in Indonesia and Malaysia, production may increase in both countries for a few more years because of two large development projects.

Indonesia is clearing one million ha of forests for an agricultural development project in Kalimantan that will supply about 6 million m<sup>3</sup> of timber for three years, and in Malaysia a 69,000 ha forest clearing is being created in Sarawak, for dam construction (ITTO 1996).

Since the 1980s, South Korea, Singapore and Taiwan also started importing wood products in substantial volumes. They used such imports for domestic consumption as well as

**Despite the decline in production in Indonesia and Malaysia, production may increase in both countries for a few more years because of two large development projects.**

for producing higher valued secondary processed wood products (SPWP) such as furniture and mouldings for export. Other countries such as Indonesia, Malaysia, Thailand and China have aggressively pursued this trend and have become the four largest developing SPWP exporters (Pleydell and Johnson 1997).

#### ■ Principal tropical species traded

One striking feature of tropical forests is the large diversity of tree and other plant species found there. However, only a few timber species have commercial value. In Southeast Asia most commercially valuable species are *Meranti* (*Shorea spp.*), *Keruing* (*dipterocarpus spp.*), *Kapur* (*Dryobalanops spp.*), *Ramin* (*Gonystylus spp.*) and *Seraya*. *Taun* is a highly valuable timber species from Papua New Guinea. In South America, *Mahogany* (*Swietenia macrophylla*, *S. mahogany*), *Cedar* (*Cedrela spp.*) and *Virula* (*Virola surinamensis*) are three main timber species for export. Other lesser used from South America are *Tauraru* (*Couratari spp.*), *Curupixa* (*Micropholis venulosa*), *Jatoba* (*Hymenaea courbaril*), *Quaruba verdadeira* (*Vochysia spp.*) and *Tatajuba* (*Bagassa guianensis*). The most popular species exported from Africa are *Sipo*, *Sapelli*, *Okoume*, *Ozigo*, *Niangon*, *Moabi*, *Agba* and *Moaba*.

Tropical forests also produce large amounts of non-wood forest products which have a growing international market. Edible nuts, mushrooms, medicinal plants, rattan, palm, aromatic oils, honey and many other products are now traded internationally. Presently, at least 150 non-wood forest products are exported, generating a substantial number of jobs and revenues for producer countries. One estimate puts total value of such exports at \$1,100 million (FAO 1997). China is the major supplier but India, Indonesia, Malaysia, Thailand and Brazil also export non-wood forest products. For example, Indonesia and Malaysia exported a large volume of rattan, while

Brazil is famous for its brazilnuts. The consumer markets for most of these products are Japan, European Union and North America.

#### ■ Large timber corporations in Asia

There are many large timber companies with huge financial and political powers in Southeast Asia. They hold large tracts of forest lands in many Asian and Oceania countries under liberal concession arrangements. Some of these companies have also started operating in South American countries, and others are seeking similar opportunities. The following is a comprehensive but not complete list of timber companies operating in Southeast Asia and South America (source: ITTO 1996 and the Internet).

##### *Indonesia*

1. Barito Pacific Timber Co., (the largest company controlling over 5 million ha)
2. Citra Lamtaro Gung Persada
3. Kiana Kertas
4. Takengon Pulp and Paper Utama
5. Gudang Garam
6. Riau Andalan Mill
7. Nippon Paper and Marubeni (Japanese)
8. Madera International (U.S.)
9. Ikeuchi Group (US based)
10. Uniseraya Group
11. MUSA (working in Suriname)
12. Suri-Atlantic (working in Suriname)
13. Panin Group

##### *In Malaysia*

1. Jaya Tiasa, (the largest company)
2. Kumpulan Emas
3. Rimbunan Hijau Group
4. Cakara Alam (working in Papua New Guinea)
5. Berjaya Timber Industries (working in Suriname)
6. SINO-PNG Pty. Ltd.(working in Papua New Guinea)



## 4. Price trends

The inflation-adjusted real price index for forest products has been fairly stable since 1969. There was some decline between 1974 to 1984 but it has been picking up gradually since then. The real price of tropical logs has followed this general price trend with some brief sharp fluctuations in the 1970s. The real price of tropical sawnwood was similar, but with larger fluctuations. For other forest products, including wood-based panels, pulp, and paper and paperboards, real prices continued to rise throughout the 1980s (FAO 1997, Barbier et al. 1994). For tropical forest products, this long-term increase may reflect both increasing scarcity and increasing demand. Real prices for most primary tropical products exhibited strong rises in early 1993 caused by the cessation of Sabah (Malaysia) log exports but showed stable or de-

clining trend since then, 1995-96 (ITTO 1996).

There are regional differences in the export prices of tropical forest products. For example, Africa generally commanded higher unit nominal prices for industrial roundwood during the period 1983-94 than Asia. In 1983 the average nominal export price for African logs was \$90 per m<sup>3</sup> compared to \$80 for Asian logs. In 1994, the prices were \$169 and \$103 per m<sup>3</sup> respectively. For non-coniferous sawnwood, the respective prices for Africa and Asia in 1994 were \$416 and \$391, while that for South America was \$309. In 1994, average export prices for Indonesian and Argentinean tropical sawnwood were highest at \$664 and \$525 per m<sup>3</sup>. The variation in prices is partly due to the species, consumer preferences and quality of export products.



**Table 4.** Major producers, exporters and importers of tropical forest products, 1995

	<i>Production</i>	<i>Exports</i>	<i>Imports</i>
Roundwood	Malaysia Indonesia Brazil India Papua New Guinea Ecuador Cameroon Cote d'Ivoire Gabon Peru Myanmar Ghana Venezuela Philippines Colombia	Malaysia Papua New Guinea Gabon Myanmar Cameroon Ghana Cote d'Ivoire Congo Zaire	Japan Taiwan S. Korea Thailand China France India Philippines Italy Portugal
Veneer	Malaysia Brazil Japan Cote d'Ivoire Taiwan Italy Thailand Ghana Indonesia	Malaysia Brazil Cote d'Ivoire Congo Cameroon Germany Netherlands Japan	China Japan Taiwan Germany Italy
Plywood	Indonesia Japan Malaysia Brazil S. Korea	Indonesia Malaysia Brazil Taiwan	Japan China USA S. Korea Taiwan

Source: Johnson, S. (*Tropical Forest Update*, 1996/1 for roundwood data, and 1996/3 for veneer and plywood data)

**Note:** Developed countries such as Japan and European countries, and newly emerging countries such as Taiwan and S. Korea produce and export veneer and plywood from imported roundwood.

## 5. Future trend

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The historical trend of increasing demand for forest products is expected to continue into the future. Many recent analyses conclude that at the global level there should not be wood scarcity, and a real long-term global increase in prices is unlikely. However, no study foresees plentiful supplies either. Despite a projected global adequacy between demand and supply, there could be local shortages of some products. A regional shortage of forest products may occur in developing countries that lack the capacity to participate adequately in international trade. Moreover, emerging concerns for environment will have a profound impact on timber production potential. For example, shifting emphasis on forest management from timber production to ecosystem management significantly reduced timber supply from U.S. public forests.

Asia will have an increasing impact on the world forest products economy. Asia's consumption of many industrial forest products already equals or exceeds that of Europe (FAO 1997). The growth in demands for forest products, caused by its expanding population and economy, are outpacing the supply potentials of the region. Thus exports of many forest

products from Asia will further decline while imports will continue to grow in the future.

As with any commodity in international trade, export reduction in one region will result in higher timber prices in all regions, which prompts higher cost producers to expand their production levels (Perez-Garcia 1995). Declining tropical hardwood inventory could raise saw log prices 60 to 80 percent above 1990 levels by the year 2000, particularly in Southeast Asia (Barbier et al. 1994). Declining exports from Asia has prompted Asian buyers to search for other sources of timber supply. South America is most likely to play a major role in timber supply in coming decades, with Brazil as the major producer and exporter (Sedjo 1995). The Amazon has high potential for timber production.

Another effect of product scarcity is product substitution. Evidence suggests that the tendency to substitute non-tropical wood products and/or non-wood products for tropical forest products is increasing. New processing technologies such as Medium Density Fiberboard (MDF) and veneer lamination are gaining rapid market share in forest products trade (Barbier et al. 1994, Pleydell and Johnson 1997).



**Table 5.** Projected trade flow in 2000 and 2010

<i>Region/year</i>	<i>projected trade</i>							
	Industrial roundwood (million m <sup>3</sup> )		Sawnwood and sleepers (million m <sup>3</sup> )		wood-based panels (million m <sup>3</sup> )		paper and paperboards (million ton)	
	imports	exports	imports	exports	imports	exports	imports	exports
<b>Asia</b>								
1994	66	14	20	7	14.9	13.9	14.5	6.4
2000	68	13	22	6	15.8	13.5	16.5	5.9
2010	75	12	24	5	17.3	12.9	20.5	5.1
<b>South America</b>								
1994	—	9	—	3	0.2	1.6	2.2	1.6
2000	—	14	—	2	0.1	1.9	1.9	1.7
2010	—	22	1	1	0.1	2.8	2.2	2.1
<b>North/Central America</b>								
1994	8	22	43	54	7.8	7.7	15.2	21.5
2000	8	17	40	58	7.6	7.7	15.3	22.6
2010	7	12	35	64	7.5	7.2	14.8	22.5
<b>Africa</b>								
1994	1	7	3	1	0.4	0.2	1.4	0.2
2000	1	7	3	1	0.4	0.2	1.4	0.2
2010	1	7	3	1	0.4	0.2	1.5	0.2
<b>Europe</b>								
1994	48	25	37	33	13.9	12.6	35.0	41.0
2000	47	24	40	31	13.5	12.6	34.7	41.2
2010	45	25	42	29	13.1	12.9	32.3	42.6
<b>Oceania</b>								
1994	—	17	1	1	0.2	0.8	1.2	0.6
2000	—	17	1	1	0.2	0.8	1.1	0.7
2010	—	15	1	2	0.1	0.9	1.0	0.9
<b>former USSR</b>								
1994	—	20	—	8	0.1	1.2	0.2	1.3
2000	—	23	—	8	0.1	1.5	0.1	1.6
2010	—	25	—	7	0.1	2.1	0.1	1.8
<b>World</b>								
1994	123	113	105	107	37.6	38.0	69.7	72.7
2000	124	115	106	109	36.8	38.4	71.0	74.0
2010	128	119	107	110	38.6	39.1	72.3	75.3

Source: FAO (1997)

**Table 6.** Production and exports of forest products in South America, 1994

	<i>South America</i>	<i>Brazil</i>	<i>Argentina</i>	<i>Chile</i>	<i>Others</i>
industrial roundwood (1000 m <sup>3</sup> )					
production	121,128	77,903	5,861	23,303	14,061
percent	100.0	64.3	4.8	19.2	11.7
export	8,952	1,600	564	6,531	257
percent	100.0	17.9	6.3	72.9	2.9
sawnwood (1000 m <sup>3</sup> )					
production	26,027	18,628	998	3,364	3,037
percent	100.0	71.6	3.8	12.9	11.7
export	2,713	1,424	4	968	317
percent	100.0	52.5	0.1	35.7	11.7
wood-based panels (1000 m <sup>3</sup> )					
production	5,068	2,552	752	722	1,042
percent	100.0	50.4	14.8	14.2	20.6
export	1,638	1,223	19	260	136
percent	100.0	74.7	1.1	15.9	8.3
plywood (1000 m <sup>3</sup> )					
production	1,339	960	59	64	256
percent	100.0	71.7	4.4	4.8	19.1
export	835	726	0	12	97
percent	100.0	86.9	0.0	1.4	11.6
wood-pulp (1000 tons)					
production	8,754	5,795	725	1,955	279
percent	100.0	66.2	8.3	22.3	3.2
export	3,925	2,186	152	1,585	2
percent	100.0	55.7	3.9	40.4	0.0
paper and paperboards (1000 tons)					
production	9,098	5,730	931	553	1,884
percent	100.0	63.0	10.2	6.0	20.7
export	1,569	1,282	6	173	108
percent	100.0	81.7	0.4	11.0	6.9

Source: FAO 1996

## 6. Impacts of increasing timber trade in Brazil's Amazon forests

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FAO's recent projection indicates distinct changes in forest products trade flows (Table 5). For most products, Asian imports will increase while exports will decline. In contrast, South America will increase its exports. For example, the region is projected to increase industrial roundwood exports from the current 9 million m<sup>3</sup> to 14 million m<sup>3</sup> in 2000 and 22 million m<sup>3</sup> in 2010. Imports to and exports from Africa and Oceania will likely remain at 1994 levels into the years 2000 and 2010.

One obvious impact of increasing tropical timber trade and declining role of Asian producers would be pressure to increase timber exports from Brazil's natural forests. Brazil is the principal South American producer and exporter, leading other major countries like Argentina and Chile by wide margins. In 1994, Brazil produced 78 million cum of industrial roundwood and exported 7 million m<sup>3</sup>. In comparison, Argentina's production and exports were 6 and 1 million m<sup>3</sup> respectively, and those of Chile were 23 and 2 million m<sup>3</sup>, respectively (Table 6).

Brazil is the fifth largest country in the world (851.2 million hectare land area) and possesses the largest expanse of tropical forests in the Amazon basin to the north. A rough estimate puts total growing stock in Brazil's forests at 56.1 billion m<sup>3</sup> (WRIL 1995). Another estimate puts the growing stock at 45-55 m<sup>3</sup> of commercial timber per hectare and its natural and plantation forests had a standing value in 1994 of more than \$3 trillion (Reis

1995). Most of the forest lands are government owned (87%).

The forestry sector comprised about 5 percent of Brazil's gross national product in 1994. The forest products industry in the Amazon region provides approximately 220,000 jobs (Reis 1995). Forest products exports in 1994 were \$2.57 billion (FAO 1996). Within Brazil, the State of Para produces about 60 percent of Brazil's tropical timber exports (Pastore 1995)

The pulp and paper industry relies principally on plantation forests located in the southern part of Brazil for its raw materials. The industry produced 5.4 million tons of paper products in 1993

from 23 million m<sup>3</sup> of wood, almost entirely from extensive forest plantations (pulpwood from natural forests 4%). Output is expanding, 5.8 million tons in 1995, and \$13,000 million in new investments are estimated for the next 10 years (Kenny 1997).

Production forest areas are often assigned to local sawmills or panel producers under a concession arrangement. This stipulates the species and volumes that are removed from an area on an annual basis. A significant volume of material, however, reaches the open market from illegal logging, and legal and illegal land conversion activities. Harvesting operations still rely primarily on manual labor with some mechanization, using chain-saws, skidders and trucks. Natural forests are harvested in selective logging basis while plantations are clear-cut (WRIL 1995).

**The forestry sector comprised about 5 percent of Brazil's gross national product in 1994. The forest products industry in the Amazon region provides approximately 220,000 jobs**



## 7. Impacts

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Changing world tropical timber trade equation will certainly impact economic, environmental and social conditions in the Amazon forests of Brazil. Increase in harvesting, processing, transportation of forest products from the Amazon forests will increase jobs, income and change institutions. Changes will occur in sectors directly connected with forestry such as logging, transportation and processing, to higher valued secondary processed wood products (SPWP), and also in service sectors like banking and finance. Government revenues from royalties, fees and taxes from timber harvesting, and foreign exchange earnings from exports of forest products could be substantial. However, it would be difficult to precisely predict where, when and how much benefits from expanded timber harvesting and international trade will occur. Critics are always skeptical of large outside investments benefiting local economy and local population. Studies from Asian tropical countries

suggest that economic benefits from increased forest harvesting usually go to logging and processing companies and migrant workers. Moreover, modern capital intensive forestry operations create fewer jobs per unit of investments than before (Barber et al. 1994). Another possible impact of expanded forestry operations is disruption of the social fabric of indigenous people whose social and cultural lifestyle could be greatly affected by forestry activities.

The most sensitive issue of possible increased timber harvesting and trade relates to the environmental implications. What will be the impact of these activities on the sustainability of the tropical rainforest? Studies on the links between timber trade and environment are numerous, conflicting and complex (Bourke 1995). Although commercial logging is not a major factor in deforestation, it could impact the Amazon forests in two ways. First is the direct impact associated with timber extraction. The Amazon forests have only a few commercially important timber species

available and they are widely scattered. Thus, the extraction of those species involves extensive disturbances. Studies in the State of Para have found that logging activities damage large numbers of other trees and saplings. For example, extraction of one tree damages, on average, 26 other trees of diameter above 10 cm. In terms of real wood volume, the damaged tree volume could exceed the extracted volume by as much as 2 to 1 ratio (Uhl et al 1991, Verissimo et al. 1992).

Harvesting of timber involves extensive logging road construction in the forests. The construction and use of logging roads disturbs the vegetation, soil and hydrological cycles. Moreover, road building and logging impact indirectly through creating forest access. This often encourages activities such as shifting cultivation, permanent farming and ranching, which lead to further deforestation and degradation. In the northern Brazilian Amazon, the

increase in national highways network over the period of 1975-88 and extent of deforestation are highly correlated (Barbier et al. 1994). Thus, logging roads in the Amazon for expanded harvesting will most likely increase pressure for changing the land uses.

Most of the Amazon forests in Brazil are not under any formal management regimes (WRIL 1995). However, one FAO/UNDP study has indicated that managing Amazon forests sustainably for industrial forestry is both economically viable and technically feasible (Schmidt 1987). If planned and implemented properly certain forestry activities could have positive impacts rather than negative. Sustainable forest management would require a sound forest policy and expanded institutional arrangements to maintain productive capacity of the forests and restrict consequences of harvesting. For this, however, a far energetic leadership in forestry is needed in Brazil (Sirmon 1996).

**Most of the Amazon forests in Brazil are not under any formal management regimes (WRIL 1995). However, one FAO/UNDP study has indicated that managing Amazon forests sustainably for industrial forestry is both economically viable and technically feasible**



## 8. Issues

### 8.1. Concessions

Most tropical forests in the world are government owned and the common practice of timber operation is to award logging concessions to timber industries. The practice of offering timber concessions to international companies has emerged as a critical issue in resource rich countries of South America. Brazil gives timber concessions to private companies to harvest in its public. In recent years, Suriname, Guyana, Venezuela and Nicaragua have granted large concessions or are considering doing so. In 1994, Suriname considered granting 4.5 million ha of forests to Asian timber companies. Guyana granted a concession to a company a forest estate of about 2 million (about half the size of Switzerland). Venezuela has granted about 3 million ha in forest concession and considering another 9 million ha including Amazon forests to offer. Since 1995, Belize has granted about a quarter million ha. International companies are actively seeking concessions in Bolivia and Peru (FAO 1997, WRI 1996).

Studies from across the tropical countries suggest that such concessions fail to collect true economic rent (stumpage value). Most countries in Asia and Africa receive a fraction of their potential economic rent and award “wind-fall” profits to the concessionaires from such timber concessions (Barbier et al. 1994). For example, in Indonesia, the concession system could capture only 33 percent of potential economic rent between 1979 and 1982, and the Philippines realized only 11 percent. Only in the Sabah State of Malaysia the concession could realize about 78 percent of the potential rent. Therefore, Brazil and other South American countries must carefully analyze the continuing use of concessions for opening the Amazon for timber operations in coming years. They must develop a sound policy in granting harvesting concessions to timber companies so that economic and environmental returns are maximized.

### 8.2. International trade agreements

International timber trade will be increasingly influenced by international trade protocols such as the General Agreement on Tariffs and Trade (GATT) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which have different, and sometimes conflicting agendas. GATT is geared towards full liberalization of international trade, including trade in tropical timber. Its basic principles are non-discrimination between like-products and elimination of trade restrictions. On the other side, CITES aims to protect endangered animal and plant species by restricting international trade.

Tropical timber trade is also influenced by the International Tropical Timber Agreement (ITTA) whose goals are both promoting international trade in tropical timber as well as achieving sustainable management of tropical forests. To accomplish this ITTA advocates internalization of all environmental costs and

promotion of sustainable forest management through incentives and certification processes. Rising concerns about tropical deforestation has led to consumer awareness in many industrialized consumer countries. This has prompted consumer movements to boycott tropical timber altogether, or to restrict imports to products coming from sustainably managed tropical forests. ITTA's second aim of achieving sustainable management of tropical forests coincides with consumer-driven “Green-wood” certification movement.

The underlying differences between different international agreements should eventually be resolved but it is most likely that future timber trade will be heavily influenced by world public opinions and tropical countries must direct their policies to sustainable forest management.

**Therefore, Brazil and other South American countries must carefully analyze the continuing use of concessions for opening the Amazon for timber operations in coming years.**



## 9. Implications

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The transition in global economy and tropical timber trade will certainly have profound impact on Brazil's Amazon forest. Increase in demand and shrinking of traditional Asian supply regions will undoubtedly bring more pressure to open up the Amazon. This presents both opportunities for sustainable economic development and risks of depleting the world's last relatively intact tropical ecosystem.

Experiences from the past suggest that most tropical countries have failed to utilize their forest resources for sustainable economic and environmental benefits. Faulty policies such as inappropriately valuing forests in comparison to other land uses and providing inappropriate economic incentives to businesses have contributed to these failures. Proper valuation of environmental and social costs is necessary to make forestry a viable land use

option. Therefore proper pricing is the key to sustainable management of tropical forests.

If Brazil is to meet the increased demand and sustain its forests it needs to pay more attention to technical aspects of Amazonian forest management. Given the complexity of Amazon forest's ecosystem and the limits of current knowledge much more research is needed to fully understand the silvicultural and harvesting problems of the Amazon forests.

Last but not least, adequate concern for and involvement of local populations in forestry operations should not be forgotten. Benefits from forests should be equitably distributed among the members of the society, particularly, the native inhabitants of the forests. In many instances, the success of a policy depends upon how effectively public participation could be mobilized.



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### Notes

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# Mercado Nacional de Madeiras Tropicais

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## 1. Apresentação

Historicamente o mercado nacional madeireiro sempre teve uma forte participação de madeiras de folhosas, particularmente as tropicais. Entre as espécies registradas na história colonial do país, e que tiveram representatividade no comércio, menciona-se o pau-brasil e o jacarandá da Bahia.

Na realidade, a produção destas madeiras esteve relacionada ao processo de ocupação da costa brasileira, e a maioria da madeira produzida foi originária da Mata Atlântica.

Com a colonização da região Sul, as florestas do planalto ou das “matas dos pinhais” passaram a ter uma forte contribuição no suprimento das demandas nacionais de madeira.

A disponibilização de grandes volumes de madeira de *Araucaria angustifolia*, pela ampliação das fronteiras agrícolas, foi um fator importante. No entanto, existem outros fatores que facilitaram o desenvolvimento da atividade madeireira baseada naquela espécie, entre eles cita-se os grandes volumes por unidade de área e a qualidade da madeira. Em pouco tempo o “pinho” passou a ser a mais importante madeira tanto para o mercado nacional como para exportação.

Juntamente com o pinho, usado principalmente para construção, outras espécies de folhosas da região dos pinhais passaram a ganhar o mercado, entre elas cita-se a imbuía, que por muitos anos foi uma das principais para a indústria moveleira.

Da mesma forma como ocorreu na região sul, a disponibilização de madeira pelo avanço das fronteiras agropecuárias foi fator determinante no desenvolvimento da indústria madeireira na região norte. Isto ocorreu particularmente na década de 70, e coincidiu com a redução da oferta de madeira, tanto de pinho como de folhosas, na região sul.

Apesar do rápido crescimento na oferta e produção de madeira de plantios localizados no sul, as florestas tropicais são, e deverão continuar sendo, a principal fonte de matéria prima para atender o mercado nacional de produtos de madeira sólida.

Apresenta-se neste documento uma abordagem geral sobre o mercado nacional de produtos baseados em madeiras tropicais, que pode ser considerado como o maior mercado mundial para madeiras tropicais.



## 2. Produção e Consumo

### 2.1. Produtos, Aplicações e Principais Espécies

Embora a literatura cite um grande número de produtos passíveis de serem obtidos a partir da madeira, na realidade, quando considerado o processamento primário, pode-se obter basicamente três produtos: cavacos, serrados e lâminas.

É a partir destes produtos primários que pode-se obter uma série de produtos, com variados níveis de transformação. Assim sendo, de cavacos pode-se obter polpa e papel, além de chapas reconstituídas (tais como aglomerado, MDF, OSB), a partir de serrados obtém-se molduras, perfis, assoalhos, forros e componentes para móveis e, a partir de lâminas, compensados e diversos tipos de painéis e revestimentos.

No Brasil as madeiras tropicais são utilizadas na indústria basicamente para produção de serrados e lâminas.

Os serrados são empregados principalmente na construção civil na forma bruta. A utilização para produtos de maior valor agregado na construção civil e na indústria de móveis é limitada a umas poucas espécies consideradas nobres e decorativas, a exemplo do mogno.

As lâminas são utilizadas para produção de compensados e, em pequena proporção (laminas faqueadas), para revestimento de outros tipos de painéis. A principal aplicação do compensado é na confecção de móveis. Na construção civil o compensado é aplicado quase que exclusivamente para formas de concreto e fechamentos temporários de obras.

O mercado nacional de produtos de madeira, assim como o internacional, é bastante seletivo em termos de espécies. Isto explica-se tanto pela tradição e moda, que leva o cliente final a preferir determinadas espécies, bem como pela tendência em reduzir a variabilidade nas linhas de produção.

Sob o ponto de vista da unidade de transformação um menor número de espécies é sempre desejável, pois leva a processos industriais mais uniformes, procedimentos repetitivos e mais facilmente controláveis.

O angelim, cedro, freijó, ipê, jatobá, maçaranduba, sucupira, tatajuba, cedrinho, cedrorana e mogno são nomes comerciais de espécies

es largamente conhecidas no mercado de madeira serrada. Na produção de lâminas torneadas e faqueadas são conhecidas e produzidas lâminas, em maior escala, das espécies virola, pinho cuiabano ou paricá, amescla, mangue, sumaúma, mogno e cedro.

Embora em princípio o número de espécies utilizadas na produção de serrados e lâminas seja grande, a base florestal, representada no caso pela floresta tropical da Amazônia, possui uma grande diversidade de espécies, e as hoje produzidas e comercializadas representam uma pequena porcentagem do total.

Ampliar o número de espécies em uso é considerado como fator fundamental à viabilização da atividade florestal/industrial na região Amazônica. Esforços têm sido feitos tanto pelos laboratórios de pesquisa como pela própria indústria.

Não existem dados precisos quanto aos avanços tidos em relação ao aumento no número de espécies em utilização no mercado nacional. Um dos indicativos que se pode utilizar para avaliar os progressos na introdução de novas espécies no mercado, é o número de espécies exportadas.

Na figura 01 apresenta-se, com base em informações compiladas pela AIMEX para o período 1989-1995, o número de espécies que em seu conjunto representaram cerca de 80% das exportações de madeira serrada do Estado do Pará. Como pode ser observado em 1989 o conjunto de quatro espécies representaram 80% das exportações, já em 1996 para o mesmo percentual foi necessário considerar vinte espécies. Para o mercado nacional existem indícios que este número é substancialmente mais alto.

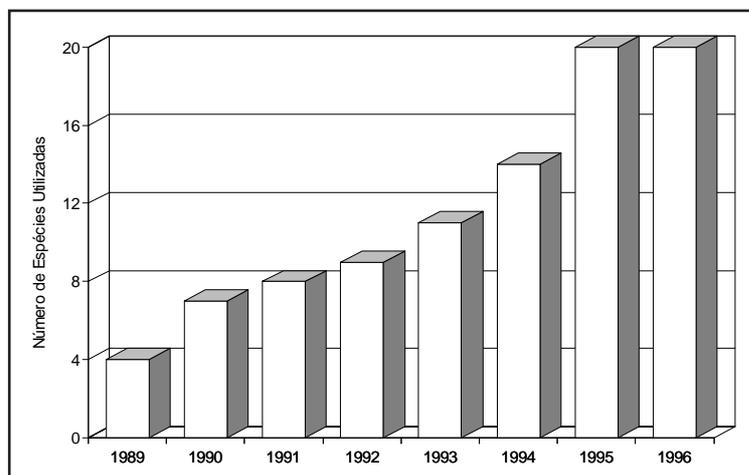


Fig. 01 - Número de Espécies Responsáveis por 80% das Exportações do Pará (adaptado dos relatórios AIMEX)

## 2.2. Evolução Histórica da Produção e Consumo

As estatísticas nacionais para produtos florestais, especialmente para produtos de madeira sólida, são bastante frágeis. Apresenta-se na figura 02 a evolução da produção e do consumo de madeira serrada tropical no Brasil com base em dados disponíveis.

Como pode ser observado, apesar do país ter enfrentado um período recessivo na década de 80 e nos primeiros anos da década de 90, tanto a produção como o consumo de madeira serrada tropical cresceu.

Os índices de crescimento observados foram acima da média mundial para madeira serrada. O crescimento na produção brasileira de madeira serrada tropical nos últimos 10 anos foi de aproximadamente 25% e no consumo praticamente 20%. A produção nacional atual de madeira serrada tropical é estimada em aproximadamente 13,3 milhões de metros cúbicos e o consumo em 12,3 milhões.

Na figura 03 apresentam-se as informações disponíveis para produção e consumo de compensado baseado em madeiras tropicais para o período 1987-96. Nos volumes apresentados estão também incorporados os volumes de compensado do tipo "combí". Este tipo de compensado é conhecido internacionalmente por ser produzido normalmente com a parte central (miolo) formada por lâminas de coníferas e a capa de uma madeira tropical.

Os dados apresentados indicam que, ao contrário da madeira serrada, o compensado de madeira tropical teve, para o período considerado, um crescimento muito pequeno na produção e uma queda no consumo nacional.

No lado da produção, o maior nível foi atingido em 1993, quando foram produzidos 1,75 milhões de metros cúbicos. A razão, principalmente para o atingimento deste nível, está associada a um mercado internacional extremamente favorável, tanto em

volumes como em preços. A produção atual para compensados baseados em madeiras tropicais é estimada em cerca de 1,4 milhões de metros cúbicos, basicamente o mesmo nível de produção do final da última década.

O consumo nacional do produto está abaixo do consumo dos últimos anos da década de 80. A redução no consumo nacional de compensados de madeira tropical é resultado da sua substituição por compensados de pinus, principalmente na construção civil e em embalagens, e do avanço dos painéis reconstituídos (aglomerado e MDF) na indústria moveleira. O consumo nacional de compensado tem se mantido entre 700 e 800 mil metros cúbicos por ano desde 1994.

## 2.3. Fluxo de Produtos e Principais Centros de Consumo

Os principais centros de consumo de produtos de madeira tropical estão localizados no sul e sudeste. A madeira é transportada das regiões de produção, particularmente do Mato Grosso, Rondônia, Pará e Maranhão para o

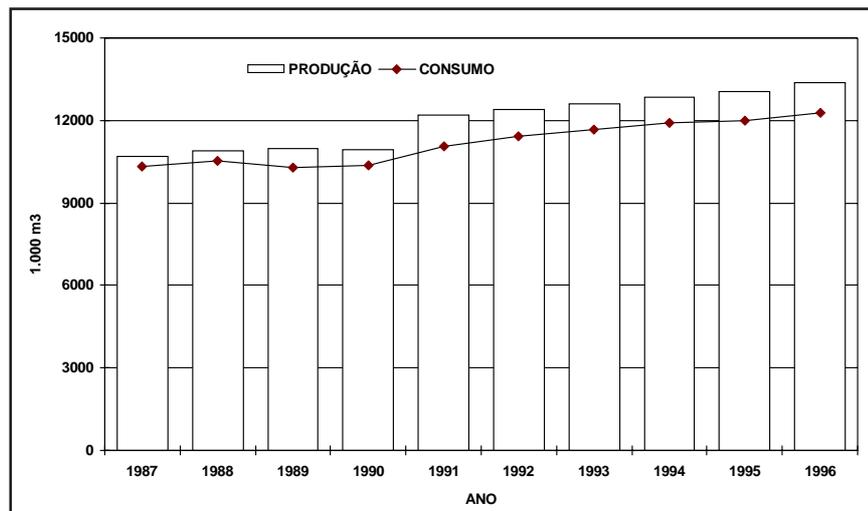


Fig. 02 - Produção e Consumo de Madeira Serrada Tropical no Brasil

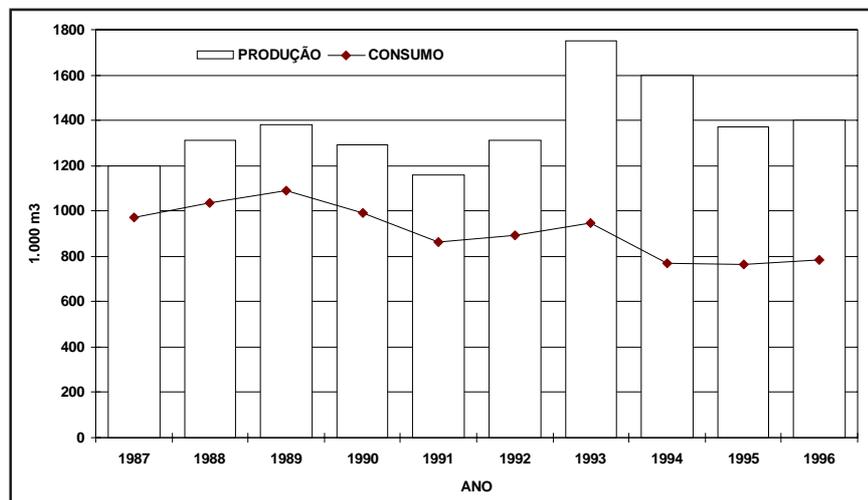


Fig. 03 - Produção e Consumo de Compensado de Madeira Tropical no Brasil

principais centros de consumo por rodovia.

O transporte é um forte componente no preço de madeira tropical nos principais mercados nacionais. Precariedade das estradas e outras implicações de ordem logística elevam os custos de frete, que atingem valores de R\$80,00 a R\$100,00 por metro cúbico no caso de madeira serrada, representando para algumas espécies entre 30 a 40% do preço do produto nos grandes mercados consumidores.

A grande São Paulo continua sendo o principal centro consumidor de madeira serrada e compensado do país. Somente uma parte do compensado que chega a São Paulo é oriundo de fábricas instaladas na Amazônia. O Paraná possui uma forte indústria de compensado, que

importa quantidades significantes de lâminas de madeiras tropicais, e compete no grande mercado representado por São Paulo. Existem, portanto, fluxos de madeira tropical no sentido norte-sul e também no sentido inverso.

São ainda importantes centros consumidores o Rio de Janeiro, Belo Horizonte e os pólos moveleiros (São Bento do Sul-SC, Bento Gonçalves-RS, Ubá-MG e outros). Na realidade, existe uma tendência dos pólos moveleiros deixarem de ser grandes consumidores de madeiras tropicais originárias da Amazônia. Por razões de custo, as empresas estão substituindo os produtos tradicionais baseados em madeiras tropicais por produtos baseados em madeiras de plantios (*pinus* e *eucalyptus*) e também por reconstituídos.



### 3. Caracterização dos Agentes da Cadeia

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#### 3.1. Cadeia de Produção

A indústria brasileira responsável pela produção de serrados, lâminas e compensados baseada em madeira tropical é extremamente fragmentada. Predominam pequenas indústrias, de origem familiar, com limitações de capital e tecnologicamente desatualizadas.

Estas características são, sem dúvida, fator limitante ao desenvolvimento e à competitividade, particularmente quando se trata de produtos primários de baixo valor agregado.

Existem várias centenas de pequenas serrarias e laminadoras, localizadas em regiões remotas, com produção média anual inferior a 6.000m<sup>3</sup>. Estas empresas não têm capacidade financeira de operar a plena capacidade, manter estoques reguladores, ou de atualizar seus equipamentos.

As pequenas empresas, pela debilidade financeira, compram sua madeira no mercado "spot", normalmente suprida por toreiros. Algumas empresas adquirem lotes de madeira em pé e terceirizam a operação de exploração e transporte.

Empresas consideradas de grande porte que operam com madeira tropical no Brasil são poucas. Em geral, são consideradas como de grande porte empresas que produzem acima de 25 ou 30 mil metros cúbicos por ano, o que na realidade são pequenos volumes para os padrões internacionais.

As empresas de maior porte procuram ter

operações mais organizadas, normalmente verticalizadas, que incluem a exploração, transporte e processamento industrial. Embora existam na região Amazônica empresas nesta categoria que estejam envolvidas em processamento secundário, e esta seja uma tendência natural para os próximos anos, um grande número de empresas agregam valor em unidades localizadas em outras regiões.

#### 3.2. Cadeia de Comercialização

A maioria dos produtores de madeira tropical vende seus produtos nos grandes centros consumidores utilizando-se de estrutura de representantes, que têm

forte influência, inclusive na formação de preços, na forma de comercialização e em outros aspectos. As empresas pequenas muitas vezes são fragilizadas por este importante elemento da cadeia de distribuição.

O nível de profissionalização dos representantes deixa a desejar, e é comum ter um

indivíduo representando empresas concorrentes no mesmo mercado. A remuneração é estabelecida através de um percentual sobre as vendas, que varia entre 4 e 5%.

Outro componente importante da cadeia de distribuição são os distribuidores. Eles dominam o mercado de grandes centros, especialmente no caso do compensado. Em geral são altamente capitalizados e trabalham com grandes estoques.

**As pequenas empresas, pela debilidade financeira, compram sua madeira no mercado "spot", normalmente suprida por toreiros. Algumas empresas adquirem lotes de madeira em pé e terceirizam a operação de exploração e transporte.**



## 4. Preços e rendas geradas

### 4.1. Formação de preços

As empresas de maior porte utilizam-se de alguns instrumentos básicos para custeamento da produção e formação do preço, mas em geral isto não ocorre nas pequenas empresas. A formação de preço é um dos pontos fracos dos produtores de madeira tropical. Normalmente são baseados na necessidade de “fazer caixa” para atender necessidades emergenciais.

A remuneração da floresta e dos investimentos fixos (custos de reposição) normalmente não são considerados na análise da rentabilidade da indústria de madeira tropical. Esta, aliás, tem sido uma prática também da indústria madeireira localizada em outras regiões, o que levou gradativamente a descapitalização e o subsequente desaparecimento da atividade.

### 4.2. Preços Históricos

Os preços de madeira tropical têm uma variação mais ampla do que as de coníferas. Isto porque as madeiras tropicais, pelo menos a maioria delas, podem ser enquadradas na categoria de especialidade.

Na figura 04, é apresentada uma série histórica de preços de toras de madeiras tropicais tradicionais no mercado: mogno, ipê e jatobá. No mesmo gráfico, apresenta-se o preço para toras de pinus, produzidas em reflorestamentos na região sul. Para fins de comparação todos os preços apresentados referem-se a toras colocadas no pátio das indústrias.

Como pode ser observado, no período analisado (92-97) os preços de toras para todas as espécies foram ascendentes. As toras de mogno praticamente duplicaram no período, e o preço atual é em torno de US\$300.00 por metro cúbico.

Outras espécies tropicais, como é o caso do ipê e do jatobá, também tiveram um aumento significativo de preço: cerca de 40% no período analisado.

O limite inferior de preço para toras de madeiras tropicais comerciais é em torno de US\$35.00 por metro cúbico posto pátio. Este valor aplica-se para madeiras de construção (espécies pouco conhecidas) e para madeiras utilizadas para produção de lâminas para miolo de compensado. O preço destas espécies é muito próximo ao preço praticado para toras de pinus de boa qualidade no sul do Brasil.

Em geral, o preço da madeira em tora para madeiras tropicais é baixo quando comparado ao praticado na Malásia e Indonésia, os maiores supridores mundiais de madeiras tropicais.

Uma série histórica de preços praticados no mercado nacional para madeira

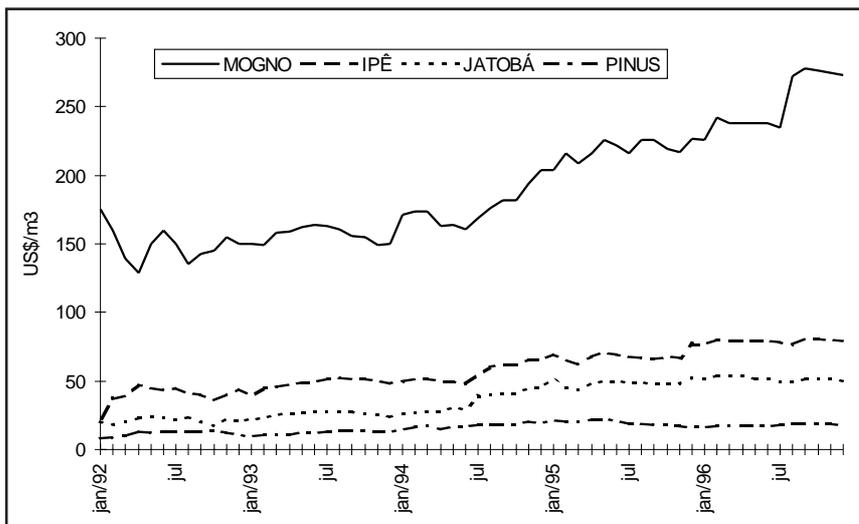


Fig. 04 - Preço de Madeira em Tora (pátio)

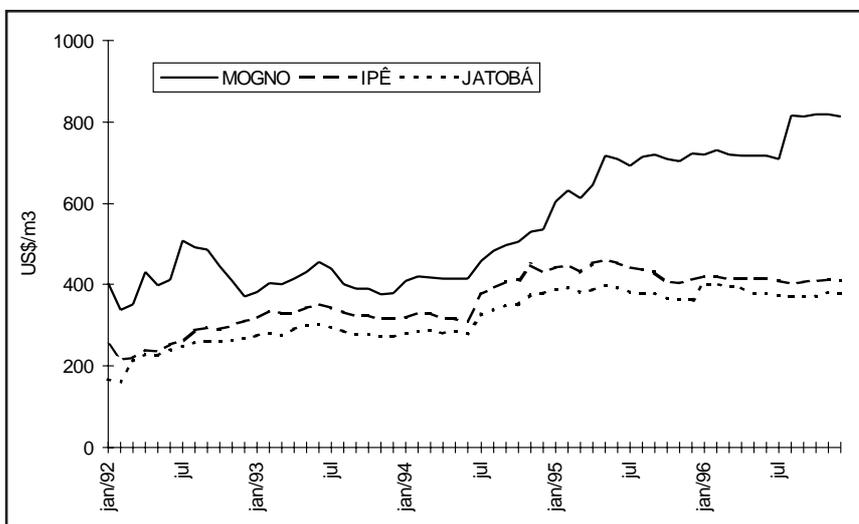


Fig. 05 - Preços de Madeira Serrada no mercado nacional

serrada de mogno, ipê e jatobá é apresentada na figura 05. Os preços apresentados referem-se a preços de madeira colocada nos grandes centros consumidores localizados no sul, portanto incluem os custos de transporte.

Da mesma forma que as toras, os preços são ascendentes no período coberto pelo gráfico apresentado. O preço atual para o mogno no mercado doméstico é em torno de US\$800.00 por metro cúbico, praticamente o dobro do valor praticado até 1994. Os preços atuais para ipê e jatobá variam entre US\$350.00 e US\$400.00 por metro cúbico.

O limite inferior de preço é para espécies destinadas à construção, que podem ser incluídas na categoria de espécies pouco conhecidas. Estas espécies concorrem com algumas espécies nativas de florestas remanescentes no sul e com a madeira de *eucalyptus* de plantios. O preço praticado para estas espécies varia entre US\$220.00 e US\$250.00 por metro cúbico, o que significa um preço mínimo FOB indústria no norte de US\$140.00 por metro cúbico.

Uma série histórica de preços para compensado é apresentada na figura 06. Os valores refletem um produto de alto valor agregado, como é o caso do compensado decorativo de mogno, e chapas de uso geral como as de virola com espessura de 15 mm. Todos os compensados são para a indústria moveleira e os preços são os praticados nos mercados consumidores (custo de frete embutido).

Embora o consumo tenha se retraído, a série histórica aponta para uma tendência de preços ascendentes. Nos últimos meses o preço vêm caindo, mas de qualquer forma, encontram-se acima dos preços internacionais. O preço atual do compensado de 4mm revestido com mogno faqueado é em torno de US\$1,300.00 por metro cúbico.

O limite inferior para compensado produzido de madeira tropical é para chapas destinadas à embalagem ou para forma de concreto do tipo descartável. Este compensado é comercializado a preços máximos de US\$300.00 por metro cúbico, próximo aos preços do produto produzido com pinus.

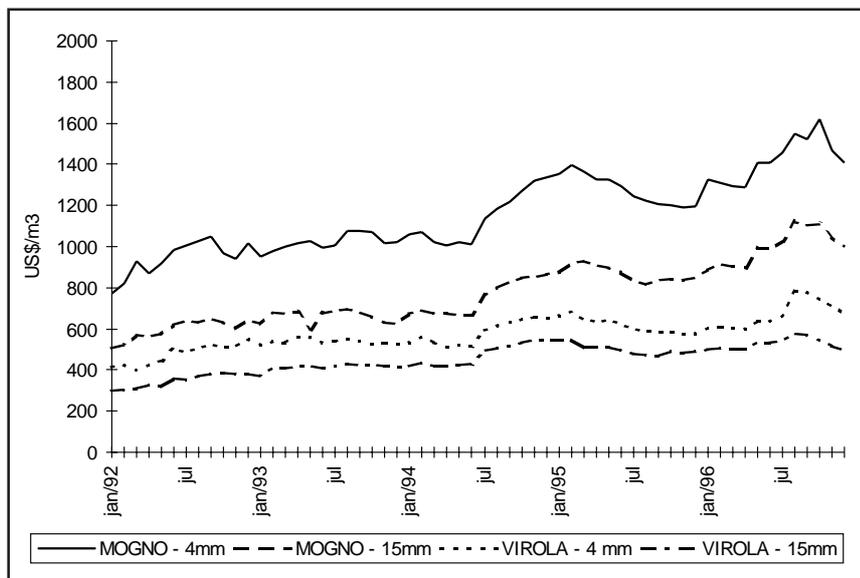


Fig. 06 - Preço de Compensado no mercado nacional

### 4.3. Competitividade

A indústria de madeira tropical nacional vem perdendo a sua competitividade ao longo do tempo, tanto no mercado nacional como internacional. A perda de competitividade está relacionada a vários fatores. Para o mercado doméstico os fatores mais importantes são:

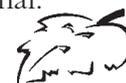
- crescentes custos de transporte;
- redução na disponibilidade de espécies de alto valor como por exemplo o mogno;
- necessidade de maiores investimentos na base florestal advindos de imposições legais;
- falta de escala de produção quando operando com espécies de menor valor;
- obsolescência dos equipamentos por falta de investimentos.

Também é um fator importante na perda de competitividade da indústria de madeira tropical a disponibilização de madeira de menor custo, produzida nos reflorestamentos localizados, no sul do país.

### 4.4. rendas geradas

Não existem informações precisas quanto às rendas geradas na cadeia nacional de produção e comercialização de madeiras tropicais.

Estima-se que, somente na base de produção (transformação primária), a atividade madeireira gere entre R\$4 e R\$5 bilhões por ano. Se incluídas a transformação secundária e a cadeia de distribuição e comercialização este valor atinge pelo menos R\$12 bilhões, representando cerca de 2% do PIB nacional.



## 5. Perspectivas

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Com base na evolução histórica da produção e do mercado nacional, bem como considerando aspectos macroeconômicos e tendências gerais de desenvolvimento setorial, apresenta-se a seguir as perspectivas para a produção de madeiras tropicais:

### ■ Quanto aos Volumes

Tanto a produção como o consumo doméstico de madeira serrada tropical deverá continuar a crescer nos próximos anos. O crescimento deverá superar o do consumo nacional, mas existem boas possibilidades de ampliar as exportações.

Na área de lâminas e compensados de madeiras tropicais é esperada uma estabilização de tanto na produção como no consumo

### ■ Quanto aos Preços

De uma maneira geral, não existem margens para novos aumentos de preço. A redução de oferta para algumas espécies poderá levar a um aumento no preço, mas serão casos isolados. A maioria das espécies deverá manter o nível atual de preços, mesmo que hajam aumentos nos custos.

### ■ Quando à Competitividade

Para os próximos anos, a madeira tropical deverá enfrentar novos concorrentes, entre os

quais o *eucalyptus* para madeira serrada, e as chapas reconstituídas, particularmente o MDF, para o compensado.

De certa forma, os acabamentos sintéticos (papéis melamínicos, e outros), também competem com madeiras tropicais, substituindo lâminas faqueadas decorativas.

O aumento da competitividade da madeira tropical passa por uma reestruturação substancial de toda cadeia de produção e comercialização, e isto será determinante para a sobrevivência da atividade.

### ■ Quanto aos Produtos

A madeira serrada e o compensado continuarão sendo os produtos mais importantes em termos de volume. No entanto, produtos de maior valor agregado passarão a ser determinantes na viabilização da indústria florestal da região Amazônica.

### ■ Quantos aos Participantes da Cadeia

A cadeia de produção e comercialização vai receber novos participantes ao longo dos próximos anos. Eles terão maior capacidade de investimento e gestão do negócio e, portanto, poderão corroborar para melhorar a eficiência e a competitividade da indústria nacional de madeira tropical.



## 6. Conclusões e Recomendações

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O conceito moderno considera que o mercado é a base para a geração de rendas fundamentais à sustentabilidade. O mercado nacional é acessível a madeiras tropicais, mas o seu potencial não tem sido totalmente explorado.

As perspectivas apontam para uma gradativa perda de competitividade da madeira tropical no mercado nacional e, conseqüentemente, da perda da capacidade de utilização do potencial representado pela floresta Amazônica para a melhoria das condições sociais, econômicas e ambientais da região.

Os esforços para a reversão deste quadro passam por uma estreita cooperação entre o agente transformador, representado pelo setor privado, e o agente promotor e regulador do desenvolvimento, representado pelo setor público. Entre as ações a serem implementadas, e que têm relação com o mercado de forma geral, considera-se como prioritário:

### ■ Investimentos maciços em pesquisa, desenvolvimento e treinamento

Os investimentos em pesquisa, desenvolvimento e treinamento deverão, entre outros aspectos, considerar a necessidade de aumentar o número de espécies em utilização e introduzi-las no mercado para compatibilizar com a base florestal, agregar maior valor na origem, melhorar a produtividade e a qualidade dos produtos.

### ■ Reduzir a fragmentação da indústria primária

Mecanismos deverão ser criados para facilitar o estabelecimento de unidade de maior capacidade de produção na indústria de trans-

formação primária, atraindo novos participantes, que possam estabelecer e gerenciar maiores escalas de produção e, ainda, integrar atividades e processos para a plena utilização do potencial.

### ■ Incentivar a indústria de transformação secundária na região

A agregação de valor na origem é uma das alternativas para melhorar a competitividade da madeira tropical no mercado. A atividade tem um importante componente social, por poder ser viabilizada em unidades de menor porte, e, também, por gerar um grande número de empregos. É, no entanto, necessário planejar criteriosamente o estabelecimento e ordenar o seu crescimento, focando os grandes mercados que melhor possam remunerar os produtos.

### ■ Desenvolver um serviço de mercado

O órgão gestor do desenvolvimento florestal deve ter à disposição, tanto para uso próprio como dos agentes envolvidos na produção e comercialização de produtos florestais, informações atualizadas de mercado. Estas informações corroboram para a transparência do mercado, e são fundamentais para a atração de investimentos e para a ampliação do mercado de madeiras tropicais.

O principal fato a ser considerado é de que o mercado é cada vez mais competitivo, e regulá-lo é tarefa do passado. Se concordado que o mercado é a principal fonte de geração de rendas para garantir a sustentabilidade das florestas tropicais, todas as ações que possam ser tomadas para melhorar a competitividade da madeira tropical são importantes.



# Geração, Disponibilidade e Uso de Informações para Manejar Florestas na Amazônia

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## 1. Sumário

Esse trabalho primeiro discute a existência e o uso das informações necessárias para o manejo de florestas amazônicas. Depois, sugere medidas para estimular o uso destas informações e para a contínua geração de informações relevantes.

O manejo da floresta requer informações sobre as características da floresta e das espécies, métodos de exploração florestal, técnicas para tratamento silvicultural e para conservação e proteção florestal. Informações sobre esses assuntos, em geral, são escassas. O planejamento da exploração é a parte melhor desenvolvida, o que permite a extração de madeira com baixo impacto deixando a floresta com potencial para regeneração. Sabe-se da necessidade de usar técnicas de regeneração artificial como plantio em clareiras para algumas das espécies madeiras. Há pouco conhecimento sobre os impactos da exploração na biodiversidade e são necessárias mais informações sobre produtividade florestal em diferentes sítios. Informações são escassas pela falta de investimentos e pela pouca atenção dada à pesquisa aplicada ao manejo.

Além disso, as informações existentes raramente são usadas nos projetos de manejo. Isso ocorre pela baixa demanda ao uso das técnicas de manejo e pela escassez de programas de extensão florestal. A demanda por informações sobre manejo seria aumentada por medidas como suporte econômico e cobrança do cumprimento das leis florestais e ambientais. Essas medidas são tratadas em outros capítulos desta publicação (ex: certificação florestal e aspectos econômicos da questão florestal). As seguintes medidas são sugeridas para aumentar o uso e geração de informações relevantes ao manejo florestal:

- Estimular a criação de programas de extensão relevantes ao desenvolvimento do setor florestal. É importante acoplar a extensão florestal a projetos de desenvolvimento rural onde o setor florestal é potencialmente importante. É importante começar com os aspectos do manejo, que resultam em benefícios mais expressivos para o público-alvo e sejam de curto prazo, como a valoração dos seus recursos. Esses benefícios abrem portas para trabalhos de mais longo prazo que tenham impactos positivos em aspectos importantes, mas talvez menos valorizados pelos usuários do recurso (ex: conservação de biodiversidade).
- Investir na preparação de materiais educativos sobre manejo florestal. Em geral há carência de materiais em português e em formatos adequados para os públicos-alvo.
- Criar e implementar mecanismos de atualização das recomendações de manejo. Esses mecanismos são necessários para o desenvolvimento de práticas mais adequadas para cada região, incluindo aspectos técnicos e legais.

- Garantir financiamento sustentado para pesquisas em quantidade e tempo adequados. A pesquisa e desenvolvimento deveriam ser feitos principalmente com rendimentos financeiros de fundos de uso exclusivo para pesquisa. Pelo menos dois tipos de fundos seriam desejáveis. Projetos de desenvolvimento florestal do setor público e privado deveriam criar seus próprios fundos desde a sua fase inicial. Os

participantes dos projetos definiriam as prioridades de pesquisa junto com pesquisadores de acordo com os objetivos do manejo. Esse mecanismo ajudaria a estimular o desenvolvimento de pesquisas mais relevantes para os problemas locais. Também deveriam existir fundos para pesquisa mais básica e estratégica (ex: mercado, tecnologia da madeira, proteção à biodiversidade) a nível regional.



## 2. Introdução

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Florestas produzem vários bens e serviços. O uso de certos recursos florestais pode conflitar com a existência ou qualidade de outros bens e serviços que, geralmente, são bens públicos. Por exemplo, a exploração desordenada de madeira pode causar erosão do solo que afeta a qualidade da água dos rios, afetando a pesca ou o uso da água nas cidades. No Brasil, existem leis que regulam o uso das florestas para garantir que os bens e serviços públicos sejam protegidos.

Nesse trabalho, discute-se as informações e medidas necessárias para manejar florestas da Amazônia para produção de madeira que respeite os bens e serviços públicos da floresta. Assume-se aqui que os objetivos declarados na legislação florestal são demandas genuinamente de interesse público. Isso inclui a proteção da biodiversidade e de áreas sensíveis como margens de rios e áreas declivosas.

O trabalho primeiro descreve as informações necessárias para manejar florestas amazônicas e discute o nível de conhecimento sobre estas informações. Depois, discute os fatores que dificultam a geração e uso das in-

formações. Finalmente, sugere como melhorar a geração e disponibilidade de informações para garantir o uso adequado da floresta.

### **2.1. O que é silvicultura e manejo florestal?**

Silvicultura é um conjunto de medidas aplicadas a floresta para a produção de certos objetivos. Como existem vários tipos de floresta e diversos objetivos (ex: obter renda produzindo madeira ou óleos medicinais), existem várias formas de praticar silvicultura. A organização das práticas silviculturais, ao longo do tempo e do espaço, e a estimativa e a avaliação de seu desempenho em relação aos objetivos é o manejo ou administração florestal. Por exemplo, o plano de manejo estipula onde e quando cortar madeira e avalia os rendimentos destes cortes. O plano de manejo também inclui medidas de proteção dos bens e serviços públicos como as áreas sensíveis e a manutenção da diversidade de espécies. Planos de manejo não são eternos e devem prever mecanismos de adaptação às mudanças econômicas, sociais e ambientais.



### 3. Disponibilidade e uso das informações necessárias ao manejo da floresta

O manejo da floresta depende de vários tipos de informações que incluem características da floresta e das espécies, métodos de exploração florestal, técnicas para tratamento silvicultural e para conservação e proteção florestal (Tabela 1). O nível de conhecimento e uso destas informações serão discutidos a seguir.

O manejo da floresta deve começar com o entendimento dos fatores que governam a reprodução e o crescimento das espécies florestais. Esses fatores incluem o solo, o clima, as características de cada espécie e a interação entre espécies. O conhecimento dos processos de regeneração permite o desenho de medidas para regeneração eficiente das espécies.

O nível de informação sobre os padrões de transformações naturais (ex: sazonalidade do clima e efeitos na vegetação) e a composição das florestas da Amazônia é entre razoável e bom. O projeto RadamBrasil, que levantou os recursos naturais da região nos anos 70, caracteriza os tipos florestais da Amazônia que é muito útil para planejar o manejo das florestas regionais. Contudo, parte das informações, principalmente sobre ecologia florestal, deve ser reinterpretada com base em informações que têm sido coletadas em florestas tropicais nos últimos 25 anos (ex: Hartshorn, 1978; Brokaw, 1980 e 1982; Balée e Campbell, 1990 e Terborgh, 1992)

O entendimento da biologia e ecologia das espécies é incompleto e pouco tem sido feito para transformar essas informações em sugestões de manejo. Um avanço nesse sentido foi o trabalho de Martini et al (1994). Eles classificaram 305 espécies madeireiras da Amazônia quanto ao potencial para aumentarem ou sofrerem redução de população devido à exploração madeireira. A classificação foi baseada em informações dos herbários da Embrapa/CPATU e do Museu Emílio Goeldi e no julgamento de um botânico especialista (Nelson Rosa, um dos autores do trabalho) com 25 anos de experiência na região. Eles encontraram que 41 espécies (13%) provavelmente sofram redução de

população, 217 (71%) se mantenham na população e 47 (15%) devem aumentar a população após a exploração. As informações do trabalho permitem a elaboração de planos tentativos para a reprodução natural de muitas das espécies madeireiras. O trabalho também indica a necessidade de métodos artificiais para melhorar a regeneração de outras espécies, tais como plantios de mudas nas áreas abertas pela exploração (ex: plantios de enriquecimento). Contudo, ainda é necessário dar um passo além. Por exemplo, fazendo indicações de como as práticas de exploração poderiam mudar para estimular a regeneração natural das espécies menos aptas a regenerar e quais os métodos mais eficientes para regeneração artificial.

A interação entre fauna e flora é importante para a regeneração das espécies madeireiras e conservação da biodiversidade. Por exemplo, o estudo de Martini et al (1994) revela que 53% das 305 espécies têm seus frutos dispersos por mamíferos e 41% são dispersos por pássaros. No entanto, existe pouco conhecimento de como a fauna afeta a reprodução, dispersão e estabelecimento das espécies madeireiras no ambiente natural. Além disso, poucos estudos avaliaram como a exploração afeta estas interações no curto e longo prazo após a exploração (Thiollay, 1992 e Johns, 1996). Mais escassos ainda são os estudos que avaliam como as diferentes intensidades de exploração afetam a fauna. Finalmente, as sugestões para minimizar os impactos da exploração sobre a fauna (Johns, 1986; Terborgh, 1992 e Frumhoff, 1995) geralmente não são utilizadas pelos poucos planos de manejo na região. Essas informações não são usadas por diversos motivos incluindo despreparo dos técnicos (falta de leitura de literatura especializada que usualmente está em língua estrangeira), dificuldade de acesso às informações atualizadas (ex: literatura defasada nas bibliotecas locais) e falta de estímulo e cobrança para melhorar os planos de manejo.

**O manejo da floresta deve começar com o entendimento dos fatores que governam a reprodução e o crescimento das espécies florestais. Esses fatores incluem o solo, o clima, as características de cada espécie e a interação entre espécies.**

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### **3.1. Estimativa da produção e da produtividade florestal**

Estimativas da produção e da produtividade florestal são essenciais para avaliar o desempenho econômico do manejo. As estimativas de produção dependem de bons inventários florestais. O projeto RadamBrasil e inventários produzidos pela FAO (Food and Agriculture Organization) são boas referências iniciais sobre a composição e o volume de madeira disponíveis nas florestas amazônicas. Obviamente, é necessário inventariar cada propriedade para planejar especificamente o seu manejo. Existem metodologias adequadas para estes inventários (ex: trabalhos da Faculdade de Ciências Agrárias do Pará e do Instituto Nacional de Pesquisas da Amazônia).

As estimativas de produtividade dependem de informações sobre a qualidade do sítio (capacidade produtiva da área) e de estudos do crescimento das espécies em cada tipo de sítio. Infelizmente ainda não foram desenvolvidos índices de produtividade para cada tipo florestal. Por isso, os planejadores têm que se basear em avaliações qualitativas e simulações. Por exemplo, para definir classes de produtividade os planejadores podem se valer dos indicadores de classes de capacidade natural do uso da terra do projeto RadamBrasil. Deve-se observar que estas classes servem para comparar qualitativamente o potencial produtivo entre áreas e não para estimar a produtividade de cada área.

O conhecimento sobre o potencial de crescimento das espécies ainda é precário, embora avanços tenham ocorrido em algumas regiões. Existem poucos estudos que avaliam o crescimento das espécies no longo prazo e em diversos tipos de sítio. Estudos de longo prazo têm sido feitos pela Embrapa/Cpatu (Silva, 1989) que monitora o crescimento de árvores após a exploração por mais de 13 anos na Floresta Nacional do Tapajós. Esses estudos revelam os principais fatores condicionando o crescimento, como a exposição à luz. O entendimento desses fatores permite o desenvolvimento de técnicas para influenciar crescimento, como o corte de cipós e desbastes (redução do número de árvores ocupando um dado espaço para aumentar o crescimento das árvores restantes).

**As estimativas de produtividade dependem de informações sobre a qualidade do sítio (capacidade produtiva da área) e de estudos do crescimento das espécies em cada tipo de sítio.**

Dada a falta de medições de longo prazo, a estimativa dos períodos de colheita é ainda tentativa. A rotação (período entre o estabelecimento da regeneração nas áreas abertas pela exploração e o corte das árvores) deve ficar em torno de, pelo menos, 70-80 anos para as espécies com crescimento mediano. O ciclo de corte têm sido estimados em torno de 20 a 33 anos (Silva, 1989 e Barreto et al 1993) para a exploração que deixa árvores remanescentes de tamanho médio (30-45 cm) para um próximo corte<sup>2</sup>.

### **3.2. Conservação e proteção florestal**

É preciso planejar medidas para proteger espécies e a capacidade produtiva da floresta (ex: qualidade do solo). Existe bom nível de informação sobre os impactos físicos imediatos da exploração florestal e como estes impactos podem ser diminuídos através do uso adequado de equipamentos e planejamento (SUDAM, 1978; Hendrison, 1990; Johns et al 1996). O uso destas técnicas em Paragominas, no leste da Amazônia, reduziu em cerca de 33% a área de floresta afetada pela exploração (Johns et al 1996). Isso ajuda a minimizar a erosão e compactação do solo. A redução da abertura do dossel ajuda também a diminuir o risco de incêndio florestal (Holdsworth e Uhl, 1997).

A legislação florestal requer a preservação das margens de rios e lagoas e áreas de declive acentuado para conservação do solo e água e de espécies. No entanto, essas medidas não são suficientes para a proteção de várias espécies, pois algumas espécies só crescem em áreas fora da influência dos rios e lagos (ex: terrenos mais secos). Além disso, tem sido demonstrado que algumas espécies animais são dependentes de trechos de floresta madura. Por isso, é necessário deixar áreas de floresta madura intacta além das margens dos rios. Estas áreas funcionariam como refúgio para as espécies que seriam perturbadas pela exploração. Após a regeneração da floresta explorada, as espécies animais poderiam dispersar para outros trechos da floresta. Essas áreas seriam também reservas de produção de sementes de espécies mais raras. É necessário notar que as sugestões para proteção de fauna devem ser consideradas como "hipóteses de trabalho". Ou

seja, estas sugestões devem ser implementadas e avaliadas quanto à necessidade e suficiência para proteger a fauna. Mas, como foi dito antes, as sugestões para proteção da fauna ainda não são sequer incorporadas na grande maioria dos planos de manejo regional.

### 3.3. A rentabilidade econômica do manejo

Análises sobre a rentabilidade da exploração e manejo florestal na Amazônia são raras, o que dificulta a tomada de decisão por parte de investidores e proprietários rurais. A rentabilidade pode ser analisada no curto e no longo prazo. A extração de madeira, mesmo de forma desordenada, como tipicamente é feita, é lucrativa (Veríssimo et al., 1992, Veríssimo et al, 1989, Veríssimo et al, 1995). No entanto, essa exploração desperdiça os recursos florestais e causa muitos danos desnecessários à floresta. Esses desperdícios e danos podem ser grandemente reduzidos através do planejamento da exploração. Estudos na Amazônia e no sudeste Asiático mostram que estas práticas aumentam a rentabilidade da exploração. No leste do Pará, Barreto et al (no prelo) estimaram o custo do planejamento da extração em US\$1,87 por m<sup>3</sup> de madeira explorada. O be-

nefício financeiro do planejamento da extração foi cerca de 2 vezes maior (US\$3,64/m<sup>3</sup>) do que os custos. Esse benefício foi resultado da maior produtividade do trabalho e na redução de perdas de madeira. Por exemplo, na exploração sem planejamento, 26,5% do volume derrubado foi perdido enquanto que a perda com planejamento foi de apenas 1%.

No longo prazo deve-se considerar a rentabilidade de manter e explorar a floresta no futuro. Dada a escassez de informações sobre crescimento e incertezas sobre preços de madeira no futuro, pode-se apenas estimar esta rentabilidade através de simulações. Por exemplo, o manejo florestal, incluindo extração planejada para reduzir os danos às árvores residuais e tratamentos silviculturais, resultam em um acúmulo de madeira após o primeiro corte que é maior do que em áreas sem manejo (Barreto et al, 1993). O valor líquido presente da exploração com manejo seria entre 30 e 38% maior do que sem manejo respectivamente para taxas de desconto entre 20 e 6%/ano. Esse tipo de análise é imprescindível para orientar, mesmo que de forma genérica, o planejamento do manejo florestal.



**Tabela 1:** Informações necessárias para manejar a floresta

#### CARACTERÍSTICAS DA FLORESTA E DAS ESPÉCIES

- Padrão de distúrbios naturais e desenvolvimento dos tipos florestais
- Composição da floresta
- Sistemas reprodutivos e padrões de reprodução das espécies
- Sistemas de dispersão de sementes
- Germinação e sobrevivência juvenil
- Estabelecimento e crescimento das espécies

#### MÉTODOS DE EXPLORAÇÃO

- Viabilidade técnica
- Viabilidade econômica

#### TRATAMENTOS SILVICULTURAIS

- Viabilidade técnica de tratamentos para aumentar crescimento
- Rentabilidade de tratamentos para aumentar crescimento
- Viabilidade técnica para aumentar regeneração
- Definição de custos e benefícios para aumentar custos

#### CONSERVAÇÃO E PROTEÇÃO

- Conservação do solo
- Conservação da fauna
- Prevenção de incêndios
- Conservação da flora madeireira
- Conservação da flora não madeireira

## 4. Os fatores condicionantes da situação atual e alternativas

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O manejo, para produzir benefícios econômicos e ambientais, demanda uma grande quantidade de informações (Tabela 1). No entanto, existe escassez de informações sobre muitos dos tópicos importantes para o sucesso do manejo. As informações existentes permitem a elaboração de planos tentativos de manejo. O planejamento da exploração é a parte melhor desenvolvida, o que permite a extração de madeira com baixo impacto deixando a floresta com potencial para regeneração. No entanto, os impactos da exploração na biodiversidade ainda precisam ser melhor entendidos. Ainda é preciso também melhores informações sobre produtividade florestal em diferentes sítios.

A geração de informação tem sido problemática, primeiro pela escassez de recursos sustentados e em quantidade suficiente para a pesquisa. Por exemplo, recentemente o FUNBIO (Fundo Nacional para a Biodiversidade) aprovou US\$ 2.4 milhões para projetos de pesquisa e desenvolvimento que ajudem a conservar a biodiversidade em todo o Brasil. Esse valor atendeu a apenas cerca de 1% da demanda oriunda de projetos com mérito para aprovação (Ciência Hoje, 1997). Um segundo problema é que pouquíssimos estudos na área florestal têm abordado o manejo florestal. Por exemplo, uma revisão da literatura florestal produzida na Amazônia indicou que só 3% dos trabalhos trataram de manejo florestal e apenas 1% tratou de práticas de exploração (Weaver, 1991).

A situação é agravada pelo fato de que as informações existentes raramente são usadas nos projetos de manejo. Parte do problema tem sido a baixa demanda pelas informações. As informações só serão relevantes se o manejo florestal for considerado importante. Porém, a maioria dos usuários da floresta não recebem sinais claros disso. Por exemplo, a legislação florestal é freqüentemente desrespeitada sem punições e mecanismos de suporte ao manejo são quase inexistentes (ex: crédito). A segunda área de problema tem sido a escassez de programas de extensão flores-

tal. Um terceiro problema é o despreparo de muitos dos técnicos regionais, como por exemplo a falta de leitura da literatura especializada que, em muitos casos, está em línguas estrangeiras. Portanto, o sucesso do manejo florestal depende de duas linhas gerais de ação: uma que estimule o uso da informação existente e outra que estimule a geração de informações relevantes.

Os mecanismos que estimulem a demanda de informações sobre manejo como suporte econômico e cobrança do cumprimento da lei são tratados em outros artigos desta publicação.

### 4.1. Sugestões para melhorar e aumentar o uso das informações disponíveis sobre manejo

- Estimular a criação de programas de extensão relevantes ao desenvolvimento do setor florestal. É importante acoplar a extensão florestal a projetos de desenvolvimento rural onde o setor florestal seja potencialmente importante. É importante atuar primeiro onde os benefícios da extensão podem ser mais expressivos e atrativos para o público-alvo. Por exemplo, a quantificação e valoração dos recursos através de inventários florestais e estudos de mercado e preço ajudam a evitar a sub-valorização feita pelos compradores de madeira. A redução de ineficiências da exploração através do planejamento da exploração ajudam a aumentar os lucros. O planejamento da exploração ajuda a reduzir os danos à floresta. Esses ganhos imediatos ajudam a obter credibilidade para implementar medidas importantes, mas que talvez sejam menos valorizadas pelos proprietários rurais (ex: conservação de biodiversidade).

- Investir na preparação de materiais educativos sobre manejo florestal. Em geral, há carência de materiais em português e em formatos adequados para os públicos-alvo. Filmes curtos em vídeo são úteis para informação mais genérica e em larga escala. Manuais e cartilhas são necessários

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para aspectos mais técnicos e detalhados do manejo, usados para o treinamento de extensionistas, por exemplo. Projetos demonstrativos de manejo são úteis como centros de treinamento.

- Criar e implementar mecanismos de atualização das recomendações de manejo. Esses mecanismos são necessários para o desenvolvimento de práticas mais adequadas para cada região, incluindo aspectos técnicos e legais. Isso poderia ser feito por grupos regionais que sistematicamente coletam, avaliam e interpretam informações e geram recomendações atualizadas sobre como melhorar o manejo. É preciso também incluir nestes grupos especialistas que fazem pesquisas relevantes para silvicultura, mas que não são profissionais trabalhando tradicionalmente nesta área. Aí se incluem profissionais como biólogos especialistas em botânica e em fauna. A legislação florestal já prevê a criação de Câmaras Técnicas dentro das Superintendências do IBAMA (Instituto Brasileiro dos Recursos Naturais Renováveis) com a função de avaliar e criar práticas locais. O IBAMA, acadêmicos e proprietários rurais poderiam promover o desenvolvimento de modelos de manejo adequados a cada região.

#### **4.2. Sugestões para a geração de informações sobre o manejo florestal**

- Garantir financiamento sustentado para pesquisas em quantidade e tempo adequados. A pesquisa em desenvolvimento deveria ser feita principalmente com rendimentos financeiros de fundos de uso exclusivo para pesquisa. Pelo menos dois tipos de fundos seriam desejáveis. Projetos de desenvolvimento florestal do setor público e privado deveriam criar seus próprios fundos desde a sua fase inicial. Os participantes dos projetos definiriam as prioridades de pesquisa junto com pesquisadores de acordo com objetivos do manejo. Esse mecanismo ajudaria a estimular o desenvolvimento de pesquisas mais relevantes para os problemas locais. Também deveriam existir fundos para pesquisa mais básica e estratégica (ex: mercado, tecnologia da madeira, proteção à biodiversidade) a nível regional. Esses fundos deveriam ser administrados como fundos privados para benefício público. O FUNBIO, único fundo brasileiro deste tipo, é administrado por membros do governo,

de organizações não governamentais, acadêmicos e empresários. Essa experiência, apesar de inicial, parece promissora.

O planejamento e implementação dessas sugestões deve ser o mais flexível possível para permitir adaptações às oportunidades e obstáculos das diferentes regiões. O projeto piloto para conservação das florestas tropicais financiado pelo G7 e o governo brasileiro, que opera vários projetos de extensão e apoio à pesquisa, oferece grande oportunidade para aprendizado. Os técnicos do governo, dos agentes financiadores e os beneficiários dos projetos devem ser consultados para avaliar como programas de suporte ao manejo poderiam ser melhor desenhados e implementados.

## *Conclusões*

O uso sustentável dos bens e serviços das florestas da Amazônia dependem do aproveitamento das informações disponíveis e da geração contínua de informações sobre o desempenho da floresta submetida ao manejo. É preciso usar a extensão florestal como elemento catalizador da adoção do manejo florestal. Pesquisa e desenvolvimento devem ser financiados principalmente através dos rendimentos de fundos de pesquisa que podem ser de dois tipos. Um que atenda especificamente projetos de desenvolvimento florestal e outro que atenda demandas da pesquisa básica e demandas de pesquisa estratégica a nível regional. Sem geração e uso adequado de informações, o sucesso da exploração florestal na Amazônia estará em risco.

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#### Notas

- 1 Instituto do Homem e Meio Ambiente da Amazônia
- 2 Neste caso, a exploração não abre espaço para o estabelecimento de novas plantas pequenas, mas sim abre espaço para o crescimento das árvores de tamanho médio já estabelecidas ao redor das árvores que são exploradas.

# Certificação Socioambiental, Bom Manejo Florestal e Políticas Públicas

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## *1. Introdução*

A necessidade de repensar os paradigmas e mudar o atual estilo de desenvolvimento está claramente estabelecida numa série de documentos de ampla aceitação internacional, inclusive a Agenda 21, aprovada na Rio-92. Um dos debates críticos da atualidade é acerca dos instrumentos mais eficazes para apoiar a promoção de mudanças efetivas no atual estilo de desenvolvimento, especialmente as atividades relacionadas com o manejo florestal. A certificação socioambiental representa um instrumento promissor para esse fim.

A certificação socioambiental oferece um mecanismo para que consumidores, governos e instituições independentes criem estímulos para a adoção de sistemas de manejo florestal ambientalmente apropriados, socialmente benéficos e economicamente viáveis. A lógica da certificação socioambiental é simples: os produtores que praticam o bom manejo florestal têm custos adicionais e seus produtos precisam ser valorizados pelo mercado e apoiados por políticas públicas coerentes (Viana 1996a).

Apesar do enorme desenvolvimento da certificação socioambiental independente nos últimos anos, existe ainda uma grande carência de informações para subsidiar o debate sobre os seus potenciais e limites (Viana et al 1996). O objetivo desse texto é fornecer uma pequena contribuição para a análise do papel da certificação florestal como instrumento para a promoção do desenvolvimento rural sustentável.



## 2. FSC e ISO 14.000

Um tema que tem gerado certa polêmica é a relação entre FSC e ISO 14000. Tratam-se de dois sistemas de certificação com conceitos e práticas bastante diferentes e que muitas vezes são confundidos entre si inapropriadamente. A principal diferença entre os dois é o fato da ISO certificar apenas a existência de um sistema de gerenciamento ambiental eficiente, sem considerar padrões mínimos de desempenho, enquanto o FSC estabelece padrões mínimos de desempenho, descritos nos seus "Princípios e Critérios" (Viana 1996a).

### 2.1. FSC

A relação dos consumidores com o setor florestal destaca-se dos demais em função de uma série de fatores. O primeiro é intrínseco à própria atividade florestal: talvez seja o setor onde um problema ambiental esteja mais claramente associado a uma determinada classe de produto como, por exemplo, a degradação da cobertura florestal e a produção de madeira. Além disso, muitos sistemas de produção florestal estão diretamente relacionados com a conservação de culturas tradicionais, variando desde os lapões na Escandinávia até os seringueiros e índios na Amazônia. Isso afeta profundamente a atitude dos consumidores de produtos florestais e foi um ingrediente importante no surgimento do movimento de certificação socioambiental.

A preocupação dos consumidores e ONGs foi o elemento central na origem do FSC (Pearce 1992, Jeanrenaud e Sullivan 1994, Ervin 1996). O setor florestal abrigou um movimento voltado para a certificação socioambiental que resultou na definição de princípios e critérios para o bom manejo florestal (veja seção 3). Esses princípios e critérios foram definidos a partir de um processo de consultas internacionais, que envolveu milhares de indivíduos e instituições e centenas de workshops em dezenas de países. Esse processo de definição culminou no desenvolvimento de uma instituição credenciadora de certificadores independentes, chamada FSC -

Conselho Florestal Mundial (Ervin 1996).

O FSC é a primeira e única instituição credenciadora de certificadores na área florestal. Trata-se de uma instituição internacional, não governamental, sem fins lucrativos, baseada em Oaxaca, México. Foi fundada em 1993, com o objetivo de promover a conservação florestal através do credenciamento e monitoramento de certificadores de florestas submetidas a práticas de "bom manejo". O FSC possui amplo apoio do setor ambientalista, crescente apoio do setor empresarial e vem recebendo crescente atenção pelos governos de diferentes países (Viana et al 1996).

Existem várias críticas ao FSC. Segmentos ligados à indústria e alguns governos reclamam da pequena participação no processo de tomadas de decisões do FSC. Originalmente, o processo de tomada de decisões do FSC (Assembléia e Conselho Diretor) estava dividido em câmaras, com 25% para o setor empresarial e 75% para os setores social e ambiental. A partir de julho de 1996 a estrutura foi alterada, contemplando agora uma participação paritária (33%) para os diferentes segmentos: econômico, social e ambiental. Desde a criação do FSC, os órgãos governamentais têm direito de participação nas Assembléias, sem direito a voto. Isso permanece até hoje.

Com relação à participação governamental no FSC, deve ser relembrado, em primeiro lugar, o caráter voluntário da certificação florestal. Em segundo lugar, vale enfatizar que, tanto a nível nacional quanto internacional, a credibilidade de órgãos governamentais de controle ambiental é baixa, fato demonstrado por uma série de pesquisas. O Brasil não é exceção. No período de 1992 a 1997, uma ampla pesquisa nacional revelou que o brasileiro atribui responsabilidade crescente às entidades ecológicas 28 e 32% respectivamente, e responsabilidade decrescente ao governo federal, 51 e 48% respectivamente; na resolução de problemas ambientais (MMA, MAST e ISER 1997). Em terceiro lugar, existe uma tendência internacional de aumentar o papel

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da sociedade civil no processo de tomada de decisões sobre sistemas de produção que afetam de forma significativa a qualidade ambiental (veja seção 4).

Um recente estudo encomendado pela Organização de Madeiras Tropicais (ITTO-OIMT), indica que, para ter sucesso, um programa de certificação não deve ser controlado pelos setores que possuem potenciais conflitos de interesse com a certificação (ITTO 1994, Ghazalli e Simula 1994). O caráter independente do FSC reforça a importância de manter uma participação equilibrada dos diferentes setores no processo de tomada de decisão. É exatamente isso que dá credibilidade às atividades do FSC.

Existe uma série de processos sendo desenvolvidos a nível nacional e regional, com o objetivo de detalhar os princípios e critérios do FSC para as diversas realidades existentes. No Brasil, por exemplo, existe um Grupo de Trabalho, composto por representantes dos setores ambientalista (Greenpeace, Amigos da Terra, WWF e Funatura, Imazon), social (FASE, COIAB, GTA, Vitae Civilis, FTIMC e ISA) e empresarial (SBS, AIMEX, ABRACAVE, FARESP e ANFPC), além de observadores ligados ao setor acadêmico (ESALQ/USP e IPT), FSC internacional, governo (MMA) e certificadores (IMAFLOA). O Grupo de Trabalho é secretariado pela WWF e tem como principal agenda a definição de critérios e indicadores para a certificação de florestas plantadas e florestas naturais de terra firme da Amazônia.

## 2.2. ISO 14000

A Organização Internacional de Padronização (International Organization for Standardization ISO) é a maior e mais importante instituição padronizadora do mundo. Foi estabelecida em 1946 na Suíça com o objetivo de facilitar o comércio internacional de produtos e serviços e estimular a cooperação científica e tecnológica internacional através da padronização. Com a série de padrões ISO 9000, a ISO desenvolveu o conceito de qualidade total, que teve grande aceitação no Brasil e no exterior. Com a nova série ISO 14000 (em fase de elaboração), a ISO pretende padronizar sistemas de gerenciamento ambiental.

Um estudo realizado pela Benchmark Environmental Consulting para o European Environmental Bureau revela uma série de problemas relacionados com a ISO 14001. O primeiro problema está relacionado com a dificuldade do uso da ISO 14001 na implementação da Agenda 21 e outros acordos internacionais. Isso se deve a uma série de fatores fundamentais como, por exemplo, o controle do processo ISO pelo setor industrial dos países industrializados e a pequena participação de ONGs, pequenas empresas e governos de países em desenvolvimento.

Um segundo problema é o fato da ISO 14001 demandar apenas a obediência à legislação dos países onde estão situadas as empresas e não à legislação dos países de origem (no caso de empresas multinacionais). Isso é particularmente grave pois contraria uma tendência estabelecida na Agenda 21, que estabelece recomendações para empresas multinacionais “introduzirem diretrizes e com-

promissos de adoção de padrões não menos rigorosos do que nos seus países de origem”. Abre, portanto, a possibilidade de certificação de empresas com desempenhos ambientais medíocres mas situadas em países com legislações ambientais menos rigorosas. Pode, indiretamente, contribuir para a exportação de “indústria sujas” dos países industrializados para o Terceiro Mundo.

Um terceiro problema é o fato da certificação através da ISO 14001 atestar a conformidade de uma empresa com os procedimentos e metas estabelecidas por ela própria. Por exemplo, uma empresa que joga uma tonelada/mês de mercúrio num rio próximo, situada num país que não tenha legislação específica sobre o tema, pode ser certificada desde que ela tenha um plano para reduzir a carga poluidora nos próximos 5, 10 ou 50 anos. Em outro exemplo, uma empresa que usa cloro no processo de produção de papel pode estabelecer uma meta de abandonar o uso de cloro gradualmente ao longo dos próximos 150 anos - desde que isso seja legal no país - e ainda assim ser certificada pela ISO. Não se certifica, portanto, o desempenho diante de padrões mínimos fixados externamente à empresa. Trata-se de uma simples certificação de

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desempenho diante de metas auto-estabelecidas, em conformidade com a legislação local. Obviamente, muitas metas e níveis de desempenho não seriam aprovados por organizações ambientalistas e movimentos sociais tanto locais quanto internacionais.

Um quarto problema é a ausência de critérios voltados para os padrões de saúde e segurança do trabalho e distribuição dos benefícios sociais. Isso não é tratado pela ISO 14001 e é um retrocesso em relação à tendência internacional, consagrada na Rio-92, de analisar de forma holística e integrada os sistemas de produção. Essa análise holística envolve uma compatibilização dos objetivos sociais com os objetivos econômicos e ambientais.

Outro problema é o caráter confidencial das informações ambientais sobre empresas certificadas pela ISO. Isso vai contra a tendência internacional, reforçada pela Agenda 21, que assegura o “direito ao conhecimento” dos impactos ambientais e estabelece uma série de recomendações para o acesso a informações.

O Global Forest Policy Project, um consórcio de grandes ONGs ambientalistas que tem a missão de acompanhar assuntos relacionados com políticas florestais a nível internacional, com sede em Washington, sintetiza os principais problemas que levam o setor ambientalista a ter dificuldades em aceitar a ISO 14001:

(i) o fato da certificação ser voltada para conformidade com os padrões fixados pela própria empresa e não desempenho diante de padrões fixados com a participação de diferentes grupos de interesse;

(ii) a inexperiência da ISO em lidar com sistemas ecológicos complexos como o caso das florestas, diante do seu caráter historicamente voltado para as ciências exatas;

(iii) as dificuldades impostas à participação efetiva e equilibrada dos diferentes grupos de interesse relacionados com a atividade florestal;

(iv) o fato dos padrões da ISO estarem praticamente não testados e submetidos a verificação independente por outras instituições.

O sistema ISO teve sucesso enquanto lidou com problemas relacionados com a qualidade da gerência empresarial e as especificações técnicas, desenvolvidas, mensuradas e monitoradas pelo próprio setor empresarial.

Se a eficiência gerencial é um assunto de pequeno interesse público, o impacto ambiental de atividades empresariais é um tema de grande interesse público. Ao tratar problemas ambientais da mesma forma que problemas operacionais de engenharia industrial, o enfoque ISO enfrenta sérias limitações na área florestal. Essas limitações devem perdurar enquanto não existirem padrões de desempenho amplamente acordados e aceitos, for desnecessário o acesso público aos resultados das auditorias, e permanecerem contradições conceituais com instrumentos internacionalmente aprovados, como a Agenda 21.

A certificação pela ISO 14001, no seu presente formato, tem sérias limitações para uso no setor florestal e é motivo de preocupação de vários setores comprometidos com a viabilização do manejo florestal sustentável.

A atual certificação ISO 14001 pode, entretanto, ter um papel positivo dentro de um

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processo de melhoria da qualidade ambiental dos sistemas de produção de bens. Um dos aspectos positivos da ISO é o fato das empresas assumirem compromissos para a melhoria contínua da qualidade ambiental dos sistemas produtivos. Em muitos casos, a certificação leva ao enfrentamento de problemas crônicos,

com o estabelecimento de metas específicas para o seu questionamento. Outro aspecto positivo é o fato da certificação através do sistema ISO requerer o cumprimento da legislação ambiental federal, estadual e municipal. Isso representa, em muitos casos, um avanço significativo em termos de melhoria ambiental.

Um sistema de normas internas para definição e monitoramento de impactos ambientais certificado pela ISO 14001 facilita o aprimoramento do sistema de gestão ambiental do produtor. Entretanto, esse tipo de certificação não pode ser utilizado como base para a rotulagem de produtos oriundos de áreas de bom manejo florestal nem para o marketing empresarial. O risco são casos de propaganda enganosa, onde a simples existência de um sistema de gerências ambientais possa ser vendida como um atestado de bom desempenho ambiental.



### 3. O conceito de bom manejo florestal

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Houve uma mudança paradigmática significativa no setor florestal nos últimos tempos, parcialmente relacionada com a certificação florestal. O conceito ocidental de manejo florestal foi o precursor da idéia de sustentabilidade da produção. Foi na Alemanha, no século XVIII, que foi idealizado o conceito de “produção sustentada”, dependendo da intensidade e freqüência da colheita e dos tratamentos aplicados à floresta. Nasceu aí o conceito de “manejo sob regime de rendimento sustentado”, que focalizava o problema da sustentabilidade da produção de florestas manejadas.

Na década de 80, sob a influência dos trabalhos da Comissão Bruntland, surgiu o conceito de “manejo florestal sustentável” (“sustainable forestry”), que abordava as dimensões sociais e ambientais da produção, para as gerações atuais e futuras, expandindo assim a dimensão estritamente econômica do conceito tradicional de “manejo sob regime de rendimento sustentado”.

Finalmente, na década de 90, com o advento da certificação socioambiental, surgiu a necessidade de traduzir o conceito de “manejo florestal sustentável” para algo mais prático, passível de uma avaliação objetiva e replicável. Surgiu aí o conceito de “bom manejo

florestal” (“good forest management” ou “forest stewardship”), que representa as melhores práticas de manejo, capazes de promover a conservação ambiental e a melhoria da qualidade de vida das comunidades locais, considerando a viabilidade econômica e o estado da arte do conhecimento científico e tradicional. Trata-se de um conceito que busca avaliar objetivamente a aplicação de boas práticas de manejo que, por sua vez, devem variar entre diferentes situações e, num mesmo local, ao longo do tempo.

A certificação florestal representa um fator que deve contribuir de forma decisiva para a reformulação dos paradigmas das ciências florestais e práticas de manejo florestal. É fundamental que as instituições de ensino e pesquisa participem das discussões acerca dos processos de certificação em andamento. Essa participação tem, por um lado, a importante tarefa de contribuir para o aprimoramento da base científica para a certificação florestal. Além disso, as instituições acadêmicas devem utilizar essas oportunidades para reformular seus programas de pesquisa e ensino, adequando-os aos novos paradigmas que farão parte das atividades florestais nas próximas décadas.



## 4. A certificação socioambiental e os grupos de interesse

A certificação socioambiental surgiu como resultado de um processo de negociação intenso, na busca constante de consenso entre os diferentes grupos de interesse. Dentre esses destacam-se os movimentos sociais e ambientalistas e o setor empresarial, para quem a certificação tem diferentes significados.

### 4.1. A certificação e os movimentos sociais e ambientalistas

A certificação socioambiental pelo FSC representa uma ferramenta extremamente inovadora para os movimentos sociais e ambientalistas, com o objetivo de estimular sistemas de produção mais sustentáveis (Jeanrenaud e Sullivan 1994). Existem vários elementos que subsidiam essa avaliação. Talvez o mais importante seja a sintonia com o ideal de desenvolvimento sustentável e, em especial, a consonância com importantes avanços obtidos na Agenda 21. Incluem-se aí as recomendações para que empresas multinacionais “adotem diretrizes e compromissos de adoção de padrões não menos rigorosos do que nos seus países de origem”. É profundamente diferente da ISO 14000, que abre a possibilidade de certificação de empresas com desempenhos ambientais medíocres mas situadas em países com legislações ambientais menos rigorosas. A certificação socioambiental pelo FSC não contribui, portanto, para a exportação de “indústria suja” dos países industrializados para o Terceiro Mundo.

O sistema de certificação socioambiental pelo FSC tem um nível de participação das ONGs ambientalistas e movimentos sociais ímpar. No caso da certificação do Conselho Mundial para o Manejo Florestal (FSC), as ONGs ambientalistas e movimentos sociais têm 66% do poder decisório, com 33% cada. Esse balanço é radicalmente diferente no caso da ISO, onde a participação desses atores é mínima, com pouquíssimo poder decisório. É também muito diferente da maioria dos fóruns internacionais como, por exemplo, a ITTO.

Os resultados das auditorias de certificação socioambiental são públicos. Isso permite o acesso das ONGs ao acompanhamento do processo de melhoria de desempenho do produtor, face aos condicionantes e recomendações da auditoria ambiental. Além disso, essa transparência permite o acompanhamento do próprio trabalho dos certificadores, facilitando denúncias junto aos mecanismos de apelação do FSC.

A certificação socioambiental avalia o desempenho dos produtores diante de padrões mínimos de desempenho. Isso dá uma mensagem clara ao consumidor quanto à qualidade socioambiental do processo produtivo. Facilita campanhas voltadas para a conscientização pública organizadas por ONGs ambientalistas e movimentos sociais. Isso é profundamente distinto da ISO, que não certifica o nível de desempenho, mas apenas a existência de um sistema de gerenciamento ambiental.

Apesar dos vários aspectos positivos para os movimentos sociais e ambientalistas, a certificação socioambiental pelo FSC apresenta desafios significativos (Faillace 1996). Talvez

o mais importante seja o monitoramento constante da ação dos certificadores. É fundamental a participação das ONGs nos processos de certificação, com o objetivo de assegurar que os pontos críticos de cada sistema de manejo florestal sejam devidamente considerados. Essa participação é fundamental para dar transparência e credibilidade aos processos de certificação. Além disso, é fundamental a participação das ONGs na estrutura do FSC. Como uma instituição nova, em fase de consolidação, o FSC precisa do constante apoio das ONGs para manter o seu ideário original.

### 4.2. A certificação e o setor empresarial

A certificação socioambiental tem sido encarada pelo setor empresarial de duas formas principais. A primeira vê na certificação uma imposição descabida de novos custos aos sistemas de produção florestal, impostos pelo movimento ambientalista e pelas indústrias dos

**A certificação socioambiental pelo FSC representa uma ferramenta extremamente inovadora para os movimentos sociais e ambientalistas, com o objetivo de estimular sistemas de produção mais sustentáveis.**

países desenvolvidos. Por outro lado, alguns vêem na certificação uma oportunidade de negócio, capaz de alavancar vendas e conquistar mercados (Eisen 1994). De maneira geral podemos dizer que, como instrumento voluntário, haverá sempre espaço – agora e no futuro – para mercados que não valorizam a certificação como característica dos produtos florestais. Assim, a certificação não é uma imposição a todos, apenas uma necessidade para o acesso a determinados mercados. Podemos dizer também que existem inúmeras oportunidades promissoras para usar a certificação como um instrumento gerador de bons negócios. Assim, a certificação pode ser efetivamente uma boa oportunidade para empresários com visão estratégica.

Há controvérsia com relação ao mercado de produtos certificados. A perspectiva mais conservadora é que a certificação será mais útil para o acesso aos mercados, cada vez mais fechados e competitivos. A perspectiva mais otimista é que a certificação criará condições para a obtenção de preços superiores para produtos certificados, acesso diferenciado a crédito e benefícios fiscais (Viana et al 1996).

Alguns mercados já estão marchando rapidamente para a certificação florestal, notadamente, Inglaterra, Alemanha e Holanda. Outros países da Europa, Estados Unidos, Canadá e Austrália vêm logo a seguir. Mais distantes estão os mercados asiáticos, Oriente Médio e América Latina. Na Inglaterra, por exemplo, um grupo de empresas que consomem ou revendem produtos florestais madeiros e não-madeiros (WWF-95 “buyers group”) movimentava cerca de US\$ 3 bilhões/ano e definiu a data de 1999 como a meta para a comercialização de 100% dos produtos florestais com certificado de origem. É valioso considerar as motivações que envolvem grandes compradores de madeira a optar pela certificação: (i) estratégia de marketing institucional, (ii) estratégia diferenciada de competição por diferentes segmentos do mercado, (iii) motivação dos próprios funcionários.

Do ponto de vista estratégico, a certificação pode funcionar como um instrumento eficaz para a manutenção de mercados compradores de madeiras tropicais, especialmente na Europa. Um estudo realizado pelo “Center

for European Economic Research” de Mannheim, Alemanha, concluiu que a certificação pode contribuir para a reversão da tendência de declínio da demanda em vários segmentos do mercado em razão de campanhas anti-consumo de madeiras tropicais.

As indústrias exportadoras brasileiras que possuem efetivamente boas práticas de manejo florestal e são “certificáveis” podem ter vantagens comparativas em relação aos seus competidores nacionais e internacionais. Trata-se de um fator capaz de diferenciar os competidores, garantir maiores fatias no mercado e, eventualmente, preços superiores para seus produtos. De uma maneira geral, quanto mais cedo for feita a certificação maiores serão as vantagens.

Além disso, vários segmentos do setor florestal brasileiro, notadamente o setor de celulose e papel, possuem práticas de manejo compatíveis com outras operações certificadas a nível internacional. Para os segmentos onde as práticas de manejo necessitam melhorias sensíveis, notadamente o setor de madeira serrada de florestas nativas, a certificação pode representar um aliado importante para as ações governamentais voltadas para a promoção do manejo sustentável.

Um elemento novo é o fato de várias instituições financeiras - incluindo o Banco Mundial, BNDES, Banco Axial

e diversos fundos de investimento - estarem considerando a certificação socioambiental para a concessão de financiamentos para o setor florestal. Trata-se de um fato novo, que tende a consolidar-se como tendência e deve causar um grande impacto para o setor empresarial.

Um dos maiores desafios da certificação socioambiental é contribuir para a viabilidade econômica do bom manejo florestal. Para isso a certificação deve contribuir para (i) pagar os custos adicionais do bom manejo florestal em relação aos sistemas convencionais de manejo, (ii) pagar os custos diretos da certificação, incluindo as auditorias periódicas, (iii) oferecer uma remuneração adicional ao produtor, como atraente econômico e (iv) facilitar a comercialização dos produtos.

Assim como para os movimentos sociais e ambientalistas, a participação do setor empresarial no FSC é fundamental. Uma das principais razões é o realismo que o setor assegura às dis-

**Um dos maiores desafios da certificação socioambiental é contribuir para a viabilidade econômica do bom manejo florestal.**

cussões, que muitas vezes têm participantes com pouco conhecimento sobre aspectos operacionais e econômicos da produção florestal.

#### **4.3. A certificação socioambiental e políticas públicas**

Existe um crescente interesse na formulação de políticas públicas voltadas para o apoio ao manejo florestal. Isso inclui regiões com realidades contrastantes, variando desde as florestas boreais da Sibéria e Canadá até as florestas tropicais da Amazônia e África. Uma das perguntas centrais desse debate é: como a certificação pode contribuir para a formulação e implementação de políticas públicas coerentes?

O ponto de partida para a análise dessa questão é o reconhecimento de um novo contexto histórico na formulação de políticas públicas. Tradicionalmente, na maior parte dos países, as políticas florestais eram formuladas pelos governos. Mais recentemente, especialmente na Europa e EUA, existe uma tendência de fortalecimento do papel das ONGs e do setor privado na formulação e implementação de políticas públicas. Isso muitas vezes envolve a colaboração direta entre ONGs e o setor privado, com os governos assumindo uma função mais de monitoramento e apoio. Uma das justificativas para essa tendência é a insatisfação das ONGs e do setor privado diante dos atuais instrumentos de políticas públicas (Elliott 1996).

Existem vários exemplos da crescente participação de ONGs na formulação e implementação de políticas públicas também no Brasil. Talvez o caso que mereça maior destaque é o Conselho Nacional de Meio Ambiente (CONAMA), que possui uma grande participação não governamental na sua estrutura deliberativa. Um recente estudo, feito pelas ONGs Grupo de Trabalho Amazônico (GTA) e Amigos da Terra, aponta diretrizes para a formulação de políticas públicas coerentes com o ideal de desenvolvimento sustentável para a Amazônia (Smeraldi 1996). Uma série de estudos sobre o setor florestal realizado pela ONG IMAZON (Barros e Veríssimo 1996) tem fornecido subsídios críticos na formulação de políticas públicas.

Um tema bastante debatido é o papel dos governos na certificação socioambiental. Desde

a perspectiva mais tradicional, que não consegue internalizar as vantagens de um sistema de monitoramento sem o controle absoluto do estado, a certificação florestal deveria ser papel do governo. Trata-se de uma posição que merece uma reflexão profunda. Se os mecanismos atuais de controle florestal são tão ineficientes (veja Barros e Veríssimo 1996, Veríssimo e Amaral 1996), mesmo com um espectro temático mais limitado, como eles poderiam alcançar a credibilidade necessária lidando com parâmetros mais complexos como os envolvidos com a certificação socioambiental? Qual seria o custo de formulação e implantação de um sistema governamental de certificação? Por que não destinar esses recursos a outras atividades como, por exemplo, a educação florestal de nível médio ou a serviços de extensão florestal, nitidamente dentro do papel dos governos e francamente deficitários? Quais seriam as vantagens de um sistema governamental de certificação? De que valeria um certificado go-

vernamental se os consumidores - do Brasil e exterior - não conferem credibilidade a ele?

Muitas vezes a certificação socioambiental é tratada como uma barreira comercial não alfandegária dos países industrializados e, portanto, contra os interesses dos países em desenvolvimento. Essa análise merece um sé-

rio reparo. Em primeiro lugar, a certificação voluntária não conflita com as diretrizes da Organização Mundial de Comércio (Droogsmá et al 1994). Por outro lado, se a certificação estimula a disseminação de sistemas de manejo de melhor qualidade ambiental e social, e ainda assegura vantagens econômicas e comerciais a esses sistemas em detrimento de sistemas convencionais de produção predatória e de poucos benefícios sociais; como ela pode ser considerada conflitante com os interesses dos países em desenvolvimento?

A certificação socioambiental pelo FSC representa uma nova ferramenta, com elementos inovadores para a formulação de políticas públicas voltadas para o estímulo a sistemas de produção mais sustentáveis. Existem três fatores que tornam a certificação socioambiental uma ferramenta atraente na formulação e implementação de políticas públicas. Primeiro é a sintonia conceitual da certificação

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socioambiental com os princípios de desenvolvimento sustentável, consagrados na Rio-92. A certificação socioambiental incorpora os múltiplos objetivos do desenvolvimento sustentável, identificando sistemas de produção ambientalmente apropriados, socialmente justos e economicamente viáveis, capazes de gerar benefícios para as gerações atuais e futuras. Segundo, a certificação socioambiental possui elevada credibilidade, dado o seu caráter independente e participativo e à sua estrutura de funcionamento. A participação equilibrada dos setores empresarial, ambientalista e movimentos sociais é um dos pilares da credibilidade do sistema. O FSC possui diversos mecanismos para o esclarecimento de dúvidas e o recebimento e avaliação de denúncias. Além disso, os certificadores sofrem auditorias periódicas, que podem resultar no seu descredenciamento, com perda imediata da certificação dos produtores certificados inapropriadamente. Terceiro, a certificação não representa custos adicionais para os governos. Isso significa um elemento importante na estratégia geral de diminuição dos custos de estruturas estatais de monitoramento.

A avaliação de políticas voltadas para o desenvolvimento sustentável requer indicadores objetivos, com custo operacional barato e de alta confiabilidade (Camino e Müller 1993). A certificação socioambiental pelo FSC oferece um indicador útil para a implementação de políticas públicas para a promoção do manejo florestal. Para os países da Bacia Amazônica, por exemplo, a eficácia de políticas governamentais voltadas para a promoção do manejo florestal pode ser aferida através de dois indicadores simples: (i) a proporção dos produtos oriundos de áreas de bom manejo florestal e (ii) a proporção da área florestal sob regime de bom manejo florestal (Viana 1995). Se, por exemplo, uma determinada região, país ou estado possuir menos de 1% da produção florestal oriunda de florestas bem manejadas, uma meta das políticas florestais é elevar esse percentual. A eficácia dessas políticas pode ser medida através da evolução desse percentual ao longo dos anos.

Um dos países com posicionamento mais arrojado com relação à certificação é a Costa Rica, que instituiu um sistema (em fase de implantação) que deverá acompanhar e reconhecer a certificação feita por instituições não-governamentais, credenciadas pelo Governo, através de um “Conselho de Notáveis”. Os produtores certificados devem receber um pagamento (cerca de US\$ 70/ha/ano) pelos serviços ambientais (gás

carbônico, água, etc) como estímulo para as boas práticas de manejo florestal.

A certificação florestal tem assumido um papel de crescente importância nos fóruns internacionais. Uma dessas iniciativas é o Painel Intergovernamental sobre Florestas (IPF), que é parte da Comissão de Desenvolvimento Sustentável (CSD) das Nações Unidas (ONU). Uma série de conferências internacionais tem abordado o tema da certificação e sua importância para o apoio ao bom manejo florestal. Um evento que merece destaque é a “International Conference on Certification and Labelling of Forest Products”, organizada pelo Governo da Austrália (Ministry of Primary Industries), em parceria com o Painel Intergovernamental sobre Florestas, realizada em Brisbane, Austrália, em 1996. O documento final da Conferência representa um avanço histórico a nível governamental e não governamental com relação à certificação florestal. Uma das conclusões da Conferência, que trata do reconhecimento da “certificação e rotulagem como uma ferramenta com potencial para contribuir para o manejo sustentável de florestas” representa uma mudança radical em relação ao posicionamento dos governos, indústrias e ONGs em relação a alguns anos atrás.

Apesar do potencial da certificação socioambiental como ferramenta auxiliar à implementação de instrumentos de políticas públicas, é fundamental ressaltar o fato de que a solução dos problemas florestais é complexa e envolve um conjunto de ações (Elliott 1996). Na Amazônia são inúmeras as inadequações dos atuais instrumentos de políticas públicas (Hummel e Freitas 1997). É amplamente aceito o fato de que existe uma necessidade de amplas reformas nas políticas públicas. Essas reformas devem incluir políticas setoriais (florestais) e inter-setoriais. A certificação pode dar apenas uma modesta contribuição, como um catalisador de mudanças (Viana 1996b).

## Conclusão

A certificação pode servir como uma ferramenta capaz de auxiliar a implementação e avaliar a eficácia de políticas nacionais e internacionais dirigidas para o apoio ao bom manejo florestal. Se essas políticas públicas resultarem, por exemplo, na certificação de 10% da produção florestal da Amazônia até o ano 2000, teremos dado um passo inequívoco no sentido do desenvolvimento sustentável e cumprimento dos nossos compromissos na Agenda 21.

A certificação deve continuar como um instrumento de mercado, de caráter voluntário e não-governamental para assegurar seu potencial de catalisador de mudanças no setor florestal. A certificação pode aumentar a capacidade da indústria de manter e expandir sua participação em mercados importantes e, ao mesmo tempo, representar um importante estímulo para a conservação dos recursos florestais brasileiros através do manejo sustentável.

Os benefícios da certificação no estímulo ao bom manejo florestal devem ser complementados por políticas públicas que facilitem o acesso ao crédito privado para investimentos e/ou criem incentivos diferenciados para produtores certificados.

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Nota

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# Forest Concession Policies and Sustainable Forest Management of Tropical Forests

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*John A. Gray<sup>1</sup>*

## 1. Introduction

Forest concessions have been reasonably successful in encouraging forest based economic development in a number of forest rich developing countries. They have not been very successful in encouraging sustainable management of tropical forests (Repetto and Gillis 1988; Poore *et al* 1989; Grut, Gray and Egli 1991). For example, in Indonesia forest concession policies and the country's rich tropical forests contributed to the very remarkable growth in forest products output, exports and contribution to economic growth, particularly since 1980 (Gray 1996b). However, this contribution may be short lived. As a result of the rapid expansion of forest production, the supply of highly valuable tropical timber from natural forests will begin to shrink by the year 2000 (Gray 1996b).

Poore *et al* (1989), in a widely quoted study of tropical forest management, found that less than 1% of natural tropical forests (less than 1 million hectares) were under sustainable forest management. However the situation may not be as bad as the figures suggest. Not all countries with tropical forests were included and only rough estimates were made for major forest countries such as Indonesia and Malaysia (Sharma *et al* 1992). Elsewhere, Poore pointed out that several countries have substantial areas of forest that do not quite qualify as under sustainable management. A small additional effort would bring these forest under sustainable management, and in most countries logged areas could be brought into sustainable forest production with little effort (Palmer and Synnott 1992).

In this paper we examine some of the problems with present forest concessions and issues in making concessions more effective (in Part 1), some alternatives to forest concessions (in Part 2), and the experiences of forest concessions in a number of countries. The forest concession experiences of other countries are summarized in a series of case studies in the annex to the paper.

We then present a set of proposals designed to deal with the problems and issues in forest concessions and make forest concession more sustainable (in Part 3). We present a detailed series of steps designed to improve the concession allocation process, concession contracts, forest management on concessions, and the monitoring and supervision of concessions. These improvements are designed to introduce performance incentives into the allocation and operation of concessions. Changes are also proposed in the structure of forest fees to better reflect the values of both the timber and the concessions, to make fees easier to collect, and to provide economic incentives for concession management.



## 2. Forest Concession Issues

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Many tropical countries face problems in achieving sustainable management of their valuable tropical forests and on forest concessions. There are increasing population pressures from agricultural incursion into forest lands. Unless tropical forests can be protected and managed, there will be little forest left to meet the country's growth in domestic demand for forest products, to meet increased export demands, to contribute to the country's economic development and development of the forested regions.

In an era of reduced government budgets forest management and protection has become increasingly difficult. In many countries, with cutbacks in staff and funding the agencies and ministries responsible do not have the capabilities to manage the forests, or to supervise on-the-ground forest activities. Thus just when tropical forests are most in need of management and protection, the government is least able to do so.

Although not a complete list of all the issues involved in forest concessions, some of the important ones are discussed. Readers may wish to add others.

### **2.1. Public or Private Forest Management**

At issue in many countries is whether tropical forests should be publicly or privately owned and managed. Forestry in developing countries faces difficulties in the regulation, control and supervision of concessions distributed throughout the country. Forest concessions are, by nature, in remote areas. Supervision and monitoring of concession by government forest services is difficult. Faced with these problems many concerned for the survival of tropical forests have argued for cancelling concessions and closing down logging operations. With cutbacks of the government sector others have argued for deregulation of forestry and the transfer of tenure and forestry responsibilities to private sector concessionaires. Neither is likely to be successful.

Closing down of logging activities and cancelling of concessions would preserve the

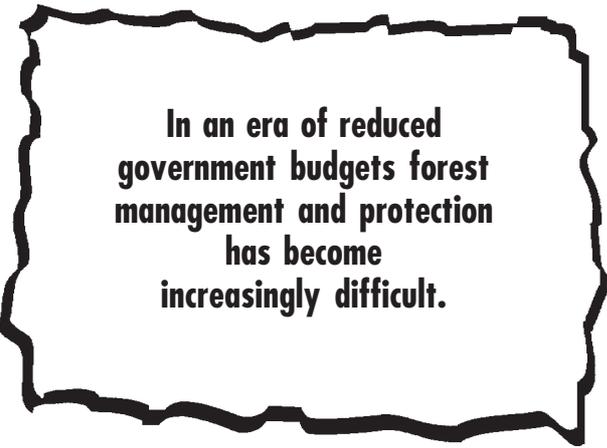
forest from encroachment by logging and logging roads, but it could leave forest areas unprotected and open to claim for conversion to other uses, principally farming. Unused land does not stay unclaimed for long in most tropical countries, witness the invasion of forest reserves where government does not have the resources to protect them. In addition, with no revenue from forests, governments will have little inclination to protect them. That is why logging bans in Thailand and Ecuador have not slowed deforestation.

The deregulation and transfer of responsibilities to private sector concessionaire is not likely to be successful either. This solution may be appropriate for forest plantations, but there are too many non-timber and environmental benefits from natural tropical forests for deregulation to be an efficient solution.

For natural tropical forests there are opportunities to strengthen forest concession contracts and procedures, to support forest management with economic incentives, to encourage or require concessionaires to undertake forest management activities, and to put forest management and concession management on a

more businesslike footing. These proposed improvements are discussed below, in Part 3.

There are also opportunities to maintain public control of forest concessions, but to privatize or contract out certain forestry activities, regulatory functions, or services such as forest inventory, scaling and grading, inspection of concessions, forest nursery operations, tree planting, and other forest management operations. The activities privatized or contracted out will still need to be supervised for performance, but the day-to-day operational activities can be delegated. Concession performance could be evaluated by an independent organization or "inspection service". Greater use might be made of refundable performance bonds, refundable at the end of each management plan upon demonstration of satisfactory performance.



**In an era of reduced government budgets forest management and protection has become increasingly difficult.**

## 2.2. Length of Concession Tenure

In many tropical countries the short length of concession tenure is often identified as a reason for the unwillingness of the concessionaires to manage the forest and to practice sustained yield forestry. It is commonly proposed that longer, more secure concession tenures would provide the required incentive for sustainable forest management. Yet, long term leases may not be the answer. Under long term tenures, or even privatization of the forest, concessionaires may continue to liquidate, rather than manage slow growing tropical forests (Vincent 1990, Gray 1994).

Where growth rates of tropical forests, in volume and value, are low, below rates of return on other investments, concessionaires will have no incentive to manage the forests, even under long term, or secure tenure. Given the slow growth rates of most tropical high forests, well below private sector rates of return, long term tenures or privatization will not provide sufficient incentive for concessionaires to practice sustained yield forestry. Concessionaires will liquidate the forests and invest the proceeds elsewhere at a higher rate of return.

In practice, under slow growth rates, short term tenures may be better. There is some evidence from Indonesia that short term tenures, renewable upon forest management performance, provide a stronger incentive to forest management than long term tenures (Gray and Hadi 1989, Gray and Hadi 1990).

Long term leases can have another disadvantage. If the lease-holder or concessionaire mismanages the forest, it may be more difficult to get rid of him than if he has a short term contract of say five years.

Instead, a more appropriate form of tenure might be a concession contract of 15 to 20 years, renewable every 5 to 10 years subject to inspection and performance evaluation of the concession. This is the type of tenure offered under Forest Management Licences in several Canadian Provinces. To ensure impartiality, inspections could be carried out by an independent agency, as proposed below.

## 2.3. Concession Size

The size of concessions varies enor-

mously among and within tropical countries (Grut, Gray and Egli 1991). In some countries concessions are too small to support viable silviculture, logging and transport units.

More often concessions are beyond the needs of concessionaires. In many tropical countries fees on forest concessions are minor, often negligible. As a result there is little or no cost to the industry acquiring and holding large concession areas. Concessionaires acquire large forest areas, often more for future "insurance" purposes or speculation that for regular timber supplies. Not only does this mean that public resources are lying idle, but these unused forests are, paradoxically, also the ones that are especially prone to deforestation by shifting cultivators. With excess forest area, the industry has little incentive to control encroachment, or to manage the area.

Consolidation of concessions of less than the optimum range should be encouraged by making them transferable, particularly to adjacent concessions. Division of concessions larger than the optimum range should be also

be encouraged. At renewal, concessions which have been operated at less than say 75 or 80 percent of their annual allowable cut could be reduced in size. This would free area for reallocation.

## 2.4. Concession Management Incentives

In most countries the concession agreements do not provide sufficient incentives for forest management nor include measurable performance requirements. Arrangements for supervision and monitoring are weak or non-existent (Grut, Gray and Egli 1991).

Incentives can be used to support the regulation and management of concessions. These can be positive incentives - payments or reduced fees based on performance - or negative - penalties or loss of deposits for non-performance.

The granting of interim concession licenses which are converted to a second stage interim licence or operating licence upon demonstrated performance is a useful approach. It puts the onus on the concessionaire to demonstrate his performance, rather than requiring the forestry department to be continually checking upon performance.

**In many tropical countries fees on forest concessions are minor, often negligible. As a result there is little or no cost to the industry acquiring and holding large concession areas.**

Concession management might include greater use of guarantee performance deposits and refunds upon performance. Prepayment of forest fees will ensure that concessionaires are up-to-date with payment of their fees. Performance deposits can be required at various stages in the concession application, approval and granting. However, concessionaires would need to be confident of the return of their deposits if the system is to provide incentives for forest management.

The concession renewal provisions at 5 to 10 year intervals, mentioned above, are another example. Other incentives are introduced into the proposals of Part 3, below.

### **2.5. Impact of Forest Fees on Concession Management**

The forest revenue system and of the forest fees on timber and on concessions can have a significant effect on forest management and the performance of forest concessions.

Problems of low forest prices on timber and of low fees on forest concession holdings are common to developed countries (Repetto and Gillis 1988). There are few countries in which forests are properly priced and economic incentives used to encourage efficient utilization and sustainable forest management. Thus there are potentially large benefits from modest improvements in the forest revenue systems of most countries (Gray 1997).

Low forest revenues can result either from low forest fees, set at levels well below the value of the timber, or from low collection rates, the result of weak and inefficient collection systems. Both are common problems of forest revenue systems in West and Central Africa and in South East Asia, and both contribute to low forest revenues yields (Grut, Gray and Egli 1991, Gray 1983).

Low forest fees distort forest management decisions, encourage inefficiencies in utilization, silvicultural investment, and conservation. Low forest fees mean that timber is underpriced and encourage poor utilization of timber in the forest and by processing industries. Poor collection rates direct individual efforts away from productive activity towards

avoidance and evasion, “rent seeking”, “bribe taking” and other “unofficial” payments. Low forest fees and revenues make forest management and forest renewal uneconomic. Low forest fees provide insufficient revenue to fund government forest management and supervision of concession operations and jeopardise the long term financial and biological sustainability of tropical forestry.

Forest fees on the timber cut along with fees on forest concessions — set at levels that reflect the value of the timber and of concessions — can: (1) deter the overexploitation of tropical forests, (2) provide economic incentives for sustainable management of tropical forests and more efficient utilization of tropical timber, and (3) generate the revenues to finance forest management and regeneration, making tropical forestry both financially and economically sustainable.

A more significant share of forest revenues could be collected through concession fees. Concession fees could include: (1) an initial concession licence fee; (2) an annual

concession fee based on the concession area, on the inventory volume, or on the annual allowable cut; or (3) bonus bids on concessions, where concessions are allocated by competitive application and through oral auction, or sealed tender.

Concession fees, properly designed, can serve a number of forest

policy objectives. First, concession fees are much easier to collect than stumpage fees on timber. With stumpage fees forestry departments are dependent on accurate and correct scaling of the timber cut, often carried out by the concessionaires. As a result of this and other factors, forestry departments collect only a small fraction of the stumpage fees due. With a concession fee there are no such problems.

Second, concession fees serve to reflect the security value of timber supply provided by the concession. This security value is an important and real value to concession holders, the insurance value of a guaranteed timber supply. Concession fees can discourage the non-productive efforts (lobbying, persuasion, influence, or bribery) “invested” in obtaining a concession (“rent seeking,” as it is

**Low forest fees distort forest management decisions, encourage inefficiencies in utilization, silvicultural investment, and conservation.**

termed), and so channel efforts into more productive activities.

Third, concession fees can encourage better management of concessions, more intensive forest management within concessions, and less speculative acquisition. Low or zero concession fees provide the wrong incentive. They encourage the acquisition of concessions, make the acquisition of large concession areas cheap, and thus encourage “cream-ing” or “high grading”, and waste.

## **2.6. Bidding for Concessions**

Concessions are too often allocated in an arbitrary fashion, which invites corruption. Persons who have no knowledge of the forest industry, and no intention of entering it, are sometimes awarded concessions which they then sell or contract out. Rent which should go the owner of the forest, is dissipated elsewhere.

When there is adequate competition, concessions should preferably be allocated through bidding. Concessions sold by bidding provide an indications of what should be charged on concessions where competition is not possible (Gray 1983, Gray and Hadi 1989).

Competitive allocation has advantages. It avoids the difficult administrative decisions in choosing among competing applicants. It allocates concession areas to those processors to whom they are most productive and valuable. Finally, it generates revenue to the forest owners, be they governments or local communities.

Bidding has another advantage. The prices bid for concessions are a market based indicator of whether forest fees on the timber harvested are at the right level. If forest fees are low, profits from harvesting timber will be large, concessions financially attractive, and the “bonus prices” bid for new concession will be high. On the other hand, if forest fees fully reflect the value of the standing timber on concessions, then the bids for concessions will reflect only the security of timber supply value of concessions.

It is recommended that competitive allocation of concessions by sealed tender be applied first to new concessions in areas of the country where competition can be expected. Competitive bidding could also be used in re-allocating concessions returned, expired and not renewed, or cancelled for non-performance, perhaps with existing holders being given the option of matching the winning bids.

Auction procedures would need to be under tight control, to ensure that bidding is competitive and that the concession is awarded to the highest bidder, or the highest ranking bidder where technical competence and other factors as well as price are considered. Bidding conditions can also be tailored to the country's industrial strategy. For example, to prevent large companies from acquiring large areas, concessions could be auctioned in small but manageable units, and small companies without concessions given bidding preferences. The concession allocation procedures might be entrusted to an independent auctioneer.



### 3. Alternative Forest Tenures

Forest concessions or other tenure arrangement for slow growing tropical forests require care in their design, because of the diversity of outputs of tropical forests (private commercial outputs such as timber. These include common property outputs such as fruit and nuts, medicinal plants, game, etc., and the diversity of non-market (public or collective) outputs such as water quality benefits, biodiversity values and other values.

In addition to forest concessions, a range of alternative forest tenures is possible. Not all are appropriate to tropical forests. Some are more appropriate to plantation forests, others to temperate forests. Here we survey a several alternative tenures, and evaluate them in terms of their economic effects and suitability for management of slow growing, natural tropical forests.

#### 3.1. Privatization of Concessions

Privatization of concessions is equal to a concession of infinite duration. The government or local community, as the owner of the forest and the seller of the wood, could continue to collect forest fees from the private concessionaire. Like most privatization, it would have to be linked to regulation (legislation) and supervision. Although sustained yield forestry in the natural tropical forests can be economically profitable to the country, in most cases sustained yield forestry is not profitable to the concessionaire. Private management of forests is only financially profitable if the growth rate in value of the forest biomass (the volume of the residual stand after logging) is greater than the concessionaire's opportunity cost rate of return (Gray 1994). If the growth rate in value is less than the concessionaire's opportunity cost rate of return, the concessionaire's financial choice will be to mine the forest, to take all merchantable trees and abandon the remnant stand to fate.

Growth rates of physical biomass of 1% to 3% per year, combined with the growth in real value per cubic metre of 1% to 2% per year (relative to other prices and inflation as a

result of increasing scarcity of timber), would yield a combined growth in value estimates of between 1% to 4% per year. This is well below the opportunity cost rates of return on alternative investments for concessionaires in most developing countries.

Slow growth is one reason why privatization of concessions, that is of the forest alone, or the forest plus the land, must be coupled with regulations of forest management performance.

Privatization will not maximize overall social benefits from tropical forestry. Privatization will not ensure production of non-timber forest products, or of the non-market, public, or collective benefits of the forest such as water management benefits, erosion control benefits, environmental and biological diversity benefits.

#### 3.2. Privatization of the Forest But Not the Land

Privatization of the forest excluding the land involves the sale of the existing forest crop and future crops for a specified time period, or perhaps forever. This is the model adopted in New Zealand for the sale of that country's exotic plantation forests (primarily radiata pine, *Pinus radiata*), with the

forests sold in lots, by sealed tenders and international bidding. The sale was for the existing crop of trees, plus the land use rights to grow a second forest crop on a 35 year rotation, or to use the land for other purposes. Bids were for an initial payment with no further fees on timber harvested. If it were not for the legal challenge of Maori land claims, the New Zealand Government might have sold the land as well. In the first round auction, held in July 1990, most of the sealed bids were rejected as too low. Only two bids, covering 15% of the forest area offered, were accepted by the government. The government then moved to sell the remainder by negotiation.

Privatization of forests may be appropriate for fast growing plantation forests, but not for natural tropical forests that grow slowly

**Privatization of forests may be appropriate for fast growing plantation forests, but not for natural tropical forests that grow slowly and generate additional non-timber benefits.**

and generate additional non-timber benefits. Plantation forests involve large initial capital investments. Security of tenure is required to allow recovery of the investment. Plantations produce primarily market outputs of wood or other products. Non-timber outputs and non-market environmental values are usually much less than in natural tropical forests. For plantation forests these non-timber and non-market values can often be protected by contract clauses, easements, or by separate land use legislation.

### **3.3. Privatization of Both the Forest and Forest Land**

Privatization could be taken one step further, to the sale of the forests and the lands. This is the approach taken by the British Forestry Commission in selling a portion of the Commission's forest plantations. It is also the model used in Chile in the sale of plantations and more recently in the sale of Chile's natural forests. Again, this approach is more appropriate to fast growing forest plantations than to slow growing natural tropical forests. As suggested above, for natural tropical forests where non-timber and non-market benefits are significant, privatization will not ensure continued production of these non-market benefits.

### **3.4. Forest Management Licences**

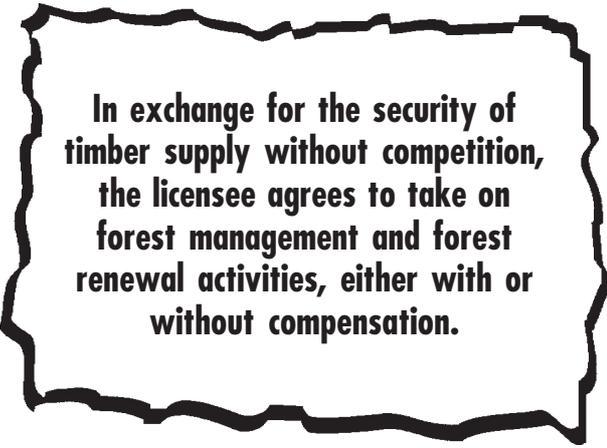
In Forest Management Licences, the forest tenure system common in Canada, the tenure is for the annual allowable cut of the geographically defined forest area, and for a specified length of time. The licensee has rights to the volume of timber equal to the annual allowable cut at prevailing forest fees. The standing timber remains the property of the government, as owner, until approval of the annual cutting plan and logging. The forest fees could either be the normal forest fees applied on other tenures, or forest fees established in the licence argument and adjusted by a pre-established formula. In exchange for the security of timber supply without competition, the licensee agrees to take on forest management and forest renewal activities, either with or without compensation.

This approach is found in several Cana-

dian provinces. In Canada jurisdiction over forest resources is delegated to the provinces. The provinces of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick and Newfoundland all provide examples, each with variations in terms and conditions and in management obligations.

Forest management licences in most provinces are for a 20-year period. A few have shorter or longer periods, 10 or 25 years. But in almost all provinces, the licence is subject to a performance review and is renewable periodically, at 5-year intervals in most provinces, 10-year intervals in others. Review and renewal provides a continuing incentive for performance of forest management activities. The licensee, who values the security of timber supply, is willing to undertake forest management and regeneration in order to preserve this security of supply. With adequate performance, tenure becomes continuing, almost perpetual. In almost all provinces there are provisions to allow withdrawal of up to 5 or 10 percent of the area at the review, if required for specific alternative land uses, as parks or reserves.

Forest management and reforestation expenditures are handled differently in each province. Other features of the forest management licence arrangements vary among the eight provinces and provide an opportunity for comparison and evaluation of actual experiences.



**In exchange for the security of timber supply without competition, the licensee agrees to take on forest management and forest renewal activities, either with or without compensation.**

### **3.5. Selling Timber with a Guarantee of Future Supply**

Under this model, companies have tenure rights either to a guaranteed share of the annual allowable cut or to a specified volume from a specific managed forest area. The tenure is to a guaranteed wood supply rather than to a specific area. Examples of this alternative are found in the timber quota systems of the Canadian provinces of British Columbia, Alberta, Manitoba and Quebec. Thus individual Canadian provinces provide examples of several forms of tenure, and a rich experience of successes and problems.

Under this form of forest tenure, the forest is managed by the forestry department rather than by the tenure holders. In British

Columbia the provincial forest service is responsible for both forest management and reforestation. In Alberta, most quota holders are responsible for reforestation. The smaller operator may either reforest or pay a reforestation fee. In some provinces such as Manitoba, additional, unallocated annual allowable cut has been auctioned by sealed tender. In most provinces timber quotas are for a fixed term. They have normally been renewed when fully utilized, subject to performance. Quotas not fully used are commonly renewed for a reduced volume. Therefore the incentive is “use it or lose it”.

### ***3.6. Selling Standing Timber Under Short Term Sales***

Under this approach the forestry department is responsible for management of the forest, for designating, surveying and selling blocks of timber under one, two, three, or five-year timber sales (or perhaps longer terms). The forestry department is responsible for supervising logging, and for regeneration afterwards. This is the traditional timber sale model.

This model is illustrated by the United States Forest Service and Bureau of Land Management Timber Sales procedures. Examples are also found in Canadian Provinces (British Columbia, Alberta, Manitoba, Ontario). The Honduras case study in the Annex (see below) provides a Latin American example of

timber sales. Limited use is also made of timber sales in West Africa and South East Asia, mostly for plantation timber. (Gray 1983, Grut, Gray and Egli 1991). In Gabon, per-tree timber sales are provided for in the legislation. The system has not been implemented because the forestry department is not able to mark the trees or control cutting (Grut, Gray and Egli 1991).

Timber sales can be by open auction or sealed tender bidding, or allocated at administratively set forest fees.

### ***3.7. Selling Felled Timber at Roadside or at Central Log Yards***

In this model the forestry department is responsible not only for managing the forest, and allocating areas for logging, but also for the logging. Logging can be done by the department itself or by contractors hired by the department. Timber can be sold at the roadside, at fixed prices or in lots by auction. Alternatively logs can be transported to a central log yard and sold in regular sales by open auction, sealed tender, or at fixed prices.

This model is used in several European countries (e.g. Sweden, Finland, West Germany) and in several developing countries (e.g. Tanzania). In Thailand, before logging was banned, the government-owned Forest Industries Organization sold logs by public auction (Gray 1983).



## 4. Making Forest Concessions Sustainable

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### 4.1. A Framework for the Management of Forest Concessions

There are opportunities to make forest concession management more effective and more sustainable. In Part 3 we offer some suggestions for improvements. We outline steps for the allocation, supervision and monitoring to improve forest concessions, along with suggestions for strengthening the forest revenue system on concessions.

The forest management concessions proposed differ from the present forest concessions (timber supply concessions) found in most countries. The forest management concessions proposed are designed to achieve protection and sustainable management of forest lands for both timber and non-timber forest land uses. They involve contracts with private sector forest industry companies to undertake management duties and responsibilities for both timber and non-timber uses in exchange for security of timber supply.

Most countries already have concession procedures. The major problems are in implementing and enforcing them. The concession procedures proposed here are intended to strengthen and extend the existing procedures, to focus on their implementation, and on concession supervision and monitoring. The key is to introduce the right incentives into the concessions agreements and forest management requirements.

The forest concession procedures proposed involve first the allocation of concession contracts by bidding or other competitive allocation, followed by the management of the concession by the concessionaire, and supervision, monitoring, and auditing of concession operations by the government or an independent agency.

However, to implement a policy of allocating lands to forest management concessions, forest rich countries still need to build the capacity to carry out the concession policies proposed: to evaluate potential concessionaires, carry out auctions of concessions, negotiate

with powerful and experienced forest companies, and carry out the monitoring and supervision of forestry and logging activities on concessions. Guyana, for example, put a moratorium on the granting of new concessions and sought foreign assistance to strengthen its ability in negotiating concessions and in monitoring and control of concession performance (Sizer 1996, and the Guyana case study below).

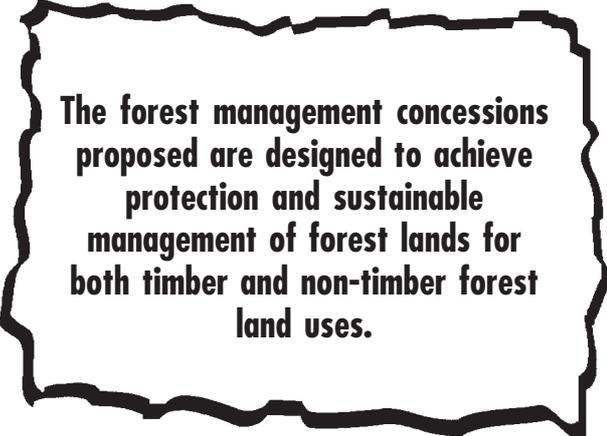
### 4.2. Concession Allocation Procedures and Steps

The forest concession procedures proposed involve first the allocation of concession contracts by bidding or other competitive allocation, followed by the management of the concession by the concessionaire, and supervision, monitoring, and auditing of concession operations by the government or an independent agency.

In this section the steps in the allocation of forest management concessions are outlined. The steps in the management and supervision of forest management concessions are described in detail in the next section.

The concession allocation and management procedures de-

scribed below are based on several sources: the ITTO Guidelines (“Guidelines for the Sustainable Management of Natural Tropical Forests” and “Guidelines for the Establishment and Sustainable Management of Planted Tropical Forests”); the experiences and problems faced by Ghana and a number of other countries in West and Central Africa; by Indonesia and Malaysia in South East Asia; by Honduras, Nicaragua, Guyana and Suriname in Latin America; and among developed countries, the experience of Canadian provinces with forest concessions and short term timber sales (ITTO 1992, ITTO 1993, Gray 1983; Grut, Gray and Egli 1991, Gray and Hadi 1989, Gray and Hadi 1990, Gray and Hägerby 1997, Sizer 1996, Sizer and Rice 1995). The experiences of a number of these countries are summarized in the Annex, below.



**The forest management concessions proposed are designed to achieve protection and sustainable management of forest lands for both timber and non-timber forest land uses.**

These procedures and steps are designed to extend present concession procedures, and are substantially more complete than the present concession procedures of most countries. They are designed as practical steps to strengthen the protection of the forest estate and to achieve sustainable forest management. If implemented they could also provide the basis for certification of forest management and of forest products.

Each step is intended to be established with "time limits" specifying maximum or minimum times for completion and procedures to be followed if the time limits can not be met.

These forest concession conditions, allocation procedures, and forest management procedures are designed for application to state lands. The procedures, with some modification could also be used by communities, or by groups of private forest owners, for forest management concessions on community of private lands.

#### **4.3. Concession Allocation Steps**

**Step 1** — Ensure the Area is Not Encumbered by Other Land Ownership or Land Use Restrictions

An important first step is to ensure that land claims are settled and that tenure rights to both the land and the timber are clear before proceeding. If land tenures and forest tenures are not settled or are unclear granting of a forest concession should be delayed until tenure issues are settled.

It is also important to ensure that the area is not covered by land use restrictions such as a biological or other reserve that would preclude timber harvesting and forest management. This should be clarified early, before proceeding.

**Step 2** — Initiation of the Proposed Forest Management Concession

In many countries the initiative for concessions has come from the applicant, with the applicant choosing the area applied for. Under this approach the better forest areas for timber production will be all taken up first, leaving the government responsible for management of the remaining patchwork of less attractive forest areas.

The recommended approach (used in some Canadian provinces) is for the government to take the initiative and identify areas for potential concessions. The Government would then invite expressions of interest in the areas for subsequent tendering. This puts the initiative in the hands of the Government. The Government chooses the forest areas to be managed under concessions, in line with regional and national development objectives, rather than the private industry's objectives. It allows the Government to achieve competition and bidding for concession areas higher bids.

This approach does not require the government agency to make the forest inventory. Interested parties would have to satisfy themselves of the quantity, species and quality of the area offered. A government forest inventory would reduce uncertainty for interested parties, save each the expense of an inventory, and likely result in higher bids. However, the Government would have to finance the forest inventory, and either carry out the inventory itself, or contract it out to a reliable,

independent private sector forestry consulting company.

**Step 3** — Advertise the Areas and Invite Expressions of Interest

Once land and forest tenure rights are settled, and the area defined, the next step is to invite expressions of interest from potential concessionaires.

The potential concession would be advertised in major forest industry trade journals in North America, Central and South America, Europe and Asia. Interested parties would be invited to indicate their interest and invited to submit information for pre-qualification of bidders.

The bid conditions, concession management requirements and other terms and conditions of the forest concession would be made available at this time to provide prospective bidders with knowledge of what is expected of them.

Minimum pre-qualification requirement would be established and indicated in the announcement. A deadline of perhaps two to three months would be given for submission of the pre-qualification materials.

**Step 4** — Pre-Qualification of Bidders

Information to be submitted for pre-quali-

**In many countries the initiative for concessions has come from the applicant, with the applicant choosing the area applied for.**

fication would include company financial and ownership information, subsidiary and related companies, information on their operations in the country and in other countries, annual reports to shareholders and audited statements for the past three years, and preliminary information on their proposed operations in relation to the concession. More detailed information would be required of qualified bidders as part of their tender.

#### **Step 5 — Approval of Qualified Bidders**

It is suggested that the agency responsible for forest administration has a limited time to evaluate the pre-qualification materials and notify qualified bidders. Two months might be sufficient. The evaluation of pre-qualification need not slow the concession process. In the meantime, potential bidders could examine the concession area and prepare their bids.

Approval would be based on the financial strength of the companies, their experience in forest management and experience in logging and processing operations elsewhere, and on their initial proposed utilization and concession operations plans. National companies might be favored in pre-qualification by preferential pre-qualification conditions.

Pre-qualified bidders would be announced. No appeal would be allowed by those who did not pre-qualify. Appeals would slow and complicate the allocation process.

#### **Step 6 — Time for Evaluation of the Area and Timber, and Prepare Proposals**

Pre-qualified bidders would be eligible to inspect the site and undertake a low-intensity reconnaissance inventory to satisfy themselves of the quantity and quality of the timber.

Two or more qualified bidders might wish to jointly undertake and fund a reconnaissance inventory. Bidders would be required to submit the details of their inventory, methods and results along with their bids.

Seriously interested companies will already have had time to evaluate the area and timber and prepare their proposals from the initial advertising of the area. However, additional time should be allowed for development of proposals. Perhaps three to five months would be sufficient additional time.

#### **Step 7 — Submission of Bids**

The deadline for receiving bids would have to be strictly observed to avoid any appeals or legal challenges.

It is recommended that concession bidding be by sealed tender. For transparency, tenders should be opened publicly. It is suggested that bidding be based on bonus bids. Bonuses would be in addition to the normal stumpage prices, area fees and other charges. The bonus bids would consist of two components: (1) an annual bonus payments per hectare on the concession, and (2) a lump sum bonus paid upon signing the contract.

Other non-monetary components of the bid to be considered in comparing bids might include: the proposed forest utilization plan, the degree of processing proposed, the employment generated, the community development proposals, and the environmental management proposals.

#### **Step 8 — Selection of the Winning Bid**

With pre-qualification of bidders, all bidders should have the necessary experience and abilities to carry out the concession management obligation. If all proposals meet the previously established concession conditions the decision should then be based primarily, or perhaps exclusively on the financial terms of the proposals. In that case the choice of the winning bid should be easy.

If the bids contain additional proposals on utilization, economic development of the area, social or environmental proposals, beyond those in the previously established concession conditions, it would be necessary to compare the financial and non-financial proposals. However, these conditions would be difficult to compare objectively. It is suggested that only when the bonus bids were equal, or within, say 5% or 10% would the non-monetary proposals in the bid be considered.

If it is desirable to give preference to national companies (such as those with majority, two-thirds, or higher national ownership), then the nature and extent of the preference should be stated in the initial announcement concession offer and in the request for bids.

#### **Step 9 — Concession Contract and Signing**

The forest management concession contract conditions are described in detail in the next section. The forest management concession contract would cover the concessionaires rights and obligations; along with the conditions for the management and operation of the commercial forest lands within the concession, and for the protection and management of non-timber producing areas within the concession.

The contract conditions should follow a standardized form, with special conditions, rights and obligations that apply to the area in question in a separate annex. Separate annexes would cover the boundary description, special forest management requirements, such as those for management of pine stands, special environmental management conditions of environmental areas within the concession, etc.

#### **4.4. The Forest Management Contract: Conditions, Steps and Approvals**

To be effective, the forest management concession contract must provide certainty of rights and obligations and security of tenure for the concession holder to carry out his management obligations. The conditions of the concession contract also need to be specified, with clear performance standards, laid out in stages, in order to provide strong incentives for compliance. These staged performance steps are described in sequence below.

##### **Step 1 — Boundary Marking**

Clear and permanent definition of the concession boundary is a vital and practical first step to forest management. It is crucial in maintaining the integrity of the forest, and for protection of the area from incursions. It is an essential first step to mapping and inventory of the forest and other non-forest resources to be managed under the concession agreement.

It is not possible to define the area for sustainable forest management, nor to derive a meaningful annual allowable cut without first defining the areas of forest to be managed.

In many countries, concession boundaries have not been marked, sometimes for years after the concession has been granted. In Indonesia, by the 1990's, the boundaries of many concessions had still not been marked, twenty years after the concessions had been granted (Gray and Hadi, 1990)(see also the Indonesian case study in the Annex). In some cases concessions have been granted with overlapping boundaries, none of them marked. Similar problems of boundary marking have occurred in Africa (Grut, Gray, and Egli 1991).

To provide an incentive for completion, permanent boundary marking should be com-

pleted and inspected by a designated date, not more than 18 months after signing the concession contract. Concession boundaries adjacent to the initial cutting area should be completed, inspected and approved before logging is allowed to begin.

##### **Step 2 — Mapping of the Concession Area**

Mapping of the concession area is a closely related and important second a prerequisite for a reliable forest inventory and forest management plans. Mapping should include the physical features of the entire concession area, both the forested and non-forest areas, as well as the non-timber, environmental and heritage features.

Deadlines would be provided for mapping of each section of the concession and for completion of the entire area. Logging operations would not be approved until mapping is completed over at least the initial operating area of the concession.

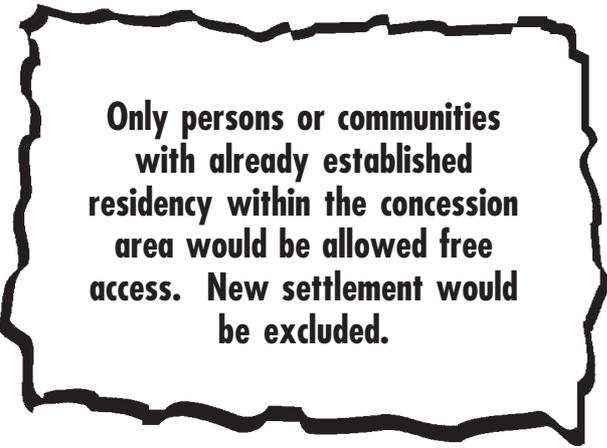
##### **Step 3 — Access Control**

An important condition for sustainable forestry is maintaining the integrity of the forest estate by protection of the area from incursion and conversion into poor quality, marginal agricultural and grazing land. To prevent agricultural incursion the concession holder would be required to control access.

Only persons or communities with already established residency within the concession area would be allowed free access. New settlement would be excluded. Agricultural development should be allowed only in limited areas adjacent to existing settlements, and only by established residents of the area or their descendants.

##### **Step 4 — Forest Inventory and Environmental Inventory**

The forest inventory should be completed before full scale harvesting is approved. An interim operational plan could be approved for an initial operating area, provided the forest inventory has been completed and an interim management plan approved for that initial operating area. However, to provide an incentive for completion of the forest inven-



**Only persons or communities with already established residency within the concession area would be allowed free access. New settlement would be excluded.**

tory and management plan, this interim operating plan and the interim management plan would be valid only for 12 to 14 months and not extended.

Forest inventory guidelines are provided, for example, by the Food and Agriculture Organization (FAO 1992).

In addition to the forest inventory, an environmental inventory would be required. Concessionaires would be expected to protect and manage the entire area and the other resources, including areas outside the designated forest operating area.

Deadlines would be set for the start and completion of both the forest inventory and the environmental inventory. Interim deadlines could also be set for completion of both inventories for the initial operating area.

### **Step 5 — Forest Management Plan and Environmental Management Plan**

Tropical forests provide a wide range of forest products (logs, fuelwood, foods and fruits, medicinal plants, wildlife) as well as a wide range of non-timber forest products (subsistence livelihood for forest dwelling peoples, watershed and environmental protection and erosion control, biodiversity values, and environmental tourism). These other non-timber forest products can often be equal to the value of timber production, but it is timber production that is usually dominant in forest management. Timber production generates the revenues earned by governments and landowners, and provides the basis to finance the protection of the forest and the management for the other non-timber forest products and benefits. As a result, the important non-timber forest products and benefits may be neglected. The management of forest concessions therefore must generate a balance between timber production and the other, non-timber forest outputs and benefits. It is for this reason that both a Forest Management Plan and an Environmental Management Plan are called for.

The Environmental Management Plan would parallel the Forest Management Plan, following a similar pattern. The Environmental Management Plan would differ from the usual Environmental Impact Statement (EIA), which merely documents the environmental resources and the impacts of a development proposal. Instead, the Environmental Management Plan would focus on the protection and management of the environmental resources (including cultural and heritage resources) within the concession boundaries.

For production forests, the management plan will provide firm guidelines on the annual yields, by species that can be cut for forest products, from which areas, and under which harvesting methods. For protection forests, the management plan would regulate the management of forest for water supply, erosion control, for conservation of biodiversity, for non-timber uses, or for recreation, and environmental tourism, and amenity values.

Requiring forest management plans will not lead to successful implementation of forest management on the ground. Nor will the approval of forest management plans lead to the implementation of forest management. Implementation of forest management also depends on a firm commitment by the Government and the concessionaire to allocate funds, personnel and other resources to carry out forest management, and for supervision and monitoring over the life of the management plan.

The forest management plan and the environmental management plan would be approved by the government agency responsible for the administration of forest concessions. However, the agency may not have the staff, resources and field capability to evaluate the management plans. If so, it would be necessary to contract out the evaluation of the management plans to an independent organization or private sector consulting firm. To ensure independence the organization or consulting firm may have to be recruited internationally.

### **Step 6 — Road Plan**

The initial road plan would provide the location of the main road system, and the planned location of main branch roads, accompanied by an overall map and detailed maps showing the location of the main roads and the main branch roads.

The road plan would include road specifications on right-of-ways, roadbed, ditching and culverts, surface materials, the level and frequency of maintenance and repair. The road plan would also include environmental conditions on stream crossing, minimum distance from streams, treatment of embankments and cuts to control erosion. The road plan would include conditions for gravel pits and prohibit gravel removal from streams.

The road plan would be approved by the agency responsible for administration of forest concessions prior to construction. If the agency does not have the capability to evaluate the road plan, evaluation may be con-

tracted out to an independent organization or consulting firm.

### Step 7 — Forest Utilization Plan

The utilization plan would be based on the forest inventory and forest management plan, and on the species composition, sizes, and quality (including defect) of the timber supply. Processing plants need to be designed to match not only the volumes of timber available, but also the species composition, sizes and quality (defect) of the timber supply. All too often processing plants are built before the forest inventory is completed, or are based on an inadequate forest inventory. The result is a processing plant that is inappropriate to the timber supply, high cost, unprofitable, wasteful of the forest resource, and contributes little to the economy.

The processing plant is an important contribution to the development of communities and the region. Thus the utilization plan is closely linked to the concession social development plan.

The location of processing facilities, and nature, size and employment involved are important parts of the concession agreement. Any changes in the location, nature or size of the processing facilities should require approval.

The concession contract should also contain commitments by the concession owner on the size, capacity, start and completion of construction, and start of operations of the plant. Any deviation from these commitments should require approval.

For each processing plant, the forest utilization's plan should specify:

- The physical location of each plant.
- The capacity, per shift, of each sub-unit, number of shifts planned per week, operating period (days/year, and weeks/year), and capacity at maximum possible operating level.
- Employment per shift of each sub-unit, man-hours per week and per year based on the planned operating schedule and at maximum possible operating level.
- The description of facilities and equipment for each sub-unit.
- Schedule of construction, start-up and full operation of the processing plants as sub-units.
- Outline of future modifications, improvements, and expansions

The utilization plan would require approval by the agency responsible for adminis-

tration of forest concessions prior to construction. If the agency does not have the capability for evaluation, it may be necessary to contract out the evaluation to an independent organization or consulting firm.

### Step 8 — Social and Community Development Plan

The community and social development plan should document commitments on the part of the concessionaire to community and social development.

It should document:

- Local community uses within the concession area for timber use, fuelwood, non-timber forest products, hunting, agricultural land uses, and other traditional land uses within the area.
- Access rights and access control of others.
- Community support for schools, health clinics, transportation.
- Local employment commitments and nature of any local employment preferences
- Training commitments.

The plan would also require approval by the agency responsible for administration of forest concessions.

### Step 9 — Initial Annual Operating Area Plan

The initial operating area plan should include the following components which are key to forest management and can be readily monitored on the ground:

#### *Logging Plan Layout on the Ground:*

The careful layout of roads, landings, and skid roads on the ground is a key requirement. It is probably the single most important practical step to environmentally improved logging and sustainable forest management of uneven aged tropical forests. Layout of the logging plan (roads, landings, and skid roads) on the ground can also benefit the concession owner by lowering logging costs, reducing damage to felled trees and improved recovery from the forest.

Proper layout of roads on the ground can facilitate road construction, reduce environmental damage, and reduce erosion. Proper road layout can also avoid wet lands, reduce road problems, and thus lower log transportation costs. Layout of landings on the ground can avoid wet locations and reduce skidding distance. Layout on the ground of skid road can make it easier to fell trees in the right direction to facilitate skidding and reduce damage to felled trees and the residual stand, reducing logging cost and minimizing logging

damage. It is a simple practical “win-win” situation.

Approval would require “on-the-ground” inspection and verification. If the agency responsible for administration of forest concessions does not have the resources to undertake “on-the-ground” inspection and verification of logging plans, then it may be necessary to contract out the inspection to a fully independent organization or private sector firm.

#### *Marking of Trees:*

It is recommended that the concession owner, rather than the concession administration agency, be responsible for marking the trees to be cut. In this way the marking of trees for cutting can be better integrated with forest operations and not hold up logging. It is recommended that marking be carried out after the roads and landings are laid out on the ground, and that the concession administration agency staff then inspect and approve both the marking and the logging plan at the same time by on-the-ground inspection. Skid roads would then be laid out after the trees are marked.

#### **4.5. Monitoring and Inspection of**

#### **Concession Performance**

Regular reporting by concessionaires on implementation of each of the concession management steps above is the first stage in supervision and monitoring of forest management on concessions. On the ground supervision and monitoring of these concession management steps is essential to achieve sustainable management on forest concessions.

On the ground inspection of forest boundaries, proper layout of roads and inspection of road plans, on-the-ground inspection of logging plan layout and marking of trees, and on-the-ground inspection of logged areas following logging are key monitoring indicators.

If the forest agency is not equipped, staffed and financed to carry out on-the-ground inspection of concessions, the alternative is to contract out the on-the-ground inspections to private sector firms of reliable reputation and impartiality with the ability and trained staff to carry out the work accurately and conscientiously.

It may be necessary to contract with forestry inspection firms internationally to ensure impartiality.

If the country is to achieve sustainable forest management on forest concessions a way must be found to fund and implement on the ground inspection and supervision of concession. It is proposed that a portion of the forest fees collected be allocated to a fund to finance on the ground inspection and supervision of forest concessions. Unless field inspection capabilities are strengthened granting further concessions can be dangerous.

Monitoring and evaluation would involve the following steps:

#### *Boundary Marking:*

Boundary marking is a key step in management of forest concessions and in the prevention of agricultural incursions. Performance in completing boundary marking can be monitored relatively easily. As boundaries are required to be clearly defined, they could be effectively checked from the air, from small aircraft at low levels. Boundary marking should be completed and checked within the time limits specified in the concession contract and before logging operations begin.

**The processing plant is an important contribution to the development of communities and the region. Thus the utilization plan is closely linked to the concession social development plan.**

#### *Boundary Maintenance:*

It is important that concession boundaries be maintained and kept clearly defined. Monitoring of boundary maintenance is also relatively easy. Boundary maintenance can be monitored by spot checks at pre-determined intervals, every two or every three years, by ground spot checks of different sections of the boundaries, or by inspection from aircraft.

#### *Mapping, Forest Inventory and Environmental Inventory:*

Evaluation of the accuracy of the forest and environmental inventories is important, but is not easy. It requires time consuming and costly on-the-ground checking.

The accuracy of the mapping can be monitored by checked randomly selected areas on the ground against the map, but even this will be expensive and time consuming. The forest inventory can be checked in the same way, by re-measuring randomly selected inventory sample plots, and by checking forest types from the forest inventory maps

against the forest types found on the ground. The environmental inventory can be checked by selective comparison of the environmental inventory data against the environmental conditions on the ground.

Checking of these inventories is expensive and time consuming. Often government agencies will not have the capacity for on-the-ground checking. Consequently, it is recommended that supervision of concessions concentrate instead on monitoring road planning, layout and construction, and on monitoring tree marking, logging plan layout, and post-logging inspections.

#### *Forest Management Plans and Environmental Management Plans:*

Forest and environmental management plans can be evaluated against the requirements and standards specified in the concession regulations and in the concession contract. However, these would be “office” or “paper” based evaluations. Without on-the-ground checking, there is no guarantee that the management plans match conditions on the ground.

#### *Road Planning and Construction:*

A well designed road system and proper road construction will contribute to an efficient logging system, reduce logging and log transport costs, and minimize the environmental impacts of logging. This should provide concessionaires with an incentive for efficient road planning and construction. However, in practice, with a very short term horizon, concessionaires often put insufficient effort into road planning and construction. The result is inefficient road layout, expensive log transportation, and environmental damage from poor road layout.

Monitoring of road planning can be done relatively easily by evaluating the road plans and accompanying maps to ensure the adequate road standards are specified, that roads are located away from streams, and that stream crossings, culverts and ditches meet environmental standards and minimize environmental impacts. On-the-ground checks can quickly verify the accuracy of the plans and maps.

Road location and construction should also be monitored on the ground, soon after construction and before logging begins, to ensure that the road layout matches the layout on the road plan and maps, and to correct any problems early. Inspection of roads shortly after construction should be relatively easy as access is then easy. For efficiency, road in-

spection can be combined with on-the ground inspection of the logging plan and inspection of the tree marking. It is important that the on-the-ground inspection of road layout, the logging plan, and tree marking be done and approved before logging begins.

#### *Post-Harvest Inspection of the Cutting Area:*

The cutting area should be inspected on the ground again following logging to ensure that the logging was done according to the silvicultural plan, that logging was done in line with environmental requirements and with minimum damage to the residual stand, that only marked trees were cut, that logs and felled trees are not left, and that trees that should be cut are harvested.

#### *Other Areas for Supervision, Inspection and Auditing:*

The other areas for supervision, inspection and auditing of forest concessions include:

- Forest Security and Protection.
- Silvicultural Management and Reforestation.
- Community Development.
- Continuous Forest Inventory.

### **4.6. Review and Extension of the Concession License**

For slow growing natural tropical forests, longer term tenure may not attain sustainable forest management, or environmental protection of the non-timber benefits, as suggested above. If the growth rates of the forest are low, below private sector interest rates and the rates of returns earned elsewhere, long term secure tenure is not sufficient to provide an incentive for managing the concession sustainably. Instead, long term tenure (or privatization of forests) will result in “high grading” and “mining” the forest, leading to rapid depletion of tropical forests (Gray 1994, Gray 1997).

Instead, sustainable forest management may be better achieved if concessions are issued for limited terms, and are renewable, subject to audit and satisfactory performance review as proposed. The performance review provides the incentive for concessionaires to manage the forests sustainably both for timber and for the non-timber environmental benefits.

It is therefore proposed that concession terms be relatively short, perhaps 10 to 12 years. With a concession term of say 12 years, an interim review is suggested in the fifth year to ensure performance meets the conditions of the concession contract and to correct any deficiencies early. A full perfor-

mance review would then be carried out in the tenth year, two years before the final year (year 12). To ensure an unbiased and independent review, it is suggested that the performance evaluation (or audit) be carried out by an external, internationally recognized consulting firm or forestry organization.

If the performance evaluation meets the conditions of the concession agreement, the concession would be extended an additional ten years, to year 22. A second interim review in the fifteenth year is recommended. If the full performance review in the twentieth year is satisfactory, the concession would be renewed for a further 10 years. After that a review every ten years prior to renewal should be adequate.

The concession contract should allow for changes to the concession area and boundaries, within defined limits, and for renegotiation of the terms and conditions to accommodate changes in circumstances on either side. The concession agreement should contain procedures for renegotiation of changes.

#### **4.7. Improving Forest Fees on Concessions**

Appropriate pricing policies for timber and concessions can provide economic incentives for improved forest management. Appropriate pricing can help deter overexploitation and encourage more efficient utilization of timber. Appropriate pricing of timber and concessions can also generate the revenue to make forest management financially sustainable.

Forest fees on timber and concessions should be set to reflect the value of the forest resource. Stumpage value is the value of the standing timber and can be derived from the market price of the logs or forest products produced, minus the following costs: (a) logging and log transportation costs, (b) in the case of processed wood products, the costs of processing, and (c) an allowance for normal profits on investments in logging and processing. Stumpage values are captured either as: (1) forest revenues (stumpage prices, fees, or taxes) collected by the owner of the timber rights (landowner, government, community or traditional owner), or as (2) above-normal profits collected by the forest industry.

Timber concessions also have value, a value in addition to the stumpage value of standing timber. Concessions provide a guaranteed, secure supply of timber to the forest industry. Forest concessions become corpo-

rate assets, and are often sold or traded. These concession values can be captured by separate concession fees. Concession fees have a number of advantages and are recommended.

Problems of low forest fees on timber and on forest concessions are common to many developing countries (Repetto and Gillis 1988; Grut, Gray and Egli 1991)(see also the country case studies in the Annex). For most countries there are large benefits from even modest improvements in their present forest revenue systems and pricing policies. Fees levied in national currencies decline in value from both inflation and depreciation of the currency. Even those set in US dollars suffer from general world inflation of 2% or more per year.

#### **■ Recommended Forest Pricing Policies on Concessions**

The pricing policies and fees proposed are designed to contribute to the long-term management and conservation of tropical forests: (1) by raising fees to reflect the value of the forest and forest concessions, (2) by structuring fees to provide incentives for improved utilization and forest management, (3) by generating the revenue to make forestry a worthwhile investment for government, and (4) by providing the revenue to finance improved forest management. The proposals include five elements:

##### **1. Annual concession fees**

— An **Area based annual concession fee** at rates that generate significant revenues and incentives for forest management is recommended. Annual concession fees should become a major revenue source. They can supplement, partly or fully replace difficult to collect volume based stumpage prices and export taxes. To this end the present annual area charges should be raised substantially.

##### **2. Initial concession fees**

— An **initial concession fee** is recommended, designed to generate sufficient revenues to cover the administrative costs in granting concessions, and to discourage frivolous or speculative acquisition.

##### **3. Bidding on concessions**

— It is recommended that concessions be allocated by **bidding** (by sealed tender or oral auction), based on **bonus bids**. Bonus bids would reflect the “security value” of the secure timber supply provided by the concession, as well as capturing a share of the stump-

age value of timber that is not reflected in forest fees on timber harvested.

#### **4. Minimum forest fees**

— **Minimum volume-based stumpage prices** are recommended. These should be high enough to reflect: (a) the administrative costs in supervision, inspection, forest renewal and forest management, scaling and collection of revenues, and (b) the environmental and other non-market values, the “opportunity cost” values that are precluded by harvesting tropical timber. Minimum volume-based fees can improve efficiency and prevent “below cost” or “below opportunity cost” harvesting of tropical forests.

— **Minimum area-based fees on forest concession**, are recommended to reflect the environmental and non-market “opportunity cost” values of alternative forest land uses that are involved in the allocation of tropical forest areas to timber production.

#### **5. A Fund to Finance Forest Management, Supervision and Monitoring of Concessions**

— It is recommended that a substantial proportion, 50% or more, of forest revenues from concessions be allocated to a fund and used to finance the supervision and monitoring of logging and forest management activities on concessions.

##### **■ Forest Fees on State Lands Outside Concessions:**

Outside forest concessions the responsibility for forest management rests with the government rather than the operator. Thus forest fees on state lands outside concessions should be higher than on concessions, reflecting the reduced forest management and protection responsibilities of the company. Area fees outside forest concessions are also recommended. They would apply only to the cutting area.

##### **■ Forest Fees on Community and Private Lands:**

Timber on community lands and private lands are the property of the owner. Usually prices on standing timber or felled timber are negotiated between buyer and seller. However, in most cases there are only a few buyers and many land owners. With few buyers and little competition for timber on private and community lands the government has a role in establishing minimum stumpage prices as

“floor prices” to protect the landowners’ and communities’ interests and ensure fair prices. It is recommended that the schedule of stumpage and area charges applied to state forest lands outside concessions be used as the minimum prices on private and community lands.

### *Summary*

The paper has introduced the important factors to consider in deciding on a system for granting management concessions. The proposals provide a framework for forest concession contracts and for a forest revenue system and pricing policies. In summary there are a number of key points to emphasise:

1. The importance of having the land tenure clearly settled before taking any steps to offer concessions. Even preliminary steps to offer additional concession areas may create land rights conflicts over anticipated future revenues.

2. Initiatives to offer new concession areas should come from the Government, not from potential concessionaires. Concessions should be offered only in situations where there will be several interested parties and competition for the area. Bidding should be encouraged in allocation of areas, to avoid corruption and maximize the benefits and revenues.

3. An effective state forest administration with field capabilities is required for supervision and monitoring of concession activities. This will ensure efficient operation of concessions, ecologically as well as economically. The services can be contracted, or delegated, but the supervision and monitoring function must be in place.

4. It is important that the concession contract and conditions incorporate incentives (positive and negative) for protection and sustainable management of the area for timber production and for other uses.

5. The concession contract conditions and concession fees should discourage concessionaires from acquiring more concession area than required to supply his processing plant. The proposed area charges would discourage acquisition of too large an area, reflect the value of the concession and be easy to collect revenue source.

6. Forest fees should reflect the value of the timber and concessions. It is important that forest fees and the forest revenue system be easily implemented and require a minimum

of effort from the authorities to operate. Area based fees are recommended. They are easy to implement, easy to collect, reflect the value of concessions, and provide incentives for efficient management of concessions.

7. A substantial proportion of the forest revenues generated should be directed to a fund to finance the supervision and monitoring of forest activities, and to finance investment in sustainable forest management to ensure continued production of timber and other environmental benefits from forest lands.

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Note

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## ANNEX: CASE STUDIES OF FOREST CONCESSIONS AND FOREST FEES

### *1. Forest Concessions and Forest Fees in West and Central Africa*

#### **Introduction**

The case study of forest concessions in West and Central Africa is drawn from Mikael Grut, John A. Gray, and Nicolas Egli, "Forest Pricing and Concession Policies: Managing the High Forests of West and Central Africa", World Bank Technical Paper Number 143, Africa Technical Department Series, Washington, D. C., 1991.

#### **Concession Management and Tenure Issues**

Forestry in West and Central Africa, as in other developing countries, faces difficulties in the regulation, control and supervision of concessions distributed throughout the country, by nature in remote areas. In Cameroon, as in many other countries, regeneration following logging is required in the forest code, but the requirements are not specified and not enforced (Egli 1990). The majority of concessions have no precise forest management plan (working plan). Management plans are required only for state forests (Egli 1990). Gabon's new forest code was written in 1982. However, the decree for its application had not been signed by 1990, and thus the forest code is not enforced (Egli 1990). In addition, in Gabon, "the presence of the forestry administration is very weak in the forest zone, and control is almost non-existent; there is little enforcement of forest regulations in the field." (Egli 1990).

#### *Concession Size*

Some concession areas are too small to support viable silviculture, logging and transport units. Others are too big to be efficiently managed. The size of concessions varies enormously within individual tropical countries.

In the Congo, 17 large companies hold concessions covering 7.7 million hectares, with concession holdings ranging from 90,000 ha to 1,200,000 ha (Egli 1990). In Gabon small concessions ("permis temporaire d'exploitation") range in size from 1 ha up to 15,000 ha, larger concessions ("permis industriel") range from 15,000 ha to a maximum of 200,000 ha (Egli 1990). In Cameroon the maximum concession size has been fixed

at 200,000 ha, irrespective of the forest type, its condition, or its allowable cut. In other countries concession size may be constrained by forest legislation or regulations to a size which is too small to manage efficiently on a sustainable basis.

#### **Forest Fees on Concessions**

##### *Low Forest Revenue Issues*

Low forest revenues are a central issue in the management and conservation of forests. Low forest revenues can result either from low forest fees, or from low collection rates — weak and inefficient collection systems.

In Cameroon the total of all forest revenues collected from all forest fees (all area- and volume-based fees) in 1987 averaged CFAF 1,603/m<sup>3</sup> (US \$ 5.40/m<sup>3</sup>). This represented only between 2% and 4% of the FOB price of export logs (Egli 1990).

In Ghana the World Bank Staff Appraisal Report of the Ghana Forest Resource Management Project found that forest revenues collected from all forest fees were some Cedis 100 million (US \$ 0.5 million), equal to about Cedis 75/m<sup>3</sup> (US \$ 0.38), and less than 0.5% of the delivered price of logs at processing plants. This was only about one-sixth the forest revenues that should have been collected even at the existing low levels of forest fees.

In Guinea the World Bank Staff Appraisal Report of the Guinea Forestry and Fisheries Management Project in 1989 found forest fees to be low, almost minute. Stumpage fees for "white" woods were GF 300/m<sup>3</sup> (US \$0.50/m<sup>3</sup>) and for "red" woods GF 400/m<sup>3</sup> (US \$0.68/m<sup>3</sup>), less than 1% of the value of the sawnwood on the local market. Stumpage fees had not been adjusted for six years.

In Cote d'Ivoire the Staff Appraisal Report of the Forestry Sector Project found that stumpage fees were low, fixed administratively, updated infrequently, and that they bore no relationship to the value of the standing timber. Stumpage fees are also easily evaded. In 1986, the total amount of stumpage fees collected was about CFAF 750 million, or about CFAF 200/m<sup>3</sup> (US \$0.58/m<sup>3</sup>) logged.

In Congo forest fees are in theory revised every five years, but in 1989 they had not been revised since 1982 (Egli 1990). In Cameroon the "valeur mercuriale" - posted export log and product prices upon which volume-based fees are based - had not changed since 1984 (Egli 1990). In Gabon and a number of other West and Central African countries, forest fees are set by presidential de-

cree, but in spite of this seeming ability to change them easily, they remain low and unchanged for years.

#### *Low Forest Fee Collection Rates*

In Ghana it was found that the government was receiving only about a sixth of what it should be receiving based on the estimated stumpage value of the standing timber. In the Congo about one fifth of volume-based forest revenue is collected. In other countries the collection rate is even lower.

#### *Log Scaling (Measuring) Problems*

Log scaling may be done by forestry department scalers, or by company scalers and checked by the forestry department. If scaling is done by the forestry department in the forest or at some central point in the log transport system, the government employees are usually dependent on the concessionaire for transportation and accommodation. They are often on their own with infrequent supervision. Being isolated, dependent on the concessionaire and poorly paid, makes the scalers vulnerable to pressure, persuasion or bribery. They may be influenced to under-measure logs, to give generous allowances for defect, to classify species in lower royalty classes, or to ignore some logs. If the scalers are not at their positions, they may be persuaded to sign scaling volume returns filled out by company scalers.

Scaling may also be done by company personnel and checked by forestry department scalers. Similar problems of under-scaling, misclassification of species, under-reporting or unscaled logs can occur. Usually the checking of company scaling involves the verification of log measurements in the company scaling records, and the pressures on and incentives for the forestry department scalers will be to accept the figures, perhaps without bothering to remeasure.

In the Central African Republic scaling is done by the companies. "Due to the lack of field control, the Ministry relies entirely on the information supplied by the companies." (Egli 1990). In Cameroon the company scaling volumes are checked at the log yard only two or three times per month (Egli 1990). On paper the allowable margin of error on inspection is 5%. In practice forestry department officials have little incentive to remeasure the timber. In addition, they will be under strong pressures, of persuasion and otherwise, to accept the company's figures.

This dependency on company records is common throughout West and Central Africa.

#### **Concession Fees**

An important issue is the role of concession fees in the forest revenue system. In most West and Central African countries, and indeed in most tropical countries, concession fees are minor, almost inconsequential, revenue sources. As a result there is little or no cost to the industry acquiring and holding large concession areas. Sawmillers or loggers acquire concessions over vast forest areas, more for insurance purposes or speculation than for regular timber supplies. Not only does this mean that public resources are lying idle, but these unused forests are, paradoxically, also the ones that are especially prone to deforestation by shifting cultivators. The forest industry has little incentive to control encroachment if they have excess area. A more significant share of forest revenues could be collected through concession fees.

Concession fees can be evaluated in two major groupings: (1) initial fees, paid at the beginning of the concession and (2) annual fees, paid each year over the life of the concession.

#### *Initial Concession Fees*

Initial concession fees are levied in a number of West and Central African countries. In most countries they are modest, or even token. They are usually so low as not to have any effect on concession acquisition or on the operation of concessions. However, if set at more realistic levels they do influence behaviour and reflect the environmental and administrative costs in granting concessions.

In Cote d'Ivoire an initial concession fee of CFAF 50/ha is levied on new concessions, and CFAF 25/ha for renewals (Egli 1990). In Cameroon initial concession fees include a "taxe d'exploitation" of CFAF 2/ha, a "taxe d'agrément" of CFAF 15/ha and a safety deposit ("cautionnement") of CFAF 40/ha (Egli 1990). These initial concession fees generate less than 1% of total forest revenues (Egli 1990). In the Central African Republic an initial concession allocation fee is levied on a per hectare basis; it is administratively set or negotiated individually for each concession (Egli 1990). If the concession is later sold, a transfer fee of CFAF 50/ha is levied (Egli 1990). In Gabon, under the forest law of 1982, a concession allocation fee of 2.5% to 10% of the expected gross sales from the concession

is to be charged on new concessions, but as that forest law has not yet been passed, it is unclear how the new concession fee will be implemented (Egli 1990).

#### *Annual Concession Fees*

Annual concession fees in most of the countries of West and Central Africa are rather low. For most countries they generate 10% or less of total forest revenues. At such modest levels they have little incentive effect on concession management or utilization, but there is opportunity for them to play a more important role in forest management, in encouraging more intensive forestry and in maintaining non-timber forest values.

**Area-Based Concession Fees:** Of the administratively set annual concession fees, the one based on the total area of the concession is the simplest and easiest to implement and administer.

In Cameroon annual area fees on concessions include four separate annual “taxes”: County Tax (“taxe communale”) CFAF 10/ha, Reforestation Tax (“taxe de reboisement”) CFAF 20/ha, Social Contribution CFAF 40/ha, and Forestry Development Tax CFAF 28/ha (all figures in this paragraph are from Egli 1990). In Gabon annual area fees on smaller concessions (“permis temporaire d’exploitation”) vary among four zones of the country, and range from CFAF 4/ha to 20/ha. In the Central African Republic the annual concession fee (“taxe de superficie”) is a uniform CFAF 125/ha under the new forest code, reduced from a fee which varied from CFAF 125/ha/year on concessions of 20 years or more, up to CFAF 2,000/ha/year on concessions of 5 years or less. In Cote d’Ivoire the annual concession fee (“taxe de superficie”) is CFAF 10/ha/year. In addition, in Cote d’Ivoire an area tax is also levied on the annual coupe (“travaux d’intérêt général”) at CFAF 160/ha.

Using the total concession area as a basis for calculating the annual concession fee will encourage concession holders to release not just excess areas beyond their needs but also non-forest areas, and forest areas of low productivity such as mangrove swamps and highland areas. These are often areas of potential conservation value, or of value in non-forest uses.

#### **Fees Based on Productive Forest Area:**

An annual concession fee based on the total productive forest area is a second alternative. However, such a fee could only be implemented after the forest inventory of the con-

cession area is completed.

**Fees Based on Inventory Volumes:** A third base is the total inventory volume of standing timber on the concession. Various merchantability classes, levels of utilization, and species grouping can be used.

In the Congo concession fees are based on the annual volume of timber available from the concession, the “volume maximum annuel” (Egli 1990). This annual cut is based on the volume of timber available in the first cutting cycle. It is an interesting alternative but with problems. As the concession is based on the volume of timber rather than a specific area, the concession and the “volume maximum annuel” will encourage the concessionaire to cream or high-grade the forest, to take his annual cut from the most valuable trees and species.

#### **Fees Based on Annual Allowable Cut:**

A fourth alternative base for the administrative setting of annual concession fees is the annual allowable cut. It has advantages, but also problems. The value of the concession to the concessionaire is closely related to the allowable cut, so it represents a fair and equitable base. On the other hand concessionaires may pressure the forestry department to overstate the annual allowable cut on a concession area, so that they will be allowed to increase their production.

### **Bidding for Concessions**

In Cameroon, as in most countries, concessions are allocated through a long administrative process without competitive bidding. The process can take up to five years (Egli 1990). Bidding on concessions is not common in West and Central Africa, or elsewhere in the world. In the Congo concessions are allocated by bidding in areas opened up to exploitation, or for concessions cancelled or returned (Egli 1990). Bidding is for the annual volume of wood available, the “volume maximum annuel” as a per cubic metre bid (Egli 1990). The government of Ghana agreed to introduce bidding in the allocation of new logging concessions and the government of Cote d’Ivoire has actually begun doing so.

## **2. Forest Concessions in Ghana**

### **Introduction**

This case study of forest concessions in Ghana is drawn from “Forest Concessions in Nicaragua: Policies and Pricing” by John A. Gray and Lennart Hägerby, Administración

Forestal Estal, Ministerio del Ambiente y Recursos Naturales, ADFOREST/MARENA, Managua, Nicaragua, May 1997. It is based on a visit to Ghana by Lennart Hägerby and Alejandro Lainez of ADFOREST in 1996.

### **The Forest Sector in the Economy of Ghana**

The forest sector is important in Ghana. About 11% of the country is forest land. The forest sector accounts for 6% of the GDP of Ghana.

The forest policy recognizes not only the importance of the forest, as raw material source for the forest industry and for export, but also as source of employment and income for large numbers of rural dwellers and in supplying fuelwood. Fuelwood supplies 90% of urban energy need and almost 100% of rural needs. As in other tropical countries, the forests have an important function in the protection of the environment. For Ghana, the forests are also necessary for the protection of cocoa plantations.

The savanna forest in the north is locally very important for firewood, charcoal, house construction, and environment protection. The commercial forests are located in the southwestern third of the country. These tropical forests grow within a rainfall range of 1250 to 2150, and cover two million hectares, to 20% of the region. Around 1.7 million ha of these forests is divided in 252 legally protected forest reserves. Outside of the forest reserves there are 370,000 hectares of forests and the remaining area has been converted into agricultural areas.

### **Organization of the Forest Authorities**

#### *The Forest Commission*

The Forestry Commission, like the Forest Department and the whole of the forest administration of Ghana is part of the Ministry of Lands and of Forest Resources. The Commission handles all aspects of the forestry sector: forest management, training, granting of concessions and preparation of legislation. The granting of concessions and preparation of legislation is the most important function of the Commission. A revision of the Forest Law has been made and is presently being debated in the Parliament.

#### *Forestry Department*

In Ghana, the forest reserves are administered by the Forestry Department, part of the Ministry of Lands and of Natural Resources.

Even for communal forests the administration is the responsibility of the Forestry Department. All managing, from forest inventories, stand delimitation, logging preparation, including an inventory at 100%, mapping and marking of the trees that are allowed to be cut, is done by the personnel of the Forestry Department. The Forest Department is large, with 100 forest professionals, 600 forest technicians, 3,000 vocational workers, in total 4,800 employees.

#### *Forest Concessions*

Practically all the forest reserves are under forest concessions. Forest concessions have had a long history in Ghana and thus some concession contracts terminate every year. These areas are subjected to new tendering for another 40 year period.

The size of concessions can vary considerably from a minimum of 500 hectares. At present there are about 200 concessions. The concessionaires are in general companies registered in Ghana. Most of the owners are national companies, but there are also Brazilian, Lebanese, German, French and other companies holding concessions.

#### *Granting of Concessions*

The interested parties first approach the Forestry Department and announce their interest in an area.

The Delegate of the Forest Department is consulted as well as the owner of the forest. When an inventory is made and the tenure is established, applications are invited. The invitation is made by the Forestry Department through announcements in the newspapers of Ghana.

A concession committee evaluates the applications, based on earlier performance of the companies. It also considers aspects of financial stability, capacity to comply with the activities, tax payment record, etc. The applications from companies that are qualified are passed on to the Forest Commission which reviews the application and analysis of the concession committee and makes the final decision.

Frequently the owner of the forest requests besides his share of the stumpage fee, social commitments on the part of the concessionaire. These can be construction of a school, a clinic, or a road.

At the moment the introduction of some form of auction procedure is the last step of concession granting. If accepted this would

mean that those companies which had been qualified would have the opportunity to make offers on the annual concession fee. The present annual concession fee is US\$0.70 per hectare per year.

In addition to the natural forest there are also forest plantations. Some of the teak plantations are ready for commercial thinning. In plantation forests, the Forestry Department charges US\$12 per hectare and US\$6 per tree in addition to normal stumpage.

#### *Forest Concession Management*

When the concessionaire requests an area for extraction, the Forestry Department makes a 100% inventory. All trees with a D.B.H. of 50 cm or more are measured, registered and marked on a large scale stand map. Each tree is numbered on the map, and on the trunk and the stump. The regional office of the Forestry Department defines the trees which can be cut by the concessionaire, along with the percentage of the total volume and the minimum D.B.H. for each species. If the basal area of trees to be cut does not reach 15 square meter per hectare no extraction is considered. Finally, a map is drawn up showing the trees allowed to be cut.

An "Annual Management Plan" is produced by Forestry Department for the cutting area, and submitted to the concessionaire for his comments. In fact, the "Plan" is not really a Management Plan, but more of a detailed set of instructions for the cutting of trees and for transporting the logs. Usually the concessionaire is given three years to carry out logging. While the logging and transport is underway a representative of the Forestry Department is present in the forest to ensure that the Management Plan is complied with. Fines are applied for cutting trees not marked for cutting. However, the fines are often less than the value of the wood.

#### *Changes in the Last Decades*

Many of the officials interviewed pointed out that the system of forest concessions had been changed significantly in the last decades. Previously, the typical concessionaire was a large company with a processing plant and its own organization for forest management and administration. This meant a different role for the Forestry Department. The influence of the Forestry Department officials was limited. On the other hand, as the companies were depending on their long term concession for the supply of raw mate-

rial to the industry, for this reason they managed the resource well.

Today's typical concessionaire is a small logging company, sometimes the owner of a sawmill, and sometimes selling logs to other industries. In Ghana the development of concessions to smaller companies has resulted in an increased demand on the Forestry Department, necessitating its expansion.

With the proposed changes in the law, it will then be easier to cancel a concession in the case of mismanagement. The legal form of the present contracts makes it almost impossible for the authorities, to cancel a concession before it expires.

The opinion of several of those interviewed is that the connection between ownership of concessions and the processing industry should be strengthened.

#### *Forest Fees on Concessions*

At present the concessionaire pays an area based charge of US\$0.70 per hectare per year for his concession. He pays stumpage, which is a volume based fee on felled trees which varies by species. These stumpage fees range from US\$2.50 to US\$8.25 per cubic meter. The fees are paid to the Forestry Department who use these revenues to cover their costs related to the specific concession, and to pay the owner of the forest. The distribution is usually 70% for the Forestry Department and 30% to the landowner, which is usually a community.

A figure of 6% of the FOB value of logs of each species has been used as a target reference level for stumpage fees. However, the present stumpage fees charged are much lower. The Forestry Department is considering raising the level of stumpage fees to 18% to 20% of the FOB value of logs. The administrative procedures require any change in forest fees to be approved by the Parliament. It is said that very strong political forces are blocking that process.

#### *Administrative Regulations and their Silvicultural Consequences*

The concessionaire receives along with the annual Management Plan a list of trees included in the cutting permit. The list specifies the volume and number of trees per species. The list is accompanied by a map in scale 1:2,500 or some times in 1:1,250 on which each tree to be logged is marked. The logging map is made taking into account the distribution of the individual trees of the pre-

ferred species as well the other species. This is to ensure an adequate composition of the forest after cutting, and especially for the next cut, 40 years later.

However, the concessionaire can choose to cut only those species and trees that he wishes, based on the argument that the other species or trees are presently not in commercial demand. He is not required to pay stumpage fees on the volume marked, only on those logged.

Until 1995 there was a ban on the export of 18 species as logs. Starting from 1995 there is a temporary general prohibition on log exports of all species. This was designed to protect the national industry and to increase the added value and create employment in Ghana. It is expected that the ban will become permanent.

### **Lessons from Ghana's Experience**

In discussions with the Forestry Department officials, the application of the concession systems in Ghana and other countries was discussed and compared. Ghana has had a long experience with concessions, first with concessions to industrial companies to provide a guaranteed supply of raw material, later with concessions to small logging contractors, making it possible to learn from the experience of Ghana and compare the approach of Nicaragua with that of Ghana. The conclusions arrived at by the forestry officials in Ghana were clear: forest concessions should be granted as a log source guarantee only to serious investors.

In Ghana the competition between the national forest industry, log exporters, and concessionaires seems to become a very political issue. Any attempt to change the regulations, legislation, or fees has created a political uproar. Revision of the Forest Law has been on the Parliament's agenda for four years, without being passed. The stumpage level and other charges are expressed in Cedes, the national currency. With high inflation stumpage prices have rapidly become obsolete. It is therefore important that a mechanism exists through which one can correct the forest fees at the Ministry level, not at the political level.

### **3. Timber Sale Auctions and Stumpage Prices in Honduras**

#### **Introduction**

This case study of timber sales in Honduras is drawn from "Forest Concessions in Nicaragua: Policies and Pricing" by John A. Gray

and Lennart Hägerby, Administración Forestal Estal, Ministerio del Ambiente y Recursos Naturales, ADFOREST/MARENA, Managua, Nicaragua, May 1997.

In late 1995 during a visit to Honduras to survey forest management and forest administration policies, a review of the newly developed procedures used for sale of timber from state owned forests was carried out.

The system for sale of state timber was developed mainly for the pine forests managed by the State Forest Management Organization (COHDEFOR). It was introduced gradually during 1995.

The structure of the forestry sector in Honduras is not typical of most tropical countries. The dominant forest type is pine. The road network is well developed, better than in many other developing countries. The forest administration, COHDEFOR, has a well developed, well staffed, and substantial organization for managing the state owned forests. Timber extraction is done by private companies who buy the timber rights to a stand with a well defined and marked volume to be cut. The size of the cutting areas offered may vary, but a standing volume to be cut of 2,000 to 8,000 cubic meters is normal. The buyers are sawmill companies or firms specializing in logging and transport, who sell the logs to the processing industry.

The State Forest Administration (AFE) is the unit within COHDEFOR which makes the management plans for the state owned forest. These management plans are revised every 5 to 10 years. When an area is considered for sale, AFE makes a detailed inventory, marks the trees to be cut, and draws up a plan of operation. Based on the information from these preparations, the stand is offered to the interested party.

The actual sale takes the form of an auction in two steps. First, a reference stumpage price is determined. Second, the timber is put up for auction.

#### **Stumpage Prices**

In setting reference stumpage prices for the timber to be sold, COHDEFOR considers that there is a direct relation between the price of sawn lumber in the domestic market and the stumpage value. This reference stumpage price is calculated on two reasons; (1) to establish the size of the bank guarantee which the potential buyer has to present to qualify to participate in the auction, and (2) to establish a realistic level of the value of the stand to sell, to which bids

can be compared, to detect and avoid the effect of cartels among the buyers.

As the starting point in establishing the reference stumpage price for the stand, a base stumpage price per cubic meter of standing volume is first established, based on 10% of the price of 1,000 board feet of sawn lumber. This value is then adjusted for three factors that are supposed to reflect the characteristics of the stand to be sold. These factors that enter into the calculations are:

- the distance to the main road
- the stand quality
- the density in trees per hectare

**Distance to public road:** If the area to be sold is not along a road, the reference price is reduced by some 10 to 13 Lempiras (Lps) per cubic meter per kilometer. The reduction is motivated by the fact that the buyer is responsible for building the access road. With a distance of more than 20 km the stand may already be considered beyond economic reach by AFE.

**Stand quality:** In this context, the quality criteria is the volume per tree. That is strongly related to the average diameter at breast height. An average of 46 cm does not affect the price, while every cm above that increases the value per cubic meter one Lps.

**Density in trees per hectare:** The number of trees per hectare in combination with the average size defines the volume per hectare. This value is of key importance for costs of logging transport and road building per cubic meter.

In some examples from the Olancho region offered for sale in 1995 the factors had the following values:

*Price of sawn lumber:* Lps1.80 to Lps4.10 per board foot. Average Lps3.11 per board foot, corresponding to approximately US\$ 139 per cubic meter.

*Distance to public road:* 1km – 29km.

*Stand quality:* Average diameter at breast height 44cm – 56cm.

*Density in trees per hectare:* 75 – 137 trees per hectare.

In these auctions the reference stumpage price ended up at between Lps190 – Lps210 per cubic meter, equal to US\$19 to US\$21 per cubic meter (at an exchange rate of US\$1 = Lps10).

#### *Minimum Stumpage Prices*

A minimum stumpage price after adjustments is maintained. In September 1995 this minimum stumpage price was 190Lps per cu-

bic meter (US\$19 per cubic meter). The reason for the minimum level of stumpage prices is that COHDEFOR is responsible for reforestation, forest management and administration of the forest. Supposedly minimum stumpage prices are intended to cover the costs of silviculture, and all other forest management and administration activities. Consequently, if the stumpage value of a stand ended up below this minimum level, it will not be put on the market, but left to mature further.

#### *Stumpage Values of Mahogany in Honduras*

The stumpage value for mahogany was Lps480 per cubic meter (US\$48 per cubic meter). However, the sale of standing mahogany timber was very limited. As for sale of pine, the forest management and administration responsibility lies with COHDEFOR.

#### **Auction Procedures**

After the stand is inventoried and prepared for sale, the State Forest Administration (AFE) places advertisements in newspapers and invites bids, to be submitted in sealed envelopes. Each offer has to be accompanied by a check as a guarantee. The value of the guarantee is 3% of the reference stumpage price for the total volume to be sold. Those companies which do not win the auction have their checks returned at the end of the auction.

On the day of the auction the envelopes are opened publicly and the top prices noted on a blackboard. Starting from the top price, open verbal bidding takes place. Within ten days after the auction the winning bidder has to sign a contract with AFE, or lose his 3% guarantee check. Upon signing, the company has to present a deposit or a bank guarantee corresponding to 15% of the total contract value. This is to assure AFE that the company has the capacity and intention to comply with its obligations in the contract.

At the end of the contract period, normally two years, the deposit is returned to the company, provided that it has fulfilled its obligations. These obligations may include restoring the logging site, or include environment protection requirements. If the performance is not satisfactory, the deposit funds are used to complete these obligations.

#### **4. Forest Concessions and Forest Fees in Nicaragua**

##### **Introduction**

This case study of forest concessions and

## Cost in US\$ per cubic meter marked

	Area based (US \$/m <sup>3</sup> )	Volume based (US \$/m <sup>3</sup> )
Initial contract fee (US\$ 690)	US\$ 0.0016	
Annual area fee (US\$ 434)	US\$ 0.036	
Exploitation tax		US\$ 2.33
Marking service by Marena		US\$ 3.33
Stumpage fee		US\$ 6 – 25
<b>Total</b>	<b>US\$ 0.038/m<sup>3</sup></b>	<b>US\$ 11.66–30.66 /m<sup>3</sup></b>
<b>Total of Combined Area and Volume Based Fees</b>		<b>US\$ 11.70 - 30.70/m<sup>3</sup></b>

forest fees in Nicaragua is summarized from “Forest Concessions in Nicaragua: Policies and Pricing” by John A. Gray and Lennart Hägerby, Administración Forestal Estal, Ministerio del Ambiente y Recursos Naturales, ADFOREST/MARENA, Managua, Nicaragua, May 1997.

### Present Forest Concessions in Nicaragua

There are two concessions in operation in Nicaragua at present, one between a company and the Government, the other between a company and an indigenous community. The concession between Sol Del Caribe S.A. (Solcarsa), a Korean company and the Government, represented by Marena, was signed in 1996. The other concession is a special agreement between Madensa and an indigenous community, Awas Tigni. Although approved by Marena, it is a special case. The forest fees were agreed between the community and the concessionaire and not defined by the Government.

An earlier concession, signed in 1995 between Profosa, a Spanish company and the Government, was canceled by Marena a year later for non-compliance by Profosa.

The Solcarsa concession has not (as of April 1997) started any forestry operations within its concession area. Instead, it is buying roundwood from private forest owners and local communities. Indigenous communities can sell the timber, provided they have the legal title to the land on which it grows. Very few legal titles to land exist in the Atlantic regions. Until land ownership is settled, an exception to law allows a community to sell the timber provided the local and regional authorities acknowledge the community's claim to the land.

Other concession areas may be offered over the next few years, once land claim issues are clarified. These include an area of 300,000 hectares of pine near Puerto Cabezas in the Region Autonoma Atlantico Norte (RAAN).

### Present Fees on Forest Concessions in Nicaragua

The concession agreement between Madensa and an indigenous community, Awas Tigni, is a special case. The forest fees were agreed between the community and the concessionaire and not defined by the Government.

The forest fees in the other two concession agreements, in the agreement with Solcarsa and in the canceled agreement with Profosa, are very similar. They include: (a) a small initial area based fee, (b) a yearly area based fee, and (c) the stumpage fees and other fees based on the volume cut. Stumpage fees and other volume based fees account for 99% of the fees paid (see the tables below).

The table below shows the fees as expressed in the concession contracts and in the ministerial administrative orders.

Initial contract fee	<i>C\$ 10 per square km</i>
Annual area fee	<i>US\$ 0.70 per square km</i>
Exploitation tax on marked volume	<i>C\$ 21 per cubic meter</i>
Marking service by Marena	<i>C\$ 30 per cubic meter</i>
Municipal tax	<i>2% of sale value</i>
Stumpage fee on marked volume	<i>US\$ 6–25 depending on species</i>

Converting area based fees to an equivalent volume basis, based on the allowable cut, involves a few assumptions. The equivalent on a per cubic meter basis was determined from the volume per hectare of allowable cut to be extracted on the 1997 Solcarsa Plan of Operations, assuming a 30 year cutting cycle and a total merchantable volume of the concession of 30 times the volume allowed for 1997.

The interpretation of how the municipal tax should be applied is unclear. If it is interpreted as a sales tax to be paid by the seller, the concession holder may not sell anything where the concession is situated but only processed products from where the processing plant is located. In this case, on State land the Government as owner of the land and seller of the wood would theoretically pay the municipal tax.

The table above shows that much less than one percent (only about 2/10th of 1%) of the forest fees on concessions holders is based on the area of the concession, almost insignificant! Such low area based concession fees will not encourage concessionaires to limit their concession to what is needed for their industrial plants. Instead the incentive will encourage the acquisition of as much forest area as possible for future speculation and to keep competition away from others.

### **Preliminary Estimates of Stumpage Values in Nicaragua**

Estimating stumpage values for Nicaragua is difficult because of the small size of the forest industry and lack of cost and prices data. There are few firms in the forest industry and competitive markets do not exist for standing timber or for logs.

A informal survey of a few sawmills and lumber exporters provided information on FOB export prices for Mahogany (Caoba) and other precious woods (Cedro Real, Cedro Macho, Guapinol, Nanciton, Mora). Estimates of logging, transport and processing costs were obtained from an informal survey of a few sawmill and logging operations. However, with few firms in the industry, cost data was limited and not statistically reliable.

**Stumpage Value Estimates:** From these sawnwood prices and the cost figures we estimated stumpage values working backward from export prices of lumber, deducting sawing costs, log transport costs, and logging cost (including allowances for normal profits in each), to arrive at the derived value of the standing trees in the forest. We arrived at stumpage values for Mahogany (Caoba) and other precious woods of US\$101 to US\$178 per cubic metre.

These stumpage values of Mahogany (Caoba) and other precious woods, US\$101 to US\$178 per cubic metre are substantial, especially compared to stumpage fees and other fees of US\$11.70 to US\$30.70 per cubic metre. Stumpage values are three to fifteen times the forest fees charged.

From these estimates of stumpage values

for Mahogany (Caoba) and the other precious wood, present forest fees charges would appear to collect between 6% and 30% of the stumpage value of the timber. For Mahogany (Caoba) and the other precious woods this leaves the forest industry with between US\$102 and US\$160 per cubic metre logged (70% to 94% of the stumpage value) as additional, above-normal profits (over and above the profits allowed for in the cost estimates).

Because of the scarcity of reliable cost and price data the stumpage values derived are only a rough "first estimate". There was little or no chance to verify the accuracy of the cost data or prices. As stumpage values are residually determined, working backward from sawnwood prices, small errors in estimating prices, costs, lumber recovery, defect or wastage can have a magnified effect on the stumpage values. In addition, the estimates may not have adequately allowed for some additional costs, or for hidden costs and "unofficial" payments.

Nevertheless, based on these estimates there is a case for raising the level of fees significantly, at least on Mahogany (Caoba) and other precious woods. Allowing for underestimation of costs in our figures, forest fees for higher valued species could be doubled and still leave the industry with a substantial share of stumpage values.

These stumpage value estimates, although admittedly rough, imply that forest fees on concessions could be raised substantially. Area fees on concessions could be increased to generate a much more substantial share of forest revenues.

### **5. Forest Concessions and Forest Fees in Guyana**

#### **Introduction**

The case study of forest concessions in Guyana is drawn from "Profit Without Plunder: Reaping Revenue from Guyana's Tropical Forests Without Destroying Them" by Nigel Sizer, published by the World Resources Institute (WRI) in 1996. The case study presented here is based on the book with excerpts drawn from the forward, synopsis and recommendations presented in the WRI Internet Web Pages.

The study by Nigel Sizer illuminates the complex obstacles to managing forests in ways that are good for the economy, the environment, and society. It also provides practical alternatives to ill-planned and poorly monitored timber harvesting.

Guyana's abundant forest resources, encompass 85 percent of its land area. The nation is under enormous pressure to sell logging rights to boost short-term economic growth. But converting that value to profit without destroying the forest resource and maintaining the fragile ecosystem is proving to be a difficult and complex task.

Sizer argues that an open invitation to investors to exploit the forest as they see fit will not work. Only maximizing a variety of forest values will improve the livelihoods of people in Guyana. Like many timber-rich, but economically troubled countries Guyana requires stronger government and civil machinery to plan and negotiate foreign investment in logging and to ensure that companies comply with national laws and codes of practice.

Guyana has made clear commitments to sustainable development by ratifying the Convention on Biological Diversity and by adopting the International Tropical Timber Organization's objective of achieving sustainable production of timber by the year 2000. Landmark domestic laws creating the Iwokrama International Rainforest Program and a new Environmental Protection Agency were passed in early 1996. But Guyana still faces serious challenges, including reforming land allocation and land-use planning, reducing damage and increasing revenues from logging, building sustainable communities, developing non-timber forest enterprises, and making foreign assistance more effective.

### Major Challenges Facing Guyana

Sizer identifies five major challenges the Guyana faces in managing its forests:

1. Reform resource allocation and land use planning.
2. Reduce the damage and increase the revenues from logging.
3. Build sustainable communities, especially around non-timber forest values.
4. Restructure institutions and improve training and education.
5. Make foreign assistance more effective.

Arguably the highest priority for the government as it seeks economic benefits from forest resources is the need to clarify national land-use planning. As noted by Guyana's National Coordinator of Land Use Planning, Andrew Bishop, institutionalization of coordination among agencies, legal authority, procedures or criteria for resolving conflicts among land users (such as loggers and miners) are all

lacking and other problems stem from institutional overlaps and from redundancy and conflict among the various sectoral laws.

Skilled personnel and basic data, as well as data-storage and retrieval systems for planning, are also lacking. Nonetheless, there is regular information-sharing and informal dialogue between key agencies such as the Forestry Commission, the Geology and Mines Commission, and the Department of Lands and Surveys.

### Priority Recommendations

The WRI study presents a series of short, mid- and long-term recommendations aimed at priority and strategic needs. The seven highest priority recommendations are:

#### 1. Define the permanent forest estate:

This should include production forest for timber harvesting, biodiversity hot spots for protection, protection forest on steep slopes and other fragile environments, and community forests.

#### 2. Maintain and extend the scope of the moratorium on major forest land-use decisions:

In early 1995, Guyana's government effectively declared a three-year moratorium on new foreign and local large-scale logging concessions to allow time for foreign assistance to strengthen the Forestry Commission and for policy and legal reform. The study recommends that the moratorium be extended in scope pending designation of new national parks and the resolution of outstanding Amerindian land claims.

#### 3. Better monitor the negative impacts of timber harvesting:

Timber harvesting is increasing rapidly, but there is little data on how it affects Guyana's forests or people. Policy-makers need such information if they are to make well-informed decisions.

#### 4. Standardize procedures for awarding concessions and revise the forestry tax structure:

Key needs are for public announcements of new forest areas available for logging, open competition through auctions, performance bonds, increased area fees, the scrapping of royalties, and thorough background checks on all investors.

#### 5. Increase the contribution of chainsaw loggers and small producers to the economy and reduce their negative impacts:

The study recommends that chainsaws be registered and licensed like firearms, small producers should be forced to pay the taxes they owe, and areas set aside for chainsaw operations should be clearly demar-

cated and activities confined to those areas.

**6. Strengthen community sustainability initiatives:** Local credit schemes, advice with marketing, basic finance, and administration could all help in strengthening forest based and rural communities.

**7. Ensure that forest-sustainability issues are adequately considered in the design of the structural adjustment program and improve donor coordination to ensure high quality assistance:** The study suggests that program components promoting foreign investment and tax reform may need special emphasis. There is also need for international bilateral and multilateral agencies to better coordinate their efforts. Modest foreign-donor interventions can buy time for alternative forest-based development. Donor efforts should be fortified and better coordinated to equip and staff Guyana's finance and forestry departments to negotiate better deals. Outside support would help local people to have a say in decisions that affect them, and to find alternative "green" routes to profiting from the forests. Eco-tourism, gene hunting, and low-impact logging all hold promise.

These seven highest priorities are discussed in turn, below. The seventeen other medium-term and long-term priorities are discussed in the book.

**1. Define the permanent forest estate to include production forest for timber harvesting, biodiversity hot spots for protection, protection forest on steep slopes and other fragile environments, and community forests.**

Through the GEF National System of Protected Areas project, a picture of the priority areas for biodiversity conservation in Guyana is now emerging. Some such areas may be under threat right now from new logging agreements or other development proposals and should therefore be high priorities for demarcation as protected areas for low-impact sustainable use. This approach is being pioneered in Guyana through the Iwokrama initiative.

Immediate action should also be taken to reduce tension and frustration among Amerindians over still-undemarcated lands that they claim. Many sound recommendations from previous studies have yet to be implemented. If these basic local demands aren't resolved, further conflicts will arise and more attention will be devoted to crisis management than to the design and implementation of

long-term development programs with communities and investors. Where the case for demarcating Amerindian lands has been clearly made, Guyana's Department of Lands and Surveys could consider delegating mapping and demarcation to the communities themselves using simple geographic positioning system (GPS) technology and basic mapping expertise from either the Department or foreign donors and NGOs. This community-based mapping approach can speed up demarcation, reduce its costs, and ensure full local support for the boundaries.

Beyond these steps, Guyana's government clearly must urgently define the permanent forest estate that includes the key sites for biodiversity conservation and community forestry, as well as sites critical for watershed protection and erosion control, including some of the hillier regions in the south, and other fragile environments.

**2. Maintain and extend the scope of the moratorium on major forest land-use decisions.**

Guyana's State Forests are already almost entirely allocated to loggers, and the government has every reason to fully investigate the development options described in this report and others before further locking up more lands in large long-term logging concessions. Other options hold great promise for generating sustainable benefits for local communities and the country.

The moratorium on large-scale logging agreements should be extended until the design of the National Protected Areas System has been completed so that areas identified as the highest priorities for national parks and other forms of reserve are not allocated for logging. The moratorium should also cover land subject to outstanding Amerindian land claims until the claims are settled. This move would create considerable international goodwill and support for further forest development programs in Guyana.

**3. Better monitor the negative impacts of timber harvesting.**

A major difficulty encountered during the study was the stark lack of information on the impacts of timber harvesting on Guyana's forests and people, even though harvesting is increasing dramatically as Barama, DTL, Case Timbers/UNAMCO, and other companies expand their production, in addition to the thousands of independent chainsaw operators.

This issue deserves urgent attention from the Guyana Forestry Commission, and it has been anticipated in the British Overseas Development Authority (ODA) support program.

**4. Standardize procedures for awarding concessions and revise the forestry tax structure to include public announcements, open competition through auctions, performance bonds, increased area fees, scrapping of royalties, and background checks on all investors.**

**Forest Fees:** Guyana's complex structure of forest sector fees, royalties, taxes, and fines includes area fees, export commissions, volume-base royalties, and corporate taxes. The government should consider restructuring this system to make it simpler and fairer and to make tax evasion harder. Restructuring should favor those companies with efficient operations that best comply with environmental and social standards.

A number of options are open to the government. The best of these is a combination of area base fees, auctions of concessions, performance bonds, selective levies, and strict penalties. Bids for concessions would be evaluated along with information about the bidders past environmental, social, and financial performance.

**Area Fees:** Area fees for current lease holders should be based on estimates of revenue and production costs from information collected in the field, from market intelligence reports, and other publicly available data, taking into account transport, labor, and other costs. A more sophisticated approach would be to differentiate among species, and among various parts of the country since differences in soils, forest types, and infrastructure may significantly alter costs. The rate would be set at such a level as to provide a well-run company with "normal profits." Once calculated, fees should be indexed with inflation. When existing leases expire, the areas should be auctioned.

A shift from royalties to area fees would release substantial amounts of Forestry Commission staff time thereby allowing them to become more active in monitoring the impacts of timber harvesting, promoting better forest management, and so on. Area fees are easy to collect and provide a strong incentive to producers to increase efficiency. They also provide the opportunity through area fee waivers for parts of concessions to encourage establishment of protected areas within concessions.

**Industry Resistance:** Locally owned logging operations are highly inefficient in many ways, but they may have enough political clout to resist higher taxes, costing the government millions of dollars each year in lost revenues. This impasse could be surmounted with a three-part "carrot-and-stick" approach: gradually increasing the rate of taxation on logging operations; forcing logging operators to improve efficiency, but also offering them the technical and financial assistance needed to modernize their forest management and milling operations and improve marketing; and implementing policy reforms that favor industrial development. Removing controls and restrictions on log exports, renegotiating tax holidays to create a level playing field, and holding government-sponsored auctions for concessionaires unhappy about reform should satisfy most concession holders.

**Auction of Concessions:** As current forest leases expire or new areas become available through other means this should be widely advertised both in Guyana and internationally. These areas should then be auctioned. Well-publicized auctions are likely to garner more than one application for the area, thus promoting bidding. Qualification for application and the right to bid should be based upon the company's financial track record, its compliance with national law, its experience in forestry, and its membership in relevant national forestry industry federations in other countries where they operate.

Auction of access to natural resources in Guyana is not without precedent. Under the State Lands Act, licenses can be advertised with costs paid by the bidder, and minimum floor prices set. The Mining Act calls for invited bids for areas of land, as well as proof of adequate financial resources and technical competence. Auctions can't work if substantial information on the area isn't made available to potential bidders. Both basic inventory data and information on access and transport costs from the area to points of export are needed. Many current logging leases will expire over the next four to five years giving time for the Forestry Commission to consolidate existing inventory data and conduct more surveys where needed prior to reissuing the leases through auction.

**Screening of Bidders:** Also essential is careful screening of foreign investors who, unlike their local counterparts, do not have a well-known track record. If the prospective investor were to pay an application fee, Gov-

ernment could use the funds to contract an independent firm of corporate intelligence experts to provide unbiased information about a company's business capacity, marketing skills and connections, respect for host-country laws, environmental clean-up records, and compliance with tax codes, as well as its financial status. Large local investors with operations, investments, and financial relationships with foreign banks and partners may need to be checked in-depth too. A smaller fee could be charged to cover the costs of reviewing track records and current financial standing.

If these background reviews reveal that the company has not always been a good corporate citizen, especially during the past five years, then it should be excluded from further consideration and a clear public explanation offered, or the performance bonds for that particular company raised due to the greater risk that they will not respect the regulations.

**Performance Bonds:** How can government provide an incentive for responsible forest management and compliance with the law and codes? It should require applicants to put up a performance bond that is paid up front, or secured by a third party, and returned to the concessionaire once the contract ends only if it has complied with basic social and environmental standards. If at any time during contract implementation compliance is breached, as much of the performance bond as is needed to pay full damages would be forfeited.

**Log Exports:** While there are no overt restrictions on log exports from Guyana, the Forestry Commission does exercise discretionary authority over log exports based upon pricing guidelines mandated by the Guyana Timber Export Board (Transfer of Function) Act of 1981. These controls allow the Commission to collect a small tax on exports and exert some control over transfer pricing (the practice of under-declaring export prices to reduce declared profits and thereby evade taxes).

The tax structure recommended above would provide a far more effective, standardized, and open-to-scrutiny means of collecting revenue and stopping transfer pricing. Experience in other countries suggests that restricting or banning log exports hurts both the economy and the environment. Restricting log exports lowers domestic log prices and thus invites inefficient local processing. The economic returns from inefficient local processing are often less than those from direct ex-

port of raw logs. "The economic consequences of imposing log-export restrictions have been negative, both from the perspective of the forestry sector and the country as a whole," says a recent World Bank study of several countries.

Environmental results have been disappointing so far too. Log-export restrictions depress local prices for logs, and low prices can invite over harvesting and waste. Removing current de facto restrictions would also create goodwill in the logging industry in Guyana important if other taxes are to be increased.

**Protection Forests Within Concessions:** Usually, large parts of concessions are off limits to logging since they are swampy, too hilly, otherwise inaccessible, or poorly stocked with commercial timber species. Concession owners should be encouraged to formally map out these areas and set them aside as permanent conservation zones, effectively managing them as private parks. In addition, around 5 percent of the operable area should be set aside to ensure that all forest types are well represented in the conserved forest estate. Such measures are contemplated in the draft Code of Practice that the Forestry Commission is in the process of introducing to the industry. Concessionaires who do this well should get some form of public recognition, annual awards or even a tax break proportional to the size of the set-aside. A simple formula now being tested in Bolivia is to forgive the area tax on the zone set aside as a permanent protected area.

## **5. Increase the contribution of chainsaw loggers and small producers to the economy and reduce their negative impacts.**

Chainsaw loggers, working alone or in small groups, have been harshly criticized. They cut timber in situ and carry it to the road or river bank by hand. Most are unregistered illegal operators who steal from the government or from concessionaires. In these cases, basic law enforcement is lacking and investing in personnel and the strategic interception of unregistered timber in transit can make all the difference. To its credit, the Forestry Commission has in recent years confiscated significantly more illegally cut timber by large and small producers alike.

In contrast, registered legal logging by chainsaw operators has much to recommend it. It can create employment because it is so labour-intensive. It may also cause less dam-

age to trees and soil as fewer roads are needed and skidders are not used. Some simple measures are recommended to make chainsaw logging less destructive:

1. Treat chainsaws as firearms and insist that they be registered and licensed to legal users only. A license code should be applied to each saw.

2. Participation by loggers in obligatory training courses organized by the Forestry Commission as a condition of getting licenses. These courses would teach best felling and cutting practice, chainsaw maintenance, and the law and codes of practice, as well as simple accounting for tax collection. Loggers could even be required to pass a simple test before being awarded their licenses. Since many of the practices taught would be in the immediate interest of the loggers to apply, better practice should follow quickly.

3. Registration and taxation of small producers (through the licensing by the Forestry Commission) with the Inland Revenue Department and enforcement of basic tax laws covering small producers. (Currently, most pay no tax.)

4. Intensification of local zoning and surveying to ensure that small-scale logging is confined to prescribed areas with adequate swaths of conserved forest between the logged areas.

5. Closure of logged areas to further exploitation to allow for forest regeneration and conservation.

Forest fees for chainsaw operators should be similar in structure to other concessionaires, with auctions, area fees, performance bonds and so on. Area fees could be higher to cover the greater cost to the Forestry Commission of policing smaller operations.

## 6. Strengthen community sustainability initiatives.

A Community Forest Conservation and Development program should be initiated to provide basic technical assistance to communities interested in developing forest-based enterprises, such as the extraction and processing of non-timber forest products, fauna management, and "green" forestry. The program could include the following elements:

1. Advice in community association strengthening, basic administration and finance, marketing, and contract negotiation.

2. Incentives to communities to participate could include access to low-interest, small loans (of say, US\$100 to US\$5,000) to help

build community enterprises. The fund could be capitalized with a small percentage of revenues from the logging and mining activities that have taken a toll on traditional communities in Guyana's hinterland.

3. A simple knowledge bank where communal experiences in development and forest resource management could be deposited and shared.

4. For larger, well-organized community development proposals, help preparing funding requests for foreign donors.

5. Marketing assistance.

6. Training in the preparation and oversight of basic biodiversity-prospecting benefit-sharing contracts.

7. Promotion of partnerships between communities and outside private investors.

**Eco-Tourism:** Before embarking on any ambitious and potentially costly national eco-tourism development program, the government should first carefully evaluate the costs and benefits of such a strategy. Such factors as the attractiveness of Guyana to eco-tourists, the degree to which benefits will stay within the country and not be exported (in, say, payments to foreign-based travel companies), the extent to which local communities will benefit, and so on. Such a study should be an integral part of the programs currently being implemented by the Organization of American States and under the Amazon Cooperation Treaty.

**Wildlife Trade:** Guyana's wildlife trade, especially in primates, parrots, and macaws is poorly monitored and regulated. Anecdotal reports of highly predatory collection and trade in live animals are common. This inherently unsustainable activity may provide significant short-term employment for Amerindian collectors, and it certainly generates large profits for a handful of traders and exporters, as well as importers and retailers abroad, but it does lasting damage to the forest environment as local populations of species that disperse seeds decline. Unless this trade can be adequately regulated and monitored, with quotas based on scientific research, then it should be again prohibited, as it was in Guyana earlier in this decade.

## 7. Ensure that forest-sustainability issues are adequately considered in the design of the structural adjustment program and improve donor coordination to ensure high quality assistance.

The multilateral finance institutions

should collaboratively review the current and the proposed structural adjustment programs to make sure that none of its components promote degradation of the forest resource base or have undue negative impacts on local communities. Especially worthy of attention are the promotion of foreign investment and tax administration reform.

Guyana has shown great leadership by offering almost 400,000 ha of lowland rain forest to demonstrate sustainable forest use. The initiative is at risk of collapse due to lack of donor interest. Iwokrama represents a unique resource for promoting basic and applied research in Guyana's forests, and it should attract foreign scientists and funds. It can help to develop new technologies, markets, and revenue-generating forest-based industries that would be of benefit to Guyana and the region.

How much Iwokrama ultimately contributes to our knowledge about tropical rain forests as a resource for development will also depend upon how effectively it forms partnerships and works with the private sector to get the innovations developed, tested, and demonstrated at Iwokrama adopted by others. For starters, the program needs to conduct research and demonstration activities outside of the Iwokrama area on commercial logging concessions and with Amerindian villages.

## **6. Forest Concessions in Suriname**

### **Introduction**

The case study of forest concessions in Suriname is drawn from "Backs to the Wall in Suriname: Forest Policy in a Country in Crisis" by Nigel Sizer and Richard Rice, published by the World Resources Institute (WRI) in 1995. The case study is based on the book with excerpts drawn from the forward and synopsis presented in the WRI Internet Web Pages.

Suriname is under enormous pressure – from within and without – to restructure its economy and heal the wounds of twelve years of civil unrest. Poor, bereft of foreign currency reserves, suffering 500-percent annual inflation and rising unemployment, Suriname is desperately resisting advice to implement structural adjustment. To attract foreign investment, the government is poised to award forest concessions covering one fourth of the nation's territory to Asian timber companies, companies whose records in Malaysia and Indonesia has been questioned (Sizer and Rice 1995).

With tropical forests covering 80 percent of its terrain, Suriname is among the world's

most heavily forested countries. Indeed, Suriname is probably richer in rainforest now than Costa Rica was when the Spaniards arrived in the sixteenth century.

### **Forest Concessions**

In 1993, Suriname, its economy near collapse, took the step of inviting foreign investors to explore possibilities for establishing multi-million hectare logging concessions in the country's interior. By mid-1994, at least five proposals were on the table and in negotiation for forest resources that had barely been inventoried or evaluated. If those contracts had gone through, some 25 to 40 percent of Suriname's land area could have been logged under conditions that would have been an economic and environmental disaster both for Suriname and for the world. Fortunately, the crisis was averted.

Each of the proposed concessions lies in forests now accessible only by aircraft or dug-out canoes. One of the tracts is home to 10,000 forest-dwelling peoples. Although the concession contracts had already been drafted and submitted to Parliament, Suriname still had the opportunity to consider other options.

Nigel Sizer and Richard Rice examines the proposed contracts and suggest options for a more sustainable approach to forest management and forest concessions.

The authors suggest that if Suriname had gone ahead with the concessions, it would have foregone tens of millions of dollars in annual revenues--up to 10 percent of gross domestic product -- essentially giving away its forests and getting shattered biodiversity, ruined fisheries, eroded soil, displaced populations, and perhaps ethnic strife in return.

Recognizing that Suriname's government may feel compelled to go ahead with substantial forest concessions, Dr. Sizer and Dr. Rice propose ways to improve concession policy, outlining how Suriname's government could protect both forests and forest-dwelling communities by ensuring compliance with contract provisions.

If it changed the way that forestry concessions are awarded, taxed and enforced, the government would prevent the worst environmental damage and reap enough revenue to deal with its most pressing social and economic problems. Specifically, the authors propose auctioning off concessions after establishing minimum bids and making sure that prospective bidders have good track records in other countries, in addition to levying

value-added taxes on timber and processed wood products.

Sizer and Rice outline how Suriname's government could protect both forests and forest-dwelling communities of Amerindians and Maroons, descendants of escaped slaves who live by the traditions their ancestors brought from West Africa 300 years ago. Launching a program to protect communal lands, sharing information with forest communities on pending development proposals, and requiring social impact assessments for concessions within or bordering on communal lands would improve development planning. Establishing a program to continuously monitor forest concessionaires' performance would help ensure compliance with contract provisions.

Sizer and Rice suggest that Suriname could strengthen social progress by requiring that concessionaires and wood-processing industries meet minimum employment standards and integrate training and apprenticeship programs into their business plans. Government could also help ensure that concession workers have the right to organize labour unions.

### **Foreign Assistance**

Recently, Suriname's government began negotiations with foreign donors to establish an assistance program that could take the place of the Asian offers for concessions.

The authors endorse the Inter-American Development Bank's efforts to take the lead in establishing a multilateral assistance package that would give Suriname enough time to explore other ways of using its forests to spur economic development. The assistance funds would help build the capacities of Suriname's public and private sectors to design sustainable forestry options, in addition to providing compensation to cover the short-term opportunity costs of putting the contracts on hold. A modest investment in assistance at this crucial juncture can enable Suriname to examine other options for forest development.

### **Directing Benefits to Forest Communities**

Backs to the Wall outlines ways to ensure that all people with a stake in the forests must be represented in decision-making circles if concession agreements are to reflect their rights and interests. Suriname has already established councils designed to give people in the hinterland a say in decisions that will profoundly affect their lives, but the nation has been unable to get them up and running because of budget

constraints. Backs to the Wall stresses that supporting these participatory mechanisms should be a key part of any international assistance package. The authors note, that simply providing Suriname's councils enough money to operate would go a long way toward bringing isolated rural peoples into the forest policy-making process.

Sizer and Rice suggest that the Organization of American States, which is already helping forest-dependent communities map their lands, could broaden its efforts into a formal land-demarcation program that includes mechanisms for resolving conflicts between communities and outside interest. Multilateral funders could supply technical and financial assistance to communities through micro-enterprise development grants to help them better satisfy their needs.

### **Conclusions**

The authors end by suggesting development alternatives that would make the most of Suriname's unique opportunities. Because the nation doesn't face the population and migration pressures that lead to deforestation in other countries, it can make a compelling case for the relatively small cash transfers needed to keep its forests intact. Besides tapping such mechanisms as the climate treaty's Joint Implementation provisions, Suriname could attract funds from debt-for development programs, green venture capital, and green investment funds. Unlike most countries, Suriname has invested little in unsustainable logging, so it is well-positioned to take advantage of the merging demand for "green seal" timber, i.e., wood and wood products that are certifiably produced in sustainable ways.

### **7. Forest Concessions in Indonesia**

#### **Introduction**

This case study of Indonesian forest concessions is drawn from a paper "Desarrollo del Sector Forestal de Indonesia: Su Contribucion a la Economia y al Ingreso por Exportaciones" presented at a seminar on the export potential of the Nicaragua forest sector, held in Managua, December 10, 1996 (Gray 1996), with additional materials from Gray and Hadi (1989) and other sources.

The present system of Forest Production Concessions (HPH) was, established in 1970 by Government Regulation No.21/1970. It forms the basis for the management of natural forests in Indonesia (Barber 1988, Gray and

Hadi 1989). Under the Concession System, private sector companies are allocated cutting rights to an area of natural forest for a fixed period (currently 20 years). Concessionaires harvest timber under a forest management plan which establishes an Annual Allowable Cut, the cutting system to be used (currently the Indonesian Selective Cutting and Planting System - TPTI), diameter limit (currently 53 cm minimum), and cutting cycle (currently 35 years).

The concession system has evolved over the past 25 years. Additional regulations and decrees have been added in response to changing circumstances in the forest industry and in world markets, the evolution of development objectives under each Five-Year Plan (Repelita), problems of forest management supervision, experience gained and lessons learned. As a result, the number and complexity of concession regulations and decrees has made enforcement difficult for the Ministry of Forestry and compliance with a complicated process for the concessionaires (Gray and Hadi 1989).

The number of concessions has grown until they cover almost all commercial forest land. By 1993 there were 576 concessions covering over 60 million ha. Concessions have been granted in all provinces, except on the island of Java and in Nusa Tenggara. Log production from concessions, officially about 25 million cubic metres/year, is generally considered to underestimate actual log production by 20% to 40% as a result of under-scaling, under-reporting and illegal logging.

Concessions granted in the 1970's are nearing the end of their 20-year term and will be subject to assessment, renewal, or re-assignment. Ministry procedures for renewal have been established (Gray and Hadi 1989). The procedures and criteria are intended to be comprehensive, but many of the criteria are subjective, rather than objective and quantifiable, making their application difficult and open to interpretation and to dispute.

### **Current Concession Management Requirements and Problems**

Forest management by concessionaires is controlled by a series of decrees and regulations that specify the management plans and procedures to be followed and the procedures for checking by the Ministry of Forestry, the regional offices of the Ministry (KANWIL - Kantor Wilayah Kehutanan), and the Provincial Forest Service (Dinas - Dinas Kehutanan).

It is generally agreed that the decrees and regulations if they could be fully and properly implemented, properly supervised and enforced, could achieve sustainable forest management on concessions. The first problem is that the decrees and regulations are often too numerous and too complex for proper compliance or effective enforcement (Gray and Hadi, 1989).

A second problem is that of implementation. Some concessionaires may try to be conscientious in following the decrees and regulations, but others are not. Without adequate supervision and enforcement there is no incentive for compliance.

A third problem is that of supervision and enforcement. Field-level inspection enforcement is weak and often not carried out. Field supervision of forestry operations is always difficult. Cutting areas are by nature remote. Transportation and living conditions in the field are not easy. Field staff of the Dinas are poorly paid, trained and supported. They are therefore open to influence from the concessionaires they are to inspect and supervise.

Although administrative guidelines are in place for control of concession operations and logging practices, the supervision on the ground and thus the implementation of the guidelines has proven insufficient to achieve performance. There is evidence of concession damage, planning, overexploitation, illegal logging, underreporting of log volumes cut, failure to forest, and dissatisfaction among forest communities. Although a number of companies in the private sector have performed well and are self-motivated to achieve sustainable forest management, the problems of field implementation have not provided the required performance incentive and has produced unfairness and inequities for those companies that have performed.

### **Ownership of Forest Concessions**

Most concessions are now owned or controlled by companies with wood processing facilities, the result of deliberate government policy decisions. This has encouraged increasing concentration of ownership. Many Forest Concessions are held by companies that are part of a larger group of companies which own plywood plants, sawmills and other wood processing plants. Ownership of concessions is concentrated in the plywood industry. Only the larger sawmills have concessions. Many medium and smaller sawmills have no assured

wood supply and are dependent on logs from land clearing.

The ownership of concessions by processing plants ensures these plants of a secure wood supply, but it means that the timber from these concessions goes to the related plants, even when the timber might be more valuable if processed into different products in another plant. Given the diversity of species in the tropical forest, and the sizes and qualities of logs, the loss of potential values from the forest may be important.

Many companies or groups hold several concessions. A 1989 study of forest concessions showed that two-thirds of the concessions were held by companies with two or more concessions. Some large forest company groups held 8 or more concessions, and up to 28 concessions (Gray and Hadi 1989). The top four concession holding company groups held 17% of the concession area, the top ten, 31% of the total area in forest concessions (Gray and Hadi 1989). Since then concessions ownership has been further concentrated.

Less concentrated ownership of concessions would facilitate development of wood processing centres and of log markets through which concession holders and processing plants could buy and sell logs to match their need for different species, grades and sizes with the supplies of timber available.

### Lessons from Indonesia's Experience

Since 1980, Indonesia has been highly successful in expanding forest products exports, in shifting from the export of logs to export of much higher values forest products such as plywood, mouldings, doors, furniture and other processed wood products, in dominating the world plywood markets, and in penetrating new markets for plywood.

Indonesia's development of the forest sector provides useful lessons for other countries. Countries seeking to expand their forest sector's contribution to the economy can benefit both from the experiences of Indonesia's successes and from Indonesia's concerns. The experience and lessons of Indonesia's successes and of the concerns are discussed in turn.

**Forest and Environmental Management:** Indonesia's forest concession system has provided the security of timber supply and basis for investment in processing plants and for their expansion and modernization. This is particularly true for the plywood industry where almost all plywood mills are tied to a concession.

However, the forest concessions have not brought about sustainable forest management nor protection of non-timber and environmental forest values.

**Concession Size:** As indicated above forest concessions in Indonesia are often large, beyond the need of concession owners. On such concessions there is no scarcity of area, and consequently no incentive to manage the forest intensively. As suggested, area based forest fees would provide some incentive to "economize" on area.

With large concessions tied to plywood mills and the larger sawmills, log markets have not developed. The smaller sawmills have difficulty in securing log supplies. Smaller concessions which provided a major part, but not all of a company's log needs would help to encourage development of log markets. Log markets would allow firms without timber supplies to buy logs, and other companies with log supplies to trade logs to obtain a more suitable species or quality mix for their plant.

**Concession Length of Tenure:** Forest concessions are currently of 20 year tenure. Some people have argued for longer tenure to match the harvesting cycle or growing cycle of slow growing tropical timber. However, longer tenure will not necessarily provide the incentive for long term forest management, not if the growth rate of the timber is less than the rate of return on alternative investments. If the growth rate of tropical forests is 1%, 2% or 3% per year and the rate of return on investments elsewhere is say 5% or 10% or more, then the incentive for concession owners will be to log the forest and reinvest the funds elsewhere. Under such circumstances longer tenure will not encourage investment in forest management (Gray 1993, Gray and Yevdokimov 1996b). Other incentives or obligations are required and will need to be enforced.

However, tropical forests provide a range of outputs and benefits in addition to timber, foods and fuelwood, medicines, recreation, environmental tourism, watershed protection and erosion control, etc. These are not marketed, and thus are difficult to value. However, the non-timber values are often equal to the timber value. When these non-timber values are added to the timber values, the benefits of forest management are at least doubled, and forest management become economically viable.

**Forest Concessions and Non-Timber Forest Outputs:** Forest Concessions in Indo-

nesia are allocated to timber production and are managed for a single use, timber production. Other uses, community uses, and right of forest communities are recognized. However, in practice forest communities, forest dwelling people and forest using groups have been ignored. This has generated conflict with forest communities and forest users. It has been suggested that local communities have a share in both the forest revenues and in the management of concessions. If local communities have a stake in the forest and a share in the management and revenues they will be more willing to balance timber and non-timber uses.

#### **Other Forest Outputs and Benefits:**

The non-timber forest uses can generate benefits that contribute to the economy in addition to timber values. Management of forest for watershed protection can reduce flood damage, save on flood control expenditures, reduce harbour siltation and siltation of reservoirs, thereby contributing to the national economy by saving on costs. By providing fuelwood, foods and other outputs, as well as jobs, to meet local communities needs, forest management for timber and non-timber outputs can contribute to local and regional development and alleviate poverty.

Management of tropical forest for environmentally based tourism can also contribute to exports (of services) and foreign exchange earnings, and to diversification of the local, regional, and national economy. In addition, environmentally based tourism is less demanding of infrastructure and is more dispersed than resort based tourism.

**Economic Growth and Depletion of Natural Resources:** Like many developing countries, Indonesia's impressive growth has been heavily dependent on its rich natural resources. As quoted above, Indonesia has achieved impressive and sustained growth, 7% per year based on measured Gross Domestic Product(GDP). However, GDP calculations can overstate growth in resource based countries such as Indonesia. Although GDP calculations include investment in and depreciation of physical capital like buildings, plant and equipment, they ignore depreciation of natural resource assets such as forests, minerals, petroleum. Thus it is possible for resource based countries to use up their natural resources, while based on GDP they appear to be growing, and end up resource poor and destitute.

In a study of Indonesia, Robert Repetto

and others attempted to correct GDP for this omission by incorporating estimates of depreciation of Indonesia's forests, petroleum resources, minerals and soil erosion (partly the result of deforestation)(Repetto et al 1989). Adjusting for resource depreciation lowered growth rates for the period 1971-1984 from 7.1% per year to 4.0% per year, a full 3% lower.

In a similar study for Costa Rica Solóranzo and others estimated Costa Rica's natural resource depreciation from deforestation, soil erosion and overfishing. Costa Rica's natural resource depreciation averaged 6.2% of GDP over the period 1970-1989. However, in the later years the rate rose to 8-9% of GDP, about three times the depreciation of buildings and equipment (Solóranzo et al 1991).

Countries with resource based economic development initiatives need to plan for investments in maintaining their resource base. Such investments, like investments in physical capital and infrastructure are development initiatives and contribute to GDP.

**Summary of Experiences and Lessons:** The review of Indonesia's experience has emphasised the importance of the incentives, incentives for exports, incentives for efficient utilization, incentives for investment, incentives for forest management, etc. An important implication is that providing the right incentives for the forest industry and other forest users is key to encouraging efficient development of the forest sector. Incorporating check and balances will facilitate supervision and make forest management more automatic and less regulatory.

## **8. Forest Fees in Indonesia**

### **Introduction**

This case study of Indonesian forest concessions is drawn from a paper "Desarrollo del Sector Forestal de Indonesia: Su Contribucion a la Economia y al Ingreso por Exportaciones" presented at a seminar on the export potential of the Nicaragua forest sector, held in Managua, December 10, 1996 (Gray 1996), with additional materials from Gray and Hadi (1990) and other sources.

The most important forest fees in Indonesia are those on the volume of timber cut. They generate well over 95% of the forest revenue. The forest fees on the timber cut are based on log volumes as measured in the forest. These fees are:

**Forest Products Royalty (IHH)** - be-

tween US\$ 7.00/cubic meter to US\$ 12.00/cubic meter depending on species (1995 rates). Levied in Indonesian Rupiah.

**Reforestation Fee (DR)** - between US\$ 13.00/cubic meter to US\$ 16.00/cubic meter depending on species and region of the country (1995 rates). Levied in US dollars.

**Forest Products Royalty (IHH):** The Forest Products Royalty (IHH) is levied in Indonesian Rupiah at rates per cubic meter of log volumes. It is set out in a schedule of rates which vary by species or species group for logs, pulpwood and other products. The schedule includes 40 different rates, although most timber harvested falls into only a few of the rates. The rates are revised every six months, based on 6% of average log prices as set by the Ministry of Forestry in consultation with the Indonesian Loggers Association (APHI) and the Ministry of Finance. Thus rates are adjusted regularly for inflation and for increases in log prices, an important advantage in keeping rates up-to-date. Revenues from the Forest Products Royalty are distributed on a percentage basis to: provincial governments, local governments, forest renewal, regional forestry administration, and to payment of property taxes.

**Reforestation Fee (DR):** The Reforestation Fee (DR) is levied in US dollars per cubic meter of log volume at rates that are now varied by species and region of the country. The rates, which are set by regulations, have been dramatically increased in recent years since 1989 through several changes in regulations (new decrees). The Reforestation Fees was originally established in 1980 at a uniform US\$4.00/cubic meter and remained at that level until 1989. In 1989 it was raised to US\$7.00/cubic meter, to US\$10.00/cubic meter in 1990, and then to the present US\$13.00/cubic meter to US\$16.00/cubic meter in 1993. As a result of these increases the Reforestation Fee (DR) is now the major forest fee. Revenues from the Reforestation Fees are paid into a "Reforestation Fund" and accumulated for use in funding reforestation on or outside concession, establishment of forest plantation, or drawn upon for other uses. The "Fund" has now accumulated a substantial surplus.

### Other Forest Revenues

Other forest fees generate less than 5% of forest revenue. They include: the scaling and grading fee charged for log measurement and based on log volumes, fees on forest concessions, the log export tax, and the sawnwood export tax.

**Fees on Forest Concessions:** Fees on concessions include the Forest Concession Licence Fee (IHPH), a one-time initial fee, which varies by province, of US\$4.00/ha, US\$7.50/ha, or US\$10.00/ha charged on the entire concession area. The Land and Improvements Tax (PBB) is the other tax levied on concessions. It is an annual tax levied by the Ministry of Finance on concessions at rates per hectare which vary by forest class. Concessions fall into the lowest of the 50 land classes. The Land and Improvement Tax generates only about 2% or less of forest revenue.

**Sawnwood Export Tax:** The Sawnwood Export Tax is at such high levels that only minute volumes of rough or semi-processed sawnwood are exported, and thus it generates very little revenue. The rates are at such high levels that the export tax is equivalent to a sawnwood export ban.

**Log Export Ban and Log Export Tax:** The Log Export Ban, introduced in 1985, has now been changed to a Log Export Tax, but at such high levels that no logs are exported legally. Thus it generates no revenue and at such high levels is essentially equivalent to the log export ban which it replaced.

### The Level of Forest Fees

The forest fees and royalties levied on the standing timber or the logs cut in principle reflects the value of the timber cut, that is, the value of the timber. Forest fees and royalties are the price paid for the timber, the raw material input of the forest industry. As with any other input and as in any other industry, if the timber input is priced too low, below its value to the industry, it will be treated as a cheap input, overused and poorly utilized. Under low timber fees the forest industry will have little incentive to maximize the value of the forest products produced from the available forests. The sectors outputs and exports will be below their potential, and generate lesser values from the forest than they could.

In the same way, if forest fees and area charges on forest concessions and other timber rights are less than the value of the timber rights, then they too will be used inefficiently and country's economic development will again be below its potential.

It is important that forest fees reflect the value of the timber, collect a fair share of value in forest fees, and keep up with changing timber values and with inflation. Forest fees that reflect the value of the timber provide an incentive to use the timber efficiently, to achieve

a high conversion rate, and to produce valuable products more that will increase export earnings. Low forest fees put a low price on timber and result in poor utilization and low conversion rates, and sanction use of valuable timber in production of lower valued products.

Until recently Indonesia's forest revenue system has not been particularly effective in collecting forest revenues, nor in reflecting stumpage values, as a number of studies have shown (Ruzicka 1979; Gillis 1988; Gray and Hadi 1990; Darusman 1992; Aspek Ekonomi Pengusaha Hutan — Seminar on Economic Aspects of Forest Revenues 1992). However, Indonesia has recently shown interest in strengthening its forest revenue system and improving revenue collection (Government of Indonesia 1990abc, World Bank 1990, Reid Collins 1993).

In a study of Indonesia's forest pricing and concession policies Gray and Hadi (1990) evaluated the stumpage values and the proportion of that value collected in forest revenues under differing situations (high and low valued species, company and contract logging, differing logging conditions and terrain). For the major species, under average logging conditions they estimated that about 29 per cent of the stumpage value was collected by forest fees. The estimates of the percentage of

stumpage values collected by forest fees varied by species and situation; from a low of 22 per cent for more valuable species on more accessible, easier to log sites; to a high of 75 per cent for lower valued species under more remote and difficult logging conditions.

Gray and Hadi (1990) also traced the trend of forest fees over the decade of the 1980's, one of significant change in the forest industry. Over the decade, inflation had a significant impact on forest fees and the share of stumpage values collected. Forest fees remained relatively unchanged from 1980 through 1988. Fees were raised in 1989 by US\$ 3.00/cubic meter and another US \$3.00/cubic meter in 1990, doubling fees in money terms and reversing a downward trend in the level of "real" (inflation free) forest fees. Forest fees, when adjusted for inflation, declined by 50 per cent from 1980, rising only at the end of the decade to end the decade in real terms only about 20% above 1980 levels in real terms, in spite of doubling in money terms.

In 1992, several additional studies of stumpage values and the share of that value collected in forest revenues were undertaken, presented and discussed at a seminar on forest revenues held in Jakarta (Aspek Ekonomi Pengusahaan Hutan — Seminar on Economic Aspects of Forest Revenues 1992) (Darusman

**Table 3.** Estimates of Stumpage Values and Forest Revenue Shares: Indonesia, 1990-1993

Source and Year:	Stumpage Values	Share of Stumpage	
		by Government as Forest Revenue	by Industry as Above Normal Profit
		US\$/m <sup>3</sup>	Percent
APHI - Association of Indonesian Forest Concession Holders (1992)	\$21	84%	16%
Tim Dep-Hut - average of five provinces (1992)	—	51%	49%
Sutopo and Darusman - Riau Province (1992)	\$48	31%	69%
Gray and Hadi (1990) - Meranti Species, easy to Moderate Terrain	\$52	29%	71%
Reid Collins (1993)	\$40-45	25-35%	65-75%
Jaakko Poyry Consultants (1992)	\$45-62	19-33%	67-81%
WAHLI - Wahana Lingkungan Hidup Indonesia Environmental NGO (1992)	—	17%	83%

Sources: Darusman 1992, Reid Collins 1993

1992). Their results are presented in Table 3.

Estimates of stumpage values collected by the Indonesian government ranged from a low of 17 per cent in a study by WAHLI, an Indonesian environmental NGO; to a high of 84 per cent in a study commissioned by the APHI, the Indonesian Loggers Association. The other studies were carried out by international forestry consulting firms and Indonesian experts. Their estimates of the share of stumpage values collected as forest revenues for a variety of species and situations varied between a low of 19 per cent to a high of 51 per cent. However, the majority of the estimates were in the range of 25 and 35 per cent of stumpage values collected as forest revenues. Variations among the studies in the share of stumpage values collected are understandable and to be expected, given the diversity of tropical forests, species, logging conditions and costs throughout the country. They point out the necessity that forest fees reflect differences in species and timber quality, location and logging cost.

Export plywood prices have risen since 1992, and as a result the stumpage prices of timber increased further. A recent analysis by the Ministry of Forestry and the British Overseas Development Agency (ODA) based on actual logging and processing cost data estimated that forest fees could be increased further, by US\$ 28.00/cubic meter to US\$57.00/cubic meter above the current (1995) levels of US\$21.00/cubic meter to US\$27.00/cubic meter, while maintaining reasonable profitability in the industry.

### Lessons from Indonesia's Experience

Since 1980, Indonesia has been highly successful in expanding forest product exports, in shifting from the export of logs to export of much higher values forest products such as plywood, mouldings, doors, furniture and other processed wood products, in dominating the world plywood markets, and in penetrating new markets for plywood.

Indonesia's development of the forest sector provides useful lessons for other countries. Countries seeking to expand their forest sector's contribution to the economy can benefit both from the experiences of Indonesia's successes

and from Indonesia's concerns. The experience and lessons of Indonesia's successes and of the concerns are discussed in turn.

Forest fees in Indonesia have reflected only about 25-35% of the value of the timber in spite of recent increases. Thus government's share of the timber values has been about one-third, leaving two-thirds of the value with the forest industry (after allowing normal profit from operations). The forest industry, of course, prefers low forest fees. These result in higher profits and make forest operations and exports more profitable. However, low forest fees do not encourage efficient use of the forest. Low forest fees provide the wrong incentive.

For the forest industry forest fees and royalties on timber and logs become part of the cost of the logs. Low fees mean cheaper logs and weaken incentives to increase the recovery of lumber and plywood. In spite of the success of the Indonesian forest industry, the product conversion factors (product recovery) are lower than comparable rates in other countries (Hardie 1989, Jayabhanu and Rolin-Hymans 1989). Improved conversion factors would result in increased output of sawnwood and plywood and help Indonesia meet future domestic demands and exports from a shrinking timber supply. Higher forest fees would provide an incentive for improved recovery.

**Level of Forest Fees:** Indonesian fees on forest concessions are low, generating less than 5% of forest revenues. With low fees on concessions there is little to discourage the acquisition and holding of large concession area, even if it is beyond a company's needs. Large forest areas are tied up in few hands. With excess area, companies have no incentive to manage their concession efficiently. The output of the forest, forest product production and exports are below the potential.

**Area Based Fees:** Higher per hectare concession fees provide an incentive to utilize the concession area more effectively, to not acquire excess area, and to relinquish excess area. In addition, area based concession fees are simple and easy to administer, and generate additional revenues, taking pressure off more the difficult to collect fees and royalties on logs.



# Política Florestal coerente para Amazônia: *Zoneamento Florestal, Florestas de Produção e Monitoramento Florestal*

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*Adalberto Veríssimo<sup>1</sup>  
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## *1. Introdução*

A Amazônia brasileira, detentora da maior reserva de madeira tropical do mundo, produz atualmente 25 milhões de metros cúbicos de madeira em tora ou 80% da produção do país. A maioria dessa produção (>90%) é absorvida pelo mercado interno. As exportações de madeira representam uma parcela modesta do mercado internacional de madeiras tropicais (em torno de 4%), mas deverão crescer expressivamente na próxima década devido à exaustão, em curso, dos recursos florestais da Ásia. Adequar-se à dinâmica de mercado e às práticas de bom manejo será o grande desafio para a Amazônia na próxima década.

Na Amazônia, a atividade madeireira se concentra ao longo de um arco ao sul da bacia amazônica e nas margens dos principais rios da região. Aproximadamente 80% do volume explorado vêm das florestas de terra firme, enquanto a produção originária da várzea representa apenas 20%. Nas regiões mais remotas, os madeireiros entram na floresta em busca apenas de espécies altamente valiosas, como o mogno. Nas áreas mais próximas, de fácil acesso, o baixo custo de transporte permite a exploração de mais de cem espécies.

O setor madeireiro da Amazônia tem ainda uma participação modesta no PIB nacional, menos de 2%. Entretanto, a nível regional a participação desse setor é cada vez mais expressiva. Por exemplo, no Pará a atividade madeireira representa 13% do PIB.

Essa importância econômica se confronta com o fato de que a exploração florestal na Amazônia ocorre de forma predatória. Os impactos ecológicos são severos nos casos em que é economicamente viável a extração de todas as espécies madeiráveis. Quando é apenas economicamente viável a extração das espécies de alto valor (15-20 espécies), os danos nas florestas são menores, mas a abertura de estradas pela atividade madeireira pode agir como um catalisador para a colonização e subsequente desmatamento.

Entre as várias causas da exploração predatória estão o baixo valor do recurso madeireiro devido à abundância dos estoques, à escassez de iniciativas promissoras de manejo florestal, ao monitoramento deficiente e à insuficiência de florestas de produção (por exemplo, Flonas).

Para que as práticas de manejo florestal sejam adotadas na região é fundamental atacar a questão da abundância dos estoques, a escassez de florestas públicas de produção e a inoperância do sistema de monitoramento e fiscalização da atividade madeireira.



## 2. Zoneamento Florestal

Atualmente não existem estratégias para decidir onde a atividade madeireira deve ocorrer ou ser proibida na Amazônia brasileira. Como resultado, a exploração madeireira tem ocorrido em muitas áreas protegidas. Sem controle e planejamento por parte do governo, a indústria madeireira poderá exaurir extensas áreas de florestas da região.

Uma maneira de elevar o preço da matéria prima é torná-la artificialmente escassa. Isso pode ser feito através de um zoneamento florestal. Em essência, o zoneamento irá delimitar as áreas que devem ser protegidas da exploração madeireira (devido ao alto valor biológico) das áreas com nítida vocação para produção florestal. Os critérios para o zoneamento devem incluir informações sobre vegetação, áreas prioritárias para conservação, situação fundiária e áreas legalmente protegidas, acesso (rodovias e hidrovias) e áreas economicamente acessíveis à exploração madeireira.

Usando essa base de informações, os pesquisadores do IMAZON geraram dois mapas. O primeiro, mostra a proporção das florestas do Estado que são economicamente acessíveis à exploração. O segundo mapa apresenta áreas prioritárias para exploração madeireira e áreas que deveriam ser protegidas. O estudo realizado em 1995 enfocou o estado do Pará, onde ocorre a maior parte da exploração madeireira do país.

Primeiro, temos que 80% das florestas do Pará são economicamente acessíveis à exploração madeireira: em 21% é viável explorar todas as espécies comerciais existentes incluindo as de baixo valor (> 100 espécies); em 30% é vantajoso explorar apenas as espécies de médio e alto valor (15-20 espécies); e finalmente em 29% é atrativo explorar apenas o mogno, uma espécie de alto valor que ocorre no sul do Estado (Figura 1).

Em seguida, mostramos como poderia ser feito o zoneamento da atividade madeireira no Estado. Inicialmente, constatamos que em 19% das terras do Estado não há recursos florestais (13% são áreas desmatadas e 6% tipos de ve-

getação não-florestal). As áreas designadas para a exploração madeireira, com base em fatores econômicos e aspectos de conservação, somaram 32% das terras do Estado. Essas áreas incluem os locais onde a exploração madeireira já ocorre. Propomos que nas áreas restantes (49%) a atividade seja proibida, pelo menos por enquanto. Entre essas áreas estão as áreas onde a atividade madeireira já é legalmente proibida (29%), bem como áreas não protegidas, mas com altíssima prioridade para conservação. E, finalmente, 32% são áreas mais indicadas para a exploração florestal com base em considerações econômicas e importância biológica (Figura 2).

Esse exercício mostra que usando informações disponíveis é possível prever a expansão da atividade madeireira e desenvolver um visão de como poderia ser feito o zoneamento dessa atividade. Certamente, outras formas de zoneamento são possíveis. Um exercício desse tipo é imprescindível na formulação de políticas públicas para o setor florestal da Amazônia. Como consequência do zoneamento, o governo pode priorizar os investimentos em infra-estrutura, promoção e os esforços de monitoramento e fiscalização em áreas previamente definidas como aptas à exploração florestal.

**Atualmente não existem estratégias para decidir onde a atividade madeireira deve ocorrer ou ser proibida na Amazônia brasileira. Como resultado, a exploração madeireira tem ocorrido em muitas áreas protegidas.**

### 2.1. Ampliar a Rede de Florestas de Produção na Amazônia

As florestas de produção (isto é, florestas nacionais, estaduais e municipais) são importantes para garantir uma proporção razoável de madeira de origem legal e manejada na região. Atualmente, as áreas de **florestas de produção** representam menos de 2% das terras da Amazônia. Dada a importância da atividade madeireira para a economia regional e a ameaça da exploração predatória para o meio ambiente, a proporção de terras designadas como florestas de produção deveria representar um proporção razoável das terras da região (> 10% das terras).

As Flonas apresentam inúmeras vanta-

gens, incluindo segurança fundiária, compromisso a longo prazo com a atividade florestal, produção sob regime de manejo e arrecadação de royalties.

Há três aspectos a serem abordados em uma política florestal com enfoque em Flonas: i. ampliação da rede Flonas (inclusive estaduais e municipais), ii. consolidação de algumas Flonas existentes em caráter demonstrativo (por exemplo, Flona do Tapajós) e iii. relacionamento dos programas estratégicos de zoneamento e monitoramento florestal.

## **2.2. Onde estabelecer novas florestas de produção?**

Uma crítica recorrente feita a respeito das florestas de produção (atualmente só existem Flonas) é de que a sua localização é remota e, portanto, não oferece atrativos econômicos para a exploração madeireira. Por essa razão, é fundamental que as florestas de produção sejam criadas dentro do raio econômico da exploração madeireira. Um estudo que está sendo conduzido pelo IMAZON mostra como as informações de preço de madeira, custos de transporte, localização dos pólos madeireiro de produção, população rural e malha fundiária em áreas de floresta podem ser utilizadas para indicar as áreas mais viáveis para o estabelecimento de florestas de produção. Os resultados preliminares desse estudo mostram, por exemplo, que as áreas mais recomendadas para o estabelecimento de florestas de produção são aquelas onde é economicamente possível extrair todas as espécies de valor econômico (> 100 espécies). No caso do Pará, 22% das florestas estão nessa situação. Em seguida, estão 30% das florestas do Estado onde é viável a exploração de espécies de médio e alto valor (15-20 espécies). Por último, há 29% das terras do Estado onde só é viável extrair o mogno, a espécie mais valiosa da Amazônia. Nesse caso, a oportunidade para a criação de florestas de produção é facilitada pelo fato de que uma parte razoável dessas terras é devoluta.

## **2.3. Florestas de produção para quem?**

Para a criação de florestas de produção, além de pensar estrategicamente sobre a sua localização, deve-se também levar em conta os aspectos de oportunidade para os diversos grupos sociais envolvidos com a atividade madeireira (empresas privadas, comunidades tradicionais, pequenos produtores).

A utilização dos recursos florestais das florestas de produção por parte das empresas pri-

vadas é recomendado e necessário, especialmente para as empresas que não possuem áreas próprias. Para atrair as empresas, será necessário revisar profundamente o modelo atual de gestão das florestas de produção excessivamente centralizado e burocrático. Os valores de royalties devem refletir as condições locais de preço para a madeira em pé (stumpage value) e devem ser calculados a partir de informações de campo.

Além de envolver as indústrias madeireiras na exploração manejada dos recursos florestais das florestas de produção, o governo precisa incorporar as comunidades locais na gestão e utilização dos recursos florestais de algumas delas. Estes habitantes locais, incluindo os caboclos e colonos, geralmente possuem um tipo de conhecimento que os predis põem a manejar a floresta de forma adequada.

É reconhecido que em alguns países as concessões para esse fim não foram bem sucedidas. Entretanto, medidas poderiam ser adotadas incluindo treinamento em técnicas de manejo, marketing (i.e., contatos com compradores, preços dos produtos no mercado, etc), para assegurar o seu sucesso. Agências do Governo e ONGs poderiam também exercer um papel importante fornecendo informações sobre questões técnicas e financeiras.

A criação de uma rede de comunidades envolvidas com o manejo florestal em florestas de produção poderia estabilizar a fronteira de forma mais efetiva do que qualquer outra medida. Ao invés de estar localizadas na frente do processo de desmatamento, essas florestas de produção poderiam atuar como zonas “tampão” contra as ameaças futuras de desmatamento, oferecendo uma alternativa econômica às populações locais baseada nos recursos florestais.

Para ter êxito a criação de florestas de produção precisa receber apoio dos governos locais. Portanto, é importante envolver os órgãos públicos locais em todo o processo de definição das florestas de produção. A forma mais promissora para alavancar apoio político é destinar parte das receitas oriundas da exploração florestal sob manejo para os municípios onde as florestas de produção estão localizadas.

## **2.4. Monitoramento Florestal**

Os esforços de criação de florestas de produção só terão êxito se houver um sistema eficiente de monitoramento para garantir o cumprimento da lei florestal. O princípio básico do monitoramento florestal é elevar os

preços da matéria prima de origem predatória de maneira a se igualar com os custos de manejo. Para isso será necessário reformar o atual sistema de monitoramento e fiscalização. O sistema em vigor é excessivamente burocrático (valoriza mais os procedimentos de escritório do que as ações de campo), ineficiente (custo elevado), não transparente (os procedimentos complexos tornam virtualmente impossível um controle social) e, portanto, sujeito a desvios e corrupção.

O sistema de controle e monitoramento florestal precisa ser reformulado. Uma maneira de fazer isso seria através de um projeto piloto que enfocasse no sistema de cadastro das indústrias, fontes de matéria prima, leis estratégicas, critérios de fiscalização, procedimentos de auditoria independente por parte de ONGs nos processos de monitoramento e fiscalização florestal.

Há necessidade também de simplificar o aparato regulatório para se fazer respeitar a legislação. Ao invés de uma série complexa de leis de valor duvidável, largamente desrespeitadas, seria mais sensato estabelecer um número bem limitado de leis de fácil implementação e que, ao mesmo tempo, assegurem o bom uso da floresta. Segundo pesquisadores do IMAZON, é possível utilizar uma lei simples que teria grandes poderes de reduzir os danos sobre as florestas e ao mesmo tempo ser facilmente implementada. Vamos chamar essa lei de "5/30/5". O "5" inicial refere-se ao número de árvores que poderiam ser extraídas por hectare; "30" ao tempo mínimo em anos para os ciclos de corte; e o último "5" se refere à largura do aceiro, que deve ser mantido em volta das áreas exploradas, durante a primeira década após a exploração, para evitar incêndios no sub-bosque. A implementação dessa lei poderá assegurar a integridade do ecossistema face à exploração madeireira.

Outro aspecto do monitoramento é a questão da punibilidade. A multa é a pena mais comum aplicada aos infratores. Os dados mostram, porém, que as multas têm sido pouco efetivas. Por exemplo, em 1996, apenas 6% das multas aplicadas na Amazônia foram efetivamente pagas pelos infratores. Isso revela a fragilidade do aparato regulatório (devido a ausência de uma "lei de crimes ambientais") além da ineficiência do IBAMA.

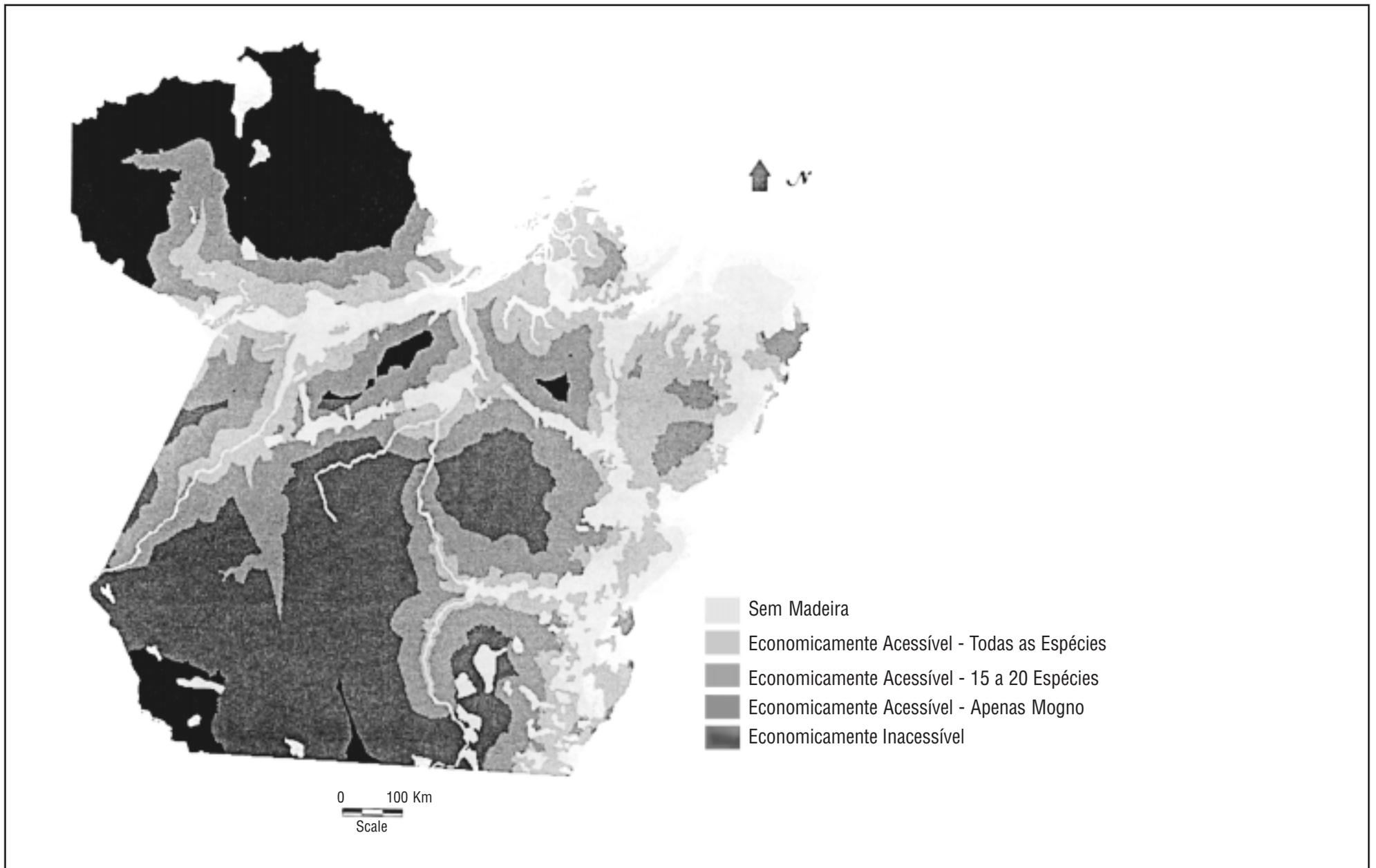
## Conclusão

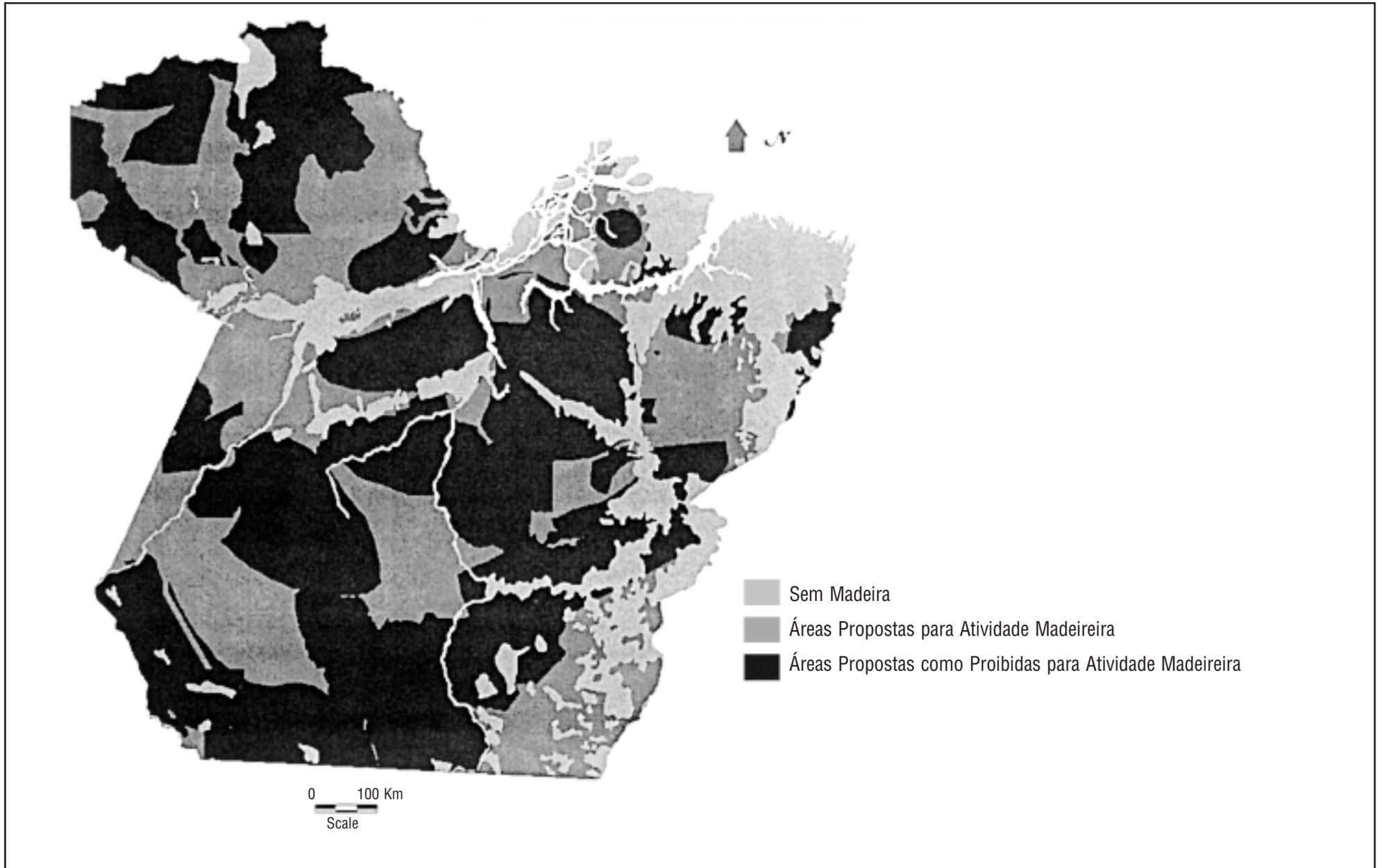
A exploração madeireira representa riscos e oportunidades sem igual na história de uso dos recursos naturais da Amazônia. Se a tendência de crescimento caótico e não controlado continuar, os madeireiros poderão afetar boa parte das florestas acessíveis da bacia amazônica. Como vimos, a exploração madeireira nesses casos é a primeira etapa da cadeia que acaba resultando em desmatamento. Apesar desse cenário cinzento, existe oportunidades promissoras para o uso sustentável dos recursos florestais na região. As ações de zoneamento florestal, criação de novas florestas de produção e estabelecimento de um sistema efetivo de monitoramento florestal são fundamentais para garantir um bom uso dos recursos florestais.

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# Some Suggested Contract Provisions for Forestry Contracts on Land Owned by The Federative Republic Of Brazil

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*David N. Smith*<sup>1</sup>

## *Preamble: Government Goals*

- All timber resources contained in the territories owned by The Federative Republic of Brazil are the national wealth of The Federative Republic of Brazil.
- The Government seeks to advance the economic development of the people of The Federative Republic of Brazil and to that end desires to encourage and promote the rational exploration and development of the timber resources of The Federative Republic of Brazil.
- The Government, through the operation of timber enterprises, seeks to receive fair value for its resources and to foster regional development, employment opportunities, and local business. It also seeks transfer of skills, know-how and technology to Brazil nationals, and acquisition of basic data regarding the country's timber resources.
- In the process of developing timber resources, the Government gives high priority to protection of the environment and avoidance of waste and misuse of its resources.
- The Company has access to the skills, information, knowledge, experience and proven technical and financial capability and other resources necessary to undertake a program of Development, Construction, Harvesting, Processing and Marketing and is ready and willing to proceed in these undertakings pursuant to the terms and conditions set forth in this Agreement.
- The Government and the Company are willing to cooperate in developing timber resources on the basis of the laws and regulations of the Republic of Brazil and this Agreement.

In consideration of the foregoing and the mutual promises and conditions set forth in this contract, the parties agree as follows:

### **Definition of Affiliated Company**

“Affiliated Company” or “Affiliate” means any person or entity that directly or indirectly (or through one or more intermediaries), controls or is controlled by, or is under common control with, the person or entity specified. “Control” (including the terms “controlled by” and “under common control with” and “controls”) means the possession, directly or indirectly, of the ability to influence management decisions. Without limiting the generality of the above, such influence is presumed to exist if one person holds, directly or indirectly, 25% or more of the outstanding voting shares of the other person or entity.

### **Harvesting And Processing In Accordance With International Standards**

The Company accepts the rights and obligations to conduct operations and activities in accordance with the terms of this Agreement. The Company shall conduct all such operations and activities in a good technical manner in accordance with good international timber industry and engineering standards and practice and in accordance with modern and accepted scientific and technical principles using appropriate modern and effective techniques, materials and methods to achieve minimum wastage and maximum safety as provided in this Agreement and governing laws. All operations and activities under this Agreement shall be conducted so as to avoid waste or loss of natural resources. Production shall not be restricted to the extraction of high grade timber and shall be in accordance with approved development plans and approved economic cut-off grades.

The Company undertakes that any harvesting, processing or treatment of timber prior to domestic sale or export by the Company shall be conducted in accordance with generally accepted international standards. In accordance with such standards, the Company undertakes to use all reasonable efforts to optimize the recovery of timber from harvesting and processing activities and shall submit evidence to the Ministry of compliance with this undertaking.

### **Services From Affiliates and Affiliate Transactions**

The Company may contract for necessary technical management and administrative services, provided that it shall not be released from any of its obligations hereunder. In the

event that such services are contracted from Affiliates, such services will be obtained only at a charge not more than a non-affiliated party with equivalent qualifications to perform such services would charge for provision of such services at equivalent standards. All such charges shall be fair and reasonable and accounted for in accordance with accepted international accounting principles consistently applied. The Company shall, on request by the Ministry, produce evidence verifying all such charges.

The Government shall in no event be bound by the Company’s characterization of any transaction with an Affiliate for accounting purposes. In the event that the Government establishes that any payment, deduction, charge for expenses or other transaction with an Affiliate is not fair, reasonable and consistent with the general practice that would have been followed by independent parties in connection with a transaction of a similar nature, the Government may, for the purposes of determining the Company’s income tax liability, substitute the payment, deduction, charge for expenses or other transaction which would have prevailed had the transaction occurred between independent parties.

### **Reports and Security Deposits**

#### *Reports*

The Company will keep the government advised about all phases of the Enterprise through submission to the Ministry of quarterly and annual progress reports, beginning with the first calendar quarter plus any part of a calendar quarter that remains following the date of signing of this Agreement. Such reports will indicate the progress and results of the Company’s Feasibility Study, Survey, Construction, and Harvesting And Processing activities under this Agreement. The Company will, upon request, keep the Minister advised from time to time of the Company’s plans concerning the Enterprise, including the progress of any construction, operation, employment and expenditure. Quarterly progress reports shall be submitted within 30 (thirty) days after the end of each calendar quarter and be in such form as the Minister may from time to time prescribe.

*Quarterly* progress reports shall include:

- (i) the results of any timber surveys;
- (ii) other timber analyses;
- (iii) numbers and locations of workings, work accomplished, number of workers

- employed and work contemplated in the next quarter;
- (iv) information concerning the selection of routes from the Timber Areas to a suitable port for the export of product;
  - (v) information concerning the planning of suitable permanent settlements, including information on suitable water supplies for permanent settlements and other facilities;
  - (vi) expenditures made;
  - (vii) copies of any maps of the Contract Area prepared by the Company;
  - (viii) information on Affiliates, contractors, and subcontractors whose services are used in the enterprise, and
  - (ix) all other information directly relevant to the Enterprise which the Government may request and which is within the Company's control in order to appraise the Company's activities under this Agreement.

The Company shall submit an *annual report* beginning with the first calendar year following the commencement of the Operating Period which shall include:

- (a) the number and description of the workings which were in progress at the end of the year preceding the year in question (with a showing as to which are in commercial production); the number and description of workings abandoned during the year; the production of each of the workings, regardless of whether in commercial production or not, with a full description of the kind and quality and analyses of timber harvested from each area, and the number of workings on which activities are continuing at year end, but which have not gone into commercial production.
- (b) the total volume of timber, by kind, broken down between volumes harvested and volumes transported from the concession area and their destination; volumes stockpiled; volumes sold or committed for export (whether actually shipped from Brazil or not); volumes actually shipped from Brazil (with full details as to the position of intermediate products, byproducts or final products and of the terms on which they were disposed); and
- (c) work accomplished and work in progress at the end of the year in ques-

tion with respect to all of the installations and facilities related to the exploitation program, together with a full description of all work programmed for the following year with respect to such installations and facilities including a detailed report of all investment actually made or committed during the year in question and all investment committed for the following year or years.

The Company shall also furnish the Government all other information related to the Company's activities under this Agreement of whatever kind and which is, or could be by the exercise of reasonable efforts by the Company have been, within the control of the Company which the Government may request in order that the Government may be fully apprised of the Company's activities.

Quarterly reports shall be submitted within thirty (30) days of the end of the quarter in question. Annual reports shall be submitted within 90 (ninety) days of the end of the year in question.

All reports shall be accompanied by *executive summaries*.

#### *Security Deposits*

The Company shall within 30 (thirty) days after the date of signing of this Agreement deliver to the Government a banker's guarantee agreement in the amount of US\$X00,000 (X hundred thousand U.S. dollars) to be known as the First Security Deposit.

The First Security Deposit shall be released by the Government in an amount equal to the minimum expenditure requirements for each period when

- (i) the minimum expenditure is made, and
- (ii) the Company has submitted the Reports required in this Article.

The Company shall within 30 (thirty) days after the date of signing of this agreement deliver to the Government a banker's guarantee in the amount of US \$ x000,000 (x hundred thousand dollars) to be known as the Second Security Deposit.

The Second Security Deposit shall be released by the Government within six months of the end of the Term of this Contract if the company has met all of its obligations, including with regard to protection of the environment and reforestation.

If the Company has not met these obligations, the Second Security Deposit shall be

used by the Government for Environmental rehabilitation and reforestation to the extent necessary.

### **Marketing**

The Company shall have the right to export [timber] [processed products] obtained from the operations under this Agreement. Without in any way prejudicing the Company's basic right to export its products, such export will be subject to the provisions of the export laws and regulations in Brazil. The Company will endeavor at all times to fulfill the requirements of the domestic market for its products provided that to do so will not jeopardize the Company in its ability to observe the provisions of committed sales agreements for its products.

The Company shall sell the products, whether to Affiliates or Non-Affiliates, in accordance with generally accepted international business practices, at the best international market prices, and on the best terms compatible in the circumstances then prevailing, provided that the Government shall have the right to prohibit the sale or export of timber or products derived therefrom as may be contrary to the international obligations of the Government or on the basis of external political considerations affecting the national interest of Brazil.

The Company shall not enter into any contract for sale of its products for a term in excess of 3 (three) years without the prior approval of the Government, which approval shall not be unreasonably withheld or delayed.

Sales commitments with Affiliates and Non-Affiliates shall be made only at prices based on or equivalent to arm's length sales and in accordance with such terms and conditions at which such sales would be made if the parties had not been affiliated, with due allowance for normal selling discounts or commissions. The Company shall submit to the Government evidence of correctness of the figures used in computing the above prices, discounts and commissions, and a copy of the sales contract.

If the Government believes that any figures used in computing the revenues are not in accordance with the provisions of paragraph 4, the Government may within 12 (twelve) months after the calendar quarter in which such products were exported, so advise the Company in writing. The Company shall submit evidence of the correctness of the figures within 45 (forty-five) days after receipt of such notice. Within 45 (forty-five) days after re-

ceipt of such evidence, the Government may give notice to the Company in writing that it is still not satisfied with the correctness of the figures and within 10 (ten) days after receipt of such notice by the Company a Committee, (consisting of one representative appointed by the Government and one representative appointed by the Company), shall be constituted to review the issue. The Committee shall meet as soon as convenient at a mutually agreeable place in Brazil. If the members of the Committee do not reach agreement within 20 (twenty) days after their appointment or such longer period as the Government and the Company mutually agree, the representatives shall appoint a third Committee member, who shall be a person of international standing familiar with the international timber industry. The Committee, after reviewing all the evidence, shall determine whether the figures used by the Company or any other figures are in accordance with paragraph 4. The decision of two members of the Committee shall be binding upon the Parties. Failure of two representatives to appoint a third member of the committee shall require the issue to be submitted to arbitration pursuant to Article [ ] [*Settlement of Disputes*] of the Agreement. Within 90 (ninety) days after the issue has been decided, pursuant to this paragraph, appropriate retroactive adjustment shall be made in conformity with the Committee's decision. The Company and the Government shall each pay the expenses of its own member on the Committee and one half of all other expenses of the Committee's proceedings.

### **Import And Re-Export Facilities**

The Company may import into Brazil, free of import duties, capital goods, equipment, machinery (including spare parts), vehicles (except for automobiles and station wagons), aircraft, vessels, other means of transport and raw materials needed in the survey, feasibility study, construction, harvesting, processing, production and supporting technical activities of the Enterprise. For any equipment directly used to support its technical operations such as laboratory and computer equipment used in Brazil but located outside its field operations, the customs duty exemptions shall be the same as above.

The exemption from import duties referred to in paragraph 1 shall apply only to the extent that the imported goods are not produced or manufactured in Brazil and available on a competitive time, cost and quality basis,

provided that for the purposes of comparing prices of imports and the cost of goods manufactured or produced in Brazil [value added tax] and import duties shall be applied to the cost of imports.

Any equipment (which must be clearly identified) and raw material imported by the registered contractors and sub-contractors of the Company for the exclusive purpose of providing services to the Company and intended to be re-exported will be exempt from import duties, [value added tax] and other levies. If such equipment and material shall not have been re-exported by the defined time, the contractors and sub-contractors of the Company shall, unless extended or exempted for reasons acceptable to the Government, pay import duties not paid upon entry. The Company shall be responsible for proper implementation of the obligations of its contractors and sub-contractors under this Article.

Any item imported by the Company or its registered contractors and subcontractors pursuant to this Article and no longer needed for the exploration and production activities of the Company may be sold outside Brazil and re-exported free from export taxes and other customs duties (excluding capital gains tax) after compliance with laws in force and of general application in Brazil. No imported items shall be sold domestically or used otherwise than in connection with the Enterprise except after compliance with import laws and regulations which are at the time of such import in force and of general application in Brazil.

During the period the Company is allowed to import free from duties, the Company shall submit to the Government not later than November 15 of each year (except where the prevailing regulations provide for other procedures) a list of equipment, spare parts and material to be imported during the next calendar year to enable the government to review and to approve the various items to be imported for the Enterprise. Notwithstanding the foregoing, the Company may request permission to amend the list of equipment and material as required during the year. In the case of an emergency where equipment not listed and approved is needed by the Company in order to maintain operations, the Company can immediately import critical items, providing full duties are paid, and can subsequently make applications for the refund of such duties.

Without prejudice to the foregoing provisions, the Company shall duly observe import

restrictions and prohibitions and rules and procedures of general application.

### **Records, Inspection And Work Program**

The Company shall maintain in Brazil precise and systematic technical records relating to, and financial records showing, a true and fair view of all of its operations and the status of timber resources, including harvesting, processing, transportation and marketing, in accordance with generally accepted accounting principles. The financial and other records shall be maintained in English and Portuguese. The Company shall furnish to the Government annual financial statements consisting of balance sheets and statements of income and all such other financial information concerning its operations in accordance with generally accepted accounting principles and all such other information concerning its operations in reasonable detail and in such detail as the Government may reasonably request.

The Government and its authorized representatives have the right to review and audit such financial statement within five (5) years after submission by the Company. The failure by the Government to make a claim for additional payment on account of land rent, royalties, corporate income tax or other payments to the Government within such five (5) years period shall preclude any such claim thereafter.

The Government and its authorized representatives may enter upon the Contract Area and any other place of business of the Company to inspect the operations at any time and from time to time during regular business hours. The Company shall render necessary assistance to enable said representatives to inspect technical and financial records relating to the Company's operations and shall give said representatives such information as the said representatives may reasonably request. The representatives shall conduct such inspections at their own risk and shall avoid interference with normal operations of the Company.

The Company shall submit to the Government not later than November 30th (thirtieth) of each year during the term of this Agreement its work program, budget plan, sales contracts and marketing/sales plans for the following year in sufficient detail to permit the Government to review such physical, financial and marketing/sales programs and determine whether they are in accordance with the Company's obligations under this Agreement. A work program and budget for the first year of this Agreement shall be sub-

mitted as soon as possible after the signing of this Agreement.

In addition, the following shall be delivered to the Ministry:

- (i) Conformed copies of all sales, management, commercial and financial agreements concluded with Affiliates and independent parties and all other agreements concluded with Affiliates, to be submitted within one month after concluding such Agreements.
- (ii) Monthly reports setting forth the quantities and qualities of timber produced, stockpiled, processed, shipped, sold, utilized or otherwise disposed of and the prices obtained.

The Company shall furnish to the Government all other information of whatever kind relative to the Enterprise which the Government may request, which is, or could be by the exercise of reasonable efforts by the Company have been, within the control of the Company in order that the Government may be fully apprised of the Company's activities.

All information mentioned in paragraph 5 furnished to the Government shall be either in English or Portuguese and all financial data shall be recorded in reals or United States dollars and records shall also be kept of exchange rates applied to the original currency.

The Company shall maintain in its principal office in Brazil all original records and reports relating to its activities and operations under this Agreement including all documents relating to financial and commercial transactions with independent parties and Affiliates. These records and reports shall be open to inspection by the Government through an authorized representative. Such reports and records shall be maintained in Brazil and all financial data shall be recorded in reals or United States dollars, and the records shall also be kept of conversion rates applied to the original currency.

The Company shall require the Company's co-participants, Affiliates, contractors and sub-contractors (to the extent that such co-participant, Affiliate, contractor or sub-contractor carries out operations and activities in furtherance of the Company's obligations, activities and operations under this Agreement), to keep all financial statements, records, data and information necessary to enable the Company to observe the above-stated provisions.

All records, reports, plans, maps, charts, accounts and information which the Company

is or may from time to time be required to supply under the provisions of this Agreement shall be supplied at the expense of the Company.

### **Bank Accounts and Currency Exchange**

All investment remittances into Brazil (equity capital as well as loan) shall be deposited into a foreign investment account held at foreign exchange bank(s) in Brazil and can be used in accordance with the prevailing investment regulations. Conversion of the foreign exchange from such account into reals shall be effected through the foreign exchange bourse at the prevailing rate of exchange.

The Company shall be granted the right to transfer abroad in any currency it may desire funds in respect of the following items, provided that such transfers are effected in accordance with the prevailing laws and regulations and at prevailing rates of exchange generally applicable to commercial transactions:

- (i) Net operating profits in proportion to the share holding of the Foreign Investor(s).
- (ii) Repayment of loans and the interest there on, as far as the loan is a part of investment, which has been approved by the Government.
- (iii) Proceeds from sales of shares owned by the Foreign Investor(s) (and approved by the Government.)
- (iv) Expenses for Expatriate personnel and training of Brazil personnel abroad.
- (v) Compensation in case of nationalization of the Company.

The proceeds of the export sale of Timber and any products therefrom can be possessed and used according to the Company's need. Without prejudicing the foregoing, the Company shall treat the export proceeds in accordance with laws and regulations that may from time to time be in force in Brazil except as the Central Bank of The Federative Republic of Brazil and the Company may otherwise agree.

The Company in the exercise and performance of its rights and obligations set forth in this Agreement shall be authorized to pay abroad, in any currency it may desire, without conversion into reals, for the goods and services it may require and to pay abroad in any currency it may desire any other expenses incurred for operations under this Agreement.

In respect of other matters of foreign currency arising in any way out of or in connec-

tion with this Agreement, the Company shall be entitled to receive treatment no less favorable than that accorded to any other timber company carrying on operations in Brazil.

The Company shall forward financial reports in accordance with the procedures required by the Central Bank of The Federative Republic of Brazil.

The Company must submit quarterly reports on all off-shore banking accounts in which funds relating to the Enterprise are deposited.

### **Joint Monitoring And Supervision Committee**

In order to monitor the activities of the Company, a Joint Monitoring and Supervision Committee will be appointed (by the Minister of Natural Resources). The Committee will be comprised of eight members. Two members will be selected by the Company and two members will be selected by the Government. A fifth member will be selected by the Government either from the government or from the academic/scientific community. The remaining three members will be selected from the following sectors: one from a Brazilian non-governmental environmental organization; one from the local community in the area to be directly affected by the harvesting and processing activities; and one from Brazil's business community. Each of these last three committee members will be selected from nominees submitted by interested parties. The Committee will meet (quarterly) to review the operations of the Enterprise, to discuss issues of concern, and to ensure that the Enterprise is being operated in accordance with the goals and expectations of the Government and the Company.

The Committee will monitor the harvesting, transporting, processing and marketing of timber products by the Company. Problems identified by the Committee will be submitted to the Government and the Company for resolution. The Committee may make recommendations to the Government and the Company concerning problems identified and may make its services available to mediate disputes.

The Committee may make recommendations for review of the terms of the Agreement in accordance with the Article ( ).

In order to pay for the costs of establishing and operating a Joint Monitoring and Supervision Committee and a monitoring system with regard to the Company's activities, the Company will contribute \$ ( ), 000 each year

during the first five years of the Agreement. The Monitoring and Supervision Committee will develop annual work plans and will submit proposed budgets to the Minister of Natural Resources and the Company for their review.

### **Schedule for Employment and Training of Nationals of Brazil**

The Company will achieve at least the following levels of employment of Brazilian nationals by the end of each period in the categories indicated, consistent with efficient operations and subject to the provisions of the existing laws and regulations which may from time to time be in force in The Federative Republic of Brazil.

	Number of Years Following the Commencement Date of the Operating Period		
	3	5	8
Unskilled Labor	100%	100%	100%
Skilled Labor	75%	90%	98%
Clerical	75%	90%	98%
Technical & Supervisory	50%	75%	85%
Management & Professional	50%	75%	85%

The Company shall not be restricted in its assignment or discharge of personnel, provided, however, that the terms and conditions of such assignment and discharge or disciplining of Brazil personnel shall be carried out in compliance with the laws and regulations of The Federative Republic of Brazil which at the time are generally applied.

The Company shall seek to provide direct participation of nationals of Brazil in the Enterprise through the inclusion of Brazil nationals in the management of the Company and among the members of its Board of Directors. To this end at least one seat on the Board of Directors will continuously be occupied by a Brazil national from the date of incorporation of the Company. The Company will also train Brazil nationals to occupy other responsible positions.

The Company shall conduct a comprehensive training program for Brazil personnel in Brazil and, subject to the approval of the Government, in other countries. It shall carry out such program for training and education in meeting the requirement for various classifications of full-time employment for its operations in Brazil within the shortest practicable period of time. The Company shall also con-

duct a program to acquaint all Expatriate employees and Affiliates, contractors and subcontractors with the laws and customs of Brazil.

The Company and its Affiliates, contractors and subcontractors may bring into Brazil such Expatriate Individuals as the Company's judgment are required to carry out the operations efficiently. Provided, however, that the Minister may make known to the Company, and the Company shall duly observe, objections based on grounds of national security or foreign policy of the Government. At the Company's request and in compliance with the existing rules and regulations, the Government will make arrangement for the acquisition of all necessary permits, (including entry and exit permits, work permits, visas and such other permits, as may be, required). The Company's request shall be accompanied by information concerning the education, experience and other qualifications of the individuals concerned. In this connection, the Company shall periodically submit to the Government its manpower requirement plans, manpower reports, training program and training report in the framework of a plan to indigence staff according to an agreed-upon schedule.

The Company agrees that there shall at all times be equal treatment, facilities and opportunities among employees in the same job classification with respect to salaries, facilities and opportunities within the timber industry regardless of nationality. The Company shall duly observe the existing labor laws and regulations which may from time to time be in force in Brazil.

Prior to the establishment of a permanent settlement, the Company shall furnish free medical care and attention to all its employees working in the area covered by this Agreement as is reasonable and shall maintain or have available adequate and appropriate medical services. If the Company establishes a permanent settlement, the Company shall furnish medical care and attention to all its employees and all Government officials working in the area covered by this Agreement at a cost appropriate to the wage level of employees. In no case may the fee be higher than the actual cost of services provided. The Company shall establish a staff and maintain a dispensary, clinic or hospital which shall be reasonably appropriate under the circumstances and according to the prevailing laws and regulations of The Federative Republic of Brazil.

If the Company establishes a permanent settlement incorporating families of employ-

ees associated with the Enterprise, the Company shall provide, free of charge, primary and secondary education facilities for the children of all employees. Rules, regulations and standards of general application for comparable education facilities in Brazil established by the Ministry of Education shall be followed.

### **Default and Suspension**

Subject to the provisions [*Force Majeure*] of this Agreement, in the event that the Company is found to be in default in the performance of any provision of this agreement, the Government, as its remedy under this Agreement, shall give the Company written notice thereof (which notice must state that it is pursuant to this Article) and the Company shall have a period of a maximum 180 (one hundred and eighty) days after receipt of such notice to correct such default. The actual time within which to correct such default shall be stipulated in the written notice in each individual case as may be reasonable under the circumstances considering the nature of the default. In the event the Company corrects such default within such period, this Agreement shall remain in full force and effect without prejudice to any future right of the Government in respect of any future default. In the event the Company does not correct such default within the time stipulated in the notice, the Government shall have the right to suspend or terminate this Agreement.

Notwithstanding the provision of paragraph 1, in the event the Company shall be found to be in default in the making of any payment of money to the Government which the Company is required to make, the period within which the Company must correct such default shall be 30 (thirty) days after the receipt of notice thereof. The penalty for late payment shall be an interest charge on the amount in default from the date the payment was due, at the rate of the New York Prime interest rate in effect at the date of default plus 4 (four) percent. This or other penalties provided for in this Article may not be taken as deductions in the calculation of taxable income.

The Company shall not be deemed to be in default in the performance of any provision of this Agreement concerning which there is any dispute between the parties until such time as all disputes concerning such provision, including any contention that the Company is in default in the performance thereof or any dispute as to whether the Company was pro-

vided a reasonable opportunity to correct a default, have been settled as provided in the Article on settlement of *Disputes*.

If the Company is found in default with regard to any of its obligations under this Agreement and does not remedy the default within the time set by the Government, the Government has the option of terminating the Agreement in accordance with the provisions of this Agreement or of suspending the Agreement for a period set by the Government.

### **Termination; Right of Government to Buy Equipment**

The Government has the rights to terminate this Agreement if the Company is in default of any of its obligations under this Agreement and fails to remedy such default in accordance with this Agreement. The Company's outstanding obligations with regard to payment of taxes, royalties and other levies imposed on the Company and the Company's outstanding obligations with regard to rectification of environmental damage will continue after the termination until such obligations are fulfilled.

If, at any time during the term of this agreement, after having used all reasonable diligence in its endeavor to conduct its activities under this Agreement, the Company believes that the Enterprise is not commercial, the Company shall consult with the Minister and may thereafter submit a written request to terminate this Agreement and to be relieved of its obligations to proceed. Such notice shall be given one year before the planned termination and shall be accompanied by all data and information of the Company's activities under this Agreement which shall include but not be limited to documents, maps, plans, worksheets and other technical data and information. Upon confirmation of termination by the Minister or within a period of 6 (six) months from the date of the giving written notice by the Company, whichever shall be the earlier, this Agreement shall automatically terminate and the Company shall be relieved of its obligations under this Agreement except as herein provided.

If termination occurs during the first six months of the Agreement, the Company shall have a period of 6 (six) months within which to sell, remove or otherwise dispose of its property in Brazil and to furnish the Government with the information to be turned over to it in respect of the work which the Company has performed to the date of the giving of the

aforementioned notice. Any property not so removed or otherwise disposed of shall become the property of the Government without any compensation to the Company.

If termination occurs after the first six months of the Operating Period or by reason of the expiration of the term of this agreement, all property of the Company, both movable and immovable, located in the Contract Area shall be offered for sale to the Government at cost or market value, whichever is the lower, but in no event lower than the depreciated book value. The Government shall have an option, valid for 60 (sixty) days from the date of such offer, to buy any or all such property at the agreed value payable in any currency freely convertible in Brazil and through a bank to be agreed upon by both Parties within 90 (ninety) days after acceptance by the Government of such offer. If the Government does not accept such offer within the said 60 (sixty) day period, the Company may sell, remove or otherwise dispose of any or all of such property during a period of 12 (twelve) months after the expiration of such offer. Any property not so sold, removed or otherwise disposed of shall become the property of the Government without any compensation to the Company.

It is agreed, however, that any property of the Company in Brazil, movable or immovable, that at the termination of this Agreement is in use for public purpose such as roads, schools and/or hospitals shall (together with their equipment) immediately become the property of the Government without any compensation to the Company.

All sales, removals or disposals of Company property pursuant to the termination of this Agreement shall be effected according to the prevailing laws, and regulations. Any gain or loss from sale or disposal shall be determined and may be taxed in accordance with this Agreement. All values shall be based on fair market values in accordance with generally accepted accounting principles.

Rights and obligations which have come into effect prior to the termination of this Agreement and rights and obligations relating to transfer of currencies and properties which have not yet been completed at the time of such termination shall continue in effect for the time necessary or appropriate to fully exercise such rights and discharge such obligations. Additionally, the Company shall be granted the right to transfer abroad all or any proceeds of sale received under this provi-

sion, subject to obligations set forth in this Agreement.

### **Cooperation of The Parties; Periodic Review**

The Parties to this Agreement agree that they will at all times use their best efforts to carry out the provisions of this Agreement so that the Enterprise may at all times be conducted with efficiency and for the optimum benefit of the Parties.

The Company agrees to plan and conduct all operations under this Agreement in accordance with the standards and requirements imposed elsewhere in this Agreement for the sound and progressive development of the timber industry in Brazil, to give at all times full consideration to the aspirations and welfare of the people of The Federative Republic of Brazil and to the development of the Nation, and to cooperate with the Government in promoting the growth and development of the Brazil economic and social structure. Subject to the provisions of this Agreement, the Company will at all times comply with the laws and regulations of Brazil.

In accordance with the provisions of this Agreement and at any time during the term of this Agreement, upon request by either party, the Government and the Company will consult with each other to determine whether in the light of all relevant circumstances the financial or other provisions of this Agreement need revision in order to ensure that the Agreement operates fairly and without major detriment to the interests of either Party. Such circumstances shall include the conditions under which the timber production and processing are carried out, the value and quality of the timber, the market conditions for and prices of the timber and processed products, the prevailing purchasing power of money and the terms and conditions prevailing in South America and elsewhere for comparable timber ventures. In reaching agreement on any revision of this Agreement pursuant to this paragraph 3 both Parties shall ensure that no revision of this Agreement shall prejudice the Company's ability to retain financial credibility abroad and to raise finance by borrowing internationally in a manner and on terms normal in the mining industry.

The Government and the Company will consult with each other concerning the general progress of the Enterprise through a joint oversight committee.

Such consultation shall be carried out in a

spirit of cooperation with due regard to the intent and objectives of the respective Parties. Both Parties desire to realize the success of the Enterprise for the benefit of the people of Brazil, the development of the nation, the growth and development of the economy and society of Brazil.

### **Promotion of National Interest**

#### *Preference for Local Goods and Services*

In the conduct of its activities under this Agreement the Company shall, consistent with its rights and obligations elsewhere under this Agreement, give preference to the requirements of consumers of Brazil for its products and the Company and its Affiliates and contractors and sub-contractors shall, in good faith and to the fullest practicable extent, utilize Brazil labor, services and raw materials produced from Brazil sources and products manufactured in Brazil to the extent such services and products are available on a competitive time, cost and quality basis. Provided that:

- (i) in comparing prices of goods produced or manufactured in Brazil to the price of imported goods, there shall be added customs duties and other levies and expenses that would be incurred up to the time the imported goods are landed in Brazil.
- (ii) in comparing the services available in Brazil 15% (fifteen percent) must be added to the charge of the imported services.

#### *Processing*

The Company shall, consistent with its rights and obligations elsewhere under this Agreement, process or cause to be processed its timber in Brazil to the most advanced stage possible with minimum wastage of timber in accordance with the best international standards.

#### Protection of Local Forest Users

The Company shall conduct the Enterprise so as to minimize, to the extent possible, interference with local forest users.

#### Protection of Sacred and Historic Sites

The Company will not operate within sacred or historic sites without the written consent of the Government. The Company will report within 7 (seven) days any discovery of

a site which may be sacred or historic. The Company will not damage or remove any sacred or historic items from the site without the written permission of the Government.

### **Regional Co-Operation With Regard To Additional Infrastructure**

The Company will at all times cooperate with the Government in utilizing its best efforts to plan and coordinate its activities and proposed future projects in the Contract Area or the Project Area. Living accommodations and facilities and working conditions provided by the Company for its operations shall be of a standard commensurate with those of good employers operating in Brazil.

In relation to the region, the Company will endeavor to assist in maximizing the economic and social benefits generated by the Enterprise in the Contract Area with respect to:

- (i) co-ordination of such benefits with local and regional infrastructure studies undertaken by the Government and with and benefits generated by other local, foreign and international public and private entities; and
- (ii) assisting and advising the Government, when requested, in its planning of the infrastructure and regional development which the Company may deem useful to the Enterprise and to existing and future industries and activities in the area of the Enterprise.

The Company shall allow the public and the Government to use the Company's installations, air strips, machinery, equipment, services and facilities ancillary thereto on such reasonable terms and reasonable charges as the Company shall impose, provided, however, that such use shall not unduly prejudice or interfere with the Company's operations hereunder.

The Company shall during the Construction Period and in accordance with the plans and designs for the Enterprise as approved by the Government construct (at its own cost) such new roads (together with all warning devices, bridges and crossings) as may be necessary for the purpose of the Enterprise.

The Company shall allow the public and the Government to use free of charge any roads outside the Concession Area constructed and/or maintained by the Company, provided, however, that such use shall not unduly preju-

dice or interfere with the Company's operations hereunder. To avoid burdening the Company with excessive maintenance costs, the Government and the Company shall together define what categories of traffic shall be allowed to use such roads and to what extent if any the Government or third parties shall contribute towards such maintenance costs.

The Company shall maintain and be responsible for the maintenance of all roads in the Concession Area.

All roads constructed by the company outside the Concession Area shall be public roads for the purposes of the provisions of the traffic laws and regulations which may from time to time be in force in Brazil. To the event that the plans and designs for the Enterprise as approved by the Government so provide, the Government will make such special regulations under the traffic laws as it considers necessary or desirable for the proper safety of the users of the said roads.

If the Company's use of the existing public roads results in significant damage or deterioration, the Company shall pay to the Government or other authority having control over the road the cost (or an equitable proportion thereof having regard to the use of such road by others) of repairs. The Company shall share in the costs of damages or deterioration and of upgrading to a necessary standard having regard to the increased traffic. In addition, the Government or other authority having control over that road may require the Company to pay a maintenance user charge based upon what is fair and reasonable having regard to the continuing cost (excluding any profit to the Government or such other authority) of operation and the maintenance of that road and the use of that road by others.

The Company shall at its own cost and in accordance with laws and regulations that may from time to time be in force in Brazil, construct and provide all storage dams, water works, treatment, transmission and reticulation works (hereinafter called "the Water Works") necessary to supply adequately the needs of the Enterprise.

The Company shall, at its own costs, operate and maintain the Water Works. The Company may charge reasonable rates and service charges to third parties for the water supply. If the Government is able to take over and adequately maintain the Water Works, the Company and its employees shall thereafter pay reasonable rates and service charges for the water supply.

In the event that the Government is unable to provide adequate telecommunications facilities, the Company may (in accordance with rules and regulations which may from time to time be in force in Brazil) install and operate such telecommunications facilities, provided that it shall allow the Government and public to use such facilities on such reasonable terms and reasonable charge as the Company shall impose, on the condition that such use shall not unduly prejudice or interfere with the Company's operations.

In the event that comparable telecommunications facilities can be provided by the Government, the Company shall be obliged to use the Government's network and shall pay standard charges for telecommunications services.

The Company may at its own cost, in accordance with the laws and regulations which may from time to time be in force in Brazil (and subject to Government approval which shall not unreasonably be withheld) construct and develop a camp or permanent facilities sufficient to service the needs of the Enterprise.

The Company is responsible for the cost of all infrastructure relating to the Enterprise.

### **Environmental Management and Protection**

The Company shall, in accordance with international standards and any environmental and natural preservation laws and regulations from time to time in force in Brazil, conduct its operations so as to (i) control waste or loss of natural resources, (ii) protect natural resources against unnecessary damage, (iii) protect sacred and historic sites from damage, (iv) prevent Pollution and contamination of the Environment, and (v) in general maintain the health and safety of its employees and the local community. The Company shall be responsible for reasonable preservation of the natural Environment within which the Company operates and for taking no acts which may unnecessarily and reasonably block or limit the further development of the resources of the area.

The Company shall include in the feasibility study for each timber operation an Environmental Impact Study (designed in accordance with generally recognized international standards) that identifies and analyses the potential impact of its operations on land, water, air, biological resources, human settlements, sacred and historic sites, forests, agriculture and tourism in the region of the Enterprise.

The content of the Environmental Impact Statement is set forth in Annex [ ]. The environmental study will also outline measures which the Company intends to use to mitigate adverse environmental impacts of harvesting and processing and for reforestation of the Contract Area including the following:

- (i) Procedures for collection of baseline data on air quality, climate, surface and ground water, properties of host rocks, flora, fauna and other environmental issues;
- (ii) Forecast quality and characteristics of airborne, waterborne or other discharges from the proposed operations;
- (iii) Environmental control standards for the proposed operation;
- (iv) Environmental control measures to be incorporated in the design of the facilities;
- (v) Assessment of the impact on the environment of the proposed operation;
- (vi) Monitoring and record keeping procedures and systems;
- (vii) Procedures for the operations of dumps and dams, the storage of mill discharge materials and the disposal of hazardous chemicals and other waste materials;
- (viii) Environmental management training program for all employees;
- (ix) Procedures for handling environmental emergencies;
- (x) Plant closure and rehabilitation plan.

The shareholders in the Company shall be jointly and severally liable for costs of reforestation and environmental clean-up costs relating to the Enterprise in direct proportion to their equity shareholdings if such costs cannot be paid by the Company.

### **Local Business Development**

The Company shall, to the extent reasonably and economically practicable having regard to the nature of the particular goods and services, promote, support, encourage and lend assistance to Brazil nationals desirous of establishing enterprises and business that will provide goods and services to the Enterprise and to the permanent settlement (if any) constructed by the Company and the residents thereof. The Company shall generally promote, support, encourage and assist the establishment and operation of local enterprises in the Concession Area.

The Company shall make maximum use of Brazil contractors and sub-contractors where services are available from them at competi-

tive prices and of comparable standards with those obtainable from elsewhere, whether inside or outside Brazil.

Insofar as it is practicable, the Company shall give first preference in its assistance hereunder to landowners in, and other people originating from, the area of the Enterprise.

The Company and Government shall, at the commencement of the Feasibility Studies Period, each appoint for such period as is reasonably necessary, a member of its staff to work together to:

- (i) identify activities related to the Enterprise (including the provision of goods and services as described above) which can be carried out by Brazil nationals or local enterprises;
- (ii) advise and assist Brazil nationals desiring to carry on those activities or to establish enterprises to do the same; and
- (iii) implement, or assist in the implementation of, the Business Development Program as hereinafter described, on behalf of the Company.

The Company shall, in consultation with the appointed Government representative, prepare a Business Development Program for the development of Brazil businesses and enterprises associated with or incidental to the Enterprise. The program shall be submitted to the Government as part of the Company's business plan.

The Business Development Program will make provision as far as is practicable for the following:

- (i) enterprises involved in the supply and maintenance of timber harvesting equipment and the provision of consumable supplies;
- (ii) subcontracting to self-employed equipment operators and road construction and maintenance;
- (iii) subcontracting of site preparation, construction and maintenance of houses, buildings, industrial facilities and other works and facilities to be established, including concreting, welding, tank constructions, steel fabrication, plumbing, electrical work and timber work;
- (vi) enterprises involved in town services such as sewerage and garbage collection, treatment and disposal, passenger transport, freight carriage of consumer items and stevedoring (except in rela-

tion to the shipping of the produce of the mine);

- (v) enterprises involved in retail stores, supermarkets, other retail outlets, canteens, restaurants, taverns, cinemas, social clubs, cleaning and laundry, and vehicle maintenance and repair facilities;
- (vi) enterprises involved in the supply of fruits, vegetables, meat and fish.

The Program may include provision for other activities agreed to by the Company and the Government.

The Business Development Program shall also include details of

- (i) the time schedule for its implementation;
- (ii) additional activities which could be established by nationals of Brazil;
- (iii) those activities in which the Company intends to commence operating but which will be transferred to Brazil nationals at a later date, on a commercial basis; and
- (iv) any facilities by way of training, technical and financial assistance which can be made available to facilitate the smooth transition of ownership and operation to Brazil nationals.

The Business Development Program shall be reviewed annually by the Company, in consultation with the Government. It may be altered by mutual consent between the Company and the Government with a view to securing the maximum benefit to Brazil nationals and local enterprises.

The Company shall consult from time to time with representatives of the Government and furnish the Government at quarterly intervals with a report concerning the following:

- (i) the implementation of the training and manpower aspects of the Business Development Program;
- (ii) the implementation of provisions relating to local purchasing of supplies; and
- (iii) the implementation of provisions relating to local business development.

#### **Financing; Debt—Equity Ratio; Disguised Equity**

The Company shall have sole responsibility for financing the Enterprise and shall maintain sufficient capital to carry out its obligations under this Agreement. The Company

may determine the extent to which the financing shall be accomplished through issuance of shares of the Company or through borrowings by the Company, provided that the Company shall maintain a ratio of shareholders equity to borrowings so as to guarantee the continuing solvency of the company in order to protect the legitimate interests of the Government, the lenders, and the shareholders.

Any long-term borrowing by the Company under this Agreement shall be on such repayment terms and at such effective rates of interest (including discounts, compensating balances and other costs of obtaining such borrowings) which are reasonable and appropriate for timber companies in circumstances then prevailing in the international money markets after complying with existing procedures for obtaining foreign loans.

The Government has the right to deny the deduction of any interest payment for tax purposes, and to charge a dividend withholding tax where, in the judgment of the Government, the financial transaction on which the interest is charged does not constitute a true loan.

#### **Assignment or Transfer of Agreement**

This Agreement may not be transferred or assigned (including for the purpose of financing) in whole or in part, without the prior written consent of the Minister, provided, however, that where the Minister consents to a transfer or assignment, the Company shall not be relieved of any of its obligations hereunder except to the extent that the transferee or assignee shall assume and in fact perform such obligations.

The shareholders in the Company shall not transfer shares in the Company without the prior written consent of the Minister which shall not be unreasonably withheld or delayed.

#### **Force Majeure**

Any failure by the Government or by the Company to carry out any of its obligations under this Agreement shall not be deemed a breach of contract or default if such failure is caused by *force majeure*, provided that the party has taken all appropriate precaution, due care and reasonable alternative measures with the objective of avoiding such failure and of carrying out its obligations under this Agreement. If any activity is delayed, curtailed or prevented by *force majeure*, then the term for carrying out the activity thereby affected and the time of this Agreement shall each be ex-

tended for a period equal to the total of the period during which such causes or their effects were operative, and for such further periods, if any, as shall be necessary to make good the time lost as a result of such *force majeure*. For the purposes of this Agreement, *force majeure* shall include among other things; war, insurrection, civil disturbance, blockade, sabotage, embargo, riot, epidemic, earthquake, storm, flood, or other adverse weather conditions, explosion, fire, lightning, adverse order or direction of any government de jure or de facto or any instrumentality or subdivision thereof, act of God or the public enemy, breakdown of machinery having a major effect on the operation of the Enterprise and any cause (whether or not of the kind therein described) over which the affected party has no reasonable control and which is of such a nature as to delay, curtail or prevent timely action by the party affected.

The Party whose ability to perform its obligations is affected by *force majeure* shall notify as soon as practicable the other party in writing, stating the cause, and the parties shall endeavor to do all reasonable acts and things within their power to remove such cause, provided, however, that neither party shall be obligated to resolve or terminate any disagreement with third parties, including labor disputes, except under conditions acceptable to it or pursuant to the final decision of any arbitral, judicial or statutory agencies having jurisdiction to finally resolve the disagreement. As to labor disputes, the company may request the Government to cooperate in a joint endeavor to alleviate any conflict which may arise.

#### **Rules For Computation of Income Tax**

“Year” means (subject to any other agreement by the Parties) from January 1 to December 31, inclusive during the term of this Agreement and, for the calendar year or part thereof in which this Agreement shall terminate, the period from January 1 to the date of termination.

“Products” means all salable timber and processed products.

“Operating Expenses” in any year means the amount of expenses attributable to the Enterprise which are deductible from income in such year. Operating expenses shall include, the following amounts which are directly related to the Enterprise:

- (a) Expenses in respect of material supplies, equipment and utilities used in the Enterprise;

- (b) Expenses for labor and other contracted services on behalf of the Enterprise.
- (c) Expenses for premiums for insurance (foreign and domestic) on physical assets, inventories, business and operation interruptions, and public liability claims, provided that where such premiums are paid to Affiliates the premiums shall not exceed those that would be payable in arms length transactions to a party not related to the Company.
- (d) Costs in respect of damage or losses to the Enterprise to the extent not fully compensated for by insurance or otherwise.
- (f) Payments by the Company for royalties and interest and other payments including those to Affiliates for patents, designs, technical information and services provided that such amounts and payments shall not exceed those that would be payable in an arm's length transaction with a party not related to the Company.
- (g) Losses resulting from obsolescence, theft, or destruction of inventory.
- (h) Payments for rentals such as those charged for equipment, plant, land and buildings.
- (h) Payments for land, land and building taxes, royalties paid to the government, [value added tax,] sales taxes on luxury goods, stamp duty, transfer tax, personal income tax on employees benefits paid by the Company as stated in paragraph 7 sub-paragraphs (a) and (b) of this Annex, import duties, and other levies paid pursuant to this Agreement, except for income taxes.
- (i) Payments for handling, loading, storing, transporting and shipping.
- (j) Payments for repairs and maintenance.
- (k) Commissions and discounts to non-affiliated parties.
- (l) Deductions permitted by paragraphs 4 through 11 below.

“Depreciation” in any year means the deduction from income of an amount in respect of depreciable assets on a straight line basis computed at a rate of [16.67% (sixteen point six seven percent)] per year. Unused depreciation can be carried forward for up to seven years.

Depreciable assets comprise tangible assets with a useful life of more than one year and include, by way of example, buildings,

machinery, equipment, dredges, vessels, railways, rolling stock, bridges, piers, roads, docks, construction in progress and other tangible assets depreciable under generally accepted accounting principles, plus all assets made available by the Company for public purposes, such as, among others, roads, schools and hospitals and their respective equipment.

“Amortization” in any year means the deduction from income of an amount in respect of amortizable assets computed at a rate of [20% (twenty)] percent per year on a straight line basis.

Amortizable assets include, by way of example, (a) patents, franchises, concessions, licenses, leasehold interest and other intangible assets amortizable under generally accepted accounting principles and (b) all expenses incurred prior to commencement of the operating period in question, including expenses incurred in acquisition of timber rights or timber information, Reconnaissance, Exploration, feasibility study and development expense, employee training, education grants and other expenses normally permitted to be amortized under generally accepted accounting principles.

“Preproduction Expenses” already expended by shareholders or the Company and directly related to the Enterprise may be consolidated into the account of the Company as a tax deductible item by way of amortization. These Preproduction Expenses must be audited by a public auditor and specifically approved by (the Directorate General of Taxation).

“Selling, General and Administrative Expenses” in any year are deductible from income and include, but are not limited to, management expenses, compensation fees for services rendered abroad, executive salaries, communication expenses, dues and subscriptions, advertising and other selling expenses, public relations, office expenses, marketing expenses (but not unrelated product research), legal and auditing expenses, general overhead expenses, (including reasonable charges of Affiliates to be allocated to the Brazil operations to the extent that these charges represent actual cost of service provided in such year).

The following items shall also be included in Selling, General and Administrative Expenses of the Company:

- (a) Wages, salaries and other compensation, including employee remuneration, of

- personnel employed or engaged by the Company or any of the Affiliates of the Company in connection with Enterprise activities and who are assigned to the Enterprise on a temporary, part-time or permanent basis. Such costs shall include employee benefits paid by the Company in respect of sickness, disability, termination, pensions, thrift plans, incentives, children's education at site, compensation training and other education programs provided they are not categorized as fringe benefits.
- (b) All necessary facilities provided in the Concession Area or in the neighborhood thereof for employees including but not limited to facilities for housing, sustenance, recreation and transport.
  - (c) Administrative overhead charges for product research, market development and technical, legal and accounting services of personnel employed or engaged by any of the Affiliates of the Company, who are not assigned to the Company but who render such services for the direct benefit of the Enterprise.
  - (d) All necessary travel expenses incurred in connection with the Enterprise in Brazil and to and from Brazil and other countries. In case such personnel are assigned to the Enterprise, such travel expenses shall include reasonable relocation expenses for them and their dependents to and from Brazil and their country of residence.
  - (e) Charges for laboratory and technical services rendered to the Company by any of its Affiliates and/or sub-contractors. Such charges shall consist of the cost of such services and shall be limited to not more than the cost which a

non-affiliated party with charge for such services.

"Interest Expenses" paid or accrued in any year on loan capital provided that the ratio of loan capital to equity capital does not exceed [ ] and the interest on loans does not exceed the generally applicable market rate at the time of borrowing.

"Losses" in any year means the excess of all deductions over Gross Income in such year. In the event a loss is incurred in any year, such a loss can be carried forward and may be deducted from net income accruing in the [7 (seven)] years next succeeding the year in which such a loss was incurred. Those losses first occurring shall be deducted first from net income accruing in the next [7 (seven)] succeeding years.

"Gross Income" means:

- (a) the gross proceeds received or accrued from the sale of the products F.O.B. point of shipment in Brazil on the basis described in the Annex on Marketing;
- (b) receipts of a capital nature;
- (c) other income of the Company actually received or accrued and not mentioned above.

"Taxable Income" in any year means Gross Income in such year after deducting therefrom all amounts in respect of expenses, costs and allowances (including the items defined in paragraphs 2 to 9 above as permitted by this Agreement.)

In all transactions with Affiliates (including calculations of deductions and Gross Income), the Company shall be bound by the final paragraph of Annex [ ] [*Affiliate Services and Affiliate Transactions*] of this Agreement.

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Note

1 Vice-Dean - Harvard Law School, Ma (USA)

# Annotated Bibliography

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*Namrita Kapur\**

## *Group 1: Economic Aspects of the Forest Question*

In chapters 10-16, The Causes of Tropical Deforestation: The Economic and Statistical Analysis of Factors Giving Rise to the Loss of the Tropical Forests, edited by Brown and Pearce analyzes the causes of deforestation in the Philippines, Brazilian Amazon, Thailand, Indonesia, and India using econometric models (book review in journal).<sup>1</sup>

Estimated at less than 4% by volume, the tropical timber trade plays a relatively minor role in deforestation. It continues to receive attention for the following reasons: 1) Logging activities provide access to the forest and are thus considered by some to be the first link in forest destruction activities (journal).<sup>2</sup> 2) Logging for export generally selects few species and utilizes heavy harvesting equipment in contrast to domestic consumption activities (NGO).<sup>3</sup> 3) Environmental groups recognize that they can effect change in the tropical timber trade through their purchasing decisions (journal).<sup>4</sup> 4) Solutions to the fundamental problems, such as poverty, overpopulation, and land tenure, are unrealistic in the short term (journal).<sup>5</sup>

According to the World Bank Research Observer, the policy dialogue could focus more usefully on the relative differences in the costs of forest land; on local rather than general concentrations of nonmarket forest-based environmental benefits, on public policy failures that distort market incentives to invest in forestry, and on the broader implications of the eventual use of forest land for subsistence-oriented populations (NGO).<sup>6</sup>

Commercially important timber species were not listed in the convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) until 1992, when international trade in Brazilian rosewood (*Dalbergia nigra*) was banned (NGO).<sup>7</sup>

Trade in more than a dozen other timber species is either banned or strictly controlled (NGO).<sup>8</sup>

Because of a battle about the proposed listing of mahogany (*Swietenia macrophylla*) in CITES that led to the subsequent delisting of several African Timber species, the Timber Working Group was established to examine the relationship of CITES to the international timber trade (NGO).<sup>9</sup>

### ***Theme 1: Prospecting Analysis of the Impact of the World Timber Market on the Conservation of the Amazon Rain Forest***

Brown and Pearce raise the issue of tropical deforestation as a problem of market and government failures and suggest the creation of global environmental markets for controlling the deforestation. This argument is based on the cost-benefit analysis of carbon dioxide emissions related to tropical deforestation. In chapter 17 and 18, Barbier et. al. examine the role of international trade in forest products for tropical deforestation and concluded that the trade would contribute only a minor part to the deforestation in a direct way. In chapter 19, Vincent argues that the trade restrictions of tropical timber will distort the signals of scarcity of tropical timber, and thus exacerbate the depletion of tropical forests (book review in journal).<sup>10</sup>

Wood Production and Trade Data, 1981-93 — Table 9.3 (NGO).<sup>11</sup>

World production of all grades of market pulp increased by about 3.5% in 1993 despite the industry laboring under one of the severest recessions. The total output reached 37.1 million tons in 1993, according to Pulp & Paper International's 1994 Market Pulp Survey. Data on market pulp output and trade in 1993 by major producing country (journal).<sup>12</sup>

Data on 1993 pulp exports from major producer countries (journal).<sup>13</sup>

The Amazon forest holds about one-third of the world's remaining tropical woods, but Brazil accounts for only 4 percent of the tropical timber market (press).<sup>14</sup>

Vincent reviews the three commonly cited reasons for the boom-and-bust cycle characteristic of tropical timber-exporting countries — exploitation by developed countries, high import barriers by developed countries on processed tropical timber, and low prices for tropical timber in the international market. He then proceeds to refute the first two of these reasons and points to tropical countries' policies related to timber concessions and log-export restrictions as primary culprits of low prices. The fees levied on concessionaires are generally a fraction of the stumpage value and the short-term nature of contracts provide little incentive for concessionaires to invest in forest management practices. Vincent proposes two possible responses to this issue: 1) Maintain government ownership, but increase the stumpage value captured by the government. 2) Give concessionaires rights that are comparable to private ownership. The problem with log-export restrictions is that they artificially suppress the signal that additional wood-processing capacity is not profitable. This keeps prices low in the international market and creates an illusion of abundant supplies of wood (journal).<sup>15</sup>

Worldwide, most plywood is consumed in the country where it is manufactured. Tropical plywoods are the exception; in 1989, almost 80% of tropical plywood was traded internationally. African and, especially, Asian countries are major plywood exporters. Only a quarter of Latin American-Caribbean zone plywood is exported (journal).<sup>16</sup>

Tropical countries need to improve infrastructure, strengthen timberland tenures and reduce restrictions on imports of high-technology equipment. Developed countries need to help solve debt problems and support efforts to stabilize regional economies. Developing forest industries is a tool to achieve sustainable forest development (journal).<sup>17</sup>

It has been estimated that mature tropical forests once covered 1.5 billion hectares, and that now only 900 million hectares of forest remain (NGO).<sup>18</sup>

Articles with information on economic incentives necessary to encourage using tropical lands to produce wood and discourage conversion to other uses (journals).<sup>19</sup>

US imported 4% of the world's 47 Mmm sup 3 of tropical timber products traded globally in 1989; Canada imported 4.3% (NGO).<sup>20</sup>

The value of total US tropical hardwood product consumption in 1993 = \$533 million. Tropical hardwood plywood represented \$412 million or 76.9% of the value of all tropical wood products consumed by the US in 1993. Imports of tropical hardwood lumber and veneer were \$99 million and \$20 million dollars, respectively, in 1993. US hardwood log imports from tropical areas amounted to \$2 million in 1993 (journal).<sup>21</sup>

Over the past 5 years, tropical plywood has accounted for, on average, 83% of the volume and 77% of the value of all US imports of tropical wood products. Southeast Asia supplied over 90% of the tropical plywood imported into the US in 1993. The major Asian suppliers of plywood are Indonesia and Malaysia (journal).<sup>22</sup>

Next to plywood, lumber is the second most important tropical hardwood product imported by the US. Latin America supplied 64% of the volume and 61% of the value of tropical hardwood lumber imported by the US in 1993. Brazil and Bolivia combined to supply 53% of the volume of tropical hardwood imported by the US (journal).<sup>23</sup>

Southeast Asia was the second leading supply region for tropical hardwood lumber to the US in 1993. Malaysia and the Philippines were the two largest Southeast Asian supply nations. Malaysia provided 16.8% of the total tropical hardwood lumber volume imported by the US, while the Philippines supplied 4.6%. Africa plus all other sources combined to provide only 5.4 Mm sup 3 (or about 3%) of total US imports of tropical hardwood lumber in 1993 (journal).<sup>24</sup>

The volume of tropical hardwood products that are traded internationally account for, at most, only 4% of the total volume of the forests cut (NGOs and journal).<sup>25</sup>

Examination of the industrial logging component (20-30% of tropical deforestation) shows that fuelwood use, including charcoal production, accounts for approximately 80% of total industrial logging removals (NGO).<sup>26</sup>

20% of all industrial logging is used by the local forest products industries, of which at least half is consumed domestically (book).<sup>27</sup>

Only about 10% of the industrial logging component is exported (journal).<sup>28</sup>

*producer countries:*

Nearly two-thirds of the world's hard-

wood harvest comes from Southeast Asia, principally the Philippines, Sumatra, and the island of Borneo. But logging has been so extensive that virtually all the lowland forests in Malaysia and the Philippines will be gone by 1990. Thailand, once a leading producer of teak, will actually spend \$100 million this year (1980) to purchase wood products from abroad (press).<sup>29</sup>

**Indonesia** — largest rainforests after Brazil, but is destroying them at an estimated 2.5 million acres/year, largely through logging and slash and burn farming (press).<sup>30</sup> Exported wood products worth nearly \$5.5 billion in 1993, almost 15% of the country's exports (press).<sup>31</sup> Indonesian log exports were banned in 1985, and low interest loans were offered to companies establishing plywood factories. As a result, exports of plywood have jumped from \$991 million to \$3.2 billion in 1992. Total exports of processed wood products, including furniture, reached \$4.2 billion in 1992, the third largest export earner after oil and textiles. Principal markets are Japan and South Korea. With pulp production costs of \$250/ton — significantly lower than European and North American producers, Indonesia is expected to become a significant producer. Exports of pulp and paper have already risen from 188,000 tons in 1987 to 660,000 tons in 1992 (press).<sup>32</sup>

**Malaysia** - accounts for nearly half of world timber exports. Sarawak accounts for most of Malaysia's production. Sarawak's unprocessed log exports have risen to 15.8 million cubic meters in 1991 from 6.7 million in 1980 (press).<sup>33</sup>

There are signs that the Sarawak government is seeking to enforce stricter controls on the logging industry and to diversify the economy. First, Sarawak is encouraging the establishment of downstream wood industries and setting aside timber processing zones in an attempt to add value to its exports to Japan and other tropical timber consumers. A fifth of timber exports are now supposed to be processed in Sarawak, a proportion which is expected to rise to 50% in the next few years. Sarawak is also trying to lure non-timber industries to Sarawak from peninsular Malaysia. Second, there is a drive to encourage tourism in the state, particularly "adventure tourism" which takes advantage of Sarawak's rivers and jungles. Third, the state is promoting the conversion of forest land to palm oil plantations and other forms of agriculture, and the Sarawak Economic Development Corporation (SEDC) is

overseeing an aquaculture project producing tiger prawns (press).<sup>34</sup>

#### *consumer countries:*

Trend in Japan to switch from tropical hardwood to temperate hardwood and softwood (press).<sup>35</sup>

The US and Europe import only 7.5% and 20.1%, respectively, of all tropical wood. Over half of all tropical timber products are imported by Japan, South Korea, China, and Singapore. Japan alone imports over 28% of the world's tropical timber (NGO).<sup>36</sup>

#### *firms:*

Jaya Tiasa — Malaysia's largest listed timber company; Kumpulan Emas — another large Malaysian timber company (press).<sup>37</sup>

In Indonesia — Barito Pacific Timber and Citra Lamtoro Gung Persada (headed by one of President Suharto's daughters) — 450,000-ton/yr bleached hardwood kraft pulp mill; Barito Pacific operates at least seven factories in Sumatra, Kalimantan and the Moluccas and shipped 1.3 million cubic meters of timber in 1992 (14% of the country's total exports) (press).<sup>38</sup> Barito had sales of \$459 million in 1993 and net profit of \$145 million, almost a 100% increase over the previous year. The company benefited from a rise in plywood process from \$300/cubic meter in late 1992 to more than \$500/cubic meter in 1994. In 1994, Barito signed a preliminary agreement with Marubeni and Nippon Pulp and Paper of Japan to establish a \$1 billion pulp plant with a capacity of 500,00 tons. Sinar Mas group controls the two principal listed companies, Indah Kiat and Tjiwi Kimia. Indah Kiat, with timber plantations and mills in Sumatra, has production capacity of 790,000 tons of pulp, of which 410,000 tons came on stream in 1994, and 344,00 tons of paper, backed up by a timber concession of 300,000 hectares. The company had turnover of \$305 million in 1993, up 53% on the previous year, but earnings fell from \$57 million to \$42 million. Tjiwi Kimia has a production capacity of 21,600 tons of pulp and 394,000 tons of paper. It supplies 35% of the domestic paper market, 50% of the local stationery market, and exports 40% of its production. The company's turnover in 1993 was up 25% to \$289 million and was predicted to rise a similar amount the following year. Net Profit in 1993 was \$37 million, up 19%. A surge in the domestic price of paper to \$900/ton, compared with \$600/ton internationally was expected to push up profits in 1994.

Indorayon, a large pulp and rayon producer, produces long and short fiber pulp with a capacity of 260,000 tons backed up by 269,000 ha of tropical forest and 86,000 ha of pine forest. Its rayon plant has a capacity of 60,000 tons (press).<sup>39</sup> Kiana Kertas is building a 1,500-ton/day bleached hardwood kraft pulp mill in Kaltim, East Kalimantan; Takengon Pulp & Paper Utama plans to build a 350,000-ton/yr mill; Gudang Garam, parent company of cigarette-papermaker Surya Zig Zag and board producer Surya Pamenang, wants to build a 500,000-ton/yr hardwood pulp mill in 10-15 years time; the world's largest pulp line, the 750,000-ton/yr Riau Andalan mill is in its commissioning phase and commercial production will start in January, 1995 (press).<sup>40</sup>

Japanese companies — Nippon Paper and Marubeni (press).<sup>41</sup>

In the United States — Madera International, Inc. (Nasdaq: WOOD).

Since 1992, 200 city councils in Germany, 51% of Dutch municipalities, and several US states (including New York, California, Arizona, and Minneapolis) have placed some type of ban on the use of tropical timber. These bans are problematic for three reasons: 1) They could make forestry less competitive with agriculture, which causes more deforestation than cutting trees. 2) They may undermine the few incentives that fledgling forest projects have to promote sustainable management. 3) Such bans conflict with international rules of free trade (NGO).<sup>42</sup>

### ***Theme 2: Analysis of Added Value***

Tropical timber producing countries face increasing pressure to meet higher value-added processing requirements (press).<sup>43</sup>

### ***Theme 3: Value of Services Provided by the Forest***

Information on what comprises a tropical forest and the rules that govern how tropical forest ecosystems work (book).<sup>44</sup>

Scientists believe that moist, tropical forests harbor the majority of the world's species (NGO).<sup>45</sup>

Tropical forests are a significant repository of carbon, which can affect global climate change (NGO).<sup>46</sup>

Von Thunes suggests that the increasing scarcity implied by deforestation will cause the values of forest-based resources (timber, fuelwood, fruits and nuts, forage, and fodder) and environmental benefits (such as climate change, biodiversity, and erosion control) to

rise until forests eventually compete well with some agricultural uses of the land. As a result, the world never will reach the physical limits of deforestation (book).<sup>47</sup>

The World Bank estimated the annual cost at more than \$500 million in forgone public revenues in Indonesia arising from losses in areas such as soil erosion and flooding (press).<sup>48</sup>

Tropical rain forests are inhabited by some 50% of the plants and animals found on the globe (estimates which range from 2 million to 30 million species). According to Edward O. Wilson, as many as 27,000 species may be consigned to extinction every year (journal).<sup>49</sup>

The flora and fauna of the Amazon vary so greatly that adjacent sites can shelter entirely different species. One hectare in the eastern Amazon may have 120 tree species, whereas a nearby hectare may have 170 (journal).<sup>50</sup>

Tropical forest loss is estimated to have contributed one quarter of the carbon released into the atmosphere during the past decade (journal).<sup>51</sup>

In the Amazon, where 50% of precipitation may be generated by the flora, changes in evapotranspiration could cause alterations in local climate and rainfall patterns that adversely affect agriculture. Reductions in rainfall, in turn, cause the local temperature to increase, hampering vegetation and crops (journal).<sup>52</sup>

Landowners in the Amazon are required by law to retain 50% of their forests — scattered woods of all different sizes and shapes can be found everywhere, often surrounded by pasture. Larger forest fragments, however, harbor more species than do smaller ones. Furthermore, species diversity requires appropriate corridors to facilitate movement between these fragments (journal).<sup>53</sup>

### ***Theme 4: The Home Market and Amazon Hardwoods***

Brazil's Amazonian tropical forests cover close to 315 million ha (778 million acres); nearly two-thirds of this area is protected in various sorts of parks and reserves. Given the plywood industry's need for superior-quality logs and the fact that not all tropical timber species are suitable for peeling, only 5-10 m.sup.3/ha are currently harvested for plywood (journal).<sup>54</sup>

One difficulty in assessing the volumes of tropical-wood plywood made in Brazil is the fact that temperate softwood panels faced

with a tropical veneer are often classified as “tropical plywood.” Most of the country’s plywood mills are in the south, where the local wood are temperate softwoods. Thus the actual share of tropical wood is smaller than the numbers indicate (journal).<sup>55</sup>

According to official statistics, Brazilian mills made 200,000 m.sup.3 (226 million ft.sup.2) of tropical plywood in 1976. Output doubled to 400,000 m.sup.3 by 1980. Nine years later, production had more than tripled to 1.26 million m.sup.3 (1.42 billion ft.sup.2) (journal).<sup>56</sup>

Several factors limit expansion of the plywood industry in Brazil. In addition to avail-

ability of timber, constraints include poor infrastructure, insufficient capital and high cost of modern machinery, economic instability, uncertainty of land tenures, environmental pressures and resulting import restrictions and competition with temperate plywood and other wood-based panels (journal).<sup>57</sup>

Pará encompasses one-third of the Brazilian Amazon and had lost 13% of its forest cover by 1990 (journal).<sup>58</sup>

In 1976, 14% of the country’s sawn wood came from the rain forest; by 1986 the share had grown to 44%. The number of wood processors grew from about 100 in 1952 to more than 3,000 in 1992 (journal).



## Group 2: Forest Management

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Map of forest types throughout the world — Figure 9.2 (NGO).<sup>59</sup>

Summary of extent and percent change from 1981-90 of forest and other wooded land by region — Table 9.1 (NGO).<sup>60</sup>

Map of estimated annual deforestation rates, by country, 1980-90 — Figure 9.3 (NGO).<sup>61</sup> According to FAO data, the world lost 450 million hectares of its tropical forest cover between 1960 and 1990. Asia lost almost one third of its tropical forest cover during that period, whereas Africa and Latin America each lost about 18 percent (NGO).<sup>62</sup> The total area deforested per decade has declined in Asia and appears to have stabilized in Africa. This has not been the case in Latin America, where increasingly more forest area was converted to other uses — primarily agricultural — from 1960 to 1990 (NGO).<sup>63</sup>

Plantation Area Within Tropical and Temperate Developing Regions, 1980-1990 — Table 9.2 (NGO).<sup>64</sup>

Estimated Rate of Tropical Deforestation, 1960-90 — Figure 9.4 (NGO).<sup>65</sup>

Degradation and Conversion of Tropical Closed Forest, 1980-90 — Figure 9.6 (NGO).<sup>66</sup>

Land Area and Use Data, 1981-93 — Table 9.1 (NGO).<sup>67</sup>

Forest Resources, 1981-90 — Table 9.2 (NGO).<sup>68</sup>

Tarapoto declaration of the Amazon Treaty Organization regarding Amazonian forests — a broad range of general guidelines for the sustainable management of forests (journal).<sup>69</sup>

To help conserve the state's forest resources, Sarawak plans to pass a law requiring timber operators to plant fast-growing trees (press).<sup>70</sup>

In Malawi, the rate of deforestation exceeds 3.5% annually, and fuelwood prices have risen by more than 5% a year for the last decade. Fuelwood may now consume 20% of the cast income of subsistence household in rural areas. Malawi's deforestation has occurred largely on open access forest (land where property rights are nonexistent or unenforced), where there is no conservation incentive. Small landowners are responding by planting trees on their own lands at a rate that may offset all deforestation within ten years (journal).<sup>71</sup>

Investors responded to higher timber prices by planing industrial forests in Costa

Rica (journal),<sup>72</sup> Kenya (journal),<sup>73</sup> and Vietnam (unpublished records).<sup>74</sup> Farmers have planted trees to meet subsistence needs in Cape Verde (journal),<sup>75</sup> China (P.h.D. dissertation),<sup>76</sup> Madagascar (NGO),<sup>77</sup> Nepal (journal)<sup>78</sup> and the Philippines (NGO).<sup>79</sup>

In a confidential report to the Indonesian government in 1993, the World Bank warned that timber companies were cutting 50% more logs that could be sustained by replanting (press).<sup>80</sup>

The result of overgrown fields, inappropriate as pasture land, and cuts in clear-cutting and cattle-raising subsidies led to the sale of logging rights on many grazing properties. More than 100 species of wood, which had been viewed as impediments to pasture, were harvested. By 1990 there were 238 sawmills near Pargominas. Today logging is the area's principal industry, and it is just as unsustainable as ranching was. AMAZON researchers have determined that for each tree that is removed, 27 other trees that are 10 cm or more in diameter are severely injured, 40 meters of road are created and 600 square meters of canopy are opened. Recovery of the forest is slow under these conditions; it can take 70 years for selectively logged forests to resemble their original state (journal).<sup>81</sup>

Four kinds of land that characterize the Amazon: 1) primary or pristine forest 2) partially regrown or secondary forest 3) pasture that is in use 4) abandoned pasture. Forest is slow to invade old pasture, in part, because some seed-dispersing birds do not venture into open spaces. Now the possibility is being examined of using these already deforested areas for agriculture, ranching, or logging. This would take pressure off the primary rain forest (journal).<sup>82</sup>

The Brazilian Foundation for Sustainable Development, a consortium of 24 of the largest Brazilian companies, was formed after the 1992 Earth Summit. The Foundation plans to support research that will define sustainable development and to help companies act in environmentally sound ways. It will also finance the Forest Fragments Project (journal).<sup>83</sup>

### **Theme 5: Management Plan as a Basic Instrument for Sustainable Forest Exploitation**

Christopher Uhl et. al. primarily propose

best management practices for terra firma forests. These practices include adopting the following techniques: 1) Conduct forest inventory and map procedures before logging to minimize waste. 2) Carefully plan machine movements. 3) Cut vines two years before logging to minimize damage to subcanopy trees during harvesting. 4) Use trained loggers to minimize waste as much as three-fold. 5) Reduce machine time by preflagging skid trails. 5) Deliberately girdle undesirable trees after logging to provide space for target trees.

Uhl et. al. conclude with the following policy suggestions: 1) Zone logging activities. 2) Install a sensible, enforceable forest code, such as "Edict 5/50/5". 5 is the limit on the number of trees that could be removed per hectare in a logging episode. 50 is the minimum number of years between logging episodes. 5 is the width, in meters, of the fire break that should be maintained around all logged stands in the first decade following logging to avoid ground fires. Such a forest code would protect the Amazon region from the leading causes of forest demise — excessive harvesting, repeated harvesting at short intervals, and fire (journal).<sup>84</sup>

Intensive replanting has turned war-ravaged South Korea into the forestry "success story of the '70s": one-third of the country has been stocked with trees in the last decade. Elsewhere, lower-key programs are seeking to reverse age-old patterns of wasteful firewood use and encourage villages to protect their local groves. Overall though, the Third World has a dismal record of forest rebuilding. Millions of seedlings have been planted in Africa, Asia, and Latin America, only to perish for lack of proper care, be nibbled to death by cattle or be cut down for firewood long before their prime (press).<sup>85</sup>

Reforestation is expensive. "Our hardwoods take 90 years to reach full height. What bank will lend us 90-year money?" asks a Malaysian forestry official (press).<sup>86</sup>

Once cut down, the rain forest does not necessarily become a desert but rather a field or a secondary forest that can again be harnessed for ranching, logging or agriculture. If this land can be returned to productivity, it would reduce pressure to cut virgin forest. It is thought that even cattle ranching may be a viable option (journal).<sup>87</sup>

It is estimated that about 40% of the Amazon's mahogany trees — which, in general, only grow in a strip across the lower portion of the rain forest — thrive on reserves (journal).<sup>88</sup>

Extractive reserves, of which there are 14 covering a total of 3 million hectares, confer land rights to squatters and people whom large landholders have dispossessed. In Brazil, 4.5% of the landowners control 81% of the farmland (journal).<sup>89</sup>

A Brazilian law prohibits the cutting of Brazil nut trees, but once pasture is burnt around them, the sun desiccates them (journal).<sup>90</sup>

Alfredo Kingo Oyama Homma of the Brazilian Enterprise for Agricultural Research (EMBRAPA) found that when a forest product such as latex becomes commercially important it is inevitably introduced into higher-yielding plantations or the material is made synthetically. As a result, the price plummets, and small-scale extraction ceases to be profitable. In counter to this, a Peruvian study found that 72 products could be harvested from a one-hectare plot for an annual yield of \$422. This appears more lucrative than the one-time logging profit of \$1,000. On the other hand, it is noted by the head of the Ford Foundation in Brazil, Anderson, that a random sampling of the Amazon would not yield such a high value of nontimber forest products. In addition, the Peruvian products could be marketed regionally, a situation that does not yet exist for many of the reserves in the Amazon (journal).<sup>91</sup>

### ***Theme 6: Forest Licenses as a Form to Control Timber Exploitation***

Critics seriously question the ability of timber certification programs to effect more sustainable practices, largely because the market has not proved willing to bear the additional costs (NGO).<sup>92</sup>

In 1994, the Forest Stewardship Council (FSC) adopted a set of principles and criteria for the sustainable management of forests, as well as guidelines on how to conduct field inspections and verify the chain of custody of certified forest products as they travel from the forest to the store shelf (NGO).<sup>93</sup>

In 1995, FSC developed a rigorous framework for the evaluation, accreditation, and monitoring of organizations that issue certification claims in the marketplace (NGO),<sup>94</sup> as well as guidelines for developing regional forest management standards and a protocol for endorsing national certification initiatives. National initiatives based on the FSC guidelines are under development in more than 12 countries, including Brazil and Indonesia (NGO).<sup>95</sup>

In response to the controversy surrounding bans, there is now a move to promote sustainably managed tropical timber through

the labeling of wood products. The organizations that have undertaken to provide independent certification operate on the principle that good forest stewardship must mean more than sustained timber supply; it also means maintaining the health and integrity of the forest ecosystem, and ensuring that all pertinent stakeholders share in the benefits. Most certifiers strive to achieve this balance by requiring long-term management plans, minimum-impact harvesting methods, efficient utilization of all forest products, and third-party audits (NGO).<sup>96</sup>

An estimated 90% of all deforestation is done for agricultural purposes, with only 10% owing to logging. Fourteen percent (240 million cubic meters) cut each year is used for industrial roundwood while the remaining 86% (1.5 billion cubic meters) is used for fuelwood and charcoal. Of the wood harvested, only 28% enters international trade in the form of logs, sawnwood, or wood-based panels — the kind of products to which eco-labeling might apply. Combined, these numbers suggest that international trade accounts for less than 1% of tropical deforestation (NGO).<sup>97</sup>

The above statistics, however, overlook the role of logging in opening up previously intact forests for other causes of deforestation:

1) For example, in Southeast Asia, logging operations generally penetrate previously inaccessible primary forest, and loggers may remove up to 40% of the standing timber volume, leaving from 15-40% of the ground with no forest cover. In South America, the FAO estimates that deforestation rates are eight times higher in logged over areas than in non-logged areas.

2) The so-called small impact of commercial logging is a claim that may be the result of misinterpreted data. FAO statistics regarding deforestation are based on the complete removal of tree cover. Most logging in the tropics involves selective cutting that leaves a residual cover. Hence, a logged-over area may not be counted as deforested even though in an ecological sense it has been deforested. In Brazil, for example, in efforts to extract 2% of the trees, over 26% of all remaining trees greater than 10 cm in diameter were destroyed or seriously damaged. In Malaysia, to remove 3% of trees, 48% of the remaining trees were destroyed. Even after loggers have left, the damage continues in that remaining trees are more vulnerable to violent storms and forest fires.

3) Statistics are also misleading in reflecting the portion of logging used for timber, as

opposed to the portion either wasted or used for other purposes. For example, the figures for timber production only represent stemwood. They do not include roughly half of the wood mass of each tree felled that is left behind. They also do not include wood produced as a by-product of road building or wood that is cut but not removed from the forest because it has been damaged or because it is too costly to haul out.

4) The figures on commercial logging also fail to consider the relative contribution of industrial production versus fuelwood extraction depending on region. The demand for fuelwood is a problem that afflicts primarily the dry tropics. In the moist tropics, however, cutting of firewood is only a serious threat in the immediate vicinity of large cities, and cutting for furniture or veneer is a much bigger threat.

5) Some tropical countries rely heavily on tropical timber exports. International trade is clearly the catalytic factor for fueling such deforestation. In Malaysia, for example, exports in 1992 accounted for 45% of all timber production (NGO).<sup>98</sup>

The first and largest forestry certification program is the US-based Rainforest Alliance's "Smart Wood" Program. It certified its first "well-managed" forest in 1990. By the spring of 1996, nearly 2.4 million hectares of natural forest had been certified by four third-party organizations. In addition to third-party certification, national certification initiatives have been proliferating. The Brazilian forestry sector has been developing a methodology to define the origin of raw materials used by the forest industry, which has resulted in a "Certificate of Origin of Forest Raw Material" (CERFLOR). Lambaga Ekolabel Indonesia (LEI) was formed in 1993 to develop a certification and labeling scheme for Indonesian forest products (NGO).<sup>99</sup>

The Forest Stewardship Council (FSC) was established in 1993 to set global standards whereby those organizations certifying the sustainability of a productive forest could themselves be accredited. To date, the FSC has accredited four third-party certifiers: Smart Wood, the SGS Forestry Qualifor Programme, and the Soil Association Responsible Forestry Programme. It is working with governments to accredit their certification schemes (NGO).<sup>100</sup>

Currently, demand for certified wood exceeds the supply in the US and UK, but this consumer demand alone has not compelled a move to certification. Benefits will accrue as consumer awareness increases and certified

producers gain market share in countries developing laws or voluntary initiatives to exclude non-certified timber. Austria requires labeling of timber from all types of forests. The "UK 1995 Plus Group," a partnership between WWF for Nature, UK and 54 UK companies has pledged to purchase and sell only certified wood and wood products by December 31, 1999. A similar "North American Buyers Group for Certified Timber" is still being designed by the New York-based Environmental Advantage. Finally, the ITTO set the year 2000 as a goal for when only sustainably produced wood products would be used in international tropical timber trade (NGO).<sup>101</sup>

The effectiveness of eco-labeling in the tropics will be most pronounced in countries that have a large share of their exports destined for Europe and the US. Congo and Gabon, for example, export 88% and 69% of tropical timber, respectively, to the European

Union. For countries, like Malaysia, which export most of their timber to Asia or Japan, US and European demand for certified products is likely to be ineffective. By far, the largest share (85%) of tropical timber is consumed by domestic markets where so far little or no consumer demand for certified timber exists.

### ***Theme 7: Methodology and Ongoing Monitoring Techniques for Forest Exploitation***

The virgin forests of peninsular Malaysia were hacked apart half a century ago, with destroying the landscape; the difference now is that everything goes faster, with much larger and more destructive machines, and that the development of all-weather roads will make it go faster yet (press).<sup>102</sup>

There are only twelve rangers to control deforestation in the Amazon (press).<sup>103</sup>



### Group 3: Institutional and Legal Aspects of Forest Matters

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An institutional crisis typically underlies a tangible environmental problem (NGO).<sup>104</sup>

Meyers points out shifting cultivators as the dominant player accounting for 61% of the current rate of deforestation in tropical countries (book review in journal).<sup>105</sup>

Palo finds by examining population density and forest coverage of 60 tropical countries that population density was strongly correlated to deforestation (book review in journal).<sup>106</sup>

Southgate obtains the result that the constraint of agricultural frontier expansion and agricultural technological improvement could bind the expansion of agricultural land into forest lands or other natural environments (book review in journal).<sup>107</sup>

Joint implementation has not been achieved on a scale large enough to reverse the trends of forest loss or global warming (NGO).<sup>108</sup>

According to a recent study by the Institut für Weltwirtschaft (IfW) commissioned by Greenpeace, agriculture (including shifting cultivation by landless, impoverished farmers) is responsible for about 90% of the hectares of tropical forests destroyed annually (NGO).<sup>109</sup>

Others believe that agriculture/ranching account for about 75% of the world's tropical deforestation, followed by industrial logging (including fuelwood), which contributes about 20-30%, and industrial development (such as road building, mining, and dam construction), which contributes about 4-5% (NGOs).<sup>110</sup>

Commercial timber interests first harvest at the margin between farmland and forest, and then move deeper into the interior until they reach a point where harvest and access costs consume the full value of the standing resource. They repeat- or pulse-harvest this land in subsequent years whenever sufficient new natural growth justifies it. An unused residual of natural forest generally lies beyond the boundary of economically viable forest; access and harvest costs for this residual exceed the value of the land for either market or subsistence production (journal).<sup>111</sup>

Private individuals and communities will establish clear rights to parts of the forest where the longrun value exceeds the costs of establishing and protecting the property rights (journal).<sup>112</sup>

The values of standing forest resources are low relative to other land uses. Forest resources may also be dispersed. For example,

fruit and nut-bearing trees tend to be scattered, and some high-value tropical timber species occur only on an occasional hectare. The costs associated with establishing and maintaining property rights for these resources can easily exceed their in situ values. Fences, forest guards, and roadblocks may help protect these rights, but trespass and theft are common even in the forests of industrial countries (journal).<sup>113</sup>

World Bank: In 1991, forest loans were the Bank's fastest-growing sector. It became the institution's priority in September 1989 when World Bank president Barber Conable announced a tripling of bank forest lending through the early 1990s. One loan submitted for approval was designed to promote timber concessions in the Ivory Coast while leveling 500,000 hectares of tropical forest. The Board asked the forest-sector to revamp its forest lending policy. One of the Bank's obstacles to reform in many of the world's forest areas - principally in Africa and the Amazon - is corrupt local governments, which turn quick profits from logging that produces fuel wood, timber, and pulp (press).<sup>114</sup>

The contribution of small farmers toward deforestation is well understood. Land clearing has been more rapid in Rondônia than anywhere else in the Brazilian Amazon and more than half the deforested land in that state is divided among small agricultural holdings (book).<sup>115</sup>

In Indonesia and Brazil, many colonists have participated in settlement projects to forested hinterlands, organized and directed by the public sector (book).<sup>116</sup>

In southern Brazil, they have been selling off their parcels, taking advantage of prices inflated by tax and other policies favorable to those with large land holdings (NGO).<sup>117</sup> Moves to agriculture's margin is also promoted by infrastructure development which reduces the cost of marketing commodities grown in remote areas (journal).<sup>118</sup> Agricultural colonists in many countries also benefit from grace periods for development credit and other subsidies.

In addition to inducements to migrate to frontier areas, agricultural colonists in the third world face tenure regimes that promote deforestation. Often, removing trees and other vegetation is a prerequisite for establishing formal property rights. In Sudan, for example, the parastatal Mechanized Farming Corporation awards fifteen-year leases only to individuals

who clear 85% of their holdings in three years. Furthermore, because developing country governments usually take years to adjudicate claims for formal property rights — particularly claims made by small farmers settling in hinterlands — colonists tend to safeguard pending land rights by using their parcels continuously for crop or livestock production. In addition, agricultural use rights are the only form of land tenure available to private agents in many countries. The government of Ecuador, for example, terminated all private timber concessions in the country's "forest patrimony" in 1982. Agricultural colonization of tree-covered land is still permitted, however (journal).<sup>119</sup>

Most colonists realize that they risk losing land not in use for crop or livestock production to other settlers if they allow their actions to be influenced by the judgment that future deforestation is more profitable than present land clearing. Accordingly, any parcel is cleared immediately if agricultural rents can be captured by doing so. Settlers are obliged to neglect returns associated with non-agricultural land uses and to respond immediately to any opportunity to capture agricultural rents (journal).<sup>120</sup>

One's ability to acquire property rights in "idle" land by converting it to an agricultural use not only induces rational settlers to deforest excessively, but also discourages them from conserving existing farmland (journal).<sup>121</sup>

Some potential limitations and pitfalls of remedying institutionally induced degradation of developing country hinterlands through non-institutional measures: In addition to reducing soil loss, the introduction of less erosive farming techniques can accelerate deforestation just as extending information on less erosive uses of newly cleared hinterlands can result in additional agricultural colonization. Similarly, removing policy-induced distortions in markets for labor, credit and agricultural commodities can either encourage soil conservation and land clearing or discourage both. At an extreme, a rise in timber prices can actually accelerate the cycle of deforestation and erosive farming, given tenurial conditions facing agricultural colonists. Therefore, the cycle of excessive land clearing and erosive farming can be broken only by accomplishing the politically charged task of changing the institutional causes of that cycle. To be specific, conservation of forested hinterlands is encouraged by strengthening the property rights of settlers, of those adversely affected by deforestation and erosion, or of both groups (journal).<sup>122</sup>

Colonists' expectations that commodity prices will increase at some future date might induce them to deforest more land now, even when current prices might not be high enough to justify such action. This might explain, in part, the speculative clearing of land (undertaken to secure property rights) in some parts of Brazil (NGO).<sup>123</sup>

Peru plans to settle 2 million peasants in the jungle over the next five years (1980-85), and Ecuador and Colombia hope to open up gas and oil fields, with long pipelines to be pushed through the forest to the coast. Brazil has done the most damage, particularly with the Trans-Amazon Highway that a decade ago first opened the interior to large-scale exploitation. Nearly 8 million acres were cleared to build the highway and its ever-spreading network of secondary roads. Agribusiness ranchers and hundreds of thousands of farmers have burned trees worth \$1 billion a year simply to clear them away. Cattle grazing and logging have further denuded the jungle (press).<sup>124</sup>

Brangantina, a region the size of Belgium on Brazil's northeast coast, was opened up for farming at the turn of the century. The project was at first considered a model for Amazon development, but by the 1940s its soil was exhausted. The government moved Brangantina's settler to Rondônia where they met the same fate more quickly (press).<sup>125</sup>

The absence of well-defined property rights is cited as a key contributor to rapid deforestation and other type of "wasteful" land use in developing areas (book),<sup>126</sup> particularly in Brazil (NGO).<sup>127</sup>

Migration to the Brazilian Amazon has occurred since the late 1960s, often through directed government colonization projects. The population of the state of Pará grew from just over 2 million in 1970 to more than 4 million in 1985 (NGO).<sup>128</sup> The amount of land in farms doubled in the 1960s and again in the 1970s. The construction of the TransAmazon and Belém-Brasília highways opened new land for private claims in the 1960s (journal).<sup>129</sup>

Title is a formal document issued by the Brazilian federal or state government, depending on the jurisdiction, that signifies government recognition of an individual's property rights to land. In addition to legal standing, the recording of the titles in the local land registry (cartório) includes survey descriptions (memorial descritivo), the location of boundary markers, and the date of recording to establish precedent for the land claim. The recording of a title includes a list of previous owners (cadeia

dominal). The record is important if there is a dispute over land transfers. Full public enforcement rights are also a privilege of a title. Having a title reduces private enforcement costs, provides security and collateral for long-term investment in land improvements, and promotes the development of land markets (journal).<sup>130</sup>

Brazilian frontiers are open for private claiming and titling. Generally, the land claim must be occupied by the claimant and improved for agricultural use — one year for claims on government land or five years for claims to private land based on adverse possession. To initiate the titling process, group organization is necessary because land agencies usually wait until a threshold number of requests are made before traveling to the site. Normally, title applications can be processed within two to five years, but if the initial claimant moves to a different site and sells the claim, the title application must be reprocessed and thus titling time is extended (journal).<sup>131</sup>

Being influenced by local political pressures, ITERPA (State of Pará Land Institute) tended to assign titles more rapidly and completely than the federal agency, INCRA (National Institute for Colonization and Agrarian Reform) ITERPA applications coincide with state election cycles (book).<sup>132</sup>

Investment in infrastructure by the federal government and subsidized colonies brought settlers to the Amazon before land values had risen to a level that attracts such migrants. In Pará declining budgets for land agencies limited their ability to process title applications (Brazilian state government).<sup>133</sup>

Ranchers have been subsidized by SUDAM (Superintendency for the Development of Amazonia, a federal agency that administered a series of credit benefits and fiscal incentives (NGO).<sup>134</sup>

Alston et. al. (journal)<sup>135</sup> provide an empirical basis for conclusions regarding the demand for and supply of title, the impact of title on land value, and its effects on agricultural investment on Brazilian frontiers. Their analytical framework incorporates the following issues: 1) Distance to market is a primary determinant of land value. At some distance, transportation costs are higher than opportunity costs of the marginal laborer. Those who settle the frontier will be those who have relatively lower opportunity costs, limited education and experience. 2) With titled land, the state assumes most of the enforcement costs, guarantees ownership, and thereby promotes investment, exchange, and production. Hence,

titled values are higher than non-titled land, especially near the market center. As you move from the market center, higher transportation costs limit the potential for exchange and production and thus land values are lower. Competition for ownership is reduced, requiring less state enforcement of title, and private enforcement costs decline. At a given distance from the market center, the difference between values of titled and non-titled land becomes negligible.

Analysis of census data with their analytical framework produced the following results: 1) Land value per hectare is a positive function of title. Distance reduces value differentially for titled and nontitled land. The contribution of title to land value is greatest at the market center, where competition and private enforcement costs would otherwise be the highest. The role of title declines with distance as competition for control declines and production and exchange opportunities diminish. 2) Land agencies influence those costs, with the state agency, ITERPA, appearing to provide titles liberally, whereas the federal agency, INCRA, appears to be very slow in titling, even in the colony of Tucumã, where land values are relatively high and distances are comparatively short. Private costs of obtaining a title from state government land agencies may be less than those for obtaining a title from federal agencies. 3) Formal property rights to land promote farm-specific investments (permanent crops and pasture), which in turn, raise land values directly.

In general: 1) Title and/or investment raised land values on Brazilian frontiers across time. In the instance of Pará, the distance effect on the value of titled land was not significant. On the other hand, higher costs associated with greater distance from administrative centers tended to reduce the proportion of farmers with titles in Pará. 2) Title and investment contribute to land value, and title promotes farm-specific investment. 3) Additionally, the expected change in value from having a title appears to increase the incidence of title.

Tenure institutions have the potential to create wealth by promoting investment, reducing enforcement costs, and extending the gains from trade. Where government jurisdictions have been confused, title has been less prevalent. Claimants to low-value, remote plots receive title, especially from ITERPA, prior to elections, whereas claimants to some more valuable plots near to markets are neglected, often due to budget and staff limitations.

The government response to the demand for property rights will be influenced by a variety of political factors, including competing constituent pressures, electoral demands conflicting agency and government jurisdictions, and fluctuating budgets and staffing for titling agencies. Government policy plays a role in all this by determining who receives title (through the allocation formula), when it is assigned (through marking and survey policies, pricing, and other settlement requirements), whether it is secure (through enforcement practices), and how conflicts are adjudicated (through the police and courts) (journal).<sup>136</sup>

The Brazilian Constitution of 1988 conferred more power to counties; therefore, these local governments could enact legislation requiring that specified land be used intensively for pasture and logging. Such laws could generate jobs for the region and preserve primary forest (journal).<sup>137</sup>

### ***Theme 8: Policy of Concessions in Different Countries and How They Apply to the Amazon***

The cost of acquiring timber concessions in Brazil, Latin America in general, and African nations is comparatively lower than other tropical timber producing countries (press).<sup>138</sup>

#### *Ghana:*

As of 1991, Ghana had banned the export of 17 timber species as a means of controlling deforestation. Royalties on tree volumes were raised to reflect the economic value of trees while a new timber concession policy was being implemented. Rex Chachu, chief director of the Ministry of Lands and Natural Resources, said the wood processing and marketing industry in the country has decided to donate one percent of the value of its export to support the afforestation and reforestation programs (press).<sup>139</sup>

#### *Indonesia:*

In 1994, the Indonesian government announced a ban on new timber concessions to private companies. In addition, existing timber areas will be taken over by state-owned agencies once their concession periods expire. The large pulp mills should not be immediately affected as their concessions are not up for renewal until 2000 (journal).<sup>140</sup>

Much of Indonesian logging is done by companies that have close connections to the government, armed forces or bureaucracy (press).<sup>141</sup>

Private Indonesian Forum for Environ-

ment — body to help settle land disputes (press).<sup>142</sup>

1994 report that the government had begun buying into some timber concessions and merging other to improve forest management (press).<sup>143</sup>

There are about 500 timber concession in Indonesia. They range in size from 20,000 hectares (50,000 acres) to 2 million hectares and are issued by the government for periods up to 20 years subject to certain conditions, such as selective cutting and replanting. Critics say that many of the conditions have not been observed or enforced. Mr. Jamaludin, the forestry minister, said the government had already bought a 49% stake in 28 concessions and would use the profits for reforestation programs. The concessions include two large ones controlled by Barito Pacific Timber Co (press).<sup>144</sup>

The World Bank expressed concern that too little is being charged for forest concessions in Indonesia and thus contributing to rapid deforestation and loss of water supplies and biodiversity. Mr. Jamaludin, forestry minister, said, in July, that over the next five years Indonesia would reduce its annual timber cut to the level that the World Bank report said was sustainable. He also indicated that the government would increase the license fees and levies paid by the holders of forest concessions (press).<sup>145</sup>

September 7, 1994: Indonesia announced it wanted 49% stake in Barito Pacific in exchange for renewal of the firm's 20-year timber concessions. Shares in Barito Pacific, whose forestry concessions exceed five million hectares (12.35 million acres), nearly eight percent of Indonesia's total natural production forests, were largely unaffected by the news (press).<sup>146</sup>

May 17, 1994: Indonesian forestry ministry banned a large timber company from listing shares on the Jakarta Stock Exchange because of suspicions that the company was involved in illegal logging. Government policy concentrates on control of illegal logging and the introduction of higher valued added products, a reduction in shifting cultivation by forest dwellers and the provision of new employment, and the establishment of renewable timber plantations to support a fast-growing pulp and paper industry (press).<sup>147</sup>

According to Indonesia's own rules on sustainable forest management, the maximum amount of timber that can be cut is 31.4m cubic meters/year, but actual demand is 44m cubic meters, almost 40% higher. More effective monitoring of resources plus better tax collection from timber corporations are the main recommendations from action groups (press).<sup>148</sup>

The average size of timber concessions is 247,000 acres (press).<sup>149</sup>

The policy of collecting the money from concession holders has been difficult to enforce. According to Forestry Minister Hasjral Harahap, about six billion rupiah (\$3.4 million) has still not been paid by some 50 timber concession holders (press).<sup>150</sup>

Timber companies are supposed to pay bond money to a reforestation fund in the ministry for every tree that is cut down. A recent study by the FAO (1988) said timber companies found it cheaper to forfeit the money than to replant the seedlings. The Forest Conservation Network of Indonesia told a recent parliament hearing there had been no proper accounting for the fund and called for an end to timber concessions. The government banned log exports in 1985 and said timber concession holders should "selectively cut" trees only of a certain circumference. The World Bank and environmental groups say timber companies cut down trees indiscriminately to remove the few valuable species from the jungle. Although Indonesia's forests are state owned, huge expanses are controlled by about 500 concession holders. The Forestry Conservation Network said many of them are held by retired military and government officials who lack expertise in logging operations (press).<sup>151</sup>

#### *Malaysia:*

Concessions are the key to the profitability of the country's timber companies, rather than the capacity of downstream production. The government strictly limits logging and many operators who do not own timber concessions have difficulty getting supplies. Concessions in Sarawak are especially valuable. Being more politically stable (Abdul Taib Mahmud has been chief minister of the state for nearly 20 years) than neighboring Sabah, Sarawak awards longer concession periods. The state allows 50% of its logs to be exported (press).<sup>152</sup>

One of the obstacles to bringing the logging industry under control is the close relationship between the loggers and the state government of chief minister Mr. Abdul Taib Mahmud. Mr. Taib's uncle and political rival, Mr. Abdul Rahman Yakub, let it be known during an election campaign in 1987 that his nephew's relatives and political allies controlled 1.6m hectares of the state's timber concessions, about a third of the total (press).<sup>153</sup>

Rights over land concessions are reserved by the constitution to the states, so there is

nothing the federal government can do. Federal regulations stipulate that most unsawn timber must not be exported as such, in order to build up a certain amount of local employment. But most of the tree-trunks go off anyway, unprocessed to Japan, Taiwan, or Korea (press).<sup>154</sup>

#### *Papua New Guinea:*

Considering lower concession prices in Latin America and Africa, logging companies in Papua New Guinea would like to appeal to the government to reduce royalties, levies and taxes on timber. Otherwise, existing timber operators will not expand operations and new ones will not likely enter. Without such measures, managing director of Rimbunan Hijau, Bhd Datuk Tiong Hiew King, predicts that the timber industry in Papua New Guinea will shrink by 30 percent within the next 12 months. He also suggested the Government amend its existing land statutes and policies to remove ambiguities that often surround the applications and interpretations of the regulations. According to him, this would boost the confidence of foreign and local investors in the country (press).<sup>155</sup>

#### *Suriname:*

Between 1993 and 1995, the Suriname government began negotiations with several Asian timber conglomerates to make 25-40% of the country's land area (7-12 million hectares) available for logging. The government reportedly plans to sell off these forests at a fraction of their potential as a means of dealing with their fiscal crisis (NGO).<sup>156</sup> Timber consortiums from Malaysia, Indonesia, and China have offered investment packages of more than \$500 million (almost equal to the country's total annual GDP) for access to remote, untouched forests in the country's interior (NGO).<sup>157</sup> A recent World Resources Institute (WRI) study on forest policy in Suriname found that the government would lose between 41-86% of potential revenue from logging, depending on how honestly companies reported their profits (NGO).<sup>158</sup> Several of the timber consortiums bidding on concessions have poor environmental track records and a history of unscrupulous business practices (NGO).<sup>159</sup> This has included, according to one report, bribing members of Suriname's parliament to secure their votes (press).<sup>160</sup> Suriname's Forest Service currently lacks the capacity to adequately monitor loggers' compliance with new concession agreements. The government may actually lose money on the proposed deal once factoring in the costs of building a monitoring capacity

(NGO).<sup>161</sup> The WRI report recommends new bidding and taxation practices so the country captures more of the return from the harvesting. It suggests that the government impose controls to minimize environmental damage and social disruption from logging. These moves would yield higher long-term profits to the country and could reduce the total area opened to timber exploitation (NGO).<sup>162</sup>

### **Theme 9: Brazilian Forests and Lumber Concessions**

Companies that process wood are required by law to plant six trees for every one that they harvest. The federal government offers no tax breaks, loans or any sort of financial incentive to encourage tree-planting (journal).<sup>163</sup>

Chairman of Madera International, Inc., Dan Lezak, announced an agreement to acquire assets consisting of timber properties and concessions in Brazil, Bolivia, and Peru value in excess of \$30 million from privately-owned Forest & Environmental Resources of the Amazon, Inc. (FERA). The acquisition will bring together two of the most environmentally con-

scious companies in the industry. CONTACT: Daniel Lezak, President and Chairman of Madera International, 818-223-8807 (press).<sup>164</sup>

In the last decade (1970-80), cattle and timber concessions have totaled more than 20 million acres — much of it to overseas based multinationals (press).<sup>165</sup>

The fierce reputation of Kayapó warriors has successfully deterred encroachments in northern Brazil. Some Kayapó chiefs, however, have opted to sell mahogany and mining rights. Greenpeace recently sought to enforce a ban on mahogany logging on the tribal lands — an action that has aggravated certain Kayapó (journal).<sup>166</sup>

The chief of the village Aukre, Paiakan, is famous as a spokesperson for protecting rain forests and tradition, as well as for being a skillful politician who could unify previously warring tribes in the face of developers. Yet other villagers have disagreed with his view. In addition, Paiakan can no longer easily be an advocate for indigenous people in the Amazon; he has been charged with attempted rape and is awaiting trial (journal).<sup>167</sup>




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#### Notes

\* UNDP/NY, USA.

Note: Unless otherwise indicated, reference number refers to entire preceding paragraph.

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