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Certification in Latin America: Experience To Date

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CERTIFICATION IN LATIN AMERICA: EXPERIENCE TO DATE

Ronnie de Camino and Marielos Alfaro

SUMMARY

Based on a study of certified forest management units in Central America, and a detailed case study from Brazil, this paper presents some of the positive and negative aspects of certification as experienced by the various actors involved. There is growing interest in certification across Central America and initiatives to define nationally-appropriate criteria and indicators are being established in many countries. It is clear that it is generally the most innovative forest owners who have become certified. For most, sustainability was already a key objective for their forest management so that the additional cost involved in becoming certified was marginal. The process of certification promoted by the Forest Stewardship Council is generally seen as a useful one, resulting in improvements to technical forest management, better relations with workers and with local authorities, and access to new markets. Nevertheless, the process is also criticised for being too dominated by Northern certification bodies with the quality of certification teams being variable from one place to another. The increasing competition between certification bodies raises questions about the potential conflict between running a business and maintaining consistent standards of certification. Other issues raised concern the perceived dominance of a Northern conservationist paradigm (both amongst NGOs and donors) which is seen to put environmental interests above business reality, is reluctant to assist private forest companies in becoming certified, and would prefer no operations in primary forest to be certified.

INTRODUCTION

Certification of forest management and chain of custody are becoming increasingly important tools for ensuring the sustainable management of forest resources in Central America and Mexico and for improving market access. The first part of this paper draws upon a study (Camino and Alfaro, 1997) in which interviews were held with 90 different actors involved in certification in Costa Rica, Panama, Guatemala, Honduras, Nicaragua and Mexico.

The actors identified were: certified forest management units, governments and their forestry institutions, accredited certification groups, forest product buyers, NGOs and civil society organisations, universities and research centres, technical cooperation projects and the international institutions supporting them, and the forest management certification system centred around the Forest Stewardship Council (FSC).

For each group of actors, recent experience highlights a number of both positive and negative aspects of certification. These are summarised in Table 1. While positive experiences can be used as a foundation for

Table 1 Positive and negative experiences of certification of different actors in Central America and Mexico

Actors	Positive experiences and opportunities	Constraints
Forest Management Units	Certified FMUs are innovative and have high standards of forest management Certification has generally not been a difficult process Certification adds credibility and improves the technical aspects of forest management Certification improves social stability Certification improves competitiveness in a variety of ways Certification is perceived to be gaining in credibility	Certification is seen to be expensive Variable quality of certification groups Unrealistic expectations of the benefits of certification The effect of political and economic instability on certification Maintaining the reputation of the label Standards applied to projects
Governments	The number of national initiatives is growing Governments see certification as an opportunity for improving forest management	Lack of government control over timber extraction Uncertain role of governments in certification Few links between forest sector incentives and certification Lack of wholehearted support from governments for national processes
Certifiers	Making certification accessible Increasing experience of certification	National criteria and indicators weak on aspects such as equity and biodiversity Lack of commitment to ITTO's 'Target 2000' Conflicts between certification and business ethics
Product buyers	Buyers are more interested in certified products	Inappropriate use of the green label Demand limitations
NGOs and Civil society	Role as promoters and guarantors of certification Role as regulators	Non-representative positions taken by NGOs
Universities	Some training in certification	Certification is not yet widely taught Universities as certifiers Lack of suitable research
Technical cooperation projects	Development of good forest management techniques Different forms of support to certification	Conditionality
FSC	Growing international credibility Progress in the development of principles, criteria and indicators Ability to resolve conflicts	Limited accreditation Lack of capacity-building

development, negative experiences should also be seen as an opportunity for correcting problematic situations and for formulating improved management strategies. Care should be taken when interpreting or trying to generalise from the experiences outlined in this paper as only certified Forest Management Units were interviewed .

The second part of the paper presents a more detailed discussion of a single case study, the Precious Woods Mil Madereira Itacoatiara project in Brazil, and its experience of certification.

PART I – EXPERIENCE OF DIFFERENT ACTORS IN CENTRAL AMERICA AND MEXICO

FOREST MANAGEMENT UNITS

Positive experiences and opportunities

Certified groups are innovative and have high standards of forest management

Those Forest Management Units (FMUs) in Latin America (and probably in the rest of the world), which have achieved certification, undoubtedly have above-average management practices both in natural forests and plantations. It tends to be the most innovative groups which have succeeded in translating sustainable forest management from theory into practice. They have achieved this through a willingness to take risks and make possibly expensive commitments, whose benefits are not always certain at the time of certification.

The first company to achieve certified forest management in Central America was PORTICO in Costa Rica. PORTICO was probably the first company to apply the CELOS forest management system developed by the University of Wageningen in Suriname at an operational scale (Bodegón and de Graaf, 1994). In recognition, it received the Tropical Forest Foundation Award for its contribution to the practical application of experimental silvicultural methods. A more recent recipient of the award was the Precious Woods Mil Madereira project in Brazil, which is described in detail in the second part of this paper. These and other certified groups are highly motivated to undertake good forest management and can be an example for others working in similar conditions.

Certification has generally not been a difficult process

Most of the certified FMUs in Central America and Mexico had already undergone a long and intense process of improving forest management practices before applying for certification. In the case of certain companies (such as PORTICO, Mil Madereira and Futuro Forestal) this was because they had sustainability and good management amongst their objectives, while various community-based groups (e.g. the *ejidos* in Quintana Roo) had been receiving long-term support from aid agencies and NGOs to improve their forest management. Very few of them, therefore, had to make serious technical, ecological or social changes to meet conditions for certification. The changes required depended to a large extent on the type of FMU concemed, with companies tending to be weaker on social aspects and community-based groups needing to improve technical and ecological aspects. Overall the survey showed that adequate techniques and solutions already exist in the economic, ecological and social fields to facilitate good management. For those

companies and communities which have been adopting these for many years, the additional investments required to comply with certification requirements are fairly minor.

Certification adds credibility and improves the technical aspects of forest management

Even for FMUs which had to make few changes, the process of obtaining certification led to technical improvements in forest management, particularly environmental ones. These lend credibility to the management practised by such companies, resulting in a medium-term positive impact on their competitiveness. Typically they include:

- Improvement in the quality of inventories;
- Reduction of the environmental impact of felling;
- Setting aside of conservation areas and biodiversity reserves, sometimes of up to 26% of the forest area;
- Landscape management;
- Better pollution management;
- Protection of watersheds and control of erosion;
- Improved disposal of forest and industrial waste;
- Protection of wildlife and control of hunting;
- Diversification of production, including a greater number of timber species and certain non-timber products;
- Use of a greater variety of species, particularly indigenous ones, for reforestation;
- Greater control of forest boundaries.

An interesting by-product of certification is that certified FMUs often begin to undertake more research, to demonstrate the sustainability of their management strategies. This includes:

- Establishment of permanent sample plots in natural forest to determine growth rates and species composition as well as the impact of felling on the remaining forest;
- Research in forest plantations including species and provenance trials;
- Wildlife studies;
- Studies on the impact of exploitation on watersheds, fauna, flora and soils;
- Studies on the potential for production and marketing of non-timber forest products;
- Establishment of systems to monitor the economic, ecological and social factors assessed in certification.

The possible additional costs initially associated with certification later become an investment resulting in better planning, work organisation and working conditions, and lower long-term management costs. Research by FMUs leads to a continuous improvement of the quality of their own forest management as well as contributing to the general body of knowledge on sustainable forest management. Relations between certified FMUs, and the environmental and forest authorities have improved considerably with the result that they run a much lower risk of having their operations halted due to legal infractions.

Certification improves social sustainability

It is often a surprise for private companies applying for certification to find out that certifiers are interested not only in the environmental aspects of forest management but also in the social and economic ones. In part, this is due to their often incomplete understanding of what sustainability involves. However, for the most part, companies have reacted well to the social requirements imposed upon them, which include:

- Compliance with social laws, including payment of social costs for workers;
- Reviewing the agreements between contractors and workers in order to guarantee compliance with social laws;
- Investment in staff training;
- Improved health and safety conditions including the use of protective clothing, the presence of first aid teams, etc.;
- Improved relations with neighbours, including resolution of land tenure disputes;
- Average salaries higher than elsewhere in the region;
- Better quality social facilities (e.g. schools, sport fields, health units).

Better social conditions guarantee work stability and higher levels of satisfaction, substantially decreasing the incidence of labour conflicts. They also lead to an improvement in relations between the FMU and local health and education authorities.

Certification improves competitiveness in a variety of ways

Although the main objective of certification is to achieve forest conservation through proper management, FMUs are motivated by a variety of factors to apply for certification:

- The desire of Northern-based companies and their local subsidiaries to demonstrate to host governments and to public opinion in their own countries, that they take forest conservation seriously and intend to make a practical contribution to sustainable forest management;
- The increased possibility of selling shares and obtaining capital for expansion if management is seen to be of a certain standard;
- Reasons of prestige and operational stability – certification greatly reduces the likelihood that local authorities will cancel operation permits due to management irregularities;
- To gain positions in green markets. PIQRO, for example, sells laminated parquet to the US market where its purchasers required FSC certification. Consequently it now obtains its raw materials from four certified *ejidos* in Quintana Roo and has also obtained chain of custody certification;
- To diversify production, creating markets for new species. Buyers are often prepared to accept lesser-known timber species if these are certified. Thus COATLAHL de La Ceiba in Honduras has moved from producing 80% mahogany and cedarwood in 1991 to only 25% now, leading to much greater flexibility in its silvicultural management;
- To obtain higher prices for their timber which may, depending on the species and the market, fetch 15-20% more than timber from uncertified forests.

Certification is perceived to be gaining in credibility

The area of certified forest in Central America and Mexico is still marginal relative to the total forest area. Currently there are only ten certified FMUs (see Table 2) covering nearly 173,000 hectares, representing 0.2% of Mexican forests and 0.3% of Central American forests. Nevertheless, since the total number of certified FMUs in the world is only around 60, Central America and Mexico are clearly in the forefront.

Even though certification is still in its infancy, most of the groups surveyed have faith in the FSC system and the quality of management

Table 2 Certified forest management units in Central America and Mexico

Name	Country	Kind of project	Area
PORTICO	Costa Rica	Natural forest	3,900
FUNDECOR	Costa Rica	Natural forest and chain of custody	15,000
TUVA Foundation	Costa Rica	Natural forest and chain of custody	750
Tropical American Tree Farms	Costa Rica	Forest plantations (*Tectona grandis*)	no data
Ston Forestal	Costa Rica	Forest plantations (*Gmelina arborea*)	15,000
FLOR y FAUNA	Costa Rica	Forest plantations (*Tectona grandis*)	3,500
PDBL	Honduras	Natural forest	25,000
PIQRO and Plan Piloto Forestal in Quintana Roo	Mexico	Natural forest and chain of custody	86,215
UZACHI	Mexico	Natural forests, pine forests	24,191
Futuro Forestal	Panama	Secondary forests	26
Total			**173,482**

in certified forests. They note the fact that all interest groups may be members of the FSC, and believe that its system of accreditation of international certification bodies gives the system independence and therefore greater credibility. Those who have obtained certification regard the process as having advantages beyond the purely economic. Most of the actors involved in the process think that certification should continue to be voluntary although some feel that market demand and a desire for certain rights and privileges are gradually making it compulsory, *de facto*.

Constraints to certification

Certification is seen to be expensive

It is often argued that the initial costs of certification are very high, leading to a loss of competitive advantage, but little attempt has been made to analyse how these costs may vary with size of forest area (ha) or levels of production (m^3). Table 3 shows that the cost of certification per hectare can vary from US$0.55 to US$21, with the cost being inversely proportional to the size of the area certified.

Based on the figures in Table 3 and the authors' knowledge of annual production in some of the FMUs concerned, the cost per cubic metre of roundwood produced can be estimated at between US$0.26 and 1.1, and for the smallest FMUs costs may even approach US$4.26 or more. These figures are consistent with others reported in the literature (FAO *et al.*, 1997). For small FMUs the main problem is one of cash-flow and finding funds to cover the initial costs of certification. If they are producing for the internal market, certification may increase their costs per m^3 by 50%. As one of the interviewees stated, certification for small FMUs may cost more than purchasing a second-hand tractor – and it is easier to see the advantages of a tractor than of certification!

Variable quality of certification teams

This is not a general constraint but has caused real problems in a few cases in which certification bodies have not selected team members well. Problems include:

- Team members who do not speak Spanish;
- Team members who are not familiar with the social or technical reality of the units they are supposed to certify (e.g. not knowing the main species being harvested);
- Teams with little experience of timber production imposing unrealistic conditions, eg. the reduction of soil compaction to below what is technically feasible;
- Foreign team members in charge of verifying social aspects who do not have an adequate understanding either of the host country's particular social context or of its indigenous and local populations.

Table 3 The cost of certification (in US$) in six natural forest areas of Latin America

Initial cost of certification	Annual cost of certification	Area (ha)	Cost per hectare (US$)
8,000	2,000	750	21.33
10,000	2,000	1,500	12.00
45,000	2,500	6,300	8.73
30,000	2,000	14,900	2.55
12,000	2,000	25,000	0.80
36,000	2,000	80,000	0.55

Note: Although these data are derived from specific cases, they cannot be named in order to avoid breach of confidentiality.

For certification to remain credible it is very important that everybody concerned should have confidence in the ability of the certifying teams. Although it is also important to keep the costs of certification down, there is a danger that trying to save on the cost of the team may result in differing levels of quality depending on the ability to pay of the FMU applying to be certified.

Unrealistic expectations of the benefits of certification

Certain FMUs applying for certification think that they will immediately get higher prices for all their products and that they will be able to sell a much wider range of species. Such short-term expectations are unrealistic as there are cases of forest owners not receiving any concrete benefits from certification. It remains to be seen whether the medium-to-long-term expectation that it will soon be impossible to export uncertified timber is well-justified or not. Even where a good market for certified timber exists, it may not be an easy one to supply. Many of the big European importers and producers, for example, want to be assured of a regular supply of certified wood. Others are unable to stockpile and want to receive timber 'on demand'. Working with such clients means that it is necessary to hold a large stocks, implying higher financial costs.

The effect of political and economic instability on certification

Most countries in the region suffer from political and economic instability, with the situation being particularly difficult in the natural resources sector. Businesses are unwilling to make commitments and incur the additional expenses of certification when the lack of well-defined policies leaves them uncertain about future government actions. Potential problem areas include:

- Provisions for moratoria on particular species without taking into account the quality of forest management of different FMUs;
- Felling regulations which vary from year to year;
- Bureaucratic obstacles which make it difficult to obtain a permit;
- Inflexibility of forest management arrangements, such as the fact that area-based management schemes prevent managers from adjusting production to market conditions (e.g. cutting more than planned when the market is good and vice versa);
- The generally negative attitude of forest services towards private business;
- The lack of clear means of establishing a dialogue with the government.

Maintaining the reputation of the label
In order to maintain the certification system's credibility, all actors have to set themselves, and other participants in the chain, very high standards. The FSC must remain vigilant, inspect every certification process carefully and make its control mechanisms known. The main problems include:

- Certifiers who focus on straightforward technical aspects of forest management and avoid discussing more difficult issues like expected yields and prices or administrative costs;
- Ambiguous use of the certificate and the label, e.g. by not dispelling the misguided belief that chain of custody is included in forest certification;
- Lack of understanding by the users of how certification works, including the belief that a certificate applies for ever and cannot be withdrawn;
- Competition among different certification bodies in order to obtain contracts, with some actively discrediting their competitors and even going so far as to guarantee certification *ex ante* in order to obtain contracts;
- Conflicts of interest where, for example, an NGO which is supporting an FMU in its attempt to obtain certification also provides members of the certifying team.

Standards applied to the projects
Some FMUs believe that the levels of requirements and some of the conditions for certification are too high, and that some of the deadlines for meeting those conditions are totally out of touch with reality. Certifiers frequently forget that sustainability is a process which is attained through continuous improvements based on realistic levels. Furthermore, they may impose conditions which are beyond the FMU's individual capacity of action, such as detailed environmental impact assessments or studies into fauna and non-timber forest products which are better carried out by research institutes.

GOVERNMENTS

Positive experiences and opportunities

The number of national initiatives is growing
The FSC has produced guidelines for the development of national initiatives and certification standards, which can then be endorsed by the FSC. More and more countries in the region have now appointed FSC liaisons and established national working groups as a first step in the process of developing national criteria and indicators as a basis for evaluating forest management in their own country. Even without formal certification, such processes define standards which can be aspired to by any forest managers. They also increase the knowledge available about certification which can be an important contribution to improving national forest policies.

Governments see certification as an opportunity for improving forest management
Government forest services are aware that certified FMUs have high standards of forest management. They see generalised forest certification as a good way of progressing towards the improvement of national forest management. There is, however, little agreement about how to proceed, whether with more or less state participation or whether the current voluntary process should become compulsory.

Constraints to certification

Lack of government control over timber extraction
In most Central American countries, governments have no real control over timber extraction. Between 25% and 60% of felling is illegal and, even in areas with felling permits, management is kept to a minimum and there is little intention of abiding by the laws. Forest owners often use authorised fellings to clear an area for other land uses. For many forest owners illegal operation may appear to be advantageous as legal felling is controlled more closely, and the necessary procedures are lengthy and prone to pressures from government officials. The additional costs of certification are unlikely, therefore, to appear attractive unless a much more favourable climate for sustainable forest management is created.

Uncertain role of governments in certification
Some forest administrations in the region believe that the State must control certification and, furthermore, that it should be the certifier. However, since forest administrations have been unable to halt deforestation, both in areas with and without exploitation permits, it seems unlikely that they could correctly administer a system that must be technically sound and have national and international credibility. While the State clearly has a role to play in promoting the process of certification, it should not control the process and certainly not act as a certifier.

Few links between forest sector incentives and certification
Most of the region's governments have developed different systems of incentives with varying success. These include tax concessions or subsidies for reforesting and managing planted forests, but very few incentives for natural forest management. Although reforestation rates have increased, incentives have had a series of problems such as:

- Lack of resources for people to gain access to incentives;
- A discretionary basis for some incentives which has led to an abuse of the system;
- Uncertainty about the periods of validity and total value of incentives;
- Lack of defined goals and objectives for the incentives.

Owners generally do their best to profit from incentives without necessarily improving their forest management. As yet, there are no moves to link incentives to certification as a condition of good forest management.

Lack of wholehearted support from governments for national processes

As mentioned above, there are several initiatives to establish national standards for good forest management. However, although all countries are participating through their governments in the definition of regional standards, many governments have a very indifferent attitude towards the national processes of definition of principles, criteria and indicators. Even though the FSC prefers civil society initiatives with minimum government participation, the lack of resources in the region means that government promotion and facilitation of the process nevertheless remains very important.

CERTIFIERS

Positive experiences and opportunities

Making certification accessible

Certification organisations accredited to the FSC have been very imaginative in developing solutions to make certification accessible to their clients. One mechanism is group certification, in which the costs are shared by several FMUs which are certified in the same process with an NGO acting as a guarantor. Another mechanism is for FMUs to obtain financial help from one of a wide range of donors interested in supporting sustainable forest management. Certainly it seems that, in the current stage of the process of certification, those businesses or groups meeting the criteria for certification can find financial help to partially or totally cover their costs.

Increasing experience of certification

The Central American and Mexican region is home to a growing number of certified FMUs. Specialists from the region are also increasingly participating in the certification process itself. Although the five groups currently accredited by the FSC to carry out certification are all based in the North, several Southern groups (including ones from Argentina, Brazil and Costa Rica) have now applied for accreditation. Should they be successful, it is to be expected that they will have lower costs as well as a better understanding of the social, economic and ecological context of the countries in which they work.

Constraints to certification

National criteria and indicators are still weak on aspects such as equity and biodiversity

The FSC's certification system defines principles and criteria of general application. The different countries, on the other hand, are defining criteria and indicators applicable to their own conditions. Although several of these initiatives appear to be developing good indicators for the technical aspects of forest exploitation, they are still relatively weak on ecological and social indicators. In particular, they do not cover non-timber forest products and biodiversity. Nor are they sufficiently linked into international processes, like CIFOR's tests of different criteria and indicators, which might help to fill these gaps.

Lack of commitment to ITTO's 'Year 2000 Objective'

Discussions at the 1992 UN Conference for Environment and Development in Rio and the resulting Agenda 21 and proposal on forest principles have been among the main motivators of certification. At the same time, the International Tropical Timber Organisation (ITTO) established its 'Year 2000 Objective' which requires that, by the year 2000, countries that produce or consume tropical timber promise only to trade timber originating from sustainably-managed forests. Using this statement as a starting point, ITTO formulated its guidelines for natural forest and plantation management, while the FSC developed its principles and criteria. Sadly, adoption of ITTO's 'Year 2000 Objective' by governments has not been very widespread and parties are not legally bound. The real situation is that the South is not making much progress and the North is not providing support or taking the necessary steps to create the conditions for its achievement.

Conflicts between certification and business ethics

Certification is no longer an idealistic scheme but has become a fully-fledged business with all the accompanying problems of market tactics and quality assurance. Certifying bodies are becoming increasingly competitive and this raises the question of whether there may be a fundamental conflict between running a business and being a good certifier. Certification training in the region, for example, has been directed mostly by one of the certifier groups, leading to the promotion of their own system and the strengthening of their own certification network. While this is seen by some as an activity to promote better forest management, others see it as a straightforward business strategy to obtain an advantageous market position. Problems have also arisen where certifiers have begun to promote the commercialisation of certified products and have recommended buyers who have been unable to fulfil their commitments to producers. Overall, there is a growing perception among government officials, local producers and national NGOs that certification is a business profitable only for a few, mostly foreign, people, and is not yet sufficiently accessible for small groups and businesses from the South.

PRODUCT BUYERS

Positive experiences and opportunities

Buyers are more interested in certified products

The commitment to buying timber from well-managed sources is gaining strength internationally. 'Buyers' groups' promoted by the World Wide Fund for Nature (WWF) have been established in several European countries and the US and are committed to gradually purchasing only certified timber. Big furniture companies such as IKEA in Sweden have also been adopting policies of maximising their use of certified timber. National-level initiatives are also on the increase. Some market chains in Mexico, for example, are interested in supplying their furniture factories with certified wood in order to offer a different product to the Mexican consumer. Market studies in Costa Rica suggest that consumers are willing to pay 5-20% more for certified products (Soihet, 1994).

In addition to timber, there are also new markets for the environmental services guaranteed by the certification of good management. These include interest in carbon off-sets, advance sales of management plans, and small hydro-electric plants which rely on the natural fall of water (rather than dams) and therefore depend on good catchment management.

Constraints to certification

Inappropriate use of the green label

Certification was originally designed to

guarantee the good management of natural tropical forests. However, the increasing number of reforestation projects and the growth of the market for plantation timber, means that certification is also being applied to plantation forests. Unscrupulous advertising claiming that plantations can reduce the destruction of natural ecosystems may contradict the original spirit of the scheme and move attention away from the sustainable management of natural forests.

Demand limitations

Although demand for certified timber is active, this does not always imply that buyers are willing to pay a higher price for it. Other buyers – as has happened in Guatemala and Mexico – claim that inconsistent product quality and problems of product classification have left them unable to pay for the products they purchased. Another problem is that the proliferation of certificates and green labels promoted by businesses themselves, forest chambers and owner associations are leading to a loss of credibility for the FSC-supported scheme. It is important, therefore, that where regional governments support national certification schemes they do so with endorsement from the FSC.

Other potential problems arise from the fact that, depending on how certification is applied (e.g. whether voluntary or obligatory, whether for timber from all countries or only from the tropics), it may be argued to be a technical barrier to trade (see Paper 23b by Bass in this Mailing). As this may fall foul of the World Trade Organization, Buyers' Groups need to be careful in the demands they make.

NGOS AND CIVIL SOCIETY

Positive experiences and opportunities

Role as promoters and guarantors of certification

National and international NGOs and civil society organisations are playing a major role in the consolidation of the certification process. They are active in providing training, in obtaining funds for certification and in facilitating contacts between producers and buyers. Many group certification schemes are guaranteed by NGOs while other NGOs and Foundations have concentrated more on developing low impact forest management techniques. NGO specialists have participated in certification teams in Brazil and Central America, lending credibility to the system because of their detailed knowledge and field experience in forest management.

Role as regulators

Many NGOs have moved from their initial opposition to the system of certification to becoming FSC members. Certain international NGOs play an important role in monitoring certification processes and, on occasion, submitting objections to the FSC. The FSC and the certifiers must then clarify the situation, often leading to improvements in the environmental, social and economic standards of the FMU concerned. International NGOs, however, do not always have the same vision as those in the South, and there is a need for the FSC and its accredited certifiers to give more voice to national NGOs and civil society organisations.

Constraints to certification

Non-representative positions taken by NGOs

Some of the actors interviewed in this survey see certification as something alien to the region, almost as interference by Northern companies and NGOs in the natural resources management and conservation policies and actions of the South. This perception is largely due to the fact that all the accredited certifiers are from the North, much certification is financed by Northern NGOs, and that it is seen to benefit consumers in the North. Particularly problematic are the positions of some international NGOs which are perceived to be promoting the Northern conservationist paradigm above respect for national (local) and traditional values. The best way of overcoming these problems may be for these NGOs to join the FSC and express their grievances in a forum in which they can be examined and perhaps lead to improvements in the system.

UNIVERSITIES

Positive experiences and opportunities

Some training in certification

Universities and other training institutions are beginning to include certification, or the broader topic of criteria and indicators for sustainable forest management, in their teaching and training programmes. CATIE, for example, covers these issues in its Masters programme and in its short International Course on Forest Management. Also in Costa Rica, students of Forest Engineering (at the university and the technical institute) study certification as part of their syllabus. Both organisations and, individual university professors are also actively participating in the national and international debate on certification.

Constraints to certification

Certification is not yet widely taught

In spite of the progress made in Costa Rica, certification is still absent from the syllabuses of most universities and faculties of the region.

Universities as certifiers

In the case of Costa Rica, the universities and even CATIE have been considering – and have not yet ruled out – the possibility of becoming certifiers. Those in favour see it as a market opportunity at a moment when universities and research centres are facing financial problems. Others think of it as a constraint because it would take universities away from their traditional teaching, research and extension function. In either case there seems to be a justified role for individual staff members being involved in certification teams.

The lack of suitable research

Certification processes have highlighted how little information is available on the sustainability of the silvicultural practices currently in use. Universities and research centres are being approached by certifiers for information on plantation and natural forest yields, the impact of felling and harvesting operations, etc. It is important that research centres synthesise and disseminate information already available and plan their research to meet these new demands.

TECHNICAL COOPERATION PROJECTS

Positive experiences and opportunities

Development of good forest management techniques

Bi- and multilateral cooperation projects are contributing significantly to improvements in the quality and level of forest management in

the region. They have also contributed widely to the development of technical norms and administrative arrangements.

Different forms of support to certification
International cooperation projects have given valuable support to certification in the region and appear ready to continue to do so in the future. Their actions include funding the certification of specific FMUs and supporting the scaling-up of pilot initiatives to bigger regions, exploring new markets for timber and non-timber forest products from managed forests, and supporting the FSC. The recent joint 'Forests for Life' initiative between the World Bank and the WWF to promote certified forest management of at least 100 million ha of tropical forests by the year 2005 will give a boost to certification.

Constraints to certification
Conditionality
The activities funded through bi- and multi-lateral cooperation usually reflect donor priorities and may have conditions attached which compete with domestic natural resource management policies. Examples of conditionality include the reluctance of development agencies in Petén, Guatemala, to support private forest management companies even though community concessions are only able to manage part of the area. Both the World Bank and the Interamerican Development Bank have policies which prevent them from supporting commercial timber extraction in primary tropical forests. In general, international cooperation for the Amazon has tended to concentrate on non-timber forest products in extractive reserves and has ignored timber exploitation, limiting the options for forest management to those considered appropriate by the North.

FOREST STEWARDSHIP COUNCIL (FSC)

Positive experiences and opportunities
Growing international credibility
The FSC certification system has gradually gained a reputation as being reliable and independent. There is widespread approval across Central America and Mexico for the FSC's role as an accreditation organisation and as a supporter and guarantor of national criteria and indicators. The increasing support received by the FSC from the international system suggests that it is meeting the expectations of both North and South.

Progress in the development of principles, criteria and indicators
Different regions and countries have different ecological, social and economic conditions which make it necessary for them to adapt the FSC's principles and criteria. CIFOR has been particularly active in coordinating efforts in all the regions to compare the criteria and indicators used by different organisations. In coordination with the FSC, much effort is also being invested to clarify less well-known aspects of sustainable forest management such as social issues, biodiversity and non-timber forest products.

Ability to resolve conflicts
The FSC is a transparent institution with conflict resolution systems which permit NGOs, civil society organisations and communities to make complaints if they feel in any way affected by the certificates for which the system acts as guarantor. Their demands are channelled through the FSC to the certifying bodies and, if necessary, certificates may be reviewed or withdrawn.

Constraints to certification
Limited accreditation
As outlined above, in much of Central America, the accreditation system is seen only to be accessible to countries from the North and large organisations and companies. Regional groups lack the structure and economic size to become certifiers. More resources are needed to help Southern groups achieve accreditation.

Lack of capacity-building
Training in certification in the Central American region is dominated by a single certifier. Many of the regional actors feel that the FSC itself should provide more independent training which is not linked to a specific certifier's label. The provision of 'neutral' training is particularly necessary to support the various regional and national-level initiatives, in which the FSC has otherwise restricted its involvement in order to maintain its independence from government structures.

PART II – PRECIOUS WOODS/MIL MADEREIRA ITACOATIARA: A CASE STUDY OF FOREST MANAGEMENT AND CERTIFICATION[1]

Mil Madereira and Forest Management in the Brazilian Amazon

Precious Woods is a company which aims to demonstrate the profitability of producing multiple goods from the tropical forest in a sustainable manner for the benefit of its shareholders and employees, local communities, the consumer and the environment. In practice, this means that it wants to produce hardwood and other forest products in tropical countries through reforestation and sustainable management of natural forests.

Through its Brazilian company, Mil Madereira Itacoatiara (MMI), Precious Woods owns an area of 80,000 ha, located 200 km east of Manaus, capital of the Brazilian State of Amazonas. The property's name is 'Fazenda Dois Mil' or F2M. Present land use at F2M is shown in Table 4. The property constitutes a complete micro-watershed so ecosystem conservation is a high priority. As can be seen in Table 4, 30% of the area is earmarked for conservation, some set aside as an absolute conservation area and the rest consisting of areas too fragile for forestry (steep slopes, lowlands, along water courses) in production compartments.

The management plan prepared for F2M was approved by IBAMA, the Brazilian Institute for the Environment and Renewable Natural Resources. The plan was improved beyond the requirements of IBAMA to meet the company's own high standards. Based on this plan, and on current operations, forest management was certified by the FSC-accredited Rain Forest Alliance in July 1997. Forest management at F2M is based on the CELOS system, developed in Surinam by a team of scientists from the University of

[1] This part of the paper is based on a presentation by Ronnie de Camino to the 'First Latinamerican Conference on Forest Certification' which took place at CATIE, 8-9 December, 1997.

Wageningen (see de Graaf, 1986), adapted by INPA (Brazil's National Institute for Research in the Amazon) to the conditions of the Brazilian Amazon, and adapted again to the specific conditions of F2M's forests by the foresters in the company. Table 5 shows the details of how the sustainable management concept is applied.

The management concept contains the following elements:

- Based on the inventory, the volume of all timber species with a dbh over 5 cm is 290 m^3/ha.
- The volume of commercial species with a dbh greater than 50 cm is 80 m^3/ha.
- The average planned logging volume is 35 m^3/ha, with a maximum of 40 m^3/ha. For each individual species, logging is limited to 80% of the commercial volume. Average annual growth rates have been estimated at 1.6 m^3/ha which would allow for a maximum of 43 m^3/ha to be logged every 25 years.
- The cutting cycle was set at 25 years, which is the term estimated for the forest area to recover its original volume after logging.
- At present, there are 65 species with market potential, of which only 28 currently have an export market.
- The forest is divided into 25 compartments of 2,700 ha each, with an average of 700 ha set aside for conservation and 2,000 ha for timber production.

The most important forests activities are as follows:

- An *Operational inventory* is carried out in the next compartment to be harvested. This consists of a complete survey of all commercial trees with a dbh greater than 50 cm. Each tree is marked with a number, its species and dbh are recorded and its location is marked on a map. The data are processed with software which pre-selects the trees to be harvested and generates a logging map for use by the field crews.
- The *Opening of roads* consists of the creation of a systematic, permanent network of logging tracks, 100m apart, yielding a road density of 80 linear m/ha. About 14 km of main roads are constructed for each compartment of 2,000 ha and one log yard is made for each 60 ha of forest.
- *Tree felling* starts by verifying if the computer-selected tree should be felled. Factors taken into account include whether or not the tree is hollow, its proximity to other trees, and the size of the gap its felling is likely to cause. If the tree is not suitable, it is replaced by an unmarked commercial tree located nearby. Felling is then carried out using power saws and wedges to fell the tree at an angle to the road and in a direction which causes the least damage to the remaining trees. Felling yields an average of 17 trees per crew per day.
- *Pre-hauling* is carried out with a Track Skidder, especially designed for low-impact extraction, combined with a winch to haul logs from the forest onto the logging tracks. About 35 logs can be extracted per machine per day.
- *Hauling* of the pre-hauled trees from the side of the road to the log yard is carried out by a Skidder with low pressure tires to avoid excessive soil compaction. 45 logs can be transported per machine per day.

Table 4 Present land use at F2M

Present Use	Area (ha)	Percentage (%)
Forest Area for Wood Production	50,000	63
Conservation Area	24,726	30
(Absolute Conservation Unit)	(5,164)	
(Conservation Areas in the Production Compartments)	(19,562)	
Deforested Area before 1993 (purchase of the property by Precious Woods)	5,845	7
Total	**80,571**	**100**

Source: Guerreiro (1996)

Table 5 Principal guidelines for sustainable forest management at F2M

Time	Activity
4 years before the first harvest	Definition of the list of commercial species. General forest inventory (0.1% intensity). Delimitation of the production area and the conservation area.
3 years before the first harvest	Topographical measurement of the area. Preparation and approval of the forest management plan.
2 years before the first harvest	Analysis of the topography and establishment of the harvest compartments and the road network. Delimitation of the planning units (10ha) in the first compartment. Inventory of 100% trees of the commercial species with dbh greater than 50cm in the compartment to be harvested; individual location of the trees mapped. Establishment of permanent plots for growth studies and follow-up of harvesting impact on the remaining forest. Cutting of vines if necessary. Construction of roads.
1 year before the first harvest	Analysis of inventory data and computerised selection of the trees to be harvested. Planning of the harvesting activities.
Year of the first harvest	Opening of the systematic network of logging roads. Logging and transportation of the lumber to the industry.
1 year after the first harvest	First monitoring of permanent plots after logging. Logging impact on the remaining forest.
Every 3 to 5 years later	Measurement of permanent plots: impact recovery, survey of future trees, measurement of regeneration. Planning and implementation of silviculture: cutting of vines, liberation of future trees, thinning to concentrate the growth of the desired species and individuals.

Source: Guerreiro (1996)

- *Permanent plots* are delimited and measured before and after felling to assess volumes, the impact of logging, growth rates, and to plan silvicultural activities.

F2M has a sawmill with a processing capacity of 70,000 m^3 of logs. Production is 35,000 m^3 of sawnwood per year but the aim is to increase transformation efficiency from the current 45% to 60%, thus bringing yearly production to 42,000 m^3. Unlike in other areas of the Brazilian Amazon, F2M has no high-value timber species such as *Swietenia, Cedrela* and *Carapa*. Commercialisation of products may, therefore, be more difficult. Nevertheless, the company has invested in a kiln drier, a wood processing plant for the production of semi-finished and finished products such as doors and windows, and expects to export 85% of its production with the remainder being sold on the local market.

The main differences between the Precious Woods system and traditional loggers are summarised in Table 6, while Table 7 shows the different impact of the two systems on the forest.

Precious Woods expects to attain an Internal Rate of Return of about 16%. This level of profit, however, is dependent on many variables, including:

- The size of the harvest – extracting less than the planned 35 m^3/ha would have a strong negative impact;
- The efficiency of conversion from logs to products;
- The proportion of processed wood and the proportion of exported wood;
- The price of the products;
- The possibility to sell lesser known species without which harvest volumes of 35 m^3/ha may not be attainable.

In addition to its own direct profits, Precious Woods also contributes to maintaining the balance of CO_2 in the atmosphere. A sustainably-managed forest avoids the emissions associated with deforestation since the area is maintained as forest. By providing local employment, it also helps to reduce the pressure on neighbouring forest areas.

THE EXPERIENCE WITH CERTIFICATION

Why Certification?

Precious Woods aims to carry out sustainable forest management. Certification is an important confirmation for its shareholders, local people and consumers, that the company is achieving its aims. Certification also implies that, unlike many forest enterprises, Precious Woods fulfils the requirements of Brazil's forestry, environmental, social and economic legislation. This has been fundamental in enabling the company to establish collaborative relationships with the forest authorities, to the extent that F2M is considered a model of good forest management. While a spirit of cooperation would be preferable, certification has also at least permitted the development of a 'neutral' climate between the company and environmental NGOs, who are otherwise opposed to any kind of commercial intervention in humid primary tropical forest.

Certification contributes to Precious Woods' favourable external image by guaranteeing the good business and forestry practices of the company. In the case of Precious Woods, this is particularly important in relation to its

Table 6 Different approaches to management of primary tropical forest

Precious Woods Model	Traditional Model
Aim of business is to achieve sustainable development in the economic, social and environmental sense.	Aim of business is to make money. Sustainable development is only a concern if required by legislation.
The Forest Management Plan is a tool for optimising activities in the field.	The Forest Management Plan is simply a legal requirment to obtain a felling licence.
The planning of activities is essential. The same amount of money is invested in planning as in the purchase of land and forest.	There is basically no planning of activities, other than the maximum possible volume at the lowest cost.
Harvest volumes are limited by forest growth rates and by the concern that not one species in the forest should disappear.	The harvest is concentrated on the most valuable species, with no consideration of their continued presence.
The cutting and extraction system has a limited impact on the forest.	The cutting and extraction system has a great impact on the forest.
Personnel are properly trained to increase efficiency and reduce the impact on the forest. Safety standards are high.	Personnel learn on the job with the aim of obtaining the highest yields, regardless of impact. Personnel safety is very poor.
Forest management includes silvicultural operations such as cutting vines, thinning and liberation, in order to favour the trees of the most valuable species.	No silvicultural operations are carried out.
Research is carried out to follow-up on the methods used.	No research.
Transparency and the promotion of the model are important goals: training and technical assistance are provided to third parties.	Training not provided to own personnel nor third parties. Competition is more important than transmitting appropriate techniques.
High management standards mean that the forest activities can be certified.	No interest in certification as it is considered an unnecessary cost.
Aim to have a permanent social impact by trying to transfer technologies to forest-owning communities and enable them to reap their own benefits.	Social concerns limited to the legal minimum.

Table 7 Impact of different forest management systems: results of a trial by FAO

Variable	Precious Woods Model	Traditional Model
Harvest in m^3/ha	38.50	114.60
Time for felling a tree in minutes	21.41	17.59
Volume per tree felled in m^3	7.08	5.57
Productivity in m^3/hour	19.76	17.92
% of production compartments with damage after felling	28.30	52.40
% of area occupied by skid trails	4.53	19.87
% timber losses during harvesting	3.90	8.50
Sum of canopy gaps of felled trees in %	10.80	24.70

Source: adapted from Winckler (1997)

shareholders, public opinion in Switzerland (from where it receives most of its capital) and the Swiss Co-operation Agency (which provided critical political and financial support). A good external image is also a crucial factor in giving the company a competitive advantage in a market like Europe, which has high environmental standards, and in helping it find a stable group of loyal clients.

Selection of the Certification Body

At the time of application, there were four FSC-accredited certification bodies. Precious Woods asked all four to prepare a proposal to certify its operation in Brazil. It then entered into a process of negotiation with those certifiers who offered the best conditions. An issue of particular concern was the selection of the certification team. This should include people with practical experience in forest management (where possible in the private sector), scientists and people with NGO experience, as well as having an understanding of the local social, economic and environmental context. The team should also combine senior national specialists with international specialists. Although none of the original four proposals was satisfactory in this respect, Precious Woods was able to negotiate an ideal team with ecology specialists from a research centre, forestry and social science specialists from a Brazilian NGO, and a specialist in low-impact logging (with many years of experience in Brazil) from an international NGO.

Given the size of the forest area to be certified, cost considerations were not critical in this case. It should be noted, however, that problems may arise when certifying groups offer to cover the costs of certification through funding from third parties. This can leave the company very dependent on the certifier and reduce its ability to make demands on its certification team. Another important issue is that certifying bodies should clearly explain the details of their certification procedure as these may differ from one to another. The FMU should be fully aware of the requirements to which it is signing up.

The certification process itself

The certification process for Precious Woods was very thorough. The procedure, including its voluntary nature, was explained through the local press and radio. Local communities and people and institutions linked to the company were asked for their opinions about the company, its relations to workers and surrounding communities, and its silvicultural methods. A public hearing, open to all possible stakeholders, gave an opportunity for any concerns to be raised. The balanced make-up of the certification team allowed adequate consideration of the economic, ecological and social aspects of forest management. The result was a set of realistic preconditions and conditions for Precious Woods to fulfil in a time-frame that took account of the gradual nature of the process.

The costs of being certified

The costs of being certified consist of the costs of sustainable forest management as well as the costs of the certification process itself. With respect to sustainable forest management, the reality is that the costs need not be higher than those of 'traditional' forest management. Improved forest management does have higher planning costs (eg. more detailed inventories, better planning of roads, control of felling and extraction) as this is the key to sustainability. These costs are compensated by higher yields and lower costs of forest operations, a better seasonal distribution of harvesting and therefore more consistent supplies for any processing industries, better labour relations due to the possibility of guaranteeing permanent jobs, etc. In the case of Precious Woods, the cost of bringing logs to the sawmill (including silvicultural treatments) is around US$32-35 per m^3.

For a company which has planned for sustainable management from the outset, the costs are not unexpected. The costs are likely to be far greater for a company trying to make the switch from traditional 'exploitation'. However, given that sustainable management is fully within the law, such companies may find that their costs are compensated by a reduction in fines and a lower risk that forest authorities close down their operations.

The costs of the certification process itself are inversely proportional to the area of the forest management unit and to the harvest volume. In medium size operations, the certification costs do not, therefore, represent a high proportion of the total costs. Nevertheless it is advisable for companies with no tradition of good forest management to have a prior evaluation carried out before applying for formal certification. This evaluation should be carried out by experts not related to the certifying body and should recommend the major changes that must be made before certification is likely.

Probable benefits of certification for MMI

Internal relations

MMI now has excellent relations with the environment and forestry authorities. This has facilitated the processing of the paperwork associated with obtaining annual harvest permits. Good forest management and compliance with the law meant that it was not one of the 60% of forest management units which had their operations provisionally cancelled after an evaluation by IBAMA in early 1997. Instead it was able to continue providing wood to the local market. In November 1997, when a neighbouring company was fined more than US$ 1 million, the resulting scarcity of sawnwood in the local market gave MMI a further advantage.

Being certified has increased the national credibility of MMI. As many of its operations are unique and have no precedents, IBAMA has been flexible and permitted experimentation. Indeed, many of MMI's forestry procedures (such as logging maps) are now beginning to be adopted as the general rule by IBAMA.

External relations

At present, there are only a few certified tropical forest operations so Precious Woods has had no difficulty in finding clients. In particular it has been able to sell certified wood to official consumers in Europe like port authorities and counties, cities and federal states. Some of these consumers originally boycotted the purchase of tropical timber and later adopted ITTO's 'Year 2000 Objective'. Since there is currently not much certified wood available from the tropics, they can become stable clients in the future and are able also to pay higher prices.

Price advantages

Competition in the tropical timber market is intense. Although end consumers may be willing to pay higher prices for certified tropical timber, the majority of intermediaries (major wood importers, producers of final goods) continue to prefer cheaper non-certified timber. There is, however, a growing group of buyers who want to work exclusively with certified timber and are willing to pay a price bonus as high as 15%.

Lesser known species

One of the most serious problems for tropical forests from the marketing point of view is the large species diversity. Precious Woods, for example, has 35 species represented in commercial quantities. This makes it difficult to find buyers, many of whom prefer to stick to a few well-known species. Fortunately, markets for certified wood appear to be more open to the introduction of lesser known species.

Some problems arising from certification

A company in the limelight

It is perhaps ironic that a company like Precious Woods is continually asked to justify its operations, on the one hand by international NGOs and, on the other, by forest owners who practise traditional logging. Certification has put Precious Woods into the limelight so that any mistake it makes will inevitably be the focus of much critical attention. In part this is because many NGOs would prefer primary tropical forests to remain completely untouched. Precious Woods hopes to promote collaboration with the NGO community through its transparent and open access policy. In 1997 it received the Tropical Forest Foundation Award for its exemplary work in forest management and this kind of recognition is important in encouraging continued efforts towards improved management.

Demand for information versus information as an asset

There is a great demand for information from national and international NGOs, bilateral and multilateral agencies. However, this is rarely matched by a willingness to reciprocate in some way. There seems to be little interest in cooperating on, or co-funding, activities that are of general or scientific interest, or in helping to overcome short term cashflow difficulties. MMI, for example, has gathered, and continues to gather, large amounts of important and unique information that could form the basis for further research. Its geographic information system, which includes references to individual trees, to inventory and harvest information, and to reasons why particular trees were rejected during harvesting, etc., is an important asset for the company. The availability of such background data could save a great deal of time in ecological, social and economic research. Precious Woods is willing to make this information available but researchers should expect to pay their own costs and, where possible, help to cover the investments already made by the company.

Who earns most from certified products?

In cases where certified timber is sold at a premium price, most of the differential remains in the hands of the importer rather than with the forest owner. Thus, if $1m^3$ of a certain species is priced at US$500 with a price bonus of 10% if certified, the owner of the unit gets a bonus of US$50/$m^3$. The buyer, however, produces a product priced at US$2000/$m^3$ so that the 10% bonus for certification amounts to US$200. The largest proportion of the bonus goes to the intermediary and not to the forests.

THE FUTURE FOR CERTIFICATION

A number of divergent interests will determine whether certification fulfils its potential of bringing a large proportion of tropical forests under sustainable management. One of these is the extent to which countries adopt ITTO's 'Year 2000 Objective'. At present the trend is far from clear. Patchy adoption is likely to lead to market asymmetry and increased competition between certified and uncertified products. Even if 'Year 2000 Objective' is more widely adopted, it does not establish certification as the mechanism for guaranteeing sustainable forest management.

Another important factor is the extent to which there is more dialogue between governments and the FSC. As outlined above, the FSC is designating liaison persons in countries and is supporting the development of national initiatives to define appropriate criteria and indicators for forest management in each country. These national criteria and indicators can then be reviewed and endorsed by the FSC for use by the accredited certification bodies. It seems, however, that some governments and official institutions have distanced themselves from their national processes and, in some way, do not acknowledge the FSC. It is important that any such conflict be discussed openly and frankly before it leads to a weakening of the certification system and a loss in consumer confidence.

Finally, and perhaps most importantly, is the need to promote improved forest management with strong political decisions and appropriate action. An example of this is the joint World Bank/WWF 'Forests for Life' initiative. In a world in which the global consequences of individual actions are well known, however, it is not enough simply to make declarations if these are not supported by implementation funds. Transforming traditional forest exploitation into good management requires funding through investments, price premiums or proper valuation and payment for the associated environmental services. The multilateral and regional funding institutions need to move from restrictive policies to proactive ones that help finance good forest

management initiatives by communities and private enterprises alike. The reactive policies that dominate today translate into a lack of action, which carries a high environmental cost. Making certification a condition for access to capital from institutions like the World Bank and the Interamerican Development Bank could be an important mechanism for supporting sustainable forest management.

REFERENCES

Bodegón, A.J. & de Graaf, N.R. (1994) Sistema CELOS de Manejo. *Werkdocument IKC Natuurbeheer* No. 65, Forestry Department, Wageningen Agricultural University, Wageningen, The Netherlands.

Camino Velozo, R. de, & Alfaro Murillo, M. (1997) La certificación forestal en Centroamerica. A report for the consultancy Recursos Tropicales Naturales, commissioned by the USAID-funded PROARCA/CAPAS project in Guatemala, December 1997.

FAO, CCAD and CCAB-AP. (1997) Certificación de productos Forestales en Centroamérica y el Efecto en su Comercialización. Background document for a workshop on 'Criteria and indicators for sustainable forest management in Central America', Tegucigalpa, Honduras, 20-24 January, 1997. Comisión Centroamericana de Ambiente y Desarollo (CCAD), Central American Council for Forests and Protected Areas (CCAB-AP) and FAO, Rome.

Graaf De, N. R. (1986) *A Silvicultural System for Natural Regeneration of Tropical Rain Forest in Surinam.* Wageningen Agricultural University, The Netherlands.

Guerreiro, C.A. (1996) Sustainable forest management. General Information. Internal document, Mil Madereira Itacoatiara/ Precious Woods, Manaus, Brazil.

Soihet, C. (1994) Conocimiento, aceptación e implicaciones de la posible aplicación de un sistema de certificación de madera en el manejo sostenible de los bosques de Costa Rica. MSc thesis, CATIE.

Winkler. (1997) Environmentally sound forest harvesting: Testing the applicability of the FAO model code in the Amazon in Brazil. Precious Woods/FAO, Rome.

WWF/WB (1997) Información cinjunta de prensa no. 27. WWF, Gland.

ACRONYMS

CATIE	Centro Agronómico Tropical de Investigación y Enseñanza
CIFOR	Centre for International Forestry Research
dbh	Diameter at breast height
F2M	Fazenda Dois Mil (MMI's forest in Brazil)
FAO	United Nations Food and Agriculture Organization
FMU	Forest Management Unit
FSC	Forest Stewardship Council
IBAMA	Brazilian Institute for the Environment and Renewable Natural Resources
ITTO	International Tropical Timber Organisation
MMI	Mil Madereira Itacoatiara (Precious Woods' Brazilian company)
NGO	Non-governmental organisation
WB	World Bank
WWF	World Wide Fund for Nature

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