

STANDING TALL:  
EXEMPLARY CASES  
OF SUSTAINABLE  
FOREST  
MANAGEMENT  
in Latin America and  
the Caribbean



GDCP-INT-006-SPA Project

In search of Exemplary Cases of Sustainable Forest Management in Latin America and the Caribbean.



Food and Agriculture Organization of the United Nations



Junta de Castilla y León, España

Compilation and drafting: César Sabogal y Jessica Casaza

Spanish edition: Nelson González

English edition and translation: Julián Dowling

Graphic design and layout: Guillermo Grebe

Photographs: A. Vitale, M. Muriel, S. Mahadeo Singh, L. Chauchard, M. Segur, F. Carrera, C. Alvarado, J. Herrero, M. Morell, V. Outon, H. Moreno, C. Sabogal, P. Bholanath, G. Marshall.

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## PREFACE

Forest cover continues to be lost in Latin America and the Caribbean at a worrying pace, contributing to the poverty that persists in the region. The alarming figure of four million hectares of native forest cleared annually in Latin America between 2005 and 2010<sup>1</sup> is evidence of this trend. But this figure does not include forest degradation, which is caused mainly by changes in land-use practices using the powerful weapon of fire.

The important economic, social and environmental consequences of deforestation and forest degradation are hard to quantify. At the same time, the economic value of a forest's many positive externalities apart from its direct or tangible benefits are difficult to measure and forest conservation is generally not considered a generator of future income.

This problem is the result of various factors including the general lack of political awareness about the goods and services generated by forests, poor land management, disputes over land ownership, population growth and weak governance.

But the contribution of forests to mitigating rural poverty is indisputable. The Buenos Aires Declaration at the XIII World Forestry Conference in October 2009 was emphatic in affirming that "forests play an important role in alleviating poverty." However, this function needs to be better documented since most of the benefits of forests for poor families are experienced at a subsistence level and are therefore not included in national statistics.

The important contribution of forests to the economy is also underestimated since only a fraction of the real benefits derived from them are measured and included in national accounts.

According to recent FAO studies, the practice of sustainable forest management has not been widely applied in Latin America and the Caribbean where the concept exists more in theory than in practice. This is partly due to lack of information, making it difficult to obtain an overall vision of forest management in the region based on the few cases encountered.

This publication aims to address this problem by collecting, analyzing and reporting exemplary cases of good forestry management. It includes examples of forest management techniques and practices used in different contexts and conditions throughout the region, highlighting the factors that facilitated their success so that others may follow their example. The book is also designed to help lawmakers create and strengthen forestry policies at different levels of government in Latin America and the Caribbean, while pointing out the major challenges that still must be faced.

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<sup>1</sup>Global Forest Resources Assessments (FRA 2010)

The book is based on a FAO study that began in 2007 following recommendations by the Forestry Commission for Latin America and the Caribbean (COFLAC in Spanish). At its 2010 meeting, the Commission suggested that publishing the study's results would make them more widely accessible, especially considering that 2011 has been declared the International Year of the Forests. The Commission also fully supported a proposal for a second phase of the project that will include more forest management cases in the region with an emphasis on training and exchanging knowledge and experiences to strengthen the application of sustainable forest management at a national level.

We hope that the publication of this book will promote the development of sustainable management practices in the region. But the application of such practices still depends to a large extent on the economic, political and cultural frameworks at a national level, which ultimately determine the balance between forest conservation and conversion, environmental protection and wood production, silviculture and agricultural activities.

Ultimately, the meaning of sustainable forest management goes beyond the problem of deforestation and reforestation. It has to do with the needs of people who live in rural communities to maintain and increase the variety of services and economic benefits provided by a healthy forest to improve their quality of life.



Eduardo Rojas- Briales  
Assistant Director-General  
Forestry Department



José Graziano da Silva  
Regional Representative for Latin America  
and the Caribbean

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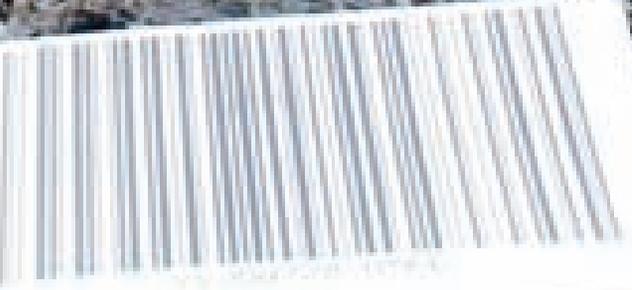
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# INTRODUCTION

The diversity of forest management experiences in Latin America and the Caribbean shows that sustainable forest management is achievable and can be a highly competitive option in a variety of contexts. Communities, companies, NGOs and the state itself, which owns most of the forests in the region, have applied techniques and practices that have kept forests standing while at the same time obtaining economic benefits and contributing to global wellbeing. Some of these cases have made more progress than others towards sustainability and should serve as a guide for similar initiatives throughout the region and the rest of the world.

The exemplary cases of forest management and cases with exemplary aspects that are discussed in this book indicate a paradigm shift in the region regarding natural resources management. Gone are the days when volume and price were the only things that mattered. Today, the regional vision is characterized by concern for the environment, better organization and social inclusion. The cases that have been organized, documented and validated in this study demonstrate how the challenges of forest management can be met to achieve economic, social and environmental benefits. The evidence that forests can be managed by applying sustainability criteria in different contexts, on different scales and by different actors shows that good management can reduce deforestation, fight poverty and maintain environmental services. The cases presented here, as well as the many other undocumented cases that exist in the region, serve as inspiration to create new forestry policies that mitigate the impact of climate change.

Readers will discover how and why these exemplary cases have achieved outstanding results in one or more dimensions of sustainable forest management as a unit or landscape scale. Drawing on the wealth of experience accumulated in this study, these are the key concepts:

- There is no one model or recipe for sustainable forest management, rather different tools and practices which, if adapted to a specific situation, scale and context, can help achieve this goal.
- Developing good forest management practices requires a strong social organization and business structure to ensure competitiveness and profitability, fair distribution of income, and respect for the functions that sustain forest life.
- Processes that promote social inclusion and a sense of ownership contribute to sustainable forest management and should be incorporated into public policies.
- Forest management helps protect land from destructive and illegal logging while ensuring legal certainty for investors.
- Forest management is a powerful conservation practice that is helping to reduce rural poverty and protect the forest's natural processes and services.

The majority of cases in this book are about forest management programs run by local communities. In nearly all these cases, organization was the first step towards community involvement and successful forest management. Designing an organizational structure according to the context, characteristics and scale of each program is an important challenge. One of the contributions of this study is to show the different kinds of organizations that have been successful.

Land ownership is an important factor in the use and management of natural resources. Some cases show that the expansion of agriculture and cattle grazing into forest areas could be avoided through local partnerships that balance production, conservation and human needs. Many families in rural areas have learned the value of forest conservation, which should translate into the creation of public policies and changes in the legal framework that benefit small-scale rural producers.

## Changing forest management concepts

The forest is the source of a variety of products and services including wood and non-wood products and services as well as social, economic and cultural opportunities. In Latin America and the Caribbean, natural forest has traditionally been used to produce wood products without much regulation or control, resulting in forest degradation and conversion of forest land to other uses<sup>2</sup>.

This situation is mainly due to political and institutional factors (like the lack of harmonization between sectorial policies and the limited capacity for action of forest administration entities), economic factors (the rising demand for wood and fuel internationally and price fluctuations) and social factors (migration and conflicts of various kinds that lead to expansion of cattle grazing). Although not often included on this list, the traditional focus of Latin American forestry education programs on inventories, harvesting and silviculture, rather than the social, economic and institutional aspects of forest management has also played a role.

It is mainly in the last two decades that the outlook of forestry professionals, and the public in general, has changed to include a broader concept of forest management and its contribution to sustainable development. Forest management theory is based on an integrated vision of the land and the forest's multiple uses with the aim of achieving sustainable production of goods and services while improving the quality of life for people. This type of management has become known as *Sustainable Forest Management* (SFM).

Today there is greater awareness about how forest management as a process must be constantly adapted to meet new objectives. This includes flexibility to adapt to different cultural and economic contexts. This model is known as *Adaptive Forest Management*<sup>3</sup>, which is based on existing resources and knowledge, but evolves as it develops to meet new goals while always adhering to the SFM principles.

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<sup>2</sup>A study of forest cover in Latin America and the Caribbean between 1990 and 2005 (FAO/FRA 2005) estimated that the average annual net loss was over four million hectares. The main causes include the expansion of the agricultural frontier, unsustainable production and the consumption of firewood and coal.

Given this view of forest management as a gradual learning experience, the expression “good forest management” is used due to the difficulty in implementing the “sustainability” component of SFM.

The sustainable management concept should be understood as an ideal state which must be reached through different levels with increasing demands depending on the country, region and the actors involved (Pedroni and de Camino 2001).

But there is still no consensus about SFM, or even good forest management, since the actors have different expectations and perceptions, methods of evaluation and even ways of reporting their progress towards sustainability. In other words, the definitions are relative and always depend on the context, the actors and the conditions in each case.

*Exemplary forest management* is even more difficult to define. The purpose of this book is to highlight cases in which the concept has been correctly applied. This is reflected both in the conditions of the forest and in the benefits generated for its owners and society in general. The aim is that these cases serve as a reference and inspiration for the management of forests with similar conditions. Even in those cases in which the concept of sustainable management has not been fully implemented yet, the organization responsible has clear objectives and aims to work towards this goal.



## Natural forest management in Latin America and the Caribbean

There are few examples of natural forest management systems in Latin America and the Caribbean. The FAO (1993) reported that in 1989 there were no large-scale sustainable management programs in tropical broadleaf dry and humid forests. The report said that, despite numerous research and development projects in the region, in the majority of countries forest management existed only in theory and was rarely put into practice. More than a decade later, although there was some progress, this was not very significant. FAO (2001) reported that in 14 Latin American countries only three percent of the total forest cover was under formal management, and even these were not classified as exemplary cases. Meanwhile, the progress in terms of forest area certification reached eight million hectares.

In 2001, Brazil and Bolivia were amongst the ten countries with the greatest area of certified forest in the world. In 2010, however, deforestation continues at a rate of four million hectares a year in the region (FRA 2010).

<sup>3</sup>Adaptive Forest Management is defined in The Dictionary of Forestry (Helms 1998) as “a dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used, along with research results, to modify management on a continuing basis to ensure that objectives are being met.” On the other hand, the Center for International Forestry Research (CIFOR), which has worked for years on this concept applying it to tropical forests, defines AFM as “a value-adding approach whereby people who have interests in a forest agree to act together to plan, observe and learn from the implementation of their plans while recognising that plans often fail to achieve their stated objectives. Adaptive Forest Management is characterised by conscious efforts among such groups to communicate, collaborate, negotiate, and seek out opportunities to learn collectively about the impacts of their actions.”

SFM can be defined, applied and evaluated through a series of principles, criteria and indicators. Different organizations have developed their own criteria based on the type of forest, scale, and products amongst other factors. Measuring environmental, socioeconomic and institutional factors allows organizations to evaluate their progress. The same criteria and indicators (C&I) can be applied in the identification and evaluation of exemplary cases of forest management.

## **Study aims and objectives**

There are many forest programs and projects in Latin America and the Caribbean considered cases of good management by the parties involved, but these are not well known beyond a small group of people. These cases should be studied and evaluated based on common criteria and characteristics determined by a team of experts so that lessons may be learned from them. The conclusions and recommendations resulting from these projects could help promote the adoption of SFM throughout the region.

There are numerous forest management publications that are linked to projects or experiences of interest to a specific group. Studies have also been done on the state of forest management at a national or regional level, or for a certain type of forest, with different objectives. However, this information is usually very general and used only in isolated cases, which makes it difficult to obtain a comprehensive vision of forest management in the region.

In 2006, the Forest Commission of Latin America and the Caribbean (COFLAC in Spanish) proposed to identify, document and describe examples of exemplary forest management practices in the region. The project began in February 2007, overseen by the Chile-based FAO Regional Office for Latin America and the Caribbean and FAO's former Forest Resources Development Service (FOMR).

The main objective of the project was to strengthen policies and the application of SFM at various levels of decision-making and policy implementation in Latin American and Caribbean countries, through the identification, description and analysis of exemplary management practices in the region. The project also aimed to show the main challenges and alternatives in different conditions and contexts.

Given that Latin American and Caribbean countries tend to be at different stages of forest management progress, the study aimed to identify a range of diverse experiences, compare them, and promote SFM through case studies that clarify the concept and show how it can be applied in different contexts.

## Evaluating excellence in forest management

A key reference for this study on sustainable forest management cases in Latin America and the Caribbean is a project by the Asia-Pacific Forest Commission (APFC), titled "In Search of Excellence: Exemplary Cases of Forest Management in the Asia-Pacific Region." This project was coordinated by the FAO Regional Office for Asia and the Pacific and the Regional Community Forestry Training Centre for Asia Pacific (RECOFTC). The results of the study were published in a book (Durst et al. 2005).

That study's main objective was to highlight the cases of good forest management in different countries, with the aim of educating the public about the feasibility of managing forests in a sustainable way and also to counter the negative opinion in some sectors about forest management. The intention was to document different cases and challenges, and learn from real-life experiences by interviewing people involved in forest management (Durst et al. 2005). The study helped improve the understanding of the common elements that comprise good forest management. It tried to identify forests where the actors involved overcame basic challenges in their daily lives. In more advanced cases, it found more sophisticated solutions developed in response to more complex problems. In both types of situations the study identified aspects of good management.

The experiences revealed common aspects of good forest management and how these can be implemented. These aspects became the basis for creating a reference model of forest management that would promote its many benefits.

The main results of this study are presented in this book, which is available in print and online. The book is aimed mainly at forestry professionals, NGO, universities, environmental authorities and politicians involved in making forestry policy at different levels as well as managers and professionals from forest organizations, companies and institutions.

The FAO Regional Office for Latin America and the Caribbean maintains a database with the cases nominated for the study and information and photographs that are available on the project's website: <http://www.rlc.fao.org/es/bosques/manejo/>

Finally, the project developers plan to organize two workshops in the region to identify the lessons and best SFM practices based on a comparative analysis of these cases.

The book is divided into three parts: the introduction; a description of the cases; lessons that can be learned from the analysis of the cases and final conclusions.

## Study methodology

The study was done in four stages. The first stage involved the definition of the criteria and indicators (C&I) for the evaluation and selection of the exemplary cases, as well as designing a form to nominate cases.

As mentioned previously, SFM can be defined and evaluated according to a series of principles, criteria and indicators (PC&I), or standards. Various organizations have made efforts at different levels to develop standards that allow an objective evaluation of progress towards sustainability. These standards have been used for multiple purposes: the monitoring and evaluation of forest management projects; auditing management operations; management certification; designing and establishing biological corridors; evaluating ecological restoration and the impact of policies on forest management (Pokorny et al. 2001, Louman et al. 2005, Morán et al. 2006). This study has used the standards to identify and evaluate exemplary forest management cases in the region.

The most relevant and widely used standards for Latin American tropical and temperate forest are those developed by the International Tropical Timber Organization (ITTO 1998, 2003) and the Pan-European and Montreal processes. The C&I model developed by the Center for International Forestry Research (CIFOR 1999), which has been adapted for use in some Latin American countries, is also included in the analysis. Another widely used international standard was developed by the Forest Stewardship Council (FSC), which is an international association with the power to certify forest certification companies. At the regional level, there are two relevant initiatives; the Tarapoto Proposal (TCA 1995, Toledo 2001) and the Lepaterique Process (Blas Zapata 2001).

By comparing the principles and criteria used in these different standards, common conditions, characteristics and aspects were obtained (see Table 6, Appendix 1).

By analyzing these common aspects, a consensus about the C&I to be used in the study was achieved at workshops for forest management experts from Central America and the Caribbean (CATIE, Costa Rica, July 2007) and South America (FAO Regional Office for Latin America and the Caribbean, Santiago, Chile, November 2007).

A call for nominations of forest management cases then went out targeted at the public and private forestry sectors, NGOs, associations, cooperatives, and municipalities in Latin America and the Caribbean. For this purpose, a database of over 500 contacts was used with ads places on websites, various organizations and at the FAO's own regional office.

The second stage involved the reception and classification of the nominations, followed by analysis and selection of the exemplary cases by the Iberoamerican Panel of Experts created by the FAO in consultation with Latin American forestry directors in the COFLAC framework. The evaluation was based on the C&I standards defined in the workshops and later revised and adjusted by the panel, which created a set of Minimum Criteria of Exemplariness (MCE) and an evaluation methodology in coordination with the project's technical team.

In the third stage, each case selected by the panel was validated in the field and documented based on the C&I standards.

Finally, the fourth stage involved the publication of this book, its dissemination throughout the region and events to analyze the findings and lessons learned. This final stage is aimed at stimulating debate and discussion so that the ideas, methods and practices used in the selected cases are considered by those with forest management responsibility at different levels of decision making.

The study methodology, references and other related aspects can be found in Appendix 1.



Ibero-American Panel of Experts and the project's technical team



Forest workers of the Guaraya community of Cururú, Bolivia

# FOREST MANAGEMENT: THE REGIONAL CONTEXT

## Forest resources

Latin America and the Caribbean has 22% of the world's forest cover spread over an area comprising 14% of the earth's land area, which is home to 7% of the world's population.

The total forest cover in the region is almost 860 million hectares. Of these, 831.5 million are in South America (97%); 22.41 million in Central America and 5.97 million in the Caribbean (FAO 2009).

The region's deforestation problem has existed for decades. Between 1990 and 2005, 64 million hectares were lost or 7% of the total forest cover. Although this occurred mainly in countries with the largest amount of forest cover, in percentage terms the loss is very significant, especially in Central America which has one of the highest deforestation rates in the world (1% annually between 2000 and 2005).

The pressure on forests is expected to intensify due to population growth and economic development. The region's population, which is estimated at around 480 million, could increase to 540 million by 2020, 83% of whom will be living in cities. The impact of globalization, including a growing number of trade and investment agreements with emerging Asian economies, will continue to have an impact on forest management in the region. Forests will also feel the pressure from export-based industrialization policies and the rising world demand for beef, wood and, increasingly, biofuel products.

The forestry sector has increased its contribution to income and employment in most of the region. The contribution of forestry activity to the region's Gross Domestic Product (GDP) has increased steadily from US\$30 billion in 1990 to US\$40 billion in 2009 (FAO).

The FAO's 2009 State of the World's Forests report highlights the role of policies and institutions in Latin America and the Caribbean:

A pluralistic institutional environment has emerged with government, the private sector and civil-society organizations having an important role in forest resource management.

Of particular interest to forestry are:

- *Decentralization, particularly recognition of the rights of local and indigenous communities to manage natural resources.*
- *Greater private investment in managing natural and planted forests.*
- *Substantial incentives contributing to the rapid growth of planted forests, including low-interest loans and tax breaks.*

- *The growing role of local, national and international civil-society organizations in forest issues, including rights for indigenous communities, forest certification and combating illegal logging and forest clearance – with special focus on Amazon forests owing to their global significance for biodiversity conservation and climate change mitigation.*

This description summarizes the political and institutional context that has developed in the region, giving rise to many of the successful initiatives which are presented in this book.

## The state of forest management

The recent political and institutional changes in the region have facilitated important progress in forest management, conservation and sustainability. Governments and consumers of forest resources have discovered new benefits and opportunities in the forest that were previously unknown.

The percentage of native tropical forests under management in the region is still very low. A report by the International Tropical Timber Organization (ITTO) indicated that just 6.47 million hectares, or 3.5% of the total forest cover in Latin American and Caribbean countries, was under management in 2006.

This small percentage that is under management uses harvesting cycles as short as five years, which according to international norms is too short for the sustainable management of the forest.

Considering this restriction, the percentage of forests under sustainable management is actually much lower than previously thought and the situation much worse. Voluntary management certification schemes have failed to resolve this problem.

The importance of natural forests in the production of wood products is falling due to the increase in forest plantations, but they are still important in some countries. Natural forests are mainly managed through private long-term concessions on relatively small areas up to 200,000 hectares (e.g. Bolivia, Guyana and Suriname).



The Amazon basin covers about 6.5 million hectares, of which 5.5 million hectares is shared between nine countries with a total population estimated at 33.5 million, including 21 million living in cities (UNEP 2009).

The main threats to the Amazon rainforest, and the way of life it supports, come from extensive cattle grazing, soya production, wood extraction, infrastructure and the oil and gas industry. Although some of these threats are intrinsically linked to globalization, the extractivist activities that affect the forest and its way of life are mostly determined by national policies. These policies have evolved in the last few decades, but became more complex in the late 1980s when economic benefits, conservation, and the rights of rural people began to compete with each other.

Source: De Jong et al. [2010].

In most of these concessions, selective extraction of timber is the main objective. However, little attention is paid to post-harvesting silviculture and unregulated harvesting that causes forest degradation.

Natural forest harvesting is still strongly oriented towards timber production. In the case of non-wood forest products (NWFP), the majority of these are used for local subsistence living, although some products are sold in local and international markets as raw material to make diverse products like cosmetics and pharmaceuticals.

The impact of deforestation on environmental services (biodiversity, water regulation, climate change mitigation and ecotourism) is the focus of increasing international attention. Although policies and laws have been the main instruments of conservation, the region is the first in the world in the adoption of market-based approaches, especially payment systems for environmental services (PSA in Spanish). Some initiatives could be expanded, but wide scale adoption depends on overcoming issues such as property rights, concerns about rural land expropriation, lack of confidence in the privatization of water supplies and insufficient information about the link between land use in the upstream and downstream parts of the valley (Dillahectares et al., 2007, cited by FAO 2009).

Some obstacles to sustainable management of the region's natural forests are (FAO 2009):

- Scarce adoption of reduced-impact logging because of weak incentives.
- Limited area of certified forests because of the high costs and absence of a price premium, especially with the availability of low-priced illegally procured timber.
- Ownership disputes from overlapping land tenure and illegitimate titles encouraging illegal logging and land conversion, especially in the Amazon.
- Diseconomies of scale for small community-managed concessions, especially those remote from markets.
- Preponderance of the informal sector (especially illegal logging and wood-processing units).

Given these obstacles, the challenges facing sustainable forest management in the region are huge. For example, there has been a significant increase in the intensity of wood extraction in the Amazon but this has not been accompanied by an improvement in the quality of operations (the majority of forest operations still do not apply good management practices, Sabogal et al. 2006) and much less by improved conditions for workers and their families. In most cases, the forest is simply abandoned after harvesting without any form of management. Illegal logging is still a threat that is difficult to eradicate, especially in areas along the agricultural frontier, with important economic, social and environmental implications. In addition, community forest management initiatives often suffer from weak organizational, management and technical capacities, as well as from external problems due, for example, to a legal framework that does not consider their reality (Sabogal et al. 2008).

In 2006, the region had 12.5 million hectares of forest plantations. Although this figure is only 5% of the total planted forest area in the world (FAO, 2006), the region is emerging as a leader in high productivity forest plantations. The area of planted forest is expected to grow to around 17.3 million hectares by 2020. Since these high productivity plantations meet most of the local

demand for firewood, they could play an important role in alleviating the pressure on natural forests and thereby allowing the generation of environmental services that are so important for society.

These observations, which are valid to a greater or lesser extent for all of Latin America and the Caribbean, should be the starting point to resolve the problems that persist in many countries and to help face important challenges, especially in terms of strengthening public institutions.

Only 40% of countries in the region have a specific forestry policy and their institutional frameworks tend to be complex and of variable quality. Forestry institutions in general have limited power with 40% of them dependent on agriculture ministries, 17% on environment ministries, and 43% on other ministries or state departments. The forestry sector's contribution to GDP is generally underestimated by accounting procedures that consider only a fraction of the real income generated by forests and related services.

Clearly more investment, stronger institutions and the implementation of integrated forestry policies could improve the situation in the region's forests. By improving research and education while supporting small landowners, governments can generate forestry innovation that promotes sustainable forest management based on respect for the many goods and services provided by forests.



Directional felling in the management area, Empresa Manoa, Brazil



Distribution of nominated forest management cases

# PRESENTATION OF CASES

## Overview of the selection process

A total of 41 forest management cases were nominated from 15 countries in Latin America and the Caribbean: Argentina, Bolivia, Brazil, Colombia, Costa Rica, Chile, the Dominican Republic, Ecuador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Peru, and Trinidad & Tobago (see Figure 1).

For the selection process, 11 *minimum criteria of exemplariness* (MCE) were used including key aspects of successful forest management including social, economic and environmental conditions. The standards applicable for each condition were used to measure one or more characteristics of the nominated cases (Appendix 2).

The Iberoamerican Panel of Experts used this evaluation process to choose “exemplary cases” and “cases with exemplary aspects.” An “*exemplary case*” is a case in which forest management has been implemented according to the sustainability criteria (some cases achieved this goal to a higher degree or level than others) and the CME standards. Meanwhile, a “*case with exemplary aspects*,” is defined as an example of forest management that is outstanding in one or more of the evaluation categories. These cases are distinguished by an original or innovative aspect of forest management so that others may learn from them.

The study began with the analysis and classification of cases based on the information submitted. Cases identified as “exemplary” then passed to the next stage in which they were checked and documented by professionals in the field to complete the process of analysis and selection. Forest management cases identified as having “exemplary aspects” were not visited in the field, but were examined based on available documentation and consultation with the nominees.

While the methodology facilitated the selection of cases classified as “exemplary” and their later validation in the field, the study’s general aim was to highlight the best, or most exemplary, aspects of the cases analyzed.

As a result of the evaluation and selection process, 22 exemplary cases and 13 cases with exemplary aspects were identified. Of all cases nominated, six could not be evaluated due to lack of information.

## **Characteristics of selected cases**

Of the 35 cases selected as either exemplary or with exemplary aspects, 16 are from Central America and the Caribbean and 19 from South America. The list of selected cases, grouped by region and country, can be found in Box 1 (Exemplary cases) and Box 2 (Cases with exemplary aspects). The type of forest, biome, organization responsible, management objectives and size of forest area is listed for each case.

Table 1. Exemplary cases by region, country and other characteristics.

CENTRAL AMERICA AND CARIBBEAN					
COUNTRY	Case name	Type of forest <sup>4</sup> and biome <sup>5</sup>	Organization responsible	Objective	Area
GUATEMALA	<b>San Andrés, Petén</b>	Broadleaf native forest Biome: S-bhf	Community association: <i>Asociación Forestal Integral San Andrés, Petén (AFISAP)</i> , through a concession granted by the State	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Non-wood products</li> <li>• Biodiversity conservation</li> <li>• Socioeconomic benefits for the community</li> </ul>	51,940 ha
	<b>La Gloria, Petén</b>	Broadleaf native forest Biome: S-bhf	Private company: <i>Baren Comercial</i> , through a concession granted by the State	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Forest restoration</li> <li>• Biodiversity conservation</li> </ul>	66,548 ha
	<b>Kobalchaj, Totonicapán</b>	Native coniferous 1 <sup>o</sup> +2 <sup>o</sup> + Forest plantations (spp. native) Biome: T-S-cf	Indigenous community association: <i>Asociación Parcialidad de Vicentes (ASPARVI)</i>	<ul style="list-style-type: none"> <li>• Forest harvesting</li> <li>• Reforestation</li> <li>• Protection of water resources</li> <li>• Socioeconomic benefits for the community</li> </ul>	815 ha
	<b>Tikonel, San Martín Jilotepeque</b>	Forest plantations (spp. native) + AFS + Native coniferous forest Biome: T-S-cf	Producers association: <i>Coordinadora Regional de Comités para el Desarrollo Integral Ambiental Tikonel Taq'che</i>	<ul style="list-style-type: none"> <li>• Recovery of productivity</li> <li>• Reforestation</li> <li>• Conservation of ecosystems</li> <li>• Better living standards</li> <li>• Developing the production chain</li> </ul>	83.2 ha
HONDURAS	<b>Gualaco y Guata, Olancho</b>	Native coniferous forest + Forest plantations Biome: T-S-cf	Community organizations (cooperatives): <i>Red Hondureña de Áreas Comunitarias Forestales de Gualaco y Guata (Red HACOFORG)</i> , with forest management contracts granted by the State	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Forest restoration</li> <li>• Protection of water resources</li> <li>• Socioeconomic benefits for the community</li> </ul>	39,542 ha
	<b>Copen, Colón</b>	Broadleaf native forest Biome: S-bhf	Community association: <i>Sociedad Colectiva Roberto Barahona y Asociados</i> , through a concession granted by the State	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Forest conservation</li> </ul>	4,149 ha

<sup>4</sup>Type of forest: Native forest (1<sup>o</sup> = primary or 2<sup>o</sup> = secondary); Forest plantations; Agroforestry systems (AFS); or a combination of two or more of these.

<sup>5</sup>Biome:

Subtropical broadleaf humid forest: S-bhf; Tropical broadleaf humid forest: T-bhf; Tropical and subtropical coniferous forest: T-S-cf; Tropical broadleaf dry forest: T-bdf; Subtropical broadleaf dry forest: S-bdf; Broadleaf and mixed temperate rainforest: B-M-trf.

## CENTRAL AMERICA AND CARIBBEAN

COUNTRY	Case name	Type of forest and biome	Organization responsible	Objective	Area
MEXICO	<b>Tezains, Durango</b>	Native coniferous forest. Biome: T-S-cf	<i>Ejido</i> with forest use rights and land tenure	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Forest restoration</li> <li>• Conservation of ecosystems</li> <li>• Forest conservation</li> <li>• Ecotourism</li> </ul>	26,038 ha
NICARAGUA	<b>Layasiksa, Región Autónoma Atlántico Norte</b>	Broadleaf native forest Biome: S-bhf	Indigenous community forestry company assisted by local professionals	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Forest restoration</li> <li>• Forest conservation</li> <li>• Improved quality of life</li> </ul>	4,664 ha
DOMINICAN REPUBLIC	<b>ADSEJO, San José de Ocoa</b>	Forest plantations (spp. native) Biome: S-bhf	Community organizations of El Derrumbado, El Tatón and La Cruz de Santana: <i>Asociación para el Desarrollo de San José de Ocoa (ADESJO)</i> , in partnership with the State	<ul style="list-style-type: none"> <li>• Forest harvesting</li> <li>• Reforestation</li> <li>• Protection of water resources</li> <li>• Socioeconomic benefits for the community</li> </ul>	300 ha
	<b>APA, Colinas Bajas</b>	AFS Biome: S-bhf	Producers association <i>Agroforestales de Zambrana-Chacuey (APA)</i> , with the support of an international NGO	<ul style="list-style-type: none"> <li>• Multiple uses (wood products, fruit and medicinal plants, tourism)</li> <li>• Biodiversity conservation</li> <li>• Socioeconomic benefits for the community</li> </ul>	875 ha
SOUTH AMERICA					
BOLIVIA	<b>Cururú, Santa Cruz de la Sierra</b>	Broadleaf native forest Biome: S-bhf	<i>Asociación Indígena Maderera Cururú, Comunidad Guaraya (AIMCU)</i>	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Forest harvesting</li> <li>• Socioeconomic benefits for the community</li> </ul>	26,421 ha
	<b>La Chonta, Santa Cruz de la Sierra</b>	Broadleaf native forest. Biome: S-bhf	Private company: <i>La Chonta Woods Ltda.</i> , through a concession granted by the State	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Adding value to forest products</li> </ul>	220,000 ha

SOUTH AMERICA					
COUNTRY	Case name	Type of forest and biome	Organization responsible	Objective	Area
BRAZIL	<b>Manoa, Rondônia</b>	Broadleaf native forest Biome: T-bhf	Private company: <i>Indústria de Madeiras Manoa Ltda.</i> , owner of the forest and wood processing plant	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Adding value to forest products</li> <li>• Forest conservation</li> </ul>	75,182 ha (60,689 ha under management for forestry production)
	<b>Orsa Florestal, Pará</b>	Broadleaf native forest Biome: T-bhf	Private company: <i>Orsa Florestal S.A.</i> , on privately owned land	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Adding value to forest products</li> <li>• Use of forest waste products</li> <li>• Generation of environmental services</li> <li>• Biodiversity conservation</li> </ul>	545,023 ha (456,546 ha, 83.8 % of the forest under management)
	<b>Iratapuru, Amapá</b>	Broadleaf native forest Biome: T-bhf	Community cooperative: <i>Cooperativa Mista de Produtores e Extrativistas do Rio Iratapuru (COMARU)</i> , with land use permits granted by the State	<ul style="list-style-type: none"> <li>• Non-wood products</li> <li>• Adding value to forest products</li> <li>• Biodiversity conservation</li> <li>• Socioeconomic benefits for the community</li> </ul>	21,380 ha
	<b>Klabin, Paraná</b>	Forest plantations (exotic) Biome: S-bhf	Private company: <i>Klabin S.A.</i> , owner of forest plantations in the Paraná Forestry Unit	<ul style="list-style-type: none"> <li>• Industrial wood production from the plantations</li> <li>• Non-wood products from native forest</li> <li>• Adding value to products from plantations and native forest</li> <li>• Forest restoration</li> <li>• Conservation of ecosystems</li> </ul>	265,748 ha
	<b>“Roberto Bauch”, Pará</b>	Broadleaf native forest Biome: T-bhf	Research and development NGO: <i>Instituto Floresta Tropical</i> , on land owned by a forestry company	<ul style="list-style-type: none"> <li>• Serve as a demonstration area for reduced impact harvesting and good forest management</li> <li>• Research and development</li> </ul>	(131,761 ha of forest plantations and 103,301 ha of conservation areas)

## SOUTH AMERICA

COUNTRY	Case name	Type of forest and biome	Organization responsible	Objective	Area
CHILE	<b>Forestal Aysén, Aysén</b>	Forest plantations (coníferas exóticas)  Biome: B-M-trf	Private company: <i>Forestal Mininco S.A.</i> , owner of the land and the plantations	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Adding value to forest products</li> <li>• Forest restoration</li> <li>• Forest conservation</li> </ul>	22,560 ha (16,055 ha of plantations and 6,505 ha of protected native forest)
	<b>Mapu Lahual, Osorno</b>	Broadleaf native forest  Biome: B-M-trf	Indigenous association <i>Mapu Lahual</i> , includes land owned by communities and individuals in the Community Parks System	<ul style="list-style-type: none"> <li>• Multiple uses (dead wood, non-wood products)</li> <li>• Conservation of ecosystems</li> <li>• Ecotourism</li> </ul>	60,000 ha (45,000 ha with forest)
COLOMBIA	<b>Chinchiná, Caldas</b>	Broadleaf native forest 2° + Forest plantations + AFS  Biome: T-bhf	Producers association <i>Agroforestales (AGROFORESTAL)</i> and local government (municipality), through the <i>Forestry Project for the Chinchiná River Basin (PROCUENCA)</i>	<ul style="list-style-type: none"> <li>• Generation of environmental services</li> <li>• Forest restoration</li> <li>• Biodiversity conservation</li> <li>• Socioeconomic benefits for the community</li> <li>• Research and development</li> </ul>	12,697 ha (almost 8,000 ha of natural or secondary forest)
PERU	<b>Aserradero Espinoza, Madre de Dios</b>	Broadleaf native forest  Biome: T-bhf	Private company: <i>Grupo Aserradero Espinoza</i> , through a concession granted by the State	<ul style="list-style-type: none"> <li>• Industrial wood production</li> <li>• Adding value to forest products</li> <li>• Non-wood products</li> </ul>	81,129 ha
	<b>El Choloque, Lambayeque</b>	Broadleaf native forest  Biome: T-bdf	Community association: <i>Comunidad Campesina de Tongorrape</i>	<ul style="list-style-type: none"> <li>• Multiple uses (wood products, non-wood products, beekeeping)</li> <li>• Rehabilitation of productivity</li> </ul>	1,027 ha

Table 2. Cases with exemplary aspects by region, country and other characteristics.

CENTRAL AMERICA AND THE CARIBBEAN					
COUNTRY	Case name	Type of forest and biome	Organization responsible	Objective	Area
COSTA RICA	<b>CODEFORSA, Alajuela y Heredia</b>	Broadleaf native forest + Forest plantations (spp. nativas) + AFS  Biome: T-bhf	NGO and producers association	<ul style="list-style-type: none"> <li>Sustainable management of forest resources</li> </ul>	3,000 ha of native forest and 2,000 ha of forest plantations
GUATEMALA	<b>ZA Reserva de Biosfera Maya, Petén</b>	Broadleaf native forest (1º y 2º)  Biome: S-bhf	Private company <i>Alimentos Nutri-Naturales S.A.</i> , A women's association producing Maya nuts	<ul style="list-style-type: none"> <li>Sustainable production of the Maya nut</li> </ul>	56 ha
GUYANA	<b>State Forest, Guyana</b>	Broadleaf native forest  Biome: T-bhf	State: <i>Guyana Forestry Commission (GFC)</i>	<ul style="list-style-type: none"> <li>Sustainable management of forest resources</li> </ul>	13.8 million ha
HONDURAS	<b>ESNACIFOR, Siguatepeque</b>	Native coniferous forest  Biome: T-S-cf	<i>Escuela Nacional de Ciencias Forestales (ESNACIFOR)</i> , on public land with private forest use	<ul style="list-style-type: none"> <li>Serve as a demonstration area for forest management</li> <li>Research and development</li> <li>Forest harvesting</li> <li>Use of forest waste products</li> <li>Recovery of productivity</li> </ul>	4,550 ha
MEXICO	<b>Parangaricutiro, Michoacán</b>	Native coniferous forest  Biome: T-S-cf	Indigenous community: <i>Nuevo San Juan Parangaricutiro</i>	<ul style="list-style-type: none"> <li>Sustainable forest management</li> </ul>	18,138 ha
	<b>San Pedro Jácuaró, Michoacán</b>	Native coniferous forest (2º)  Biome: T-S-cf	Indigenous community association: <i>Unidad de Explotación Forestal y de Usos Múltiples in the ejido of San Pedro Jácuaró</i>	<ul style="list-style-type: none"> <li>Wood production</li> <li>Sawmill industry</li> <li>Ecotourism and recreation activities</li> </ul>	1,750 ha

SOUTH AMERICA					
COUNTRY	Case name	Type of forest and biome	Organization responsible	Objective	Area
ARGENTINA	<b>Bosque Modelo, Jujuy</b>	Broadleaf native forest Biome: S-bdf	Public-private association: <i>Asociación Bosque Modelo Jujuy</i> y empresa <i>Juan Minetti S.A.</i>	<ul style="list-style-type: none"> <li>Biodiversity conservation</li> <li>Forest restoration</li> <li>Protection of wildlife, soil and water resources</li> </ul>	12,391 ha (3,035 ha under forest management)
BOLIVIA	<b>ASL San Antonio, La Paz</b>	Broadleaf native forest Biome: S-bhf	Community association: <i>Agrupación Social del Lugar (ASL) San Antonio</i>	<ul style="list-style-type: none"> <li>Sustainable management of forest resources</li> </ul>	14,986 ha
BRASIL	<b>Parque San Marcelo, Sao Paulo</b>	Forest plantations (spp. native) Biome: S-bhf	Private company: <i>Internacional Paper do Brasil</i>	<ul style="list-style-type: none"> <li>Biodiversity conservation</li> </ul>	187 ha
CHILE	<b>Las Colonias, Región de Los Lagos</b>	Broadleaf native and mixed forest Biome: B-M-trf	Group of small and medium-size forestry producers in the Las Colonias sector	<ul style="list-style-type: none"> <li>Production of timber and firewood</li> </ul>	350 ha
ECUADOR	<b>ASOKANUS, Morona-Santiago</b>	Broadleaf native forest Biome: T-bhf	Community association: <i>Asociación Artesanal Agroforestal KANUS</i>	<ul style="list-style-type: none"> <li>Sustainable wood production</li> </ul>	59,134 ha
PERU	<b>Communities and AIDER, Ucayali</b>	Broadleaf native forest Biome: T-bhf	Indigenous communities of the <i>shipibo-konibo</i> tribe, supported by the NGO AIDER	<ul style="list-style-type: none"> <li>Industrial wood production</li> <li>Non-wood products</li> <li>Generation of environmental services</li> <li>Improved quality of life</li> </ul>	34,631 ha
	<b>Communities and Venao SRL, Ucayali</b>	Broadleaf native forest Biome: T-bhf	Indigenous communities: <i>Unión de Comunidades Indígenas Fronterizas del Perú</i> ; and a private company: <i>Forestal Venao SRL</i>	<ul style="list-style-type: none"> <li>Industrial wood production</li> <li>Improved quality of life</li> </ul>	169,159 ha (141,623 under forest management)

Most of the selected cases are native forests (26 cases); 4 are forest plantations; 4 are a combination of native forest, forest plantations and agroforestry systems; and 1 is an agroforestry system only.

The cases can be classified as subtropical broadleaf humid forest (12 cases), tropical broadleaf humid forest (11 cases), coniferous tropical and subtropical forest (7 cases), Tropical and subtropical broadleaf dry forest (2 cases) and temperate forest (3 cases).

A summary of these characteristics is shown in Table 3.

**Table 3. Classification of selected cases by geographical region, forest type and biome**

FOREST TYPE / BIOME	CENTRAL AMERICA AND THE CARIBBEAN	SOUTH AMERICA
Total cases	16	19
<b>a) Tipo de bosque</b>		
Broadleaf native forest	6	15
Native coniferous forest	4	-
Forest plantations	1	3
Agroforestry system	1	-
Mixed (Plantation – Agroforestry system – Native forest)	4	1
<b>b) Biome</b>		
Subtropical broadleaf humid forest	7	5
Tropical broadleaf humid forest	2	9
Coniferous tropical and subtropical forest	7	-
Tropical broadleaf dry forest	-	1
Subtropical broadleaf dry forest	-	1
Temperate broadleaf mixed forest	-	3

The most frequent forms of property ownership, right of access and use of forest in the region are represented by the selected cases. The majority of cases of forest management are the responsibility of native communities or associations, community cooperatives or groups of local producers, including networks of community organizations. Eight cases correspond to forestry companies (some of which include partnerships with communities) and in two cases educational or research institutions are responsible (see **Table 4a**). There is one case in which the State is responsible for direct management (Guyana).

With regard to management objectives (see **Table 4b**), the production of wood on an industrial scale is the most common objective among the selected cases. Other objectives that appear most frequently are the generation of benefits for the communities, landscape restoration and conservation of biodiversity. In general, however, the selected cases include a wide range of objectives (21 in total) including nine with an economic-productive focus, five with an environmental focus, five with a social focus and two with an educational-research focus. Most cases have several objectives: half of them have four or even five objectives (productive, environmental and social), while at the other end of the spectrum three cases have only one objective: timber production.

The scale of management is variable from just 83.2 hectares of forest plantations and agroforestry systems under management by an association of small producers, up to more than half a million hectares of Amazon forest managed by a forestry company. One third of the cases are developed in areas with less than 5,000 hectares, while another third are in areas covering between 10,000 and 50,000 hectares. The largest areas correspond to cases of management by companies.

Table 4 a. Organization responsible for forest management in selected cases

SELECTED CASES							
	San Andrés						
	Forestal Aysén						
	Empresa Manoa						
	Roberto Bauch						
	La Gloria						
	Tikonel						
	El Choloque						
	San DiegoTezains						
	Guataco y Guata						
	Cururu						
	Reserva Iratapuru						
	Colinas Bajas (APA)						
	ADSEJO						
	Orsa Forestal						
	Klabin S.A.						
	Kobalchaj						
	Copen						
	La Chonta						
	Layasiksa						
	Chinchina						
	Mapu Lahual						
	Aserradero Espinoza						
	Communities and Venao						
	Communities and AIDER						
	ESNACIFOR						
	Bosque Modelo Jujuy						
	ASL S. Antonio						
	Parque S. Marcelo						
	Las Colonias						
	ASOKANUS						
	CODEFORSA						
	ZA Reserva Maya						
	Parangaricutiro						
	San Pedro Jácuaro						
	State Forest Guyana						
RESPONSIBLE ORGANIZATION							
Native or indigenous community							
Association, cooperative or group of community members / local producers / companies							
Association of community organizations or partnership between community councils (small-scale farmers/indigenous people)							
Private company							
NGO, education or research institution							
State							

Exemplary Cases

Cases with Exemplary Aspects





## Overview of selected cases

To organize the exemplary cases, and cases with exemplary aspects, the outstanding aspects (criteria) have been identified in each case. Although the cases demonstrate a wide variety of situations according to the minimum criteria of exemplariness, it is possible to group the initiatives according to one or two components of sustainable forest management that are notable for their exceptional quality.

Four groups of exemplary cases and cases with exemplary aspects have been identified (Table 5), which give an overview of the cases described in the following chapters:



**I: GENERATION OF GOODS AND SERVICES OF SOCIAL INTEREST.** These cases are good examples of SFM, especially in their social and economic aspects, by generating greater local benefits through the diversification of uses and/or adding value to products and environmental services, while maintaining high standards in the implementation of management. Seven cases have been identified in this group: three in Central America and four in South America.



**II: ORGANIZATION AND TECHNOLOGICAL DEVELOPMENT.** These cases also show a high level of quality in social terms, as well as an exemplary capacity for institutional and technological development. There are eight cases identified in this group: four in Central America and the Caribbean and four in South America.



**III: PROTECTION AND CONSERVATION OF VALUES.** These cases demonstrate notable progress in social and environmental aspects through innovative mechanisms of conservation and protection to increase the environmental benefits of the forest under management. Six cases have been identified: three in Central America and three in South America.



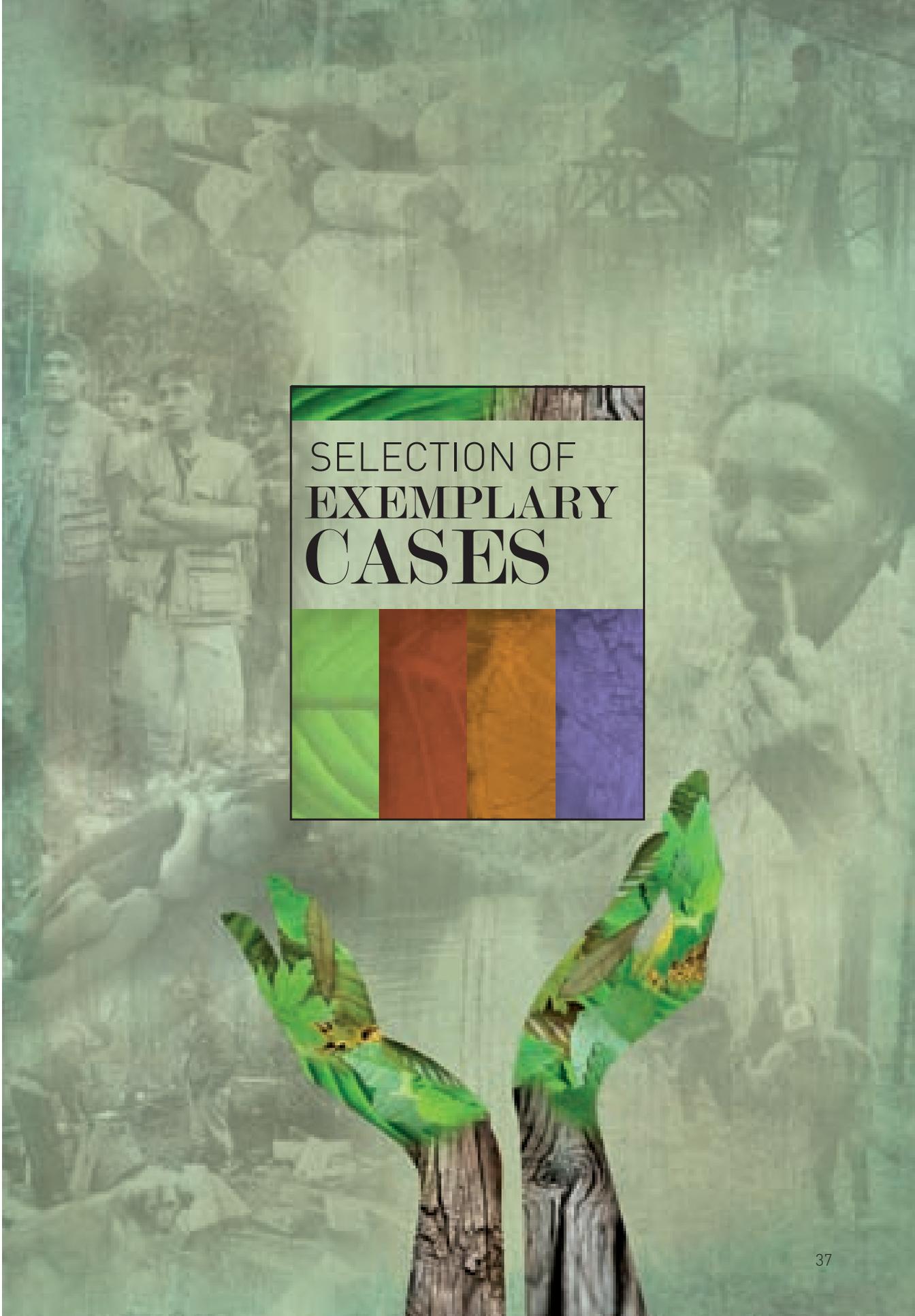
**IV: INNOVATIVE PARTNERSHIPS AND CAPACITY BUILDING.** This group includes cases that have showed solid progress towards SFM by establishing strong, effective and participatory organizational structures and innovative partnerships, which has allowed them to excel in economic and/or environmental aspects of management. Fourteen cases are identified in this group: five in Central America and the Caribbean and nine in South America. Two of these cases are notable for their training, educational and outreach activities to promote forest management.

**Appendix 4** shows how the selected cases (exemplary cases and cases with exemplary aspects) are grouped according to their compliance with the minimum criteria of exemplariness, including details about the exceptional qualities of each case.

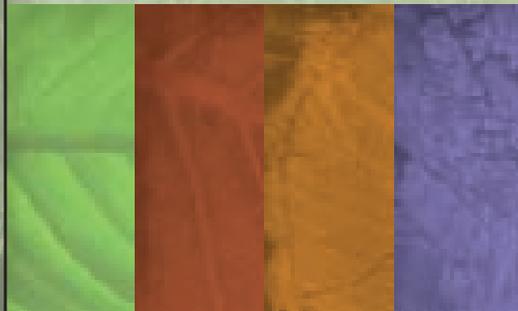
**Table 5: Exemplary cases and cases with exemplary aspects by group**

EXEMPLARY CASES	
<p><b>GROUP I</b></p> <p>Empresa Manoa - Brazil                      Forestal Aysén - Chile                      San Andrés - Guatemala                      La Gloria - Guatemala                      Tikonel - Guatemala                      El Choloque - Peru</p>	<p><b>GROUP II</b></p> <p>Cururú- Bolivia                      Iratapuru - Brazil                      Gualaco y Guata - Honduras                      Tezains - Mexico                      ADSEJO - Dominican Republic</p>
<p><b>GROUP III</b></p> <p>Orsa Florestal, Pará - Brazil                      Klabin - Brazil                      Kobalchaj - Guatemala                      Copen - Honduras                      La Chonta- Bolivia                      Layasiksa - Nicaragua</p>	<p><b>GROUP IV</b></p> <p>“Roberto Bauch” - Brazil                      Mapu Lahual - Chile                      Chinchiná - Colombia                      Aserradero Espinoza - Peru                      APA, Colinas Bajas - Dominican Republic</p>

CASES WITH EXEMPLARY ASPECTS	
<p><b>GROUP I</b></p> <p>Communities and AIDER - Peru</p>	<p><b>GROUP II</b></p> <p>ASL San Antonio - Bolivia                      ZA Reserva de Biosfera Maya - Guatemala                      Communities and Venao - Peru</p>
<p><b>GROUP III</b></p>	<p><b>GROUP IV</b></p> <p>Bosque Modelo Jujuy - Argentina                      Parque San Marcelo - Brazil                      Las Colonias - Chile                      CODEFORSA - Costa Rica                      ASOKANUS - Ecuador                      ESNACIFOR - Honduras                      State Forest - Guyana                      Parangaricutiro - Mexico                      San Pedro Jácuaro - Mexico</p>

The background is a collage of various images. At the top, there's a stone archway. Below it, a group of people, possibly students, are standing. On the right, a man is shown in a thoughtful pose with his hand to his chin. At the bottom, two hands are shown holding green leaves. The overall color palette is muted greens and greys.

SELECTION OF  
EXEMPLARY  
CASES





Indigenous community of Layasiksa, Nicaragua

## SUSTAINABLE FOREST MANAGEMENT VERSUS EXTRACTIVISM

By César Sabogal

Location	Municipality of Cujubim, Rondonia state, Brazil
Biome	Tropical broadleaf humid forest
Type of forest	Native
Organization	Private company: <i>Indústria de Madeiras Manoa Ltda.</i>
Objective	Industrial wood production – Adding value to forest products – Forest protection
Area	75,182 hectares, including 60,689 ha available for harvesting

The firm Indústria de Madeiras Manoa<sup>9</sup> owns 75,182 hectares (ha) of land in Cujubim municipality in Rondonia state in Brazil's Amazon. Since 2005, 73,079 ha have been certified by the Forest Stewardship Council (FSC). Of these, 60,689 ha are used to produce wood and 14,493 ha are protected. Manoa is a pioneering company in sustainable forest management in Brazil and the first to obtain the FSC certification in Rondonia, a state which has registered high levels of deforestation for decades and where forestry activity tends to be informal and often illegal.

### Extractivism

The predominant forest types in this area according to Brazil's classification system are lowland and sub-mountainous tropical rainforest. The most common species found in these forests are: jequitibá (*Cariniana spp.*), roxinho (*Peltogyne sp.*), faveira (*Dinizia sp.*), angelim colorado (*Hymenolobium sp.*), copaíba (*Copaifera sp.*), guariuba (*Clarisia racemosa*), maracatiara (*Astronium lecointei*), jatobá (*Hymenaea stigonocarpa*), freijó (*Cordia goeldiana*), tauari (*Couratari spp.*) and pino cuiabano (*Schyzolobium amazonicum*).

Manoa bought the property in 1983. In 1986, the National Institute of Settlement and Agrarian Reform (INCRA in Portuguese) carried out a process of reclaiming state-owned areas to facilitate rural settlements. But Manoa's forest area was confirmed as its

<sup>9</sup>Manoa is owned by Grupo Triângulo ([www.triangulo.com.br](http://www.triangulo.com.br)), based in the city of Curitiba in the state of Paraná. This group owns forestry projects in the southern and Northern regions of Brazil. It has around 2,000 employees working in the production of plywood, chipboard panels, sawn timber and floors. Most of its production is for export.

legal property so it was protected from rural settlements that were gradually invading the region. In neighbouring areas that were involved in the agrarian reform, however, deforestation has advanced rapidly with the division of land into small lots for agricultural activities.

The foundation of economic activity in Cujubim municipality and the surrounding region is wood production followed by fishing, agriculture (mainly cacao, manioc and rice for local and regional markets) and the extraction of rubber, asaí berries and Brazil nuts.

In recent years, the municipality has seen a boom in forestry activity: the number of sawmills has grown from two to more than 60, processing wood mainly produced by small groups of independent loggers. The majority of wood that leaves the municipality is sold as logs or roughly sawn timber with little added value<sup>10</sup>.

The local population has grown to 15,000 in recent years due to intense migration. Around 60% of the population lives in rural areas or “líneas” as the roads opened by INCRA for settlement are called. The region is on the agricultural frontier with the expansion of the forestry industry and the conversion of forest areas for other uses. But the municipality’s infrastructure has been overwhelmed by the level of migration. As a result, 20% of the population is homeless, 70% do not have running water, 50% is without electricity and 17% of children and young people are not in school.

## Manoa’s first steps

The recent history of Cujubim is closely linked to Manoa’s history. Douglas Granemann, the owner of the Triángulo Group in the city of Curitiba, arrived in Rondonia state in the 1990s with the aim of creating a lumber company. At that time there was no electricity, road access was difficult and there was almost no workforce. After buying land in Ariquemes to build a sawmill, he gave up the idea and returned to Cujubim (then part of the Río Crespo municipality) where the city gave him some land. Granemann signed an agreement with the local power company to pay half price for electricity, improved the road access to the city and began installing wells. In 1996, Granemann opened his first sawmill in Cujubim, and eventually other forestry entrepreneurs followed him to the city.

Manoa began forestry activities in 1997, but some of the companies it subcontracted to provide services did not comply with the firm’s environmental standards. As a result, Manoa shut down operations between 1998 and 1999 and then again from 2000 to 2002. In this period, the company reorganized its processes based on reduced impact management techniques and sustainability. It invested in hiring and training workers, new equipment, infrastructure and the wellbeing of its employees. It also hired consultants specialized in sustainable forest management techniques.

The company restarted its operations in 2003. Two years later, in 2005, it obtained the international FSC certification. The company also certified its production chain to guarantee the origin and traceability of its products from the moment a tree is felled until the final product is delivered in Curitiba.

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<sup>10</sup>Cujubim used to be famous as one of the municipalities with the highest rate of illegal logging in the Amazon. But Brazil’s environmental protection agency, Ibama, launched a crack down in 2008, with federal agents, accompanied by police and soldiers, occupying the city for more than three months. Many companies were closed down and workers fired, which created serious social and economic problems in the city.

Also, in 2005, and with the support of the International Tropical Timber Organization (ITTO), Manoa became a pioneer in the process of certifying its production under the Brazilian Forestry Certification Program (CERFLOR in Portuguese), which is a national certification system administered by Brazil's National Institute of Metrology, Regulations and Industrial Quality (IN METRO), recognized by the Programme for the Endorsement of Forest Certification (PEFC), the world's leading forestry certification system. The process of CERFLOR certification was concluded in 2006, which made Manoa the only company in Brazil's forest management sector certified by both of the country's certification systems.

Maintaining these certifications requires six independent audits per year: two focused on management, two on the chain-of-custody in Rondonia state and two in Curitiba.

### Forestry management in practice

Manoa hires third parties during the harvest season to produce wood from its forest area. The company mainly works with two services companies: Florestal, which is in charge of pre-harvesting activities (planning operations, forest inventory, marking boundaries, creating maps) and post-harvesting activities related to silviculture treatment and monitoring; and Krismilla, which is responsible for the harvest operations and building infrastructure (roads, bridges, log stockpiles etc).

Manoa field teams make sure these companies comply with the firm's standards and procedures. In addition, Manoa works with STCP-Project Engineers, a consulting company which helped it obtain the FSC certification.

The company produces approximately 20,000m<sup>3</sup> of wood a year comprised of 27 different species. The area is divided into annual production units of 1,680 ha each with a harvesting cycle of 27 years, but Manoa is currently producing at a rate of 1,200-1,500 ha a year with average intensity between 10 and 15 m<sup>3</sup>/ha.

The logs are transported from the forest to Manoa's sawmill in Cujubim, which only processes six species of trees. The remaining species are sold as raw logs to other companies in the region.

Manoa adds value to its production by producing beautiful, high quality wood floors in Triângulo Pisos e Painéis, a subsidiary of the Triângulo Group which owns Manoa.



Entrance to the company's forest management area



Using a *skidder* to transport logs

The company is also making an effort to increase the diversity of species harvested. In just a few years it has increased the number of species from 12 to more than 50 and invested in market testing new species.

Manoa has also studied the possibility of selling carbon credits generated by reforestation, which is an attractive alternative market for forestry companies.

## Reduced-impact logging

To make its operations sustainable, Manoa has developed programs that guarantee the conservation and protection of its natural resources.

In 2001, the company adopted Reduced-Impact Logging techniques (RIL) and is closely monitoring the impact of its operations on the forest and the environment. Some of the measures adopted to promote biodiversity, soil and water conservation are:

- **A regular forest inventory which allows workers to detect endangered species of trees, sources of drinking water for wildlife (“soleras” or “colpas”), Amazonian dark earth indicating possible pre-Colombian ruins and other ecologically sensitive areas.**
- **To avoid damage to protected areas (such as riverbanks), the trees are marked up to 20 meters from the bank.**
- **Roads are built along drainage canals to avoid unnecessary damage to the environment.**
- **Access roads may not be used when it rains.**
- **Harvesting begins in the farthest flung areas, progressing gradually towards the main roads in the fall and winter months.**

## Environmental monitoring

Given the impact of forestry operations on its natural resources, Manoa is permanently monitoring the fauna and flora in the area. This is done by the company’s field teams and also by specialists and professors at Rondonia University under an agreement signed in 2005. To expand the area being monitored, the company has partnerships with two other research institutes.

One of the company’s first steps was a study to identify characteristics considered exceptional or of critical importance for conserving biodiversity. This study, carried out by consultants and Manoa employees, identified high value conservation characteristics in flora and water resources. With this information, Manoa took a series of steps to protect them:

- **Observing legal restrictions against logging endangered species in protected areas.**
- **A road network that avoids, where possible, waterways such as rivers and lakes.**
- **Not cutting trees with hollows in their trunks that could be used for shelter by mammals and birdlife.**
- **A prohibition on hunting in the whole property with round-the-clock surveillance.**
- **A restriction on the number of people entering the forest to reduce the potential impact on fauna.**



A camp in the management area



Cujubim public school built by the company

- Market research on new species with the objective of expanding the services offered by the forest.
- Educating employees about environmental and legal aspects of forestry operations.
- Maintaining a highly trained workforce aware of all environmental aspects.

Monitoring fauna is especially important since the area under Manoa's management is near conservation areas such as the Samuel Ecological Station, and the Jamari and Jacundá National Forests. Together these form a vast area (approx. 480,000 ha) of habitat, which is particularly important for larger animals.

A study by the Rondonia University evaluated the impact of forestry operations on the habitats of certain animals and, based on the conclusions, suggested measures to minimize these impacts. The results to date show Manoa's property contains significant diversity and provides shelter and food to an abundance of fauna. Amongst the vulnerable and endangered species are the giant armadillo (*Priodontes maximus*) and spotted paca (*Agouti paca*) as well as big cats, like the black jaguar (*Panthera onca*); the cougar (*Puma concolor*); leopard (*Leopardus pardalis*); and tiger cat (*Leopardus spp.*). These results confirm that the area under management is crucial to safeguarding endangered species.

As part of its post-harvesting activities, Manoa also evaluates the damage caused by harvesting and monitors the forest's condition on permanent one-hectare plots.

## A good employer

Manoa is the biggest industry in Cujubim. It is, therefore, very important for the local economy and social development in the area. The company's activities have created jobs in a rural area which offers few other job opportunities. With some 450 employees, including direct and indirect jobs, Manoa is the biggest employer in the city, providing around 40% of its total tax income. Its activities also benefit local retailers and contribute to economic growth.

The company provides good working conditions for its engineers and loggers, offering training and job security.

Loggers are not forced to work under productivity goals but rather according to certain responsibilities, thus ensuring norms and safety procedures are followed.

Improved working conditions have also helped to increase productivity and reduce costs in recent years.

Manoa has also invested in training and educating its workers with the aim of improving their performance, creating safer working conditions and reducing environmental impacts.

The company has established partnerships with organizations like the Amazonian Nature Institute (INAM in Portuguese) and ITTO to train its workers in the design and construction of forestry infrastructure, tree selection and hauling, safety, forestry legislation and certification.

The owner of Krismilla, a Brazilian forestry services firm hired by Manoa, explains: *"I have a team of workers who are highly trained and earn a competitive salary with good benefits. They are paid even during rest periods. It's interesting to compare working conditions today to how they used to be. There has been a big change. In the beginning, the workers were afraid of so much control, so many changes, without seeing the benefits. But now they see the improvement in productivity and lower costs... and they have enthusiastically accepted the new way of working."*

Since arriving in the region, Manoa has supported the municipality with cash but also by improving transport infrastructure and providing equipment, fuel and basic food supplies.

In 2003, Manoa hired a consultant to write a report that would help it define a social policy suited to the city's needs, with actions aimed at long-term sustainability rather than short-term benefits.

As a result, Manoa has prioritized education, financing the construction of the Rayo de Luz Municipal School including the purchase of equipment and desks. The school has the capacity for 180 students as well as a crèche for 25 toddlers. Due to the high demand, however, the school currently receives 400 children in two shifts. The company also offers educational talks about the environment and contributes to events organized by the school.



Main road through the management area



The forest manager and an advisor study a map

# Forestal Aysén

## A FORESTRY COMPANY INVESTS IN REFORESTATION WHILE GENERATING ALTERNATIVE SOURCES OF INCOME

By Luis Chauchard

Location	Río Ibáñez, General Carrera province; Coyhaique, Coyhaique province; and Puerto Aysén, Aysén province in Chile's Region XI (Aysén)
Biome	Broadleaf and mixed temperate rainforest
Type of forest	Forestry plantation (exotic conifers)
Organization	Private company: <i>Forestal Mininco</i>
Objective	Industrial wood production – Adding value to wood products – Forest restoration – forest protection
Area	16,055 hectares of plantations and 6,505 ha of protected native forests

Forestal Mininco's Aysén project, in the far south of Chile, is a large-scale initiative which has successfully reversed the process of forest degradation caused by forest fires used in the past to increase land for extensive cattle farming. The project, which has included replanting native trees in cooperation with the local community, has generated employment and brought about a cultural change so that the community now sees the forest as an alternative form of development rather than a problem to be cleared.

### Reforestation

The Aysén project comes at a historic time in the context of the region's land use. The region of the same name, covering a total 10.5 million ha, was settled more than 100 years ago. Native forests covered a large portion of the territory but settlers came to graze cattle, which meant using fire to clear large areas. Huge fires were lit repeatedly from 1890 onwards. More than two million hectares of forest were lost and, with it, vegetation that protected against erosion. Thus began a process of gradual, large-scale environmental degradation that continues today. A large quantity of soil has been blown away by the wind or washed away by rainwater. The extreme erosion has caused sedimentation in rivers, as well as the disappearance of aquatic and riverbank habitats for fish and mammals. The sediment in the Aysén River has built up

so much that the port at its mouth had to be moved 15 km along the coast.

In addition, recent eruptions in this volcanic area – like the Hudson Volcano en 1991 – have left large areas covered in ash.

Extensive cattle farming in the areas previously covered by forest has taken a heavy toll on soil fertility. Added to this is the lack of awareness about the potential for alternative development offered by the forest, a shortage of skilled local labour, difficult access due to the topography, and an inhospitable climate.

This was the situation faced by Forestal Mininco when it began the Aysén project in 1990 with the aim of harvesting valuable, fast-growing conifers for wood production; recovering degraded areas; and protecting the remaining native forest.

Forestal Mininco is part of the Chilean wood and paper products conglomerate, Compañía Manufacturera de Papeles y Cartones (CMPC), the largest forestry company in Chile and one of the most important in Latin America with over 574,000 hectares of forest. The Aysén project is focused on three main areas:

- **Creating forests through plantations of exotic conifers of the genus *Pinus* and *Pseudotsuga*.**
- **Protecting existing native forest.**
- **Working with local communities to create jobs, provide training and develop an environmental education program for schools.**

The main species used for reforestation are *Pinus ponderosa*, *Pinus contorta* and *Pseudotsuga menziesii*. The main species in the remaining native forests are *Nothofagus pumilio*, *Nothofagus antartica* and *Nothofagus dombeyi*.



Silviculture treatment of a coniferous plantation

### More and better employment

Forestal Mininco has an office in the city of Coyhaique with a staff of eight fulltime employees (this rises to 50 in months of peak activity). Most employees are natives of the region. In the case of the forest nursery, all the workers come from the nearby village of Mañihuales.

The Aysén project forms part of the company's Business Development area and is not a separate business unit. This has allowed the project to be included in the firm's Environmental and Social Responsibility program (RASE in Spanish). Although the project's inclusion in this area has created some uncertainty about its future, it has continued for 20 years with important benefits for the region.

The number of new jobs created by the project, considering those working in areas like planting, safety, pruning etc., rose from an average 73 each month in 2001 to 85 in 2009. Mininco hires between three and six external companies depending on the time of year, but recently all six are needed given the increase in work due to the age of the forests.

The high standards maintained by the project's activities have improved working conditions including safety and hygiene.

After the eruption of the Hudson Volcano in 1991, large areas were covered by a thick layer of ash. Forestal Mininco developed a technique to reforest these areas with new plantations, which have grown at one of the highest rates in the region. This has allowed the firm to recover productivity in large areas of land previously considered unusable.

To take advantage of this new forest capital and obtain income in the medium term, Forestal Mininco has hired an expert to certify the project under the UN's Clean Development Mechanism in order to sell carbon credits abroad.

In agreement with the community, the company's plant nursery has also started to produce a wide variety of native species while developing techniques for reseeding and the acclimatization of plants transplanted from the field. Production has reached 2.7 million seedlings a year, which is more than enough to meet the needs of Forestal Mininco and other local landowners.

The company has recently reduced its plantation rate due to lower demand in the regional market, but the development of biotechnology norms has created an opportunity to enhance the reforestation of native forests and begin germplasm conservation programs.



Land degraded by extensive grazing



Soil covered in volcanic ash



Productive rehabilitation with plantations

## Being a good neighbour

The company has developed a good neighbour strategy with local communities based on transparency, integration and an open doors policy. It includes three areas of action:

- **Rural employment:** Includes the creation of jobs linked to training and qualifications.
- **Education:** The firm's environmental education program has helped drive a cultural transformation regarding land use and environmental management.
- **Rural development:** The starting point was to include the community in the business plan with a long-term vision to ensure the local population understands that reforestation and environmental protection are keys to the region's economic development.

The project began 20 years ago with an integrated vision based on returns over 35 years, which is the harvesting cycle of the trees. The initial goal was to create 30,000 hectares of forests with the idea that half of these would be managed by other landowners in the region. The aim is to create a centre of forestry development that spreads the social and economic benefits throughout the region. Before the project, there were approximately 7,000 ha of forest.

Today, there is around 43,000 ha of which 16,000 ha is managed by Forestal Mininco.

Since 2003, the company has implemented an environmental education program in all the schools of the region. This innovative program teaches children about issues related to biodiversity, forests and wood production. In 2009, 3,500 children participated in the program bringing to 19,000 the number that has participated since the beginning.

The company also participates in town hall meetings about local development issues along with other public entities and community organizations. In addition, Forestal Mininco is on the board of the government's Regional Productivity Development Agency, as one of three private sector representatives.

## A cultural change

The consequences of forest fires, intentionally lit throughout the Aysén region in the mid-20th century to make room for cattle grazing, are visible to the naked eye: severely eroded hillsides, fields made barren by overgrazing and the burnt-out remains of tree trunks.



Generation of knowledge in the production of pine seedlings in the nursery

This degradation could only be halted with radical measures. Today, 20 years since the start of the project, a private forestry initiative with state support has been able to change the idea of an “inconvenient forest” for a new notion based on the idea that “the forest is an excellent partner for regional development.”

This on-going cultural transformation is the result of measures including:

- **The creation of a local forestry centre supported by local landowners.**
- **High start-up investment resulting in the creation of jobs.**
- **An emphasis on local hiring, training, safety standards, hygiene and environmental awareness.**
- **Effective community integration through improved infrastructure, participation in neighbourhood meetings, an open doors policy, etc.**
- **Promotion of silviopasture systems with added environmental, economic and social value, along with measures such as the opening of silviopasture forests to allow cattle from neighbouring properties to enter.**
- **Environmental education programs for school children.**

Forestal Mininco’s project can be summarized as an investment with long-term returns (25 to 40 years), which began in opposition to the dominant cultural imperative; that the forest should be cleared to graze more cattle. When the Aysén project began, community members might have thought something along these lines: “If the forest returns, the area for cattle grazing will be reduced.”

Today, 20 years on, the project has created important changes in land use while fostering regional development. Forestal Mininco’s decision to seek returns from related activities such as the sale of carbon credits, logging agreements with third parties and selling seedlings from its nursery, are valid alternatives to traditional forest management.



The Huemul (*Hippocamelus bisulcus*), a protected animal in the region



Coniferous forests managed to maximize growth rates and maintain the health of the trees

# San Andrés

## A COMMUNITY ORGANIZATION MANAGES A UNIQUE NATURAL RESOURCE RESPONSIBLY

By Juan Herrero

Location	Municipality of San Andrés, Petén department, Guatemala
Biome	Subtropical broadleaf humid forest
Type of forest	Native
Organization	Community association: <i>Asociación Forestal Integral de San Andrés, Petén</i> (AFISAP)
Objective	Industrial wood production – Harvesting non-wood forest products– Conservation of biodiversity – Socio-economic benefits for the communities
Area	51,940 hectares

In 1999, the Guatemalan community association, *Asociación Forestal Integral de San Andrés, Petén* (AFISAP), was awarded a 25-year renewable concession for the San Andrés forest management unit in the Multiple Uses Zone of the Maya Biosphere Reserve with an area of 51,940 hectares.

AFISAP complies fully with the strategic objectives of the Maya Biosphere Reserve by protecting Mayan archeological sites as well as the biodiversity of the flora and fauna. It has opposed deforestation, cracked down on illegal logging and hunting and reduced the impact of forest fires, while acting as a barrier against the expansion of the agricultural frontier. Above all, the organization has managed the forest using integral management plans approved and monitored by Guatemala's National Council of Protected Areas (CONAP in Spanish) and certified by the Forest Stewardship Council (FSC).

In the 11 years since AFISAP was formed, the area under its management has brought important socio-economic benefits for its members and the population of San Andrés, Petén.

## Natural heritage

One of the most important native forests in Mesoamerica is found in Petén department, Guatemala. This unique forest is rich in natural resources and archaeological finds with monuments dating from the ancient Mayan civilization.

In 1990, the Maya Biosphere Reserve (MBR) was created. Measuring 21,130 square kilometers, it is the largest area in Central America still covered in tropical rainforest, with a wide variety of ecosystems and an abundance of flora and fauna.

The creation of the MBR generated a series of clashes between local communities and government institutions. The frequency of poaching and forest fires rose sharply. To mitigate opposition, the government, through CONAP, took the decision in 1994 to award management concessions for the forest areas in the reserve. This process required a series of efforts to strengthen capacities in local communities and develop a business focus within a framework of sustainability.

According to CONAP's plan, the MBR was divided into three areas according to the type of activity permitted in each:

- **Buffer Area:** The main objective of this area is to alleviate pressure on the Multiple Uses Area by ensuring sustainable uses of land and natural resources in the area adjacent to the MBR.
- **Multiple Uses Area:** This is the largest area of the reserve. Since it is next to the Core Area, harvesting of wood and non-wood products is permitted but in a sustainable way depending on the area's potential.
- **Core Area:** This ecologically sensitive area includes protected wildlife areas and archaeological finds. Here there are some areas where natural processes, including evolution, have continued for centuries and where, for ecological, scientific and cultural reasons, there is no human settlement and absolutely no land use changes are permitted.



Selection of leaves from the Xate  
(*Chamaedorea oblongata*)



Xate leaves ready for export

In 1996, a group of neighbours in the San Andrés municipality saw how the government had awarded forestry concessions to rural communities in other parts of the country, and took the initiative

to form a committee. This committee formed the basis of AFISAP, which today has 173 members including 15 women.

In 1999, CONAP awarded AFISAP the San Andrés Management Unit. The area of the concession is relatively flat with an altitude of 150 to 175 meters above sea level. The area includes abundant and varied natural resources with a diversity of flora and fauna.

Three types of forest have been identified: high forest (29,174 ha), medium forest (16,077 ha) and forests in recovery (6,187 ha). This last type mainly includes lands previously used for planting crops and raising farm animals. There are also small lakes covering a total 146 ha, which are known for the excellent quality of their water.

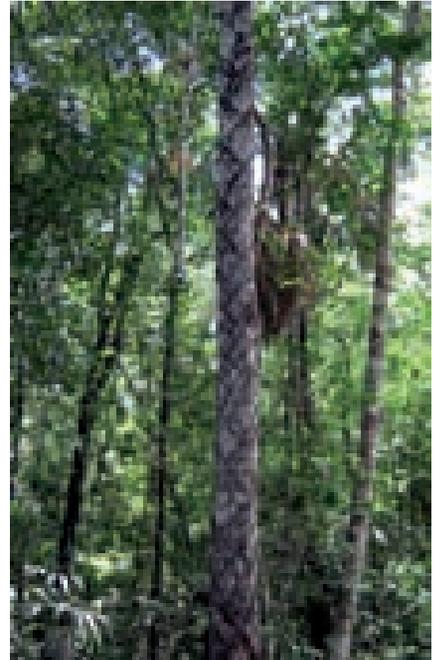
The vegetation is comprised of various tree species: caoba (*Swietenia macrophylla*), ramón blanco (*Brosimum alicastrum*), zapotillo (*Sideroxylon meyerii*), caniste (*Sideroxylon campechana*), chicozapote (*Manikara zapota*), ccoche (*Cojoba arborea*), chacaj (*Bursera rimaruba*), jobo (*Tapirira guianensis*), botan (*Sabalmoriciana*), cedro (*Cedrella odorata*), malerio (*Aspidosperma megalocarpum*), amapola (*Pseudobombax ellipticum*), santamaría (*Calophyllum brasiliense*), pucte (*Bucida buceras*) and manchiche (*Bucida spp.*). The list of protected species includes Guatemala's national tree, ceiba (*Ceiba pentandra*), pimienta (*Pimenta dioica*), which is used for non-wood products, and the cantemó (*Platymiscium pinnatum*) used by guacamaya parrots for nesting.

The area has special ecological importance due to the fact it is a natural habitat for the guacamaya parrots, a native, endangered species. There is also a wide variety of other bird species (hawks, falcons, owls, herons, and toucans), mammals (tapirs, jaguars, tigers, pumas, wild hogs, and monkeys), reptiles and tortoises.

## Use of wood products

The forest management is based on a long-term (40 year) plan. The area is divided in eight blocks of 5,600 ha each and harvesting is in five-year cycles.

Each block is divided into five areas of 1,120 ha each, in which AFISAP has obtained an average production of 1,324 m<sup>2</sup> in the last five years.



Extraction of chico zapote (chicle)



Wood from the caoba tree  
(*Swietenia macrophylla*)

Each year an Annual Operating Plan is created. This includes volumes and species for logging, amongst other dasometric indicators, and is approved by CONAP, which gives the community a logging license based on the volume of wood to be produced.

AFISAP harvests wood and non-wood products in its concession area. Wood products mainly come from a few species: caoba (*Swietenia macrophylla*), cedro (*Cedrella mexicana*), manchiche (*Lonchocarpus castilloi*), santamaría (*Calophyllum brasiliense*) and pucté (*Bucida buceras*), with a logging density of 1.5 trees/ha. The association also harvests about 25% of its concession's potential in non-wood resources, mainly from the xate (*Chamaedorea oblongata*), chicle (*Manikara zapota*) and pimienta (*Pimienta dioica*) species. But most of the concession's economic income, around 90%, comes from selling wood products.

The median cutting diameter for these species is defined according to their abundance and maximum diameters reached. For example, for a group of high value commercial species, the median diameter is 60cm, while for other species it is between 45cm and 50cm.

The logging intensity for the commercial wood species is 80%. The trees that have value as seed trees are left standing.

In the beginning, the association sold wood by the square foot, which meant the client took care of logging and transporting the wood. In its third season (2001), AFISAP sold its wood through an intermediary because it did not have a commercial license to sell wood. To fix this problem, the association created a company in 2002 to manage its exports.

The following year, AFISAP bought a mobile sawmill comprised of a 5" table saw mounted on a vehicle. This investment allowed the association to transform logs into lumber and sell it directly to clients without intermediaries. The association also recently acquired a carpenter's workshop to add more value to its products which are mainly exported to North America, Central America and the Caribbean, while a small quantity is sold in Guatemala.

The association studies the area after the harvest to determine the environmental impact caused by roads, log piles and clearings, and proposes measures to mitigate their impact. In 2009, 14.65 hectares were affected by the harvest, or just 2.03% of the area logged.

## Product diversification

AFISAP's income in its first nine years came from harvesting wood. In 2007, the association began to diversify its activities, adding the production of xate palm (*Chamaedorea spp.*) and gum from chico zapote (*Manilkara zapota*).

The leaves of the xate palm have a wide range of uses including as a component in flower arrangements due to their beauty and resistance to discoloration. These are mainly exported to the United States.

In the beginning, AFISAP awarded permits to third parties to harvest these leaves. But this brought problems due to the impact of the "xateros" (leaf cutters) on the environment including the disposal of organic waste from camp sites, camp fires, illegal hunting and fishing and incorrect methods of cutting leaves off the palm trees.

As a result, AFISAP developed a management plan for this species approved by CONAP. Currently, the production of xate leaves is done by workers from the municipality (43% are members of AFISAP), who have traditionally done this work in a sustainable fashion.

The extraction of chico zapote (*chicle*) is also done by people who have lived on the land for many years. AFISAP was not interested in this activity initially, but today it is part of its production activities employing 20 people, 70% of whom are members.

The chico zapote gum is used as a raw material to make chewing gum. It also has numerous other uses and is often in high demand. The association has a license awarded by the National Chicle Council (CONACHI in Spanish) for the extraction and transport of this product. However, the work is carefully monitored to ensure the production of the gum is sustainable.

As part of its diversification strategy, AFISAP acquired the agro-forest farm El Triunfo in 2007. The farm covers 46 hectares and is 11 km from San Andrés. The aim is to develop projects on the farm that create jobs for the local community. Today, El Triunfo produces organic fruits and vegetables like jicama, camote, macal, habanero chili, oranges, mandarins, lemons, jocotes, mangos, avocados, bananas, caimitos, moxan, pacaya, nances (fruits with local names). Fish farming, poultry and beekeeping projects have also been developed on the farm. The aim of the beekeeping project is to produce not only honey, but also beeswax and propoleo.

Finally, the association is interested in starting an ecotourism project which it hopes to develop in the near future.

## Social responsibility

AFISAP is a non-profit entity so its earnings cannot be split either directly or indirectly among its members. Instead, the association reinvests its earnings with the aim of creating jobs, benefitting its members and the population of San Andrés municipality. These investments also contribute to meeting the municipality's health, education and infrastructure needs.

This table shows how AFISAP's earnings were distributed in 2007:

Use of Funds	Quetzals <sup>11</sup>
School materials	15 949,11
Member insurance	78 486,90
Member donations	37 337,00
School donations	6 181,57
Church donations	345,00
Public donations	3 648,40
Non-member donations	397,43
Christmas gift baskets	33 788,00
Donation of wood products	23 589,00
<b>Total</b>	<b>176 133,41</b>

<sup>11</sup> In 2007, US\$1 = 7.70 Quetzals



A campsite

AFISAP's objective is to contribute to local development as well as protecting its forest resources. A key activity of the association is preventing and fighting forest fires, which are frequent in the area due to human causes. Preventative measures include building anti-fire trenches, forest surveillance and calling in firefighters in times of peak danger. These actions, although costly, are indispensable to reduce the damage caused by forest fires.

The association has also cracked down on illegal squatting and trespassing, while slowing the uncontrolled expansion of the agricultural frontier and cattle farming at the expense of the forest.

Another aspect of AFISAP's work is the protection of water sources. This includes conserving riverbank vegetation and taking care not to disrupt waterways while building new roads.

The management plan includes evaluating the damage to vegetation after the harvest, reforesting clearings left by the harvest and removing or burying waste from the campsites, amongst other measures designed to minimize the impact of forestry activities.

In recognition of its forest protection and conservation standards, AFISAP received a prize from CONAP for being an exemplary community forest management organization in the Maya Biosphere Reserve. The association has also been recognized by international organizations for its work protecting the red Guacamaya parrot.

## Members and partners

One of the keys to AFISAP's success is the active participation of its members in the day to day running of the organization, from planning the harvest to selling its products and services. Its members have improved their operational, technical and administrative skills, which have allowed the association to reach its current level of development.

However, the participation of women in the association is still very small. To change this situation, a Women's Committee was formed with the aim of promoting gender equality inside the organization and at the community level.

Since its beginning, AFISAP has established partnerships and received support from different institutions and organizations that have been important for its development and growth. For

example, the ProPetén International Conservation Project advised the association on how to formalize its activities, as well as providing financial and technical support. The Training and Productivity Technical Institute (INTECAP) also helped train its personnel.

The association also has a close relationship with the National Chicle Council, the Institute of Anthropology and History, the National Forest Institute, universities (like CUDEP, CUNOROC and Mariano Gálvez), and colleges (like ICAVIS and SAKLUM). These education centres help with research and provide interns to work in the concession.

AFISAP is an active member of the Association of Petén Forest Communities (ACOFOP), which helped it obtain the forest management concession in the first place and offers research and technical support.

The U.S.-based NGO Rainforest Alliance offers technical assistance for xate production, especially in terms of exports. Meanwhile, The Wildlife Conservation Society (WCS) develops environmental projects in the concession area and monitors wildlife.

In the first few years, AFISAP used the U.S.-based firm SmartWood, the world's leading FSC forest management certifier, to certify its forests. Today, it does this through the Forest Services Community Company (FORESCOM), in which AFISAP is a shareholder. FORESCOM in turn hires SmartWood to certify a large area of forests and the cost is covered by the association.



Ecotourism potential

La Gloria

# CONSERVATION AND LOCAL DEVELOPMENT THROUGH FOREST CONCESSIONS

By Juan Herrero

Location	Poptún municipality, Petén department, Guatemala
Biome	Subtropical broadleaf humid forest
Type of forest	Native
Organization	Private company: <i>Baren Comercial</i>
Objective	Industrial wood production - Forest restoration – Biodiversity conservation
Area	66,548 hectares

Baren Comercial is a Guatemalan forestry company founded more than 20 years ago in the department of Petén. Its activities include extraction and production of wood products as part of its forest management plan that includes forest protection and conservation. The firm has generated jobs and developed social programmes that have benefitted the local population.

## To protect and conserve

Baren Comercial began its operations in the town of Poptún and since 1999 it has also operated in the nearby municipality of San Andrés.

The company has co-administered the La Gloria forest management unit, one of the forestry concessions in the Multiple Uses Area of the Maya Biosphere Reserve, since 2000. The concession was awarded as the result of a public tender process run by the government of Guatemala to protect and conserve these forests.

Baren Comercial is committed to protecting and conserving the forest resources in its concession area through these actions:

- **Conducting forestry activities according to a forest management plan approved by the National Council of Protected Areas (CONAP in Spanish) for an initial period of 25 years.**

- **Monitoring and evaluation of its forestry activities to prevent and mitigate negative environmental impacts.**
- **Maintaining its FSC (Forest Stewardship Council) certification for all its forest operations, complying with international standards.**
- **Defining high value conservation areas that require special attention due to their characteristics.**
- **Diversifying the uses of different species harvested and incorporating added value into its products.**
- **Development of social programs (health and education) that benefit the company's workers and the population of San Andrés.**

## Concessions as a development alternative

In the 1980s, the government of Guatemala made the decision to promote the settlement of Petén department, with the aim of developing agriculture and cattle farming. As a result, thousands of Guatemalans from other departments came to Petén. The awarding of land leases to new settlers was conditional on their improvement, which was interpreted by the settlers as clearing forests for agriculture. The government recommended, although did not make obligatory, that 25% of the forest be left untouched. As it turned out, most of the land in Petén department is not suitable for agricultural uses but that realization came too late to save most of the forests.

In 1989, the Protected Areas Law was passed and, the following year, the Maya Biosphere Reserve was created in the northern area of Petén department. Since then, the situation has improved, but due to the lack of authorities in the area, groups of farmers have invaded the area and occupied parts of National Parks and other Protected Areas on the reserve, which continues to this day.

As a result of this situation and the alarming destruction and deterioration of forest resources, the Maya Biosphere Reserve forest concessions project was born as an alternative for forest conservation and improving living conditions for the local population. The process was led by CONAP, which sought to support community groups and forestry companies to stop the deforestation process.

Through a public tender, CONAP awarded 14 concessions to 12 communities and two forestry companies. In this way, CONAP delegated the responsibility for executing the forest management plans with the goal of conservation as well as bringing social and economic benefits for the region.

In 1999, Baren Comercial won the concession for the La Gloria forest management area covering 66,548 hectares. Through its contract, the company obtained the right to conduct sustainable harvesting of wood products and to pay taxes. CONAP, however, can still authorize third parties to use and harvest non-wood forest products in the area. Baren Comercial has fully complied with the terms of its contract in all technical, legal and economic aspects, which explains why CONAP has renewed its contract.

The process of deforestation in the reserve continues at an alarming rate, but not on the land under the concessions which shows that CONAP's policies are having the desired effect. In fact, the concessions have formed a barrier to prevent the continued expansion of the agriculture frontier into the reserve. Baren Comercial's main objective is the harvesting and processing of wood. However, its mission is to do this without damaging the forest's fragile ecosystem, which means

protecting and conserving biodiversity, restoring forests after harvesting and ensuring the preservation of cultural values (archeological sites) in the concession area.

## Supporting local development

The main contribution of the company to local development is the creation of stable employment – up to 150 jobs annually on average – which benefits more than 100 families in the municipality.

The company's workers receive regular training to improve their performance. In the last five years, an average seven training events a year have been held for forestry and plant workers.

The company has a multi-generational vision in the sense that it looks to hire young people, seeking a balance between older and younger workers.

In addition, it has shown concern for social development issues such as health. The Baren health clinic is staffed by a doctor and an assistant who attend patients one week a month. Consultations and medicine for workers are generally free. The programme "Healthy Child" offers free checkups for every child and vitamin supplements for children up to 13 years. The clinic also realizes educational activities related to food nutrition, delousing and first aid.

Education is another priority for the company, which awards scholarships and holds educational events that create awareness in children and young people about the need for reforestation, conservation, waste collection and the protection of waterways. Around 13% of the population has benefitted from these programmes.

The company also provides construction material for workers' houses at cost, covers 70% of the cost of their lunches and provides workers with life and unemployment insurance.

The company has also supplied materials to build schools, financed the salaries of teachers and provided financing for the construction of infrastructure projects such as roads.

Baren Comercial aims to offer good working conditions. In the forest camps (which are temporary for one year), the sleeping areas, kitchen-dining rooms, storage areas and bathrooms are separate. The water



"Trespassing prohibited, road closed for reforestation Baren/Conap"

is chlorinated, filtered or boiled. The food provided exceeds the calories and proteins required by a worker for the level of effort required of them. Biodegradable solid waste is buried underground. The camp also has a first aid kit and a 4-wheel drive vehicle in case of emergency.

The camp tasks are organized according to a 22-day work schedule with eight days of rest. All public holidays are also respected. Workers receive bonuses for productivity and good performance. Full compliance with labor laws is shown by the fact there has never been a lawsuit against the company in all the years of operations.

Forest and plant personnel use adequate safety equipment according to their job. Heavy machine and chainsaw operators are trained how to operate their equipment safely and efficiently.

The traditional knowledge of the local people, passed on from generation to generation, is incorporated in the daily management of the forest and some methods improve the overall results.

Interns from at least three universities in the country visit the company each year, participating in forest activities and industrial processes. Personnel from 10 community forestry concessions have also been trained by Baren Comercial. Over eight months, they received training so they can replicate the same model in their community forests.

## Harvesting process

Logs extracted from the forest are processed in two ways: primary, referring to lumber produced with conventional processes; and secondary, which produces value-added products including laminated panels, plywood, floors, moldings, wainscoting, and furniture.

The wood that is cut, transported and processed corresponds to 100% of the volume in the annual operating plan, which includes 30% of waste on top of this amount. However, given the efficiency of the harvesting process, the real volume of waste does not exceed 6%.

The collection of waste reduces the possibility of plagues and eliminates flammable material in the dry period. However, the cost of transporting and collecting waste exceeds the price obtained for these products.

Reduced impact techniques are used in the extraction process to reduce the damage to forests. For example, the average number of trees damaged by logging annually is 0.73 trees/ha or 1.77 m<sup>2</sup>/ha.

In recent years, an average of 21 species has been harvested. The majority of these are unknown in the market, which means it is necessary to integrate them in industrial processes and promote them through the diversification of products with value added. The company has developed new and innovative processes for producing parquet floors, wood panels, plywood, boards, doors and other wood items (columns, chair legs, handrails, tool handles, pens, etc.). In the creation of these products, the company aims for quality over quantity given that the annual volumes of raw materials are limited due to the low production potential of the forest and the low intensity logging established in the management plan.

Baren Comercial has also promoted the harvesting and processing of secondary species. Since 2003, it has used a higher percentage of secondary species at a higher cost and greater difficulty in terms of finding export markets. The company is already generating some returns from these secondary species in the international market.

The firm's harvesting and silviculture activities are governed by its general management plan, five-year plan and the annual operating plan approved by CONAP. These are based on the guiding principle for the concessions, which is to harvest forest resources in an environmentally friendly way in harmony with nature and society.



Fire control tower

The annual forest inventory identifies sites that should be protected from logging due to, for example, wildlife habitat. When the company begins work in the forest, measures are taken to minimize the impact on fauna in these areas.

Within the company's management unit, the protected areas comprise about 20% of the area, which could increase as more studies are performed.

Although there is no specific plan for the conservation of soil and water resources, the company aims to reduce the negative impact on these resources when it plans and implements forestry activities, especially regarding the construction of roads, campsites, log piles etc. The water resources form part of the protected areas in the management unit. In some cases temporary, or "baden" bridges are built, so as not to block the flow of water.



A campsite

The disposal of solid and liquid wastes is strictly controlled. Non-organic waste (plastic, glass, metal, rubber etc.) are collected and taken out of the forest. In addition, products are not handled inside the concession area. Fuels and lubricants are handled properly in specific areas, and leftover lubricants are transported to the company's plant outside the forest.

## Forest production capacity

Maintaining the production capacity and sustainability of the forest is a priority for Baren Comercial.

Its annual cutting permit is calculated based on the size of the area to be logged in the annual operating plan and an inventory of the trees available for harvesting (with diameter of 10cm or more). The volume established by the permit is designed to maintain the forest recovery/production capacity for the 25-year logging cycle. This measure is applied to all species, particularly those of higher economic value (caoba and cedar).

The average area logged each year is between 0.027% and 0.037% of the concession area, which includes the construction of roads, log piles, and clearings for harvesting.

Between 15% and 20% of the trees for potential extraction are left standing as seed trees. These are marked to ensure they are left untouched during the logging process. These trees are chosen based on notable characteristics such as their size, health and state of growth in order to guarantee the natural regeneration of the ecosystem.

Conservation areas to preserve biodiversity, which are monitored by environmental organizations, have been identified and marked.

The firm's activities are checked through four annual studies: two by CONAP during and after the harvesting; one by the certification agency at the end of operations; and one by the company itself at the end of operations.

Each year, in parallel to harvesting activities, the company evaluates the state of the forest and measures the tree cover for future harvests. This allows it to know the forest's production capacity in the medium and long term, which is important for good forest management.

Due to the risk of forest fires, the company has an annual forest fire prevention and control plan which is approved by CONAP. Amongst other measures, this plan includes the cleaning and maintenance of the road network and digging of anti-fire trenches, training of personnel (mainly supervisors and campsite workers) and regular monitoring of the borders of the concession area especially in the high-risk period during the summer months.



Reforestation in a *bacadilla* (clearings produced by logging)



A stump marked for monitoring

Due to third parties harvesting non-wood products from the forest, the company has used extraordinary measures to prevent the risk of forest fires, avoid water pollution (in small lagoons, “*cibales*” and areas with poor drainage) and stop illegal hunting.

The company has personnel and equipment ready to fight forest fires as well as observation towers, a radio communication system, a caterpillar tractor and a water tanker. It has also signed agreements with neighboring concessionaires and commercial aviation companies. Since Baren Comercial was awarded the concession nine years ago there has not been a single fire recorded in the area.

## Forest research to improve management

Practically all the forests in the company’s concession area have been harvested at some point, and are therefore considered secondary forests in process of regeneration. Improving their health, composition and structure while also harvesting wood is a challenge. Baren Comercial has designed a research programme with the aim of determining the production and reproductive capacity of the forests in its area.

The company has established five permanent measurement lots, which monitor the diametric growth rates of different tree species. In one of these 100-hectare lots, a 2004 research project applied silviculture methods to four of the main species in the ecosystem (*Swietenia macrophylla*, *Lonchocarpus castilloi*, *Calophyllum brasiliense* and *Aspidosperma stegomeres*). These studies produced information about growth rates and dasometrics that have enriched the company’s database and provided scientific evidence of how the forest should be sustainably managed.

Baren Comercial also supports research projects by other institutions, such as The Wildlife Conservation Society’s (WCS) study of the jaguar (*Panthera onca*), and another by the Institute of Anthropology and History (IDAEH) on the “*El Pesquero*” Mayan archaeological site.

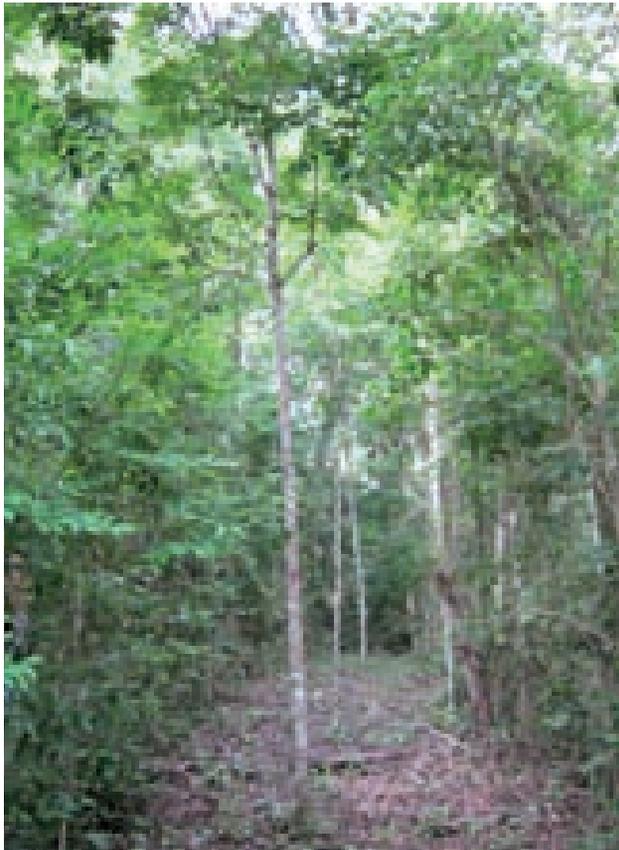
The company has also studied the uses of secondary tree species, as part of the company’s diversification plan aimed at generating value-added products. This research is aimed at secondary species since the majority of these are unknown in the national and international market.

Reforestation is a systematic practice in the areas affected by harvesting activities such as log piles and temporary roads. To ensure the supply of seedlings, the company has a forest nursery that produces around 10,000 plants annually of the species with highest economic value. The company also uses direct seeding, seed germination and bare root plants. Direct seeding is the most common practice with around 50,000 seeds sown annually using this method.

The progress achieved in the La Gloria concession in social, economic, and environmental aspects have made it a textbook case of sustainable forest management. Elements of this experience can be replicated by other forestry companies in Guatemala and other Latin American countries. In conclusion, some final lessons are:

- **Forest concessions are a form of administration which, if well managed, can yield good results and become drivers of sustainable forest management.**
- **Even though the forest concessions have an important business motivation, a healthy balance can be achieved between the sustainable harvesting of trees and social, labour and environmental goals.**

- Forest concession owners can develop programs to support the local community and provide services for workers without negatively affecting its economic management.
- Supervision and monitoring by governmental organizations is essential to ensure that companies comply with their management goals as well as their social and environmental commitments.
- Investing in silviculture and forest management studies has an important impact on SFM and a positive impact on the company's productivity and economic results.
- The harvesting of non-traditional species is an important activity that contributes to the sustainable management of native rainforests.



A reforested road

# Tikonel

## SMALL FORESTRY PRODUCERS LEARN HOW TO CREATE THEIR OWN PRODUCTION CHAIN FOR EXPORT

By Juan Herrero

Location	Municipality of San Martín Jilotepeque, Chimaltenango department, Guatemala.
Biome	Subtropical coniferous forest (sub-mountainous humid forest, humid subtropical forest, and dry subtropical forest)
Type of forest	Plantations (native species), agroforestry systems and native conifers.
Organization	Association of producers: <i>Coordinadora Regional de Comités para el Desarrollo Integral Ambiental Tikonel Taq'iche</i> .
Objective	Productive rehabilitation, reforestation, conservation, improved quality of life for the community and development of the production chain.
Area	83.2 hectares

Breaking the cycle of poverty, or “defying their fate” as the expression goes, is what ten Cakchiquel indigenous communities are gradually doing in the department of Chimaltenango in the central region of Guatemala. These communities, organized in the Tikonel Association of Forest Producers, have successfully implemented a vertical forest production chain from growing seedlings in the nursery, to reforestation and management of the plantations, harvesting, carpentry and the export of wood products. The following is a description of the association’s history, achievements and the keys to its success.

### Recovering from the Civil War

The Tikonel Association is based in the municipality of San Martín Jilotepeque in the department of Chimaltenango. Chimaltenango, located 1,800 meters above sea level and 54 km from the capital Guatemala City, covers 1,979 km<sup>2</sup> and receives an average 1,588 mm of rainfall annually. The climate is mild with temperatures between 12 and 24°C.

The region was devastated by the long Civil War from 1960 to 1996. In addition to the thousands dead, the war left deep scars in Guatemalan society, affecting the self-esteem of rural people and sowing distrust in their interpersonal relations.

Chimaltenango's main income is from coffee. Most of the families are poor, although not at the level found in other rural areas of Guatemala. In the family economy, the role played by women is very important because they raise poultry and pigs as well as participating in agricultural labour. Many of these women sew "huipiles" (a typical Guatemalan shirt), which are mainly for family use but they also sell them to intermediaries in San Martín.

In 1991 wood producers from the town of Sacalá contacted *Cauque Farms*, a Guatemalan company that produces and exports organic agricultural products. Sacalá leaders asked the company to help them find alternative forestry activities given the quality of the soil in the region and the fact that wood for heating and other uses is very important for local communities. They also recognized the need to conserve water resources since the area has important river valleys, like the Pixcaya, which supplies water to Guatemala City.

In response, *Cauque Farms* proposed to support the development of a forestry system that contributes to the socio-economic development of the area with a strong community focus. The firm formed a partnership with the local community, which agreed to provide workers for reforestation activities. For its part, the company agreed to support forest management, supply materials for the nursery, and buy harvested wood to provide an incentive for producers in the short term.

## Adding value to wood products

The association's initial objective was to protect the environment and produce firewood for the community. But in 1994 the idea was born to create wood products for export and construction began a small workshop with basic machinery (at that time there was no electricity in Sacalá) to produce wood toys with financing from the Swiss NGO *Hélvetas*. Ten local woodworkers (five men and five women) were trained, products were designed and customers sought, with the educational toy store *Teach* becoming the workshop's first client.

To promote the business, the community launched a project called "The Sacalá Bunny" after a children's story in which rabbits and other animals of the forest find a home thanks to forest conservation and reforestation efforts. The "Bunny" also refers to the special meaning this animal had for the Mayas. The *nanhual* (rabbit) is synonymous with abundance and prosperity in Mayan culture.

In the first four years of the project a plant nursery was opened, the first lots were created and the workshop started operations. The workshop began using bought wood with the aim of opening new markets, gaining experience and developing business abilities.

In the next three years (1997-2000), the venture was expanded to include other producers in the area. In 1997 the Chuisac community joined followed by Pachay the year after.

The Tikonel Association of Forest Producers was formed in 2000. In 2004, the San Bartolo community joined and today there are 10 communities in the association, with 227 members who own a total 83.2 hectares of forest land organized in a vertical production chain.

The association is a not-for-profit, nonpartisan and nonreligious entity dedicated to promoting the social, cultural and economic wellbeing of its members and communities through integrated development projects. The association provides training and technical assistance to its members to manage their plantations and native forests, but the members are directly responsible for managing their own forest.

The association's main objective is to encourage sustainable development alternatives for indigenous communities on marginal land. But its activities are not just sustainable, they also look to reverse the damage done to the forest ecosystem, ensuring projects are carried out in accordance with the local culture and respectful of local customs while generating jobs and improving the economic wellbeing of families.



A pine plantation of the PINPEP Programme



Landscape in Sacalá

### Entrepreneurship and forest protection

The “*vertical forest production chain*” model implemented by the Tikonel Association began with the cultivation of native and other plant species in nurseries. Later, the plants were distributed amongst the members so they could establish their own plantations with the aim of native forest conservation and wood production. This last activity involves two steps: the first is primary production of timber, which is done using a traditional saw; then, in the secondary production stage, finished wood products are produced. In this second stage, the association has developed an innovative new process combining wood objects with typical textiles.

The idea of combining wood and textiles led a group of women from local communities to develop a project called “*female indigenous micro-business*.” The project has allowed the women to participate in the production chain and produce a variety of products (handicrafts, games, and other objects) for export, obtaining good economic returns as a result.

The land managed by the association includes three types of forest: sub-mountainous humid subtropical forest; humid subtropical forest (temperate); and dry subtropical forest. Of the variety of tree species in these areas, those that have been used in plantations include pino candelillo (*Pinus maximinoi*), aliso (*Alnus acuminata*) and ciprés (*Cupressus lusitanica*). In the native forests, other

species include oak (*Quercus spp.*) and madrone (*Arbutus xalapensis*).

The aliso (alder) is the main species used by the association given its rapid growth (its cutting cycle is around 12 years) and the fact that, even though its wood is not as high quality as other species, it can be used in a wide variety of toys and other common use items. The other two species used on the plantations (pine and cypress) produce better quality wood, but their cutting cycle is around 20 years. However, considering that the demand for alder is limited and its market value is half that of other conifer species, pine is now being planted more than alder.

Since 2006, the areas reforested by the association have been entered in the Incentives for Small Landowners Program (PINPEP) of the National Forest Institute (INAB in Spanish), which has allowed members who reforest their land and manage their forests sustainably to obtain economic benefits.

### Setting an example

Even though the Tikonel Association still has to resolve some issues related to the economic management of its business, it is a good example of sustainable forest management. In a country where many production practices have been based on the overexploitation of natural resources, the conservation standards adhered to by the members of the Tikonel communities have a powerful effect on other communities and are a benchmark that should serve as a reference to design public policies. The participation of the Tikonel Association on the board of the National Forests Institute (INAB), which is the main state entity in charge of reforestation and sustainable forest management, offers the possibility of influencing forest development issues that involve small indigenous producers in the country.

One of the merits of the Tikonel Association is that it has moved up the production chain beyond being a simple supplier of raw materials. This has been achieved through the workshop and the development of new products for export markets, including products combined with textiles and non-wood products like fibre, bark, seeds etc. In addition, the association has formed partnerships with other small producers in areas such as textiles,



An aliso (*Alnus acuminata*) plantation of the PINPEP Programme

furniture, and construction, and has sold its products to important industrial manufacturers, such as Ron Zacapa, and stores with considerable retail market share including CEMACO and Kalea.

The association has the clear aim of adding value to its forest products to improve the profitability of its forestry activity. The results so far are encouraging, although there is room to improve by, for example, expanding the workshop and organizing the production system to process a larger quantity of wood.

The association's concept of integrated development has strengthened the cultural and spiritual identity of the indigenous communities as well as preserving their traditional forestry practices and knowledge for future generations. There is now a greater concern to protect the environment and, specifically, the forests. The use of forest plantations helps protect native forests as well as forest resources like soil and water. Many of these plantations have been created under the PINPEP incentives mechanism of the National Forests Institute, but the members are ultimately the ones who perform and monitor forestry operations on their land.

The association has used educational activities to increase awareness in the population about the importance of forests, and it encourages its members to take measures to prevent forest fires.

Another important aspect of the Tikonel Association's experience is the on-going search for partners willing to contribute to its goal of sustainable forest development. The association has received technical and financial help from many organizations and institutions like the Humanist Institute for Cooperation with Developing Countries (HIVOS), the National Fund for Peace (FONAPAZ), the Social Investment Fund (FIS), the Guatemalan government, the Association of Rural and Indigenous Agro-forest Communities (ACICAFOC), and the National Forests Institute (INAB). The association has also formed partnerships with companies and producers, which have allowed it to create new production chains and expand its offer of forest products.

# El Choloque

## A POOR COMMUNITY SAVES A TROPICAL DRY FOREST FROM DESTRUCTION AND IMPROVES ITS QUALITY OF LIFE

By Miguel Segur Pelayo, José Andrés Orellano Rodríguez  
and Patricia Medina Llerena

Location	Motupe district, Lambayeque department, Peru
Biome	Tropical dry forest
Type of forest	Native
Organization	Indigenous community
Objective	Multiple uses (firewood and timber, non-wood forest products, beekeeping) – Forest restoration
Area	1,027 hectares

Tropical dry forests stretch from southern Ecuador on the Santa Elena Peninsular to the Chiñama River valley in the north of Peru, and represent a unique biome on the planet, although one that is threatened. These forests form part of the “*Centro de Endemismo Tumbesino*”, which is considered one of the most important regions on the planet for its richness in endemic species and is one of the world’s biodiversity hotspots<sup>12</sup>, according to the organization *Conservation International*.

According to Birdlife International, a global alliance of conservation organisations, there are around 800 bird species in the region including 55 endemic species (7%); 142 species of mammals with 54 endemic (38%); and 6,300 species of plants including 1,290 endemic (20.5%).

In the north of Peru, the dry forest extends along the coast through the departments of Tumbes, Piura, Lambayeque and the north of La Libertad which is connected to the Marañón valley by the Porculla mountain pass (2,100 meters above sea level), the lowest pass in the entire Andean chain. Despite the difficulties of indiscriminate logging and desertification, the members of a local community have managed to conserve the forest and at the same time improve their living standards thanks to the goods and services obtained from the forest.

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<sup>12</sup>The British biologist Norman Myers coined the term “biodiversity hotspot” in 1988 as a biogeographic region characterized both by exceptional levels of plant endemism and by serious levels of habitat loss. The term has been adopted by international conservation agencies to draw attention to biologically sensitive areas of the planet that are threatened [Extract in Spanish: <http://www.nodescatalogacion.com/2010/02/letras-de-murga.html>].

## Against the odds

The village of El Choloque, in the Motupe district in the department of Lambayeque, Peru, consists of 60 families. The living conditions of these families are rough. They lack running water and electricity. Other basic services, like education and health, exist, but are provided in centres far from the community. Public services are limited to a network of roads and an uncovered canal system for irrigation. However, the community has received support since 1994 in the form of technical and humanitarian assistance (food donations).

Between 1994 and 1996, the community received technical and financial support from the Algarrobo Project (in the framework of the National Forest Action Plan) for the sowing of native species and the protection of natural regeneration.



Nursery with native species

In 2003-2004, thanks to financing from the UNDP's Small Donations Program (SDP) and the World Environment Fund (WEF), the community realized an inventory of its forest resources and their potential. It also received training for sustainable dry forest management, created a Community Forest Management Plan and identified sustainable economic opportunities.

Then, between 2005 and 2008, with the technical and financial support of various institutions, many families began producing organic honey and alpagate honey (produced by a species of stingless bee).

The community is organized by a town council. It is surprising how well this council works and the level of participation and commitment of its members. The meetings are convened well in advance, motions are proposed and voted on by those in attendance, and the minutes are recorded and posted on a bulletin board in the community centre.

There is also a committee that organizes a neighbourhood watch to prevent poaching and illegal logging. The community members are particularly proud of the protected area designation for their forests.

In addition to the town council, the community has organized the Association for the Protection of Dry Forests of El Choloque (ASPROBOS). The association and the council exist harmoniously, with the former organizing the participation of community volunteers.



Agroforestry plot

## Focus on regeneration: a long-term vision

The forest area in the El Choloque village management plan, established in 2003, covers an area of 1,027 hectares, and includes different forests types as follows:

Areas of the Management Plan by Forest Type	Area (ha)
Sparse dry forests in lowland areas	255.5
Dry forests in hilly areas	107.8
Semi-dense dry forests in hilly areas	666.12
Total	1,027.42

The Community Forest Management Plan outlines the community actions aimed at conserving the dry forests ecosystem and developing sustainable production processes that improve the standard of living.

Víctor García, a local beekeeper and director of ASPROBOS, was the first in the community to raise his voice against logging in Hualtacal (a hilly forest area formed by the anacardiácea *Loxopterygium huasango* species). He argued that the minimum legal diameter for logging, 30 cm, was too small since trees of this size can grow to become much bigger. García's opposition gave rise to what is today the Hualtacal Management Plan, focused on the production of organic honey. The following table shows the forest's evolution since then:

## Tree Cover in the Hualtacal Dry Forest (2003 – 2007)

Area	2003	Silviculture Activity	2007	2011 Projection
Loma Facunda	Very sparse dry forest: 44 trees/ha, 16 plants/ha, 7.8% of tree cover.	Protection of 10 plants/ha.	Sparse dry forest: 54 trees/ha, 12% of tree cover.	Sparse dry forest: 54 trees/ha, 15% of tree cover.
Loma Diana	Very sparse dry forest: 152 trees/ha, 175 plants/ha, 20.4% of tree cover.	Protection of 30 plants/ha.	Semi-dense dry forest: 182 trees/ha, 31% of tree cover.	Semi-dense dry forest: 182 trees/ha, 45% of tree cover.

The El Choloque community has a long-term vision of natural resources management with a 20-year plan. The members understand that the forest must be protected, which is why they guard their forest areas, sow seeds to diversify species and increase tree cover while protecting natural regeneration.

### Honey: a sweet option

In addition to agro-forestry work and silviculture activities designed to promote regeneration and forest restoration, the community members – both men and women - have developed a prosperous business producing organic honey, alpargate honey and jams.

The community has to repay part of the funds obtained to build their agro-industrial plant, but so far honey production on its own does not generate enough income to meet this obligation, said community member Micaela Martínez. But thanks to the production of jam by local women, the community was able to make the payments. This was an important step for the women of the community to participate in the decision-making process.

Non-wood products like honey and jam show the value of biodiversity in this forest hotspot, and its need for protection. The production of honey by the stingless alpargate bee (*Meliponinae*), of the genus *Plebeya*, is particularly important given the special qualities of this bee's honey, although there is scarce scientific information about the species.

The members receive payment from ASPROBOS for their work. The association administers the activity and controls all the income, making it a more powerful economic actor in the market than the villagers would be on their own. The income is used as capital to obtain external funding and is reinvested in equipment such as storage facilities, industrial production equipment etc. ASPROBOS has obtained an important certification that guarantees that its honey production is organic. This helps exports of its products which tend to sell very quickly.

### Replicating the experience

The participants in this endeavour have been able to create an efficient, independent organization while protecting their forests, which in turn provide them with goods and services that generate income and improve their standard of living.

The association has grown by executing projects successfully and transparently, which has built its good



Organic certified beehives with native bees (*Plebeya spp.*).



Organic honeycomb

reputation in the community. It has obtained financing from banks and won the support of regional and local governments, allowing it to establish synergies and become an example for the region. In this regard, the association is a leader in developing processes to improve forest management and is contributing to the sustainable management of dry forests throughout the region.

At a local level, the association helped the Tongorrape area of Lambayeque department obtain its status as a protected area, and has supported the development of a sister organization that protects forests and promotes sustainable management in the Palo Blanco sector, upstream from El Choloque. It is also imitated by new organizations in small communities of the Chirñama river valley and has signed agreements with them to develop joint conservation initiatives. The biggest producers in ASPROBOS act as coaches, applying teaching methods such as “learn by doing” (*aprender haciendo*) and “from farmer to farmer” (*de campesino a campesino*).

At a regional level, the association is promoting the development of a regional system of protected areas in the Lambayeque department. This would promote tourism activities (bird watching, organic food sales, adventure tourism etc), that are a priority for the Lambayeque government since tourism creates alternative income for local communities.

At a sector level (organic honey production), ASPROBOS is a member of the Peruvian Association of Small Ecological Producers, which has given it the organic honey certification.

ASPROBOS also participates in regional organizations promoting biodiversity conservation such as the Lambayeque region’s Forest Conservation Council and its Local Council for the Lambayeque Conservation Areas System.

Many factors have contributed to ASPROBOS’ success, including the vision of its members, strong leadership, and the support of local and regional authorities. This support has helped the village of El Choloque to keep going even during tough times when other communities might have decided to split the profits and walk away. As a result, the community has managed to conserve its tropical dry forest that was threatened with destruction, while improving the quality of life for its members.

# Cururú

## AN INDIGENOUS COMMUNITY ORGANIZATION HARVESTS WOOD AND NON-WOOD PRODUCTS TO DEFEAT POVERTY

By Henry Moreno

Location	Guarayos province, Santa Cruz department, Bolivia
Biome	Subtropical broadleaf humid forest
Type of forest	Native
Organization	Indigenous association: <i>Asociación Indígena Maderera Cururú</i> (AIMCU)
Objective	Industrial wood production – Forest harvesting – Socio-economic benefits for the community
Area	26,421 hectares

The promulgation of Bolivia's Forest Law in 1996 allowed many indigenous communities to form their own forest management plans allowing them to realize forestry activities, generate income and improve their quality of life.

One example of this is the community of Cururú, in the province of Guarayos, 310 km from the city of Santa Cruz de la Sierra, in the department of Santa Cruz. This community formed a woodworking association to manage the forest and has achieved significant progress with a bright future ahead.

### A forestry tradition

The Cururú community forms part of the Guarayos Indigenous Peoples' Land programme (*Tierras Comunitarias de Origen* in Spanish), established in Bolivia's Constitution of 1994. Under this programme, indigenous communities are allowed to develop their own economic, social and cultural systems.

The Guarayos are part of the Guaraní group of South American indigenous peoples. They arrived in Bolivia possibly in the 15th or 16th century, but were driven into the forests in the northern part of the country by the loss of their lands to conquest. There they led a semi-nomadic existence and live today in 60 small villages spread out over a large area. The Guarayos remained independent until the end of the 18th century when the Jesuits

began to systematically convert them. The traditional religious authority of the community is the “cacique”. The *cacique* figure survived the time of the Jesuit missions and is responsible for ensuring the preservation of the Guaraya culture and religion. Each community has a head council, or “cabildo”, made up of 12 councillors, called “cabildantes”, who elect the *cacique*.

The Guaraya families traditionally practice subsistence agriculture, complementing small-scale cattle farming with forestry activity, hunting, fishing and handicrafts. The forests are mainly used to provide raw materials for their housing needs, food security, energy, handicrafts and medicines.

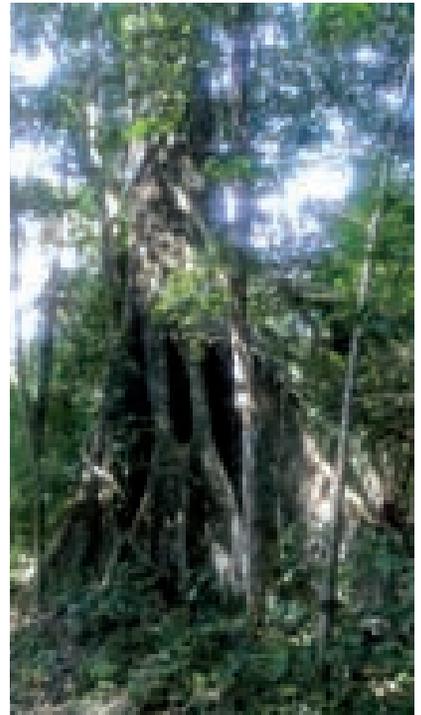
The most common tree species are: tajibo (*Tabebuia impetiginosa*), cuchi (*Astronium urundeuva*), mara (*Swietenia macrophylla*), ocho (*Coumarouna micrantha*), curupaú (*Anadenanthera colubrina*), cerebó (*Schizolobium spp.*), paquió (*Hymenaea courbaril*) and sirari (*Ormosia coarctata*).

The Guarayos have a rich artisanal tradition of using forest resources. They use them for making musical instruments, handicrafts, furniture, canoes and some tools. Non-wood products include cusi palm oil (*Attalea speciosa*), honey, wild fruits, resins, and latex. They use a wide variety of plants for medicinal purposes and use palms in multiple ways: the trunks as beams for their houses, the leaves for roofs and weaving baskets and the seeds for extracting oil. From the palm known as motacú (*Attalea phalerata*) they obtain palm hearts and fruit. The main species used for firewood are: lachiquii, curupaú, ambaibo (*Cecropia spp.*), cuchi, palo santo, picana (*Cordia sp.*), guayabochi (*Euklistia spruceana*), zabuco, aliso and blanquillo (*Ampelocera ruizii*).

Since the introduction of the Forest Law, which made forest resources available for commercial purposes, many Guaraya communities organized themselves in forestry associations to harvest their forests and obtain economic returns.

## A way out of poverty

The Cururú community is formed by 212 people in 32 families. Road access to the community is very difficult, especially in the rainy season, but the best way to get there is along the Blanco River. When the river is low, it is possible to drive a vehicle from Urubichá to Cururú and the neighbouring cattle farms.



Evergreen forest with dense vegetation and medium to high canopies

The community has a school with two teachers and 56 students in different levels. Normally these types of community schools only teach young children, but in this case there are students through grade eight.

The boys and girls also work from a young age with their parents and learn skills for farming, ironworking, carpentry, leather working, weaving, shipbuilding, masonry and arts like music.

The Cururú community has no health service despite having a first aid station, and so patients must travel to Urubichá for medical attention or to Ascensión de Guarayos, the provincial capital, where there is a hospital. However, young people from Cururú are training as nurses with the aim of returning to their community to offer basic health services.

Cururú also lacks running water, electricity and sewage treatment. Water for human consumption is obtained from the Blanco River using three waterwheels. Latrines with septic tanks are also being built. Given these precarious sanitary conditions, common health problems like diarrhoea and respiratory infections affect children especially.

In 2001, the Cururú community agreed on a General Forest Management Plan covering 26,421 hectares (including 25,838 ha for harvesting and 83 ha which is protected) with a logging cycle of 30 years. Since then, the community has received technical support from the Bolivia Sustainable Forest Management Project (BOLFOR) and other organizations, which have helped conduct forest inventories and improve forest management.

The area covered by the management plan is in the Amazon River valley, near the Blanco and Negro Rivers (both tributaries of the Itenez River). The Cururú community itself is on the banks of the Blanco River. However, none of these rivers flow through the forest management area where there are only a few small streams that dry up completely in the dry season.

To administer the management area, the community created an association called the Cururú Indigenous Lumber Association (AIMCU in Spanish). The AIMCU is a community-owned forest company comprised of 32 members. To date, the association has managed six annual forest harvests.

In 2007, the Cururú community certified its forest under the Forest Stewardship Council (FSC) criteria after signing a technical and economic cooperation agreement with the company INPA Parquet in Concepción.



Area under forest management,  
Cururú community



Forest under management using  
a polycyclic system

## Community organizations

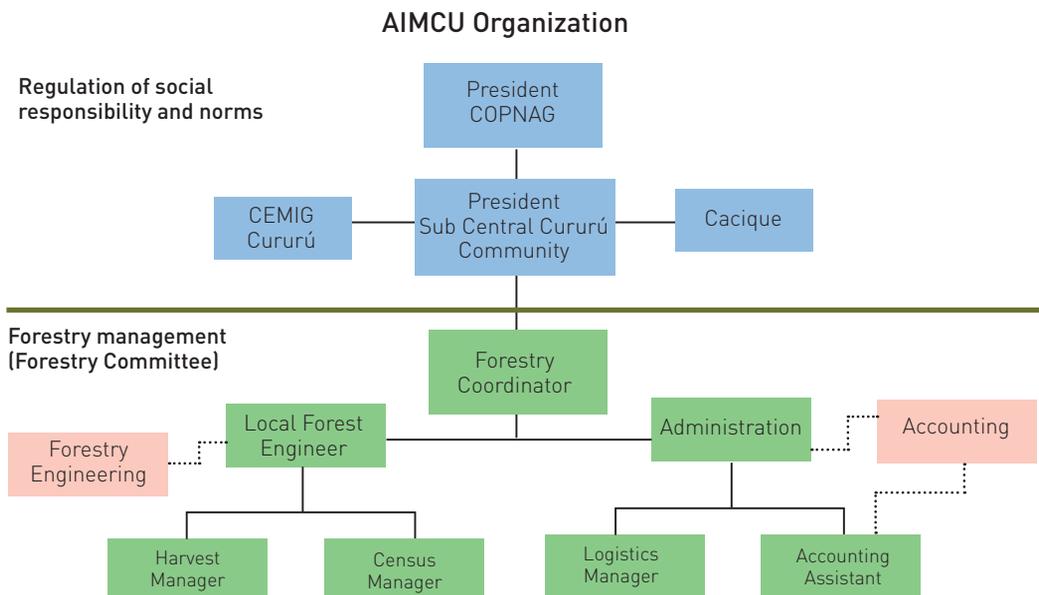
The Guarayos indigenous community land covers more than 2.2 million hectares. The area includes community centers in Yotaú, Yaguarú, San Pablo, Urubichá (Uribichá, Salvatierra and Cururú) and Ascensión de Guarayos, which are organized by the Guarayos Center for Indigenous Peoples' Organizations (COPNAG). COPNAG is made up of different departments responsible for taking action within the management area.

There is also a Guarayos Indigenous Women's Centre (CEMIG), which is in charge of promoting the development of women in the area.

Cururú as "the only community that complies with all the technical and legal requirements to carry out forest harvesting," said COPNAG's president, Idalberto Ireilory. In addition, AIMCU "has realized that social responsibility is key and so is acting responsibly," said COPNAG's secretary of communications, Rufina Moronechi.

As the legal representative responsible for the association's forest management plan, COPNAG must ensure the sustainable harvesting of forest resources under the framework of the national forest law and internal norms.

AIMCU is in charge of executing the Community Forest Management Plan, in compliance with the rules established by COPNAG for the use of natural resources.





A campsite



Community housing

AIMCU is responsible for maintaining an efficient business structure; approving the annual forest operating plans; and organizing committees for the different forestry activities.

AIMCU's team is in charge of supervising and administering all forestry activities as well as security to stop third parties from invading the land. In addition, the company publishes monthly and annual financial reports for COPNAG's natural resources department.

The AIMCU Forestry Committee is comprised of a coordinator, a financial administrator, a logistics manager, an accountant and a forestry engineer. The association also employs a forestry professional who is responsible for reporting back to the country's forestry regulator.

To control the association's income, payments are deposited in a bank account in the name of the Cururú community in order to avoid potential problems when individuals manage large sums of money.

### Benefits of sustainable management

To ensure the Cururú forest management plan is implemented correctly, the AIMCU has developed a training program for technical and managerial aspects of sustainable forest management. AIMCU's forestry operations team has received training over several years, which has allowed them to gradually take on the technical and administrative responsibilities under the management plan.

Most of the income generated is used to cover operating costs of forestry and other activities and the remainder is divided amongst the members.

The community decided that 15% of the profits should be paid top workers as a production bonus, 3.5% to COPNAG and 5% for the community. Payments to the community and COPNAG are designed to support their forest-related activities in Cururú.

The creation of jobs for both men and women is one of the key benefits of the wood producers' association. Al-

fredo Añez Yamba, who is 32, has worked as a chainsaw operator for four years: “*I am very happy working in the forest, I have enough money for my family [five children and his wife] and school.*”

In addition, AIMCU is developing a project to improve community housing, which has included buying 42,000 roofing tiles for local families. The project is supported by a group of architects, which has come up with a new housing design that respects the traditional Guaraya architecture.

Thanks to AIMCU, the community has the confidence to continue with its forestry activities on more than 26,000 ha of land certified by the FSC, which means operating as a sustainable community forestry company. The FSC certification should also allow AIMCU to obtain better terms in its negotiations with potential customers.



A boy of the indigenous *Gwarayu* (Guarayo)

## Iratupuru

# SMALL-SCALE BRAZIL NUT COOPERATIVE PRACTICES SUSTAINABLE FOREST MANAGEMENT AND PRODUCES VALUE-ADDED PRODUCTS

By César Sabogal

Location	Municipality of Laranjal do Jarí, Amapá state, Brazil
Biome	Tropical broadleaf humid forest
Type of forest	Native
Organization	Cooperative of small producers: <i>Cooperativa Mista de Produtores e Extrativistas do Rio Iratapuru</i> (COMARU)
Objective	Harvesting of non-wood products - Adding value to wood products - Biodiversity conservation - Socio-economic benefits for local communities
Area	23,330 hectares

The main economic activity in the small community of San Francisco de Iratapuru, which is located in Amapá state, is harvesting Brazil nuts, breu resin and copaíba oil from the nearby Iratapuru River Sustainable Development Reserve (RDS)<sup>13</sup> in Brazil's Amazon. The management of the forest areas in the reserve for the extraction of Brazil nuts and breu resin has been certified by the Forest Stewardship Council (FSC).

The community is organized in the Iratapuru River Cooperative of Producers and Extractors (COMARU in Portuguese). This organization owns a plant to produce oil from Brazil nuts, which adds value to the product. As a result of these activities, the families of the community have obtained social and economic benefits, while investments have been made to improve environmental protection and education.

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<sup>13</sup>RDS is a category in Brazil's National System of Conservation Units (SNUC), defined as a reserve inhabited by indigenous peoples whose existence is based on sustainable systems of harvesting natural resources, developed over generations and adapted to the local ecological conditions. These reserves also play an important role in nature and biodiversity conservation.

## A cooperative of traditional forest producers

The San Francisco de Iratapuru community at the mouth of the Iratapuru River is just outside the RDS limits. Some 150,000 hectares of the 802,000 ha reserve are occupied by 66 families that have received government licenses to operate Brazil nut plantations.

### Colocações: Family-run forest units

The “colocações” are individual family-run production lots that are formed through informal agreements between local people. The boundaries of these units are marked by paths, waterways and landmarks. The family occupying such a unit is allowed to use its natural resources. If one family stops using their lot, however, another can agree to take it over. The size of each lot, like its physical boundaries, is not formally established, but their owners traditionally respect and maintain the limits, which reduces the risk of invasion or losing their land use permit.

The San Francisco de Iratapuru community is comprised of 36 families and around 200 residents in total, bound together by bonds of family, culture (traditional extraction activity) and religion (the majority are Catholic). The majority are also illiterate. The community has a leader and an association which, since 2008, invested in social projects using funds provided by the cooperative.

Before becoming part of the cooperative, most producers (many from Laranjal do Jarí and other nearby communities) confined their activities to the reserve. They produced latex, macaranduba milk and balata gum, but they earned most of their income from Brazil nuts.

The Iratapuru River Cooperative of Producers and Extractors (COMARU), created in 1992, has 46 members.

The main economic activity in the community is gathering and selling Brazil nuts. Between February and August, the families head out to their lots to collect nuts. Between September and January, they survive on subsistence agriculture (corn, beans, manioc and rice mainly), raise farm animals (chickens, pigs), hunt, fish and grow vegetables. Some of them work in the mines. The extraction of wood is allowed but only as much as they need for their own use, it cannot be sold.

The community has two first aid stations, a primary school, treated water, electricity at night (generated by a motor fuelled by the municipality), a hotel and a skills centre where courses are given in extraction and processing, eco-tourism, and handicrafts.

Although living conditions have improved, there are still areas for improvement. The sanitary conditions are poor: only part of the population uses outhouses (sewage is thrown out in front of houses), and only a few families bury their rubbish.

The state government is also planning the construction of a hydroelectric plant that will use the huge potential of the Santo Antônio falls, but will flood part of the community, forcing people to move to higher land.

## Collecting Brazil nuts

In Brazil there is no legal norm that requires a plan for managing non-wood products. In the case of San Francisco de Iratapuru, the forest management plan is based mainly on the knowledge of the local population which has extracted these products for centuries. The community currently harvests three non-wood products: Brazil nuts and oil (*Bertholletia excelsa*), breu resin (*Protium palladium*) and copaiba oil (*Copaifera spp.*), although this last one has not been certified.

The forest management was certified in 2004 under a simple procedure for a group of seven producers covering a total area of 13,250 hectares. By 2009, this number had risen to 27 producers (31 lots) with a total 23,330 ha. Not all producers in the cooperative are certified, but those that are must protect the environment, use safety equipment during the harvest and remove garbage from the extraction area.

On average, up to four workers are hired on each lot to strain oil from Brazil nuts depending on the productivity and size of the grove. The average production per tree is 300 litres but there have been cases up to 500 litres.



### Extraction of non-wood products<sup>14</sup>

The management of non-wood products by members of the COMARU cooperative follows the pattern of other traditional peoples in the Amazon. The main product is the Brazil nut, which is collected by families on their lots near the Iratapuru River. The extraction of resin from the breu tree and oil from the copaiba is also starting to complement the collection of Brazil nuts.

In February, the family moves to their lot for the harvest period where they live in a temporary campsite. The owner takes part in the collection along with his older children and sometimes other community members in return for payment. The women and smaller children stay at the campsite and prepare the meals. The workers go to the Brazil-nut groves each morning where they collect the fallen orizos (the name of the Brazil nut fruit) from under the trees. The orizos are cracked open to obtain their seeds. At the end of each day, the seeds are put into baskets and taken to the campsite. The seeds are then washed and bagged, ready to be transported to the community along the Iratapuru River on boats or launches owned by the cooperative.

The copaiba is harvested on lots where the species is abundant. A drill is used to make a hole in the tree and extract the oil, which is then collected in drums and transported on the river.

The breu resin is only taken from trees when the product is found hardened on the outside of the trunk so it is not necessary to harm the tree.

<sup>14</sup>[Source: SmartWood - Imaflores 2007].

The copaiba is harvested on lots where the species is abundant. A drill is used to make a hole in the tree and extract the oil, which is then collected in drums and transported on the river.

The breu resin is only taken from trees when the product is found hardened on the outside of the trunk so it is not necessary to harm the tree.

The production capacity is extremely variable but for areas between 1,200 and 3,200 ha, production averages between 20,000 and 120,000 litres of Brazil-nut oil, 120 to 150 litres of copaiba oil and 100kg to 300kg of breu resin.

The community extracts oil from the nuts in a special plant. The process includes drying the fruit in an oven, breaking it open, selecting, grinding and, finally, pressing the nuts to obtain the oil. Eight to ten people work in the drying while 38 people work in the other stages.

The oil is stored in 45 kg drums, which are transported by river to Laranjal do Jarí and then to the port of Belém.

But the community has faced some problems. In 2002, a fire destroyed its cookie factory that had been built with financial support from the Amapá government and the Environment Ministry. The factory, which brought income and jobs for the community, produced 600 kg/day of cookies with two daily shifts of 12 workers each. For other reasons, the community also stopped producing desserts and dehydrated nuts.

One incentive to expand the range of products is the purchase by Brazil's National Supply Company (CONAB) of Brazil nut flour used in school lunches. The cost of producing flour is very low, basically manpower and electricity for drying and packing. This by-product, which used to be thrown away, could generate additional income for the community.

The San Francisco de Iratapuru community cooperative has received support from public and private organizations in the form of advice, training, management and product development, as well as financing for manufacturing infrastructure.



Brazil nut tree (*Bertholletia excelsa*)



Collected Brazil nuts

## Better prices = social benefits

In 2005, the community signed an agreement with the Brazilian cosmetics company *Natura*, which buys Brazil-nut oil and supports the community by providing advice related to certification and social development. This type of partnership between a local community and a large company is relatively new in Brazil. *Natura* guarantees that 5% of the profit obtained from the sale of its products that contain forest ingredients from the community will be put into a Profits Sharing Fund. This fund is managed with the participation of the community and is only used for social projects. In the case of breu resin, the community receives a percentage of the profits for sharing its genetic and traditional knowledge as required by law. In return for access to the breu resin gene pool, the company also pays into a separate community fund.

COMARU's raw material production is pre-certified, which guarantees the purchase of the Brazil nuts by its partners. The price of the product is defined by the members and is slightly higher than they would receive from intermediaries.

But the benefits from the *Natura* fund are more important for the community than the income obtained from the sale of its products, and are an incentive for the community to maintain its forest certification.

The fund has financed scholarships for young people, mainly for technical degrees (agriculture and forestry) to increase the local knowledge in the community. These also help build leadership capacity and improve management skills related to Brazil nut production. Resources from the fund have also been used to improve health services (water treatment and basic first aid), as well as build a community centre and a new library.

The community members have obtained job security, safety equipment, and health check-ups for those who work in the factory amongst other benefits. The community has less health problems today as a result of hygiene measures (e.g. waste management).

Women are playing an increasingly important role in the community; the president and executive secretary of the cooperative are both women. And the hard work of processing the Brazil nuts is done mainly by women.



School of the San Francisco community

## Management based on traditional practices

The proper management of non-wood products has helped maintain and protect the forest, added value to the community's extractivist culture and facilitated the transfer of knowledge to the next generation.

The management principles and rules that regulate forestry activities are mainly based on the community's traditional knowledge. These rules allow the cooperative to maintain its certification and if a worker does not follow them, he or she is notified and a note made on their record. If the worker breaks the rules again, their contract is suspended.

The community has been recognized at an international level for its certification and for balancing production with conservation, which has attracted the interest of universities and other institutions. These include flower and fitosociology research as well as studies on the impact of forest management on regeneration, fauna, and social development. In this last case, studies have shown a low impact due mainly to the small area under management, which represents less than 1% of the RDS.

COMARU's vice-president is a young person who was educated as a forestry engineer outside the community and then returned to take up the position. One of his main priorities has been to hold workshops on certification, management and community organization.



Community leader and villagers of San Francisco

## Areas for improvement

Despite the assistance it has received, the organization's management is still weak. *"It's difficult to make a Brazil nut farmer into a businessperson,"* said one community leader, Mauro Barbosa. The transition can be summarized as going from a subordinate attitude (waiting for someone else to solve your problems) to a more take-charge attitude. The farmers were not ready to deal with the bureaucracy, markets and demands associated with the certification process. In this regard, the cooperative needs to be strengthened.

The community also needs to strengthen its internal communications methods and environmental education based on strong values.

There are also worrying signs like the lower production of Brazil nuts in recent harvests. Production has a two-year cycle, but many of the trees have been producing less year to year. There are still few community members who have planted their own trees, but one of them is Mauro Barbosa who insists the community needs a plant nursery: *"The community still does not realize how important this is. They think there are plenty of trees and they don't worry about making their production sustainable,"* he said.

Another concern is the domestic market. Natura buys two tons of Brazil nut oil from the cooperative each year of the six tons it produces. This means it has to store part of the production until it finds another buyer. The producers have realized the key is opening new markets and that means integration with other communities to negotiate better terms.

The San Francisco de Iratapuru community has many challenges ahead including the development of alternative products like possibly soaps and perfumes. Other potential sources of income in the community include fish farming and agro-forestry systems.

# Gualaco y Guata

## A COMMUNITY ASSOCIATION STOPS NATIVE FOREST DESTRUCTION AND ADOPTS SUSTAINABLE MANAGEMENT

By César Alvarado

Location	Municipalities of Guata and Gualaco, Olancho department, Honduras
Biome	Tropical and subtropical coniferous forests
Type of forest	Native forest + plantation forest
Organization	Community association: <i>Red Hondureña de Áreas Comunitarias Forestales de Gualaco y Guata</i> (Red HACOFOGG)
Objective	Industrial wood production – Landscape restoration – Protection of river valleys – Socioeconomic benefits for communities
Area	39,542 hectares

In 2004, 39 rural communities in the Guata and Gualaco municipalities in Honduras' Gualaco National Forest began managing their resources sustainably with the aim of improving their quality of life. The 4,000 people who live in these communities have achieved important progress towards this goal.

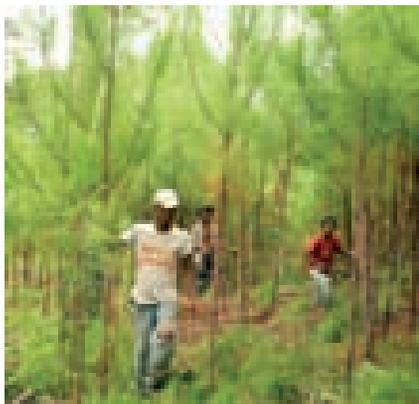
### Forest under pressure

The mainly coniferous forests managed by the communities represent 43% of the national forest area. These forests were first logged in 1988 to supply raw material to the state-owned pulp and paper industry, which at that time had the exclusive right to harvest and sell lumber. Through tax-free areas, auctions and licenses, companies logged much of the pine forest, leaving a few low-density forests in the less accessible areas of Gualaco and Guata.

Before 2003 the state did not have the technical capacity for sustainable forest management and a lack of regulation accelerated the deterioration of the forests. Between 1999 and 2003, a total 153,000 m<sup>3</sup> of wood was officially harvested. However, given the limited supervision at that time, the actual figure was probably at least double this amount.



Forest plantations



Silviculture activities: thinning and pruning are applied to increase the value of the wood

The pressure applied by wood merchants (legal and illegal) on forest areas was so strong that it began to affect food security and water sources for more than 50 communities. Public protests against illegal logging by inhabitants of these communities at the offices of the former State Forest Administration (AFE)<sup>15</sup> became frequent.

AFE, for its part, lacked the resources to fight illegal logging and fires on its own. Once the financial incentives for local communities disappeared, the forest fires grew with greater intensity. Moreover, communities did not report illegal logging unless it directly affected their source of water. In such conditions, the regeneration of the forest was seriously threatened and with it the long-term wellbeing of the communities. Fires destroyed so much of the forest cover that in 2004 the Gualaco municipality became one of the 13 municipalities most affected by forest fires nationally. In addition, the forest suffered from a plague of weevils (*Dendroctonus frontalis* e *Ips* sp.).

The communities did not obtain many benefits from the forest. At the most, they provided manual labor to the forest companies. As in other parts of the country where this system continues, subcontractors were forced to pay a tax for harvesting timber from the forest.

Since the locals could not see any benefit from the forest, they opted for subsistence farming and extensive cattle farming. Until 2004, most people in these communities worked in the production of basic grains (beans and corn), coffee and beef.

### Community forest management

The new Forest Law of 2008 facilitates sustainable management of forest resources by local communities. The Institute of Forest Conservation, Protected Areas and Wildlife (ICF in Spanish) has created a method for communities to award forest areas to companies under long-term management contracts that favor community development and forest conservation.

Given that the forest areas of Guata and Gualaco municipalities are state-owned, the state signed long-term contracts with 39 communities that

<sup>15</sup>Today AFE is known as the Institute of Forest Conservation, Protected Areas and Wildlife (ICF in Spanish).

stipulate the rights and responsibilities of both parties for sustainable management. Of the 131,426 hectares that make up the Gualaco National Forest, the state has assigned the management of 39,542 ha to local communities.

Forestry activity represents one of the main activities in the community, offering stable work year round. At least one member of every family works in forestry and their income is at least minimum wage or higher.

The wood is sold mainly as timber, but some communities have acquired mobile sawmills to create more jobs and add value. These investments are designed to boost employment and increase earnings.

In the interest of transparency, community organizations use a “public sale” mechanism for wood products, which allows not just companies but also social organizations and environmental authorities to participate.

Two types of structures have been created to manage forest activities: the *Inter-communal Council*, which manages the social development agenda, and the *Agro-forestry Cooperative*, which manages the production agenda. The communities have grouped themselves in five cooperatives: Brisas de Oro Verde, Áreas Verdes, El Paisaje, Flores Nuevas and San Antonio, with a total 491 members (30-40% of whom are women). Since 2005, their efforts have produced the following results:

- **Gross income from sales of wood products = US\$518,600**
- **Taxes paid to the state = US\$224,300**
- **Number of jobs created = 5,560**
- **Investments in forest protection = US\$39,100**
- **Investments in nurseries and reforestation = US\$12,700**
- **Investments in improving rural roads = US\$23,700**
- **Investments in infrastructure projects = US\$40,200**

The cooperatives use 60% of their profits for community improvement projects and 40% for investments and the purchase of production equipment. Investments have included water treatment systems, solar energy, public bathrooms and health services, church construction, repair of community centers and roads.

Community investments in infrastructure come from the sale of forest products. No other commercial activity (cattle farming, production of grains and coffee) generates “contributions” to social development in this way.



Community nursery: villagers of all ages and sexes take part



Families participate in forestry activities



The cooperatives are 30-40% formed by women

## An alliance for progress

The communities are grouped in five areas (La Ensenada, Camalotal, El Aguacate/Talquesate, San Antonio and La Peña). Each of these includes representatives of social foundations, women's groups and other organizations. The communities have also created Agro-forestry Cooperatives or community-run companies, which implement the production agenda.

To manage the regional development agenda, the community areas and organizations formed the Honduran Association of Community Forest Areas of Gualaco and Guata (Red HACOFODG). The cooperatives also joined Honduras' Agroforestry Producers Federation and are members of the Central American Indigenous and Rural Agroforestry Community Association (ACICAFOC).

Women, with a different production agenda from the men, work on the community farms creating artwork out of pinecones that has been a great success in the market.

Since the beginning, the communities have been supported by the German government's international sustainable development organization, GTZ, which has been working to promote forestry development in Honduras through its "community concept strategy" mainly in the eastern part of the country. Based on its experience in Honduras, the GTZ has passed its knowledge on to the communities of Guata and Gualaco.

The NGO The Nature Conservancy (TNC) has also provided technical assistance to the communities for forest protection. The Central American Indigenous and Rural Agro-Forestry Association, the Integrated Management Program of Ecosystems in Indigenous and Rural Communities in Central America (ACICAFOC/PMIIE) and the Municipality of Gualaco have supported communities with plant nurseries, reforestation (to recover degraded forest areas) and forest protection. Moreover, the authorities (first AFE, now ICF) have been permanently involved in monitoring forest activities.

These partnerships and agreements have strengthened the communities' projects and have reduced by at least 2% the area affected by forest fires. In addition, thanks to silviculture and protection efforts, there have been no outbreaks of bark weevils with any significant economic or environmental impact. The communities have produced around 300,000 plants that have been planted in 600 ha of forest area seriously affected by previous outbreaks.

According to their management plan, communities have hired forestry engineers, organized fire brigades to control forest fires and hired exterminators to stop any disease outbreaks. As regards illegal logging, the communities have managed to nearly eliminate it completely in almost 40,000 ha of state-owned forest, in partnership with the Armed Forces and the ICF.



Women receive training to make handicrafts

## Tezains

# A COMMUNITY COOPERATIVE PROTECTS THE FOREST AND PRODUCES INNOVATIVE PRODUCTS AND SERVICES

By César Alvarado

Location	Durango state, Mexico
Biome	Tropical and subtropical coniferous forest
Type of forest	Native
Organization	Indigenous community: <i>Ejido San Diego de Tezains</i>
Objective	Industrial wood production – Landscape restoration – Conservation of ecosystems – Forest protection – Ecotourism
Area	26,038 hectares

San Diego de Tezains is an ejido in the mountainous region of the Sierra Madre Occidental, in Durango State, Mexico. It covers around 60,000 hectares of land, of which 26,038 ha are commercial forests. The round wood logs extracted from these forests are used to make boards, boxes and pallets amongst other products.

The ejido, with 374 members and a population of 1,600, has become an important social and business organization, especially in terms of silviculture, industrialization and marketing, and has become one of the main forestry producers of Durango. Since 2000, its operations have been certified by the Forest Stewardship Council (FSC). This case should be considered a model for community forest initiatives in Latin America.

### A well-structured organization

The San Diego de Tezains ejido is in the north-eastern part of Durango, in the municipality of Santiago Papasquiario. It was created in 1993 by presidential decree, with an area of 12,041 ha designed to benefit 171 small-scale farmers. In 1970, the area was expanded to 48,000 ha and in 1995 to 60,000 ha with a total 374 members.

The landscape is harsh, with huge mountains and deep ravines. The average altitude of the area available for plantation is about 2,400 meters above sea level (msl), ranging between

a minimum of 1,850 msl and a maximum of 3,047msl. The region's road network is insufficient and the population is small, but the market of Santiago Papasquiario city serves as a distribution centre for forest products.

The use and harvesting of forest resources is the main economic activity of the ejido. At a 1995 meeting, in addition to assigning plots and defining their limits, the ejido agreed to maintain the communal land arrangement and work the forest lands collectively.

The forest management plan covers 26,038 ha of commercial forests (43% of the total area) and is oriented towards the extraction of round wood and its transformation into diverse products, as well as ecotourism.

The agriculture practiced by local families is basically subsistence farming in a relatively small area compared to the land used for forest harvesting. Corn is their dietary mainstay, followed by cereal, beans and fruit.

Extensive cattle farming is limited to a few co-op members dedicated to this activity at the family level, raising cattle, horses, pigs and poultry.

The forests are mainly temperate with diverse combinations of pine and oak, deciduous forest and riverbank vegetation. The most common types of forest in this area are pino-encino (*Pinus-Quercus*) mixed with other species like madroño (*Arbutus sp.*), táscate (*Juniperus sp.*) and, to a lesser degree, áile (*Alnus sp.*) and álamo (*Populus sp.*).

In 1950 a ban was imposed on forestry activities in Durango, which was lifted in 1970 beginning a period of strong growth in the production of wood products. A decentralized public organization was created called Mexican Forest Products (PROFORMEX in Spanish), which offers services related to forest management including technical services, harvesting and marketing.

Initially, the ejido acted as a supplier of raw materials to PROFORMEX, but in 1974 it separated from this organization and, thanks to a loan from the National Communal Lands Development Fund (FONAFE), it bought a sawmill. Then it began producing and selling wood products independently. To do this, the ejido has developed a solid and well-defined organizational structure.



Forest waste collection site



Forests of pine and oak (*Pinus-Quercus*)

The ejido members agreed to a collective management scheme for harvesting their forest, overseen by a General Assembly that is in charge of all forestry activities.

The ejido also has its own technical council formed by professionals from the region who have contributed their own financing. Currently, the service is run by a forestry engineer who is also an ejido member.

The community-owned company employs an average 200 workers in different processing activities from extraction to marketing.

## **Reducing poverty and supporting social development**

Forestry activity has made an important contribution to reducing poverty and improving the quality of life of families in the ejido.

Unemployment does not exist in San Diego de Tezains. The minimum salary paid by the co-op's company is three times higher than the average for the region. The company gives preference to local workers and is an important source of jobs for the community.

The company also invests in social projects like water treatment systems, drainage, schools, health centers etc. All the company's employees have health insurance and access to medical services.

The co-op also supports primary and secondary schools and gives scholarships to outstanding students, whether co-op members or their family members. It's not a requirement that these students, once they have graduated, return to their community. But it is worth noting that a large majority do return and become involved with the forest co-op company, which offers good salaries and other benefits.

The profits are distributed equally among the 374 members whether they work in the company or live on the community lands. The workers receive dividends every three months without exception. The rights and obligations established by Mexican law for the workers and their families are fully respected. In addition, the property titles (called "certificates of land rights for common usage") can be passed on to future generations and used as loan guarantees.

Women have an important role to play in the production process, especially in activities related to the plant nursery, the production of toothpicks and broom handles, packaging and administration amongst other activities. Moreover, there is a Women's Industrial Agricultural Service, which receives some of the co-op's profits to develop its own projects. There are 146 female co-op members with property rights, representing 39% of all members.

## **Good forest management practices**

The co-op's forest management practices are established in its 15-year operating plan and its annual operating plans. These are approved by the state's forestry service, CONAFOR, and are also supervised by the company's certification agency.

The co-op uses various innovative forestry management techniques that are worth highlighting.

Mobile harvesting equipment, for example, is not used in the forest. Instead, the workers use five tow bikes that are rented from members under a "semi-private" system. Their production is measured by cubic meter and the members can hire workers at their convenience, provided they have the training necessary to use the equipment.

Workers are paid for collecting forest waste, including the branches and trunk sections, by cubic meter, provided it is stacked and placed according to the direction of the slope where the land has been eroded.

The trucks that transport the wood from the forest are administered directly by the company. A member can also obtain a truck and pay for its maintenance. The transport of timber and other products to market is done using company vehicles or rented trucks. In some cases, the customer takes care of their own transport.

Permanently seeking new markets for its products helps to make the co-op's activities economically sustainable, and all activities are subject to financial analysis and accounting.

One of the company's key strategies has been reinvesting its profits to ensure efficiency in the production processes and the competitiveness of its products in the market.

The co-op members have a clear long-term vision of natural resource conservation, which is based on the community's proud forestry tradition, and the forest management plan has achieved the aim of sustainable harvesting.

The plan implemented by the co-op complies with the Sustainable Forest Development Law and related norms. The co-op also has a logging permit awarded by the Department of Environment and Natural Resources (SEMARNAT), which checks the harvesting reports and other documents. The community's forest management is overseen by the National Ecological Institute, which establishes environmental criteria and norms.

### **Adding value through ecotourism**

The co-op has developed processes that add value to forest products, with the majority of investment going into industrial production equipment.



State of the forest after harvesting



Production of wood products



Wood processing is the main industry

The company has three sawmills that are used to process different types of wood. The waste, mainly bark and sawdust, is stored and sold separately. The system of wood selection follows the country's classification criteria, which uses a points system and collects information for accounting purposes.

All the wood is treated to prevent discoloration then air dried and, finally, packed. The company also has a drying room for wood used in furniture manufacture.

The company sells round wood (mainly from the genus *Quercus*), lumber, toothpicks, sawdust, woodchips and bark (to produce fertilizer) amongst other products.

The company is very careful to fulfil all its obligations to its clients in terms of delivery times and the quantity and quality agreed. Its main markets are in Monterrey, San Luis Potosí and Toluca. The woodchips and sawdust are sold to two large panel products companies in Durango and Michoacán.

Soon, the company also aims to produce plywood, mouldings and furniture.

But new products are not the co-op's only innovations. The co-op has recently developed a new ecotourism project called "San Diego Paradise" ([www.factorweb.net/paraisodesandiego/](http://www.factorweb.net/paraisodesandiego/)). This project demonstrates how far the local community has advanced, which only four decades ago survived by subsistence farming and manual labour in the mines.

The San Diego ecotourism complex, located in an area of great natural beauty, offers a variety of services including cabins, fishing, interpretative trails, lookouts, camping areas, equipment rental for outdoor sports and diverse wildlife, all of which makes for an excellent recreation and adventure alternative in the region.

The complex uses the logo of Mexico's Tourism Department and is included on its list of tourist attractions, which is key to attracting visitors and generating income for the ejido.

### Forging alliances

The ejido has developed a successful strategy of alliances with private, state and semi-state organizations at various levels. In addition, it has maintained strong links with high schools and universities.

One of the ejido's strongest partnerships is with the Community Forest Development Program (PROCYMAF) of the National Forestry Commission. This program, led by co-op members, communities, and indigenous peoples' associations aims to strengthen community forest management schemes and help the owners of these resources generate alternatives sources of income.

In the last two years, as a result of these partnerships, the co-op has implemented various activities aimed at sustainable development: acquiring road clearing equipment; modernizing factories; buying machinery to improve productivity; reforestation including soil conservation, maintaining reforested areas and ensuring plant health; market studies to increase exports and identify demand for products with value added; technical studies of conservation areas with diverse ecosystems; strengthening the "Paraíso de San Diego" ecotourism centre; and giving technical advice to the Centre of Forest Engineering Studies.

The coop has also established partnerships with various universities in different research areas. The objective of these studies is not just to obtain an immediate benefit for the company, but also to contribute to the development of science and education in the region.

The central government has a series of programs supporting silviculture, forest protection and industrial development. For example, the program ProÁrbol, aimed at promoting silviculture, has supported reforestation and soil conservation using forest waste products.

The level of social-organizational maturity achieved by the co-op is one of its main strengths and is a key element for its long-term sustainability in terms of community entrepreneurship.

For their exemplary management of forest resources, the co-op members of San Diego de Tezains obtained the 2009 Forest Merit Prize in the category of community silviculture presented by the President of Mexico.

## A STRONG COMMUNITY ORGANIZATION USES REFORESTATION TO PROMOTE DEVELOPMENT

By Fernando Carrera

Location	San José de Ocoa Province, Dominican Republic
Biome	Subtropical Broadleaf Humid Forest
Type of forest	Plantation forest (native species)
Organization	Community organization or partnership between community councils: <i>Asociación para el Desarrollo de San José de Ocoa</i> (ADESJO)
Objective	Forest harvesting - Reforestation – Watershed protection – Socioeconomic benefits for communities
Area	300 hectares

The Association for the Development of San José de Ocoa (ADESJO in Spanish) in the Dominican Republic is formed by 152 communities, representing 12,450 families, organized into 83 community councils. The association is a good example of community organization, mainly due to the strong level of participation by the local communities in development projects and activities. Three of the councils - El Derrumbado, El Tatón and La Cruz de Santana – are involved in forest management.

These communities have developed forest plantations with the aim of harvesting wood and protecting the forest in the basin formed by the Ocoa and Nizao rivers, in a relatively dry area (annual rainfall is 600 to 1,000 mm) which has been devastated by the expansion of agricultural production, mainly plantations of kidney beans (*Phaseolus vulgaris*). The widespread deforestation is due to competition for land in a country with a total area of 48,000 km<sup>2</sup> which must feed almost nine million Dominicans, two million Haitian immigrants and four million tourists each year. This combined with the fact that part of the Dominican Republic's grain production is sent to neighbouring Haiti, with which it shares the island.

This is the context in which ADESJO, known locally as the “*Junta*”, has implemented development projects to improve the lives of rural families in the province of Ocoa.

## United and organized

ADESJO was formed in 1962, a year after the fall of the dictatorship of President Trujillo (1930-1961), but was only legally established in 1968. The mentor and guide for ADESJO was Father Luis Quinn<sup>16</sup>, a Canadian priest who, in the 1960s and 1970s, was branded a communist in various sectors for his revolutionary ideas of community participation and was only later recognized for his work at a national and international level.

In 1967, the state's Secretary of Forests was under the administration of the Secretary of Armed Forces, which declared a ban on forestry due to the high rate of deforestation in the country at that time. This situation, far from stopping the problem, allowed the expansion of the agricultural frontier by preventing forests from being used for commercial purposes and discouraging any attempt at reforestation. Despite this unfavourable framework, the first forest plantations were created in the area for protection, mainly consisting of the pine species *Pinus occidentalis*.

In the 1980s, reforestation projects were developed thanks to support from international organizations. Two important things happened in that decade to motivate communities to continue with reforestation activities. The first was the recovery in 1987 of the La Vereda river, which years before had dried up due to deforestation in the highlands. This was key for the communities to realize the importance of tree cover for water resources. The second event was the decision by the Forest Service to award reforestation permits along with logging rights, which meant trees could only be harvested from forest plantations.

In 1990, the community councils were created, which grouped together the different community associations. The councils began to plan their development through ADESJO, which formulated new projects. Communities were already aware about the benefits of this type of organization. The seeds sown by Father Quinn had begun to bear fruits; ADESJO became a model of organization and participative management with a clear environmental aim.

In 2007, the Junta suffered a tough blow with the death of its founder and executive director, Father Luis Quinn. Some thought his death would sap the will from the organization but that did not happen; the community's foundation was solid and the work continued. However, Father Quinn is sorely missed. As one community member said: *"Without Father Quinn we are still alive but our heart does not beat like before. If we were planting pines, he would plant the first seedling; if we had to open a path, he would lead the way; if we were going to build a house, there he was with a hammer and nails. He always had his work clothes on. Father Quinn was a spiritual and material guide for Ocoa. He taught us to stick together and be organized."*

## The "Junta" is us

ADESJO was created with the strong support of the Catholic Church. The association promotes integrated sustainable development in the province of San José de Ocoa and surrounding areas, through the participation of its members in social, economic, educational, cultural, environmental and health programs.

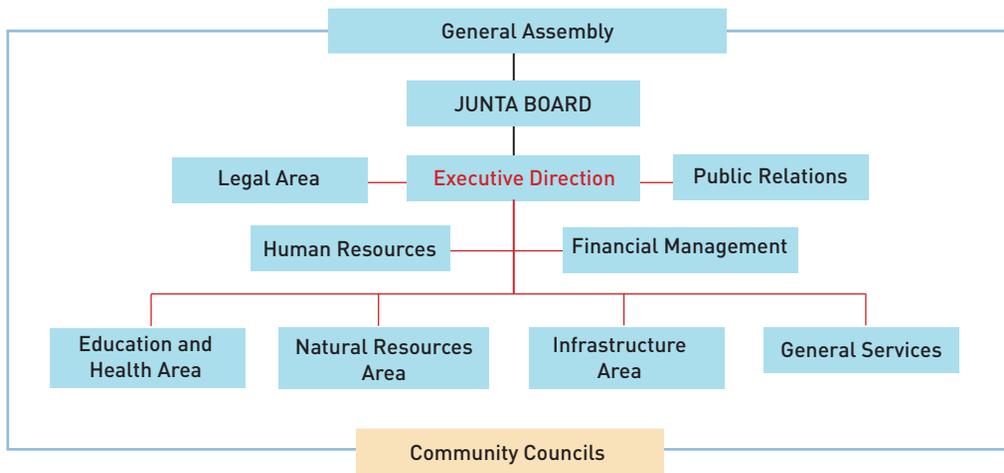
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<sup>16</sup>The Dominican government gave Father Quinn its highest distinction, "The Order of Canada." In addition, he was decorated by the President of the Republic, Hipólito Mejía, with the "Order of Duarte, Sánchez and Mella," nominated for the "Alternative Nobel Prize," and decorated with the Supreme Cross by Pope John Paul II.

ADESJO's community councils hold a General Assembly every two years to elect a board [the Junta]<sup>17</sup>, which in turn appoints an executive director and fills other positions. The communities feel fully identified and represented by this organizational structure. *"The junta without us is nothing and we are nothing without the junta. Without the junta the communities would be isolated, without any rights, without formal participation, without an institution that helps us to channel resources and resolve the problems we face,"* said one community leader.

### The Association for the Development of San José de Ocoa (ADESJO)

Organigrama



The "junta" implements projects in different areas at the request of the communities and the activities are executed by community volunteers. ADESJO is an organization with a lot of prestige and credibility, which allows it to obtain technical and financial support from national and international institutions.

#### Types of projects developed by ADESJO

**Education:** Organization of Community Councils, elimination of child labour, participation of children in educational camps, adult literacy, training for rural teachers, etc.

**Infrastructure:** Construction of rural schools, first aid stations, community centers, roads, housing, aqueducts, drinking water, rainwater capture, outhouses, alternative energy (solar panels), installation of TV-Centers (for distance education).

**Natural resources:** Irrigation systems, soil conservation, reforestation, fruit and forestry nurseries, mini-greenhouses, production of organic fruit and vegetables, animal distribution, beekeeping, water culture program, post-harvest management of basic grains and seeds, amongst others.

<sup>17</sup>The Junta is formed by 11 members in addition to the Executive Director. The president of the Junta and five members of the board are chosen from civil society, and the other five members are people with official positions (two employees of the institution, two representing the community councils and a member of the Catholic Church).

## Taking care of our own resources

The community councils were created in San José de Ocoa starting in 1990, with the support of a regional development project financed by the German government's international technical cooperation agency (GTZ). Many community associations participate in the council (such as school boards, agricultural societies, producers and women's associations). The council is elected for two years and is comprised of seven to nine members depending on the number of community associations. The board has a president, a treasurer and a coordinator for each area (natural resources, health, environment, infrastructure, etc.).

The council creates a community development plan and annual plans with activities in different areas. The council meets on the first Friday of each month with the junta to coordinate and decide on joint programs.

Of the 83 councils in ADESJO, 26 of them have a female president and 26 women's associations are represented. *"We women are fighters and we know that without organization you can't achieve anything. One time some people came to dig a mine and we, the women's organization, stood up to them. We called on the other organizations to stop the mining because it would have forced local people to move. In agreement with the community organizations, we got the support of the provincial authorities and we won this fight because we were organized,"* said one community leader.

The Forest Watch Committees are formed by up to nine volunteers from different communities who are in charge of protecting the forest and supporting the Forest Service. They are ready to intervene and report any illegal activity in the forest such as illegal logging. They also control poaching, receive training and are equipped to prevent and control forest fires. *"We are monitoring the forest 24 hours a day... Who better than us to take care of our natural resources?"* said one member of the committee.

Some community members have proposed that logging permits issued by the Forest Service should also be approved by the Forest Watch Committees to avoid abuses by people that take advantage of political contacts to pressure the Provincial Forest Department for permits. The committees in river valley located downstream are keen to protect the forest upstream, especially near the source of the river.

The *"convite"* (or invitation) is a form of community labour practised in rural areas, whereby everyone works once a week for one of its members or in an activity of common interest. It is unpaid work, but the individual or institution that invites people to work for them provides food. The majority of projects executed by the junta (aqueducts, schools, reforestation, maintenance of plantations, etc.) use the *"convite"* labour model.

## Reforest, reforest

The province of San José de Ocoa has some 7,000 hectares of reforested land. The most planted species (90%) is a native pine species, *Pinus occidentalis*. Other species used are: *Pinus caribea*, palma manacla (*Euterpe oleracea*), corazón de paloma (*Colubrina alborensis*) and *Eucalyptus camaldulensis*. The junta has a plant nursery with capacity to produce 350,000 plants<sup>18</sup>. Currently, the nursery is not working at full capacity due to lack of seeds, which is a problem given the high demand of seedlings for reforestation.

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<sup>18</sup>The plants in the nurseries are grown in plastic cartons in special cones to facilitate their transport.



Reforestation in harvesting and protected areas



Protection of hillsides



View of the valley with planted terraces

The communities have clearly marked the areas meant for protection and production and are aware of the importance of the forest for protecting their water sources.

The communities of El Derrumbado, El Tatón and La Cruz de Santana with only 300 hectares of reforested land between them (a small proportion of the total area in the province), are nevertheless a good example of how community councils operate. These three communities are in the municipal district of La Ciénaga in the basin formed by the Ocoa and Nizao rivers.

The land tenure model used in reforested areas is one of two types: a) lands organized by the community councils, or b) farmers who have agreed with the councils for the reforestation and management of their land.

Reforestation activities begin with the signing of a land management plan between the owner of the lot, ADESJO and the respective community council. Then the Secretary of Environment and Natural Resources (SEMARENA) is approached to obtain planting permits with logging rights for the lands to be reforested.

The next step is the organization of teams comprised of community volunteers. Their work is monitored by ADESJO and the farmers themselves. The field activities include clearing the ground and planting seedlings from the ADESJO nursery. The seedlings are delivered for free to the community councils.

Two or three months after planting, the first clean-up around the seedlings takes place. Then, a second clean-up eight months later, and successively once a year during the next five years. All these activities are done by volunteers according to the “convite” model.

Around 90% of reforestation is done using *Pinus occidentalis*. Given that this species grows relatively slowly, the first thinning and clean-up must be done in the fifth year. This consists of eliminating twisted and/or split trees. A second thinning is done in year seven or eight. At that time, good quality branches are extracted and sold or used for building homes in the community. From year 12 to 15 a third thinning takes place, which produces timber for processing. The final logging of *Pinus occidentalis*, which should occur after 30 to 40 years, has not yet taken place.

The communities do, however, have experience harvesting *Pinus caribaea*, a species which grows well at an altitude less than 1,000 meters above sea

level, with logging cycles of 24 years, trunk diameters of 35 to 40cm and heights of 18-20 meters. *Pinus caribaea* does not grow well in high altitude areas, which is why *Pinus occidentalis* is preferred for reforestation.

## A changing landscape

Farmers give the community councils 20% of the profits from wood sales in exchange for the silviculture and monitoring activities realized by the council volunteers and ADESJO. This model is known as *"Payment in the form of a share of profits."* The councils decide how to invest the funds obtained in this way, whether in community projects or dividing the profits among the members.

Another model is known as *"Land in exchange for water."* This involves farmers who are willing to give up to 50% of their lands to other farmers in the community in exchange for being included in irrigation projects. Landowners must agree to reforest part of their land as well so, for each hectare irrigated, an estimated 30 hectares are reforested.

Regarding this mechanism, an ADESJO official said: *"You have to give up some land to get water, which in large quantities is a way of paying for environmental services because irrigation equipment is given in exchange for protecting the forest in the upper part of the river basin."*

The landscape of the area has changed radically as a result of work by communities to stop the expansion of farmland, control illegal logging, hunting and fishing, prevent and control forest fires, and reforest.

The communities also protect their rivers, streams, waterfalls and springs. Water is transported through aqueducts for human and animal consumption and for irrigation.

The communities of San José de Ocoa have developed a solid, well managed organization to promote their development and create forest plantations that provide products and income for their families as well as protecting the waterways they depend on for their livelihoods.



The "convites" (volunteers)



ADESJO nursery



Participation in the Community Council

## La Chonta

# MANAGEMENT MODEL OF FOREST CONCESSIONS ADMINISTERED BY PRIVATE FIRMS

By Henry Moreno

Location	Provinces of Guarayos, Velasco and Ñuflo de Chavez, department of Santa Cruz, Bolivia
Biome	Subtropical Broadleaf Humid Forest
Type of forest	Native
Organization	Private company: <i>La Chonta Woods Ltda.</i>
Objective	Industrial wood production – Adding value to forest products
Area	220,000 hectares

With more than three decades of experience in forestry activity, La Chonta Woods Ltda. is one of the most important companies in Bolivia. It has 220,000 hectares of forests distributed in two forest concessions: La Chonta, in the province of Guarayos, and Lago Rey, in the provinces of Velasco and Ñuflo de Chávez. Both concessions are certified by the FSC and are starting their third recertification period, which shows the good management practices implemented by the company.

### The beginnings

The beginnings of La Chonta Woods date from 1974 when the then national forest authority, the Center for Forest Development (CDF in Spanish), awarded the company two forest harvesting contracts in the northeast of Santa Cruz department: La Chonta and Lago Rey. Initially, the harvesting was based on the mara or coaba (*Swietenia macrophylla*) and cedro (*Cedrela fissilis*).

In 1997, when the new forest law took effect (Law 1,700), the previous contracts became 40-year forest concessions of 100,000 hectares for La Chonta and 120,000 for Lago Rey. The company quickly adapted to the new norm and became one of the first forest companies in the country to obtain the FSC certification.

The La Chonta Concession is about 31km (as the crow flies) to the northeast of the Ascensión de Guarayos community, connected by a road that is drivable most of the year. The Lago Rey Concession is about 300km from La Chonta.

The annual harvesting area is 5,400ha, which produces an annual volume of 24,000 m<sup>3</sup> of round wood.

According to the vision of La Chonta Woods, the long-term economic growth of the company should contribute to the development of the local economy and the conservation of the environment, without ignoring the opportunities in the short term. The conservation methods and sustainable development strategies are part of the company's principles. In line with these values, the company has a mission to "conserve the forests through sustainable management and sell tropical wood products of high quality, with social and environmental responsibility to ensure an attractive economic return."

The policies that guide the company's actions are:

- **A continuous process of improvement that reduces the company's impact on the environment.**
- **Our commitment to prevent, correct and compensate adverse situations in the company's activities to protect the environment, activity facing the challenges and taking advantage of opportunities.**
- **Manage the forests, resources and area of operations with respect through practices that ensure the sustainability of the forest while protecting the soil, water, flora and fauna.**
- **Meet the demands of Bolivian legislation with respect to environmental and social issues.**
- **Establish and maintain relations with neighbouring communities, local, regional and national institutions, universities and other organizations as a strategy to generate synergies.**

The company's structure is vertical with general management, administration, primary forest and industrialization and secondary industrialization. The company has highly qualified personnel in all these departments, which allows for optimal functioning of its operations.

The production process includes primary transformation (sawn and dried) and secondary transformation (furniture, mouldings, floors). Much of the



Forest management area



Processing wood in the forest

production is exported to the United States and Europe, and includes products of excellent quality made from alternative species like: bibosi (*Ficus sp.*), yesquero blanco (*Cariniana lanerensis*), ochoo (*Hura crepitans*), yesquero negro (*Cariniana estrellensis*), among others.

## Respect and mutual benefits

La Chonta Woods contributes to local development in various ways. Of its 120 employees who work in the sawmill and the forest, 70% are originally from the area, mainly the community of Ascensión de Guarayos. But there are still few women involved in the company's activities.

The firm regularly updates and adjusts its human resources policy with the aim of generating a work environment based on respect and trust. It supports its employees and in return expects a sense of loyalty to the company.

When a conflict arises, the company seeks a solution through mediation. The problem is identified, negotiations are held and both sides make commitments.

The company also interacts with the local communities near its concessions to maintain good relations. Based on studies of the project's social impact, the company has developed various Corporate Social Responsibility programs with local communities. With support of the Bolivian Foreign Trade Institute (IBCE in Spanish), the company is implementing a program to improve relations with forest communities and the conditions for workers, focusing on social inclusion, avoiding child labour and promoting gender equity in forest production.

The company has signed agreements to bring school students to the forest to learn about concepts of sustainability and to introduce the concept of sustainable management in teaching programs. It also facilitates internships for outstanding students in areas related to their career interests.

The company has implemented social programs that include infrastructure projects and diverse initiatives for local communities:

- **Maintaining 160km of roads in good condition all year round for forest harvesting and transport of residents to and from local communities.**



Marking and identifying trees for harvesting

- Purchasing products (like milk, corn, rice, yuca, etc) produced by the communities to feed company workers.
- Strengthening indigenous organizations through responsible wood purchases and training young indigenous people about forest management.
- Supporting environmental education by including material about natural resource conservation in the academic curriculum of the Urubichá school and broadcasting a radio program about environmental issues.

## Silvicultural management

The silvicultural management of forests is based on studies of the natural regeneration and growth dynamic of the forest, and on the formulation of special treatments, supported by scientific institutions such as the Bolivian Forest Research Institute (IBIF in Spanish). One of the most important research centres in the country is in the La Chonta forest, administered by IBIF, which monitors a series of permanent measurement lots (PPM). These studies have allowed the company to make decisions to redirect forest management practices in search of sustainable forest productivity.

The silvicultural system developed is polycyclic since the behaviour of the forest in the next cutting cycle is still being studied. In order to prevent imbalances between the current cycle and the next one, the company has implemented a series of measures:

- **Increasing the number of seed trees close to the Minimum Cutting Diameter (MCD) or slightly less to guarantee the provision of seeds for the regeneration of harvested species.**
- **Identification and marking of trees to be used for seed production of desirable commercial species to avoid unnecessary harm to them during the commercial harvest.**
- **Use of tables or tariffs in estimating volumes of each species to reduce the bias in the visual estimation of the commercial height of trees for harvesting, which will generate benefits in terms of better control of wood and reduction in forest survey times.**
- **Taking samples from the Annual Harvesting Areas (AHA) after harvesting to determine the density of desirable species in the site, which will provide useful information in terms of applying silviculture thinning treatments to improve tree growth.**



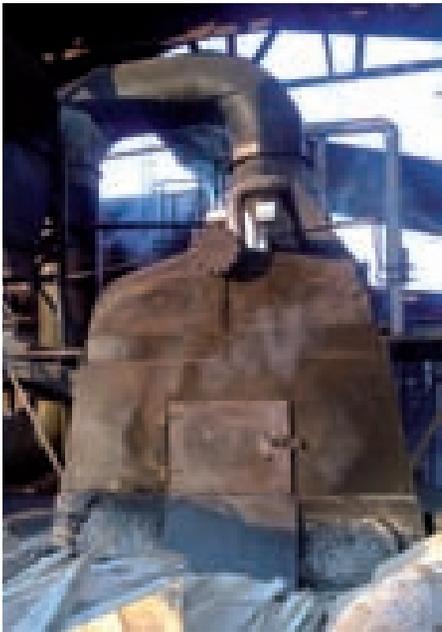
Certified wood

- Applying measures to stimulate the natural regeneration of commercial species in the AHA, monitored through a biannual evaluation program.

## Harvesting model

The aim of the company's harvesting system is to achieve efficiency while caused the least amount of damage possible to the natural regeneration, ecosystem and biodiversity. The following activities are included in Reduced Impact Logging (RIL) activities:

- Identification of commercial forest productive structures based on the level of abundance and dominance of certain species.
- Implementation of a harvesting model aimed at species of commercial interest, guided by the Minimum Cutting Diameter.
- Use of selective logging.
- Identification, delimitation and respect of unproductive and protected forest areas.



Furnace for generating electricity

The company also uses complementary silviculture treatments to change the forest structure with the aim of ensuring regeneration and increasing growth to achieve future economic benefits. These treatments include:

- Harvesting techniques that minimize the impact on natural regeneration, leaving seed trees untouched and applying the Minimum Cutting Diameter for each species.
- Elimination of vines from trees in the current and future harvests to stimulate forest growth.
- Marking trees for future harvest.
- Soil scarification consisting of removing the soil around the remaining trees to guarantee natural regeneration.
- Enriching "rodeos" (stockpiles of logs) with fast-growth species, combined with medium-growth species.

Given that there is a risk of reducing the diversity and proportion of certain species in the application of these treatments, they must be carefully planned and trained personnel must perform them to avoid any problems.

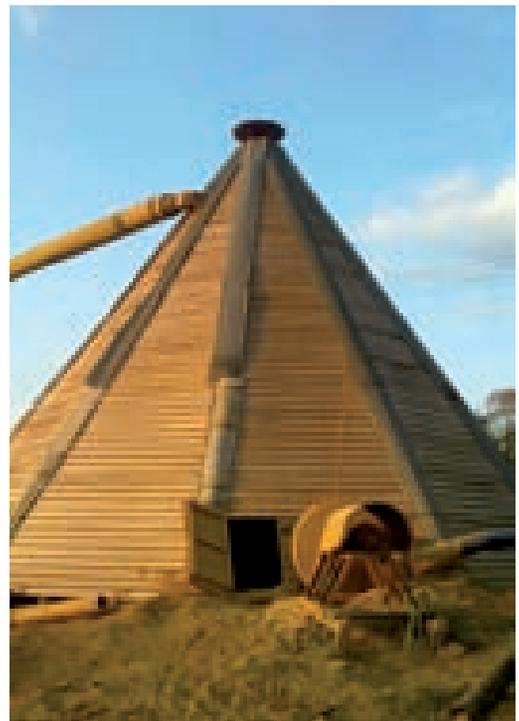
## Adding value and waste management

The company has built and equipped a sawmill near the forest area, which produces high quality sawn and dried wood while improving efficiency and reducing costs. The sawmill has the capacity to produce 15,000 to 20,000 m<sup>3</sup> a year depending on the type of wood (hardwood and softwood, respectively) and a second train has just been installed with annual capacity of 20,000 to 25,000 m<sup>3</sup>. The installations include 14 chambers for drying wooden panels with capacity of 600 m<sup>3</sup>.

The company also has a sawmill with a thermoelectric generation system. This allows it to burn the waste and twigs cut in the forest (after they are washed in the lumberyard) to feed the furnace in the generator which transforms the steam into enough electricity to meet the sawmill's demand and save around 800 liters a day of diesel fuel (the main fuel used before this system) which represents savings of US\$600 a day. For these efforts, La Chonta Woods has received various prizes such as the national Energy Eco-efficiency and Environmental Improvement awards.

La Chonta's main products - laminated panels, finished wood products, wooden doors, frames, mouldings, beams, and durable garden furniture – are sold in the internal market and exported.

The company has adopted a series of measures for the management and disposal of waste products. These substances are not handled near waterways or camps. The waste dump for diesel and oils is protected from sunlight and insulated from the ground with the type of fuel and evacuation procedures clearly marked in case of a spill. The waste oils, lubricants and other products from forestry operations are placed in tanks for transport to their final disposal site or reuse (for example, in chainsaws or in sterilizing logs). For the disposal of organic waste, septic tanks far from waterways are used and sealed after each operation.



Use of waste products for electricity generation



Adding value to lesser known species

## Keys to success

Some of the aspects mentioned have been key for the success of the company:

- The company's vertical structure integrating the forest, the industry and the market.
- Investment in people through efforts to maintain a close relationship with neighbouring communities based on respect, cooperation and mutual benefit.
- Using forest certification as a tool for planning and management while also obtaining national and international prestige.
- Building a sawmill near the forest and developing thermoelectric power generation to lower costs and increase the use of forest products and services.
- Research studies (such as silviculture practices) have allowed the company to continually improve its management of the forest.
- Finally, the company's efforts to add value to lesser known species of wood and insert them in the international market.

# Orsa Florestal

## A PRIVATE COMPANY BALANCES PRODUCTION, SOCIAL DEVELOPMENT AND ENVIRONMENTAL CONSERVATION

By César Sabogal

Location	Municipality of Almeirim, Pará state, Brazil
Biome	Tropical broadleaf humid forest
Type of forest	Native
Organization	Private company: <i>Orsa Florestal S.A.</i>
Objective	Industrial wood production – Adding value to forest products – Use of forest waste – Generation of environmental services – Biodiversity conservation
Area	545,022 hectares (83.8 % is forest)

The company Orsa Florestal manages 545,022 hectares of land (of which 456,546 ha is forest) in the Municipality of Almeirim, Pará state, in Brazil's eastern Amazon. The forest is in the central-northern part of Pará state near the neighbouring state of Amapá on the banks of the Amazon River. The area has been certified by the FSC and also has chain-of-custody certification. In addition to obtaining economic benefits, Orsa Florestal takes social and environmental responsibility for its actions while promoting sustainable development in the Valle de Jari region.

The company is part of the Orsa Group, one of the main Brazilian producers of wood and paper products, which is also studying potential markets for non-wood forest products. The group generates more than 5,300 direct jobs (and around 2,700 indirect) and its revenues were 1.6 billion reais (around US\$915 million) in 2008.

### Working with local communities

Orsa Florestal was created in 2002 with activities focused in three areas: sustainable forest management to produce timber; extraction of non-wood forest products; and generation of agro-industrial businesses with local communities. These last two areas have been developed and managed locally by the Fundación Orsa, a non-profit institution created by the group to promote social development.

The climate in the Jari region has two well-defined seasons; rainy (from January to July), and dry (from August to December). The temperature is stable year round (average 25.5 to 27.4°C) with average annual rainfall of 2,115mm.

The landscape in this large territory is varied and consists of three types: *planalto* at altitudes between 400 and 600 masl; undulating areas with elevations up to 200 masl (*the platôs*); and an ever-changing landscape formed by canals, small rivers, lakes and other waterways. The majority of land is covered in yellow latosol and red-yellow podsol soil.

The vegetation in Jari is varied and includes diverse types of forest and non-forest formations. The main type of vegetation in the region is the equatorial sub-perennial forest. This includes eight types of forest, according to Brazil's classification, each with a different composition of species.

A total 507 species of trees can be found in these forests belonging to 59 families. The richness of the fauna is also considerable, including 215 species of birds, 38 species of mammals, 33 species of reptiles and six of amphibians.

In Grupo Orsa's area (which includes native forest and plantations managed by its subsidiary Jari Celulosa) there are 98 communities with more than 3,034 families or 14,347 people. Many of these form part of traditional communities and have been living in the region for decades, while others arrived more recently in search of work opportunities in new agro-industrial projects.

The main economic activities in the region are based on subsistence agriculture and "extractivism" (wood and some non-wood products), followed by secondary activities like fishing and retail.

### Multipurpose forest management

Orsa Florestal manages its native forest according to a management plan approved in 2001 and under FSC certification since 2004. The activity is focused on the extraction of wood for timber and collecting waste to use as fuel for generating electricity.

The area is divided into blocks of 1,600 hectares each, which are subdivided into small units or lots of 10 ha each, which are in turn divided into eight lots of 1.25 ha each. In total there are 30 annual production units, one for each year in the cutting cycle.

The logging intensity is 20 to 30 m<sup>3</sup>/ha. The annual extraction volumes are between 150,000 and 200,000 m<sup>3</sup>. The highest volume species with the greatest commercial value are: angelim vermelho (*Dinizia excelsa*), producing 13.90 m<sup>3</sup>/ha; maçaranduba (*Manilkara huberi*), 6.28 m<sup>3</sup>/ha; mandioqueira (*Qualea paraensis*, *Q. albiflora*), 5.53 m<sup>3</sup>/ha; and taxi (*Tachigalia myrmecophila*), with 7.10 m<sup>3</sup>/ha. The average harvest in the last three years is 26 m<sup>3</sup>/ha of which 50% is angelim vermelho (*Dinizia excelsa*) and the other 50% is divided between 21 species.

For each production unit, an annual operating plan is drawn up to define the activities in the area. The forest inventory is completed two years before the harvest of trees with a minimum 40cm diameter in a group of 94 potential and commercial species.

The logging plan is designed by qualified professionals using geo-processing tools (*ArcGis software*).

The company hires third parties to build roads, haul logs and waste, and transport timber. This method was chosen due to costs since the contractor is usually more efficient and specialized in these types of operations.

In terms of silviculture, native species are planted to enrich the soil in clearings bigger than 400 m<sup>2</sup> where angelim vermelho and piquiá (*Caryocar villosum*) have been cut and in clearings over 250 m<sup>2</sup> for other species.

The company employs 480 people for forest management and wood processing activities, hiring local labourers where possible. Of this number, 150 are employed in other activities in-between harvests (February to June), especially the chainsaw operators.

The company also collects the branches of logged trees up to 10cm in diameter using a team comprised of a *mini-skid* operator (an adapted farming tractor with a claw), a chainsaw operator and an assistant. The production relationship is 1:1, which means that the extraction of 200,000 m<sup>3</sup> of logs generates a similar volume of branches. In 2008, 40% of the branches were collected while in 2010 this amount should grow to 80% thanks to an improved collection system. Jari Celulosa uses the branches as fuel for its furnaces instead of other fossil fuels.



### Fundación Orsa

The Fundación Orsa, a non-profit institution created in 1994, is the social arm of Grupo Orsa. It receives 1% of the group's annual gross income, which is invested in social projects on its own or in partnership with other institutions (universities, governmental organizations and public and private entities).

The Fundación's early projects were designed to promote education, health and human rights for children and young people in the region. More recently, its efforts have been focused on creating jobs and rural income. To this end, the Fundación has been promoting local development projects aimed at generating sustainable businesses ([www.fundacaoorsa.com.br](http://www.fundacaoorsa.com.br)).



Forest under management

## Sustainable community businesses

The three municipalities that make up the Jari Valley in the state of Amapá have serious problems with respect to education, health and transport amongst other issues. Given this reality, as well as Grupo Orsa's investments and social projects, the Fundación Orsa created a list of priority communities to develop sustainable businesses, preferably through agricultural projects and local innovations.

This led to the creation of the Agro-Forest Business Promotion Program for the development of rural communities. These projects are designed to strengthen family operations in production chains with potential to generate income. Amongst the projects in this program are:

- **Curauá:** A pilot project in six communities begun in 2006 which is based on the growing of curauá (*Ananas erectifolius*)<sup>19</sup> and the harvesting of its fibre. The curauá is planted at a high density of 25,000 plants/ha and produces two harvests every six years. Around 50 farmers participate in the project, each with one to two hectares for harvesting. Some also grow manioc and eucalyptus with curauá. The auto parts company *Pematec-Triangel*, from Santarém, buys all the fibre produced by the farmers in Jari Valley. The first harvest was in September 2007 with total production of 15 tons of fibre. The income generated by curauá that year was 8,000 real/ha (around US\$4,570). Each farmer received 660 real (US\$380) monthly. The Fundación proposed expanding the project to 100 farmers. In parallel, the company is studying the curauá-eucalyptus pairing, which if successful could open the door to production and processing on an industrial scale.

- **Eucalyptus:** This project was begun in 2006 by Jari Celulosa with the aim of integrating local farmers in the company's production activities. The area planted by each farmer is between 4 and 20 ha and is harvested every six years.

- **Brazil nut (*castaña*):** This project promotes the development of the Brazil nut production chain supported by the firm Ouro Verde, in which Orsa is a shareholder. The aim is to obtain a competitive price for this product in the market.

<sup>19</sup>The Curauá is native to the Amazon and comes from the pineapple plant family. Its natural fibre is used by the automobile industry as a natural substitute for polypropylene in upholstery such as the vehicle's roof and trunk cover.

- **Manioc (*yuca*):** This project aims to improve the manioc genetic material, growing techniques, productivity and quality. The yuca is a subsistence crop that can easily be partnered with curauá. This project involves 110 farmers in 18 communities.

- **Beekeeping:** A program to promote beekeeping in local communities which supports the organization of honey producers while benefitting 35 families.

- **Vegetables:** This project involves 55 farmers in three communities with the aim of reaching a total 100 farmers in 2010. It promotes the use of ecofriendly fertilizers and compost, based on ecological concepts.

The Fundación Orsa also contributes to the management of the municipal councils (in Laranjal do Jari, for example, it supports children's associations) and promotes social inclusion initiatives in schools.

One such initiative consists of night courses for workers taught by Orsa company volunteers at the camp. The workers receive a diploma once the course is completed.

Employee benefits include medical assistance and basic food supplies. In the case of contractors, benefits include: medical assistance, food, training, housing, water, electricity and vacations for the whole family. Thanks to the union, all workers have access to a dental plan.

## Innovative management and conservation techniques

The company monitors activities to ensure they are being performed according to the FSC certified procedures and environmental and safety standards. The team of inspectors informs the corresponding department about areas in need of improvement.

The forest is monitored through a system of permanent one-hectare lots for each 200 hectares of forest. The data is collected starting one year before harvesting, then the following year and later every two and five years after that.

In addition, the company studies the natural regeneration in clearings formed by logging. Good regeneration has been observed in clearings where enrichment plantations have been established.



A farmer with eucalyptus and curauá crops



The Bituba operations base in the forest management area



Extraction of wood under  
FSC certification

The area's fauna is also monitored regularly with support from the University of Lancaster, which is measuring the impact of forest management on local wildlife.

Through on-going monitoring, the company determines the need for reforestation and the recovery of clearings caused by harvesting. In the plantation areas, this activity is done between harvests and usually involves covering the area with eucalyptus bark to promote decomposition and the planting of native species. Another method, used in the native forest, consists of covering the top layer of soil to promote growth of vegetation.

The company has also implemented measures to promote biodiversity conservation:

- There are around 120 hectares of wildlife corridors in the areas under management.
- Vines are removed one year before the harvest to prepare trees for logging and reduce the potential damage to nearby trees.
- The logging and hauling operations are suspended for the four months of winter, and timber is transported on roads in order to reduce the environmental impact of operations and wear on equipment.
- Procedures are used to mark and protect areas where rare or endangered species of wildlife are found.
- Hunting and fishing is controlled by a team of company rangers who patrol the area constantly.
- The company defined a part of the *Cerrado*<sup>20</sup> as a High Value Conservation area with rare characteristics identified through studies of the area.

Measures taken by Orsa Florestal to protect the forest include:

- A forest protection service composed of forest rangers trained and registered with the federal government.
- Regular forest patrols by land and water in 4-wheel drive vehicles and launches that stop land invasions, illegal logging, and any form of environmental harm. The communities help the company in this task by informing of any problem.
- If any illegal activity is discovered, information is gathered, the GPS coordinates are noted, a map is created and a photographic record is taken. This allows the company to the activity to the authorities.

<sup>20</sup>A geographical area characterized by thin forest cover where low bushes and grasses predominate.

- **Prevention of wildfires and the preparation of firefighting teams.**
- **Communities are educated about the proper use of fire as well as prevention measures.**

## Management and research partnerships

There is a very fluid communication between the company's corporate headquarters in the city of Monte Dourado and personnel in the forest area, with regular meetings to analyse the situation.

Field teams keep a daily record of production. At the end of the day, field reports are sent to Monte Dourado where, through a computer program, the data is compared to the inventory. Two days later the information is returned to those in charge of field operations to help them make decisions. This feedback can lead to adjustments in, for example, logging intensity.

The company has developed a training program for its workers in areas of safety and health, SFM techniques, forest certification and the chain of custody, amongst other aspects.

Orsa Florestal has technical agreements in place with various universities and research institutions:

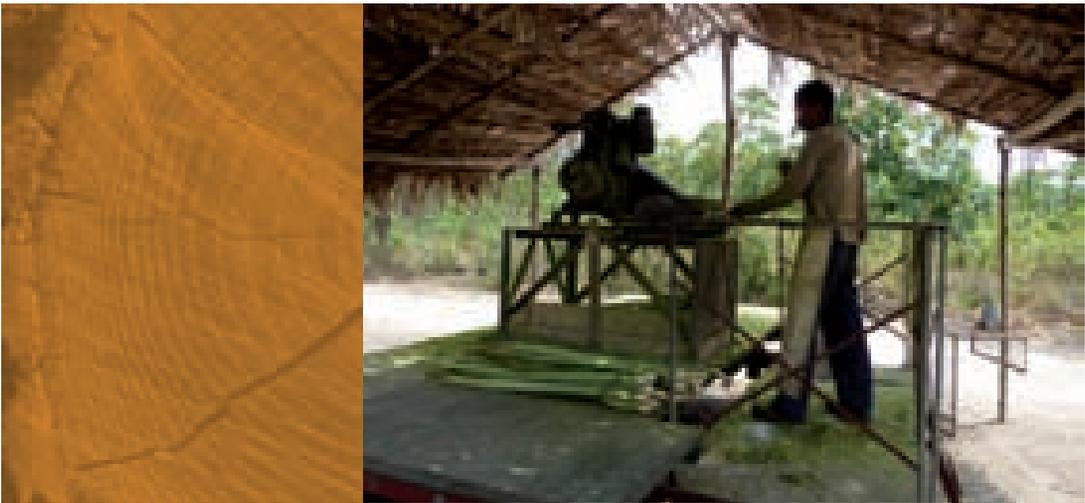
- **University of Freiburg, Germany: Study on the impact of different logging intensities and hauling systems on economic and ecological sustainability, and a comparative study on wood extraction systems.**
- **Brazilian Agro-Forestry Research Enterprise (EMBRAPA in Portuguese): Study on the natural and artificial regeneration of commercial forest species in clearings left by extraction.**
- **The Botanical Garden Research Institute of Rio de Janeiro: Creating an environmental model of tree species using data from the forest inventory.**
- **Federal University of Vicosa: Studies of forest growth in areas under management.**
- **University of Lancaster, England: Monitoring of the long-term impact of forest management on biodiversity.**
- **University of East Anglia, England: Study of the ecological value of secondary and primary forest plantations in terms of wildlife diversity and services.**



A log transported using a *skidder*

## Final thoughts

The good level of management achieved by Orsa Florestal in one of the largest areas of tropical forest under certified management in the world is the result of various factors. One of the keys to the company's success is its long-term business vision: *"We have learned that it is important to bring the environment, community interests and profitability into harmony. For us, the economic feasibility is just as important as social development and the participation of local communities,"* said Sérgio Amoroso, president of Grupo Orsa.



A defibrator for curauá (*Ananás erectifolius*)

Klabin S.A.

# RATIONAL AND MULTIPURPOSE USE OF FORESTS ON A LARGE SCALE

By Henry Moreno

Location	State of Paraná, Brazil
Biome	Subtropical broadleaf humid forest
Type of forest	Forest plantation (exotic species) + native forest
Organization	Private company: <i>Klabin S.A.</i>
Objective	Industrial wood production from forest plantations – Harvesting non-wood products from native forests – Adding value to forest products – Forest restoration – Ecosystem conservation
Area	265,748 hectares including 131,761 ha of pine and eucalyptus plantations and 103,301 ha of conservation areas

Klabin is Brazil's largest manufacturer of pulp and paper products. It has 17 plants in Brazil and one in Argentina. It produces round wood and cellulose from more than 130,000 hectares of pine and eucalyptus plantations and harvests non-wood products from native forest. The company abides by strict environmental norms and is a pioneer in Brazil with its forests and production processes certified by the Forest Stewardship Council (FSC).

## Historical background

Klabin bought the Hacienda Monte Alegre in the town of Tibagi, Paraná state, in 1934. In 1941, it established the first eucalyptus and araucaria plantations, followed by the first pine plantations, imported from the United States, in 1951. The first paper factory began operations in the Hacienda in 1946.

The guiding principles of the Klabin Group were, and continue to be, respect for nature and the environment, using a sustainable model that balances productivity with social wellbeing without harming the future of the planet.

Modern forest management practices, combined with concern for the environment and social responsibility, helped Klabin become the first pulp and paper company on the continent to receive the FSC certification in 1998.

The company is also certified to harvest medicinal plants, which allows it to export therapeutic and cosmetics made from plants with the FSC seal.

In 2005, Klabin received the FSC chain of custody certification for paper and boxes made from natural fibre and, later, for the production of recycled paper, bags and cardboard boxes.

Today, Klabin's forest areas in Paraná total 265,748 hectares, including 103,301 ha of conservation areas and 131,761 ha of planted pine and eucalyptus forest. These areas are mainly in the Monte Alegre Hacienda, in the town of Telémaco Borda, and in other Paraná municipalities, forming part of the Paraná plateau in the Brazilian highlands.



Certified wood



View of planted forests mixed with native forest areas

## Multipurpose forest use

The company's activities are based on the following principles:

- Continually improving the quality of products and services to meet the expectations of clients, employees, shareholders, the community and suppliers.
- Ensuring the supply of wood to industrial units in a sustainable way without affecting the natural ecosystems on the plantations.
- Promoting the practice of recycling cellulose fibres in the production chain.
- Avoiding and preventing environmental contamination including water pollution, solid waste and atmospheric emissions.
- Promoting the personal and professional growth of its employees and improving their working conditions, health and safety.
- Practicing social responsibility with a focus on local communities.
- Complying with national environmental, health and safety norms.

In the framework of these principles, the company realizes various forest products (wood and non-wood) including cellulose, timber and medicinal plants to make cosmetics. It uses the production potential of the forests and, at the same time, protects the natural resources.

The company's forest management system minimizes the effects of monoculture forestry by using the forest plantations in an integral way and also harvesting non-wood products from natural forests.

## **Forest management**

Klabin's forest management is based on studies of the wood quality, soil, and vegetation (even using a micro-propagation lab). Thanks to the results obtained, it has developed highly productive and reliable forests in terms of cellulose production.

The forest management plan includes harvesting rates, inventories, studies and simulations to ensure the supply of raw materials to the firm's factories and the market. The company also has a forest protection plan to prevent forest fires and control pests.

Klabin, which has its own plant nursery, is self-sufficient in production of seeds. The nursery produces more than enough plants to meet the needs of its forestry units and excess pine and eucalyptus seeds have been sold since 1969. The nursery uses seed selection to guarantee strong and healthy plants with a production capacity of 17 million seedlings a year.

Organic production and minimum tillage techniques are used on the forest plantations. Pests and diseases are controlled using traditional practices to reduce infestations including proper selection of plantation areas, soil management, crop rotation, and a mix of plants and seedlings.

Land preparation, planting, weeding and fertilization are important activities in the production process. Pruning and selective logging are used to reduce the number of trees per hectare in certain periods of the cycle to reduce competition and promote the growth of healthy trees.

The wood is harvested using different systems according to the tree age and type of species while protecting the surrounding native forests. Klabin has acquired heavy machinery that reduces the environmental impact of logging and uses waste biomass. The company has opted for mechanization to provide better working and safety conditions for its employees.

## **Non-timber products**

For non-timber forest products, Klabin has implemented a herbal medicine programme, which has become an example of sustainable use of native forests. The programme seeks to preserve the biodiversity of the forest and its rational use.

The company has implemented a non-timber forest products research programme to analyze forest ecosystems and provide information about plant species.

Potential species are defined by the inventory, studies of reproductive biology, demographics and growth, the number of individuals and the amount of biomass available. These allow the company to minimize environmental impacts and ensure the maintenance of species.



Medicinal herbs



Seed orchard for producing certified crops

Concern for the environment has guided the actions of the company since its foundation. In Paraná, the Klabin area is the largest green area in southern Brazil, easily identifiable in satellite photos. Its plantations contribute to the protection of biodiversity and maintenance of water sources. Forest management follows a mosaic pattern with plantations of pine and eucalyptus trees interspersed with areas of native forests to promote biodiversity.

In 1980 Klabin established an ecological park covering 11,196 hectares, of which 7,883 ha are natural forests, mainly formed by *Araucarias*. Some of these forests are maintained in their original state. The park management plan was developed in 1988 including an animal nursery to study native fauna. With modern infrastructure to serve visitors, the park is popular with tourists. In addition to viewing rare wildlife (such as the puma and the lobo-guará, there is a trail through the forest that allows visitors to see local flora and enjoy the beauty of the surroundings.

The Monte Alegre Natural Heritage Reserve (RPPNS in Portuguese) covers an area of 3,852 hectares and is located on the Monte Alegre Hacienda. It was created in 1998 by the Environmental Institute of Paraná (IAP). The reserve is intended for scientific research, the protection of biodiversity and water resources, the supply of seeds for the recovery of degraded forest areas, and protecting archaeological, historical, cultural and paleontological sites.

### Socio-environmental responsibility

Klabin takes social responsibility seriously by promoting and supporting social, cultural and environmental projects in local communities.

The company's relationship with its employees is based on mutual respect and a successful safety and occupational health programme. The programme seeks the continuous improvement of job safety and health by actively involving the staff. The company also offers a medical and dental program as well as social services, food, transport and training programs.

The company's Caiubi environmental education programme raises environmental awareness among teachers and students. This programme has already benefited nearly 130,000 students and 1,900 teachers of schools in the

Telemaco Borba region. Teachers pass on what they have learned about flora and fauna to students through fun activities. *“Parents are very grateful and motivated... the programme increases the confidence of their children,”* said Cleuza María Taques Carneiro, the principal of the President Castelo Branco Municipal School.

The company also has a forestry development programme in Paraná which seeks to promote forest plantations at the level of small and medium-sized farmers. This programme is the result of an agreement between Klabin, farmers, municipalities, the Brazilian Company of Technical Assistance and Rural Extension (EMATER) and the Environmental Institute of Paraná (IAP). More than 50,000 hectares of forests have been planted in this way and 7,600 producers have benefitted from the programme.

Klabin also contributes to regional institutions through financing and paper donations. Each year, it donates tons of paper to local schools, hospitals, associations and churches.

## A LOCAL COMMUNITY MANAGES ITS FOREST SUCCESSFULLY AFTER A DIFFICULT START

By Juan Herrero

Location	Momostenengo municipality, department of Totonicapán, Guatemala
Biome	Tropical and subtropical coniferous forest
Type of forest	(Primary and secondary) native conifers + forestry plantation (native species)
Organization	A community cooperative: <i>San Vicente Buenabaj community</i>
Objective	Forest harvesting - Reforestation - Watershed protection - Socio-economic benefits for communities
Area	815 hectares

The Guatemalan indigenous community of San Vicente Buenabaj has overcome many difficulties to become an example of community forestry management. Today it protects its native forest, collects seeds to plant in its nursery, reforests degraded areas, produces timber and prevents wildfires. Payment for families in the community is through the products they produce in these activities. In 2008 San Vicente Buenabaj won a national prize in the category of community forest management.

### Ancient Mayan heritage

San Vicente Buenabaj is a community of ethnic Mayan Kiché, belonging to the municipality of Momostenengo in Totonicapán department, Guatemala. It is 225 km from the capital, Guatemala City, at an altitude ranging between 2,700 and 3,300 meters above sea level. The community is comprised of 13 villages at the headwaters of the Cuilco, Chixoy and Samalá rivers. Its 12,000 inhabitants are descendants of the Nehaib, one of the four tribes of Kichés. They are mainly engaged in the cultivation of corn, wheat and potato and creating handicraft products. But in the last ten years there has been a major exodus of the population to other countries of Central and North America in search of work and better living conditions.

Momostenengo is one of the municipalities of Guatemala classified as extremely poor. Since the community's Spanish founder, Diego Vicente, obtained royal titles to the land in 1868, there has been a complex struggle for possession of the territory. Some of these territorial conflicts continue to this day. The San Vicente community, however, has managed to preserve the forest cover over much of its territory.

Although land in the community is privately owned, the right of its use is collective in nature. In Guatemala, many communities maintain this ancient system of communal land tenure, which is part of their identity and contributes to greater equity in the use of resources. One characteristic of this communal property regime is the so-called "*parcialidad*"<sup>21</sup>.

The "parcialidad" of San Vicente is led and represented by a board of directors. This board manages the use of the forest, which is communal. The community has become a legal association and is constituted as the Parcialidad of San Vicente (ASPARVI in Spanish). According to its statutes, the main activity of the association is to manage the natural resources of the community, mainly its forests and water supplies.

The Kobalchaj forest overseen by the "*parcialidad*" has an area of 815.24 hectares and is mostly composed of native, primary and secondary forest. It is dominated by species with very good wood such as roble or encino (*Quercus spp.*), also (*Alnus jorullensis*), pino de las cumbres or colorado (*P. rudis*), madrone (*Arbutus xalapensis*) and the pinabete or spruce (*Abies guatemalensis*). The latter is especially appreciated in the community as a source of high quality wood. Today it is protected because it is in danger of extinction. In addition, there are white pine (*Pinus ayacahuite*) planted in eroded areas and on steep slopes.

## A difficult transition

As in many indigenous communities of western Guatemala, low impact extraction techniques were used to provide firewood and timber for the community members on special occasions (village parties, treatment of the sick, religious activities, payment for communal services, etc.). These permits were awarded by the Communal Auxiliatura and were targeted at mature or dead trees with the best specimens only used when timber was required. These activities, although low impact, began little by little to degrade the genetic quality of the forest.

In this way, the Kobalchaj forest was managed for many years without any kind of technical assistance and, in fact, illegally because logging took place without a license from the former Directorate-General for Forestry and Wildlife (DIGEBOS), now the National Institute of Forests (INAB). The situation reached a crisis point when the DIGEBOS intervened as the result of a complaint about illegal harvesting. Faced with this problem, the community formed an association and, with the support of the UNDP Small Grants Program, developed a plan of forestry management in 2001, and joined INAB's Forestry Incentives Programme (PINFOR).

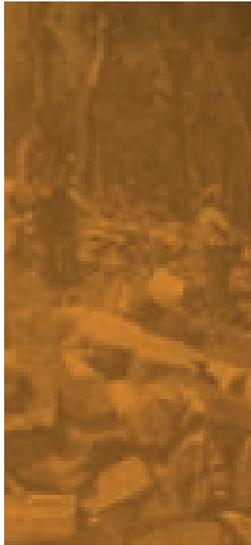
Admission to PINFOR meant the community could obtain resources for its projects, but at the same time it was forced to assume commitments and responsibilities, which were not well understood by all in the community. This situation, coupled with general distrust of the authorities, generated serious problems within the "*parcialidad*" and with INAB. These problems came to a

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<sup>21</sup>A "parcialidad" in Spanish is a group of people within a community (in this case San Vicente) that are working together towards a common goal.

head when the Institute decided to cancel the association's management license for breaching the management guidelines including extraction in unauthorized areas and unlicensed chainsaws.

In September 2007, with the crisis finally resolved, the community redesigned its management plan and updated its annual operating plan. The board of directors played a key role in informing the villagers so they understood and accepted the new management plan. The implementation of the 2007-2008 annual operating plan was a success. Selective harvesting took place in three areas and products were distributed among 13 villages that took part in the work. The planning and organizing of activities has progressively improved since then.



### How the Kopalchaj forest is managed

Based on a general map of the area and a forest inventory, the Kopalchaj forest has been divided into areas according to the community management plan:

**Protected area:** 178 hectares for conservation of flora and fauna. The steep slopes, water sources and abundant pinabete, a species in danger of extinction, were key characteristics for selection.

**Harvesting area:** 256.6 hectares for communal forest extraction activities. High density, slow growth forest and the presence of sick trees were indicators for selection in this area.

**Reforestation area:** 170 hectares of which 65 ha have been reforested at a rate of 15 ha annually.

**Farming area:** 210.7 hectares for agricultural use by the villagers of San Vicente Buenabaj, although this area is in the process of being included in the reforestation area.

In 2009, a project supported by the Swiss NGO H elvetas facilitated the creation of a Community Forest Office headed by a forest service professional. Thanks to coordination between this project, INAB and the association, permanent plots were established to monitor the remaining trees and study disease outbreaks in oak trees. New regulations for forest use are currently being designed which harmonize village traditions with legal and technical criteria in order to ensure forest sustainability. The management plan is also being updated based on an inventory of the whole forest area, taking into account not only the timber potential but also related environmental services.

### Emphasis on reforestation

The forest under management includes the pinabete (*Abies guatemalensis*), an endemic species which is in danger of extinction. The only species harvested in the forest are encino and roble which have the largest populations.

The community's forestry management is geared to reforestation and the protection of endangered natural species as well as seed stands depending on the production of seedlings in the nursery.

The species used in reforestation are native, with the exception of the *Pinus patula*, which has been introduced on a small-scale due to its fast growth and resistance to bark weevils (*Dendroctonus fontalis*). The management plan includes reforestation using native species for fear that introduced species could alter the ecology of the area.

In addition to forested areas and crops, there is vacant land in the community. In the past, the board of directors distributed these lands amongst the community members to be used for crops. But since the land is not very suitable for farming, these eventually became degraded and were abandoned. Currently, the association is considering using these areas for new forest plantations.

So far, the San Vicente “*parcialidad*” has established four reforestation projects through PINFOR incentives, with a total area of 75 hectares which include trees of different ages and species, especially *Pinus patula*, *P. rudis*, *P. ayacahuite*, *Alnus jorullensis* and *Cupressus lusitanica*. The main aim of these plantations is recovering degraded areas on steep slopes and eroded soil at altitudes of up to 3,000 masl and to generate timber. Each year, INAB, in coordination with the board, performs field inspections to evaluate tree diameter and height, which allows it to determine the growth rate of the plantations.

The only disease present in the forest is the pine weevil (*Dendroctonus fontalis*), which is being treated through regular control (removal of infected and diseased trees) and the establishment of new plantations to assist recovery.

The villages are actively involved in fire prevention and participate in fire fighting in the event of a fire. At the beginning of the dry season, the association performs a series of activities related to forest fire prevention: digging anti-fire trenches, clean-up of waste and forest prevention courses for community members. There is a community fire brigade with basic equipment (helmets, jackets, glasses, masks and gloves). There are also 12 forest rangers, organized into two groups of six that patrol the forest and are relieved every 15 days. If they spot a fire, they report it using radios purchased by the board with resources from the INAB’s Forest Incentives Programme. As a result of these activities there have been no fires in the area, although there have been in the surrounding areas.



Reforestation under PINFOR



Protected forest and neighbouring areas

The forest rangers also have the task of catching those responsible for illegal logging. According to the severity of the infraction, the board imposes a sanction based on the standards established by the community. Sanctions can range from a simple warning to the confiscation of products and tools, water service suspension or exclusion from all community benefits.

## Contributions and benefits

Work in the forest is not paid in wages, but rather in products which are distributed according to the participation and contribution of each family. On average, the implementation of the annual operating plan creates more than 5,500 tasks, equivalent to an average 22 people working per day. Each member has to work two days for free per year in community activities such as forest plantations, clean-up, and harvesting.

In 2008, the community extracted more than 2,000m<sup>3</sup> of wood, which directly benefited 550 families. The price of firewood sold to the families of the community is symbolic; it covers only the cost of fuel, oil and the labour of chainsaw operators. In 2008, the price per cubic metre was 15 quetzals (approximately US\$1.88<sup>22</sup>),- while wood of the same quality in the local market at that time had an approximate value of 200 quetzals (US\$25).

The Kobalchaj forest is near the headwaters of three rivers. The water flowing from them supplies 13 villages and benefits an estimated 3,000 families. In addition, there are other municipalities (e.g. Huitán and Cabricán Quetzaltenango) and other communities in Momostenango that benefit from water that originates in these basins. Since its beginning, the community has understood the link between the forest and its water supplies. This explains why they are extremely careful about protecting water sources. In each village there is a Water Committee which coordinates the protection and improvement of the forest. All freshwater springs have a strict protection area, in which no tree may be harvested within a radius of at least 50m.

The possible production of bottled water would leverage the excellent quality of water from the Kobalchaj forest. If this project becomes a reality, the community would have another source of income.

The forest of San Vicente Buenabaj is scenically beauty with species of roble(oak) *Quercus sp.* and pinabete, which comprise a unique landscape. Similarly, there is a great diversity of animal species: rabbits, birds (like the woodpecker and the raven), reptiles, snakes, armadillos, foxes and the quetzalio, among others.

## Sustainable management

Respect for traditional knowledge and culture is deeply rooted in the community. These customs are passed on from generation to generation. Community forest management activities have the same social roots that govern the community's organization.

Harvesting jobs are organized by the board of directors. Before starting work, activities are coordinated between the villages so that there are enough people involved in the various tasks, including the transport of forest products and cleaning up of

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<sup>22</sup>Exchange rate on 12/04/2010: 1 Quetzal = US\$0.12

development areas. Safety rules set by the association are respected in all operations to prevent accidents.

Internal conflicts in small Guatemalan communities are not uncommon. In the case of San Vicente, the organization has been able to establish mechanisms to resolve disputes. The mayor's office is responsible for resolving social problems while the "parcialidad" resolves disputes relating to the use of the forest. If a solution cannot be reached, a General Assembly is held to decide the matter.

The board of directors is formed by people from the community so all members share the same culture and language. It is an inclusive organization welcoming men and women alike. The election of board members takes place in the General Assembly and is for a period of two years.

The creation of the annual plan and its subsequent approval, in the case of San Vicente, requires a special process which ensures that as few trees as possible are cut down. This means that even if the annual timber quota can be increased, only poorly shaped or sickly trees can be cut, leaving stands of trees with better development prospects (seed trees and, above all, pinabete trees). This model is used to avoid the visual impact of forest exploitation and potential disagreements between community members, authorities and other organizations. Also, heavy logging equipment is not used to reduce the impact of forest management on the environment.

## The key to success

Another exemplary aspect of this community is its participation in research aimed at improving the management of the forest. This includes the establishment of permanent plots in areas under management to study outbreaks of disease in species of encino and roble and analyse the growth of the forest.

In the medium-term the community is studying the creation of natural regeneration plots of *Abies guatemalensis* (pinabete). This research is being carried out with the support of student interns: INAB, Hélvetas, the Forestry Technical School (ESTEFOR), and the University of San Carlos have taken part in these studies.



Community members participate in harvesting activities



Community of San Vicente de Buenabaj, a protected area

The association has consistently applied its forest management plan since its approval in 2000. The board of directors keeps a record of people involved in its implementation and of all products produced.

The management plan is updated annually according to the information generated by the studies. A forest engineer, in coordination with the board, marks those trees that will be extracted. During the harvest there are people responsible for ensuring that marked trees are respected and protected trees are not removed.

In the regional context, many indigenous communities are opposed to the management scheme, arguing that it causes serious damage to the forest. Indeed, some communities have failed to implement similar management plans in other areas of Totonicapán department. In this regard, the understanding and maturity shown by the community of San Vicente is remarkable, and it has become an example for progress in the field of sustainable forest management.

The community's participation in the Forestry Incentives Program (PINFOR) certainly favoured its strong development by facilitating diverse projects and establishing plantations.

Local communities become more involved in forest management when they perceive a tangible benefit as a result. This was the key to success in San Vicente. In this community, thanks to good forest management families have been able to preserve the forest and, at the same time, make use of its products (such as firewood and timber) and receive environmental services in return.



Women participate in the harvesting

Copen

# A COMMUNITY SIGNS A FOREST MANAGEMENT CONTRACT FOR SUSTAINABLE FOREST USE

Por César Alvarado

Location	Iriona municipality, Colón department, Honduras
Biome	Subtropical broadleaf humid forest
Type of forest	Native
Organization	Community association: <i>Sociedad Colectiva Roberto Barahona y Asociados</i>
Objective	Industrial wood production - Forest protection
Area	4,149 hectares

Copen is a pioneering community in Honduras in the sustainable management of forest resources. Located in the Plátano River Biosphere Reserve, declared patrimony of humanity by UNESCO, it has made considerable progress in the rational use of forests, environmental protection and improvement of the quality of life of its members. This community's experience offers various exemplary elements that are worth studying.

## A community forest association

The community of Copen is located in the Iriona municipality in the department of Colón. Like many communities on the Atlantic coast, its origin is a consequence of the activities of transnational banana plantations that operated on the north coast of the country between 1920 and 1960. The vast majority of families that make up the community come from the department of Olancho.

The weather is warm, with an average temperature of 25°C and 3,000 mm/year of rainfall. The average altitude is 60 meters above sea level.

Families are engaged in agriculture, cultivating beans, corn and rice for their own consumption, with only 8% of products are sold in neighbouring communities. They also raise cattle for family use while 45% of people work as labourers for other members of the community.

Land used for crops and/or livestock is mostly owned by the farmers who tend them, although most of the property titles are not formalized. Around 27% of community members do not own land so they rent or borrow land to grow their crops.

Electric power comes from a generator which runs for three hours a day, but much of the houses have solar panels for the operation of their radios and lighting at night. Around 95% of households use wood as an energy source, while the remaining 5% use gas.

The predominant vegetation consists of mature broadleaf forest. The most abundant species is the selillón (*Pouteria sp.*), mainly found with coaba (*Swietenia macrophylla*), san juan areno (*Vochysia ferruginea*) and santa maría (*Calophyllum brasiliense*). There is also a variety of species with high value in the market, like the cedro real (*Cedrela odorata*), rosita (*Hyeronima alchorneoides*) and nogal (*Juglans olanchana*), among others.

Wildlife is rich and varied. Among the mammals are the paca (*Agouti paca*), deer (*Odocoileus sp.*), margay (*Felis wiedii*), monkey, pig, and many others. Birds include the toucan (*Ramphastus keel*), turkey (*Agriocharis ocelata*), the guara (*Ara macao*), and the parrot. There are also several types of snakes. Hunting provides additional food for the family diet.

In 1996, the community of Copen formed an organization called the Sociedad Colectiva Roberto Barahonay Asociados, with 25 partners as part of a strategy promoted by the State Forestry Administration (AFE)<sup>23</sup> to promote community development and curb the advance of the agricultural frontier. In this way, the community was assigned areas for harvesting and given technical advice.

## Forest management contract

In Honduras there are many laws and regulations which, directly or indirectly, establish provisions for the conservation and management of natural resources. The new Forest Law promotes and encourages the participation of communities in sustainable management of forest resources. Based on this legislation, government policy<sup>24</sup> facilitates the incorporation of communities in sustainable forest production through long-term community forest management contracts, as well as strategic alliances with other actors in the supply chain.

In 1998, the group officially started forest harvesting activities under a land use agreement with the state comprising 4,149 hectares for an initial period of five years (now extended until 2014). Of this land, 44% corresponds to mature forest which produces timber, while 25% is protected. Another 27% is part of the micro-basin that supplies water to the community and the remaining 4% to secondary forest in the highlands.

At that time the forest was a three hour walk from the community with no existing road network. Due to the high rainfall and topography of the area, harvesting activity was only feasible during the summer, i.e. in the first half of the year.

<sup>23</sup>Today the AFE has been replaced by the Institute for Forest Conservation, Protected Areas and Wildlife (ICF in Spanish).

<sup>24</sup>AFE/ICF, forest management agreements, agro-forestry cooperatives.

The community agreed to produce timber for sale in the market using chainsaws for cutting trees and band saws or *guapotas*. Depending on the location of the cutting area, the transport of timber to the river was done by humans or mules, which could make one to three trips per day. The timber was then transported by river to Copen, which took a full day due to the winding river full of submerged obstacles. The timber collected in Copen continued its journey by river to the coastal city of Palacios, which took 3-5 days. From that point, the cargo was shipped in small boats to the main market at the port of La Ceiba. Thus, in the early years, timber production was a costly, dangerous and unprofitable business, but in the absence of another source of productive activity was one of the few alternatives available to the local population. Today, the transport system has been improved through new highways, which has resulted in economic and social benefits for the entire community.

### Improved productivity

In 2000, the community of Copen supported by the Italian NGO Cooperation for the Development of Emerging Countries (COSPE), the State Forest Administration (AFE, now the ICF), and the Green Wood Foundation, developed a general management plan, which included technical support and training to improve timber production and transport.

The use of GPS has been incorporated in the forest inventory to mark trees for extraction as well as reserve trees, seed trees and forest limits. This system is also used for identifying and monitoring natural regeneration after harvesting.

Cutting techniques in the lumberyard, or "*bacadilla*"<sup>25</sup>, have also been improved. Chainsaw operators are trained in selective logging in order to avoid damage to surrounding vegetation and obtain a greater volume of commercial quality product. Onsite wood processing with a frame saw is used because of the advantages this brings in the use and quality of the wood. Waste generated by harvesting is stored in specific areas to maintain the scenic beauty of the area.

Wood transport used to present many difficulties and was expensive for the community, but today a combined land and water route has been established. This includes new stretched of highway, mainly from Copen to the nearby town of La Champa - where there is an AFE management unit



Cooperative management area



Agroforestry cooperative

<sup>25</sup>An area where logs are piled during harvesting.

and maintaining the road from La Champa to Sico, the most important city of the area. Using these roads has allowed the community to eliminate intermediaries and to get wood to market quicker, not only to La Ceiba, but to the second most important city of the country, San Pedro Sula.

In order to add more value to the raw material from the forest and generate more employment, a portable *Wood Mizar* sawmill was donated to the community. With this machine, processed wood, or timber, transported to the community by river or mules could be cut to specific dimensions.

## Forest sustainability

Guaranteeing the sustainability of harvested species, in terms of quantity and quality, is crucial for the community's long-term development. The "annual allowable cut" (*posibilidad silvícola*) scheme which defines the volume for the annual cut based on the annual operating plan is simple and known to all field personnel.

For extraction purposes, an inventory is performed for all species greater than 50cm diameter at chest height; the minimum cutting diameter is 50cm, except for caoba which is 90cm.

When the presence of species in a certain area is reduced, none of these trees are logged. In harvesting areas, monitoring is used to verify the presence of species. If the volume is low, seedlings are relocated from areas of abundant natural regeneration. In the medium term, this method should obtain information about the state of regeneration of mahogany (caoba), which is the main strategic species for the socio-economic stability of the community.

Of the total forest area assigned to Copen, 70.6% has been defined as an exclusive protection zone. To contribute to the protection and conservation of this area, the community maintains a close relationship with the army and AFE since illegal hunting and timber harvesting still exist, although at a much smaller scale than before.

Under Copen's management the agricultural frontier has not expanded over the last decade and the forested area has been maintained for sustainable use and environmental protection. Forest health can be inferred by the quality of the water downstream.

Actions to increase awareness about the importance of protecting and rationally harvesting the forest have achieved positive results in changing the attitude of the population, which now sees the correlation between the conservation of natural resources and the possibility of a life better. This is significant progress, especially since Copen is in the buffer zone of the Plátano River Biosphere Reserve.

## Search for new markets

The forest and the community are far from the nearest markets while timber prices depend mainly on the species and their quality. Quality is given much importance due to the specialized market for which the largest amount of timber is intended. The personnel in charge of classifying the timber quality have received specific training in this area.

Species are classified into three categories depending on the market. The first category is traditional species, which includes the caoba. The second is commercial species such as: san

juan areno (*Ilex tectonica*), santa maria (*Calophyllum brasiliense*), barba de jolote (*Cojoba arborea*) and varillo (*Symphonia globulifera*). Finally, the third category is potential species: selillón (*Pouteria izabalensis*), másica (*Brosimum alicastrum*), piojo (*Tapirira guianensis*), san juan del pozo (*Voshysia guatemalensis*) and paleta (*Dialium guianensis*).

Despite the physical quality and aesthetic aspects of these species, the only species that can feasibly be harvested given current market prices is mahogany (coaba). The cost of getting this wood to La Ceiba port is US\$2.31 per board foot, where good quality wood can fetch a price of US\$3.22. For other species, the sale price in the market is less than US\$2.00 per board foot, which does not justify making the same effort as with mahogany (coaba). Of course, the formula used to determine this is based on the price of the product and the cost of extraction.

However, the community is concerned about AFE's recent move to increase the coaba tax by 300% to reduce its logging nationwide. If Copen maintains its annual operating plan, revenue will be reduced considerably.

According to the 2009 inventory of an area of 23 hectares, the volume of coaba allowed to be cut was 118.70m<sup>3</sup>, compared to 217.20m<sup>3</sup> for other commercial species and 736.95m<sup>3</sup> for potential species. Of this potential, only 11% of the volume will actually be removed. It is expected that species other than coaba will have greater participation in the future, which is why the management plan calls for intensive monitoring to define the future structure and composition of each forest area.

Copen community members have received training in aspects of organisation, administration and management. They have also been trained in marketing, which is strongly supported by the NGO Green Wood, especially in the handling of negotiations with buyers and the search for market opportunities. For this purpose, the community sent wood samples of different species to the Taylor Guitars factory in California. The coaba samples were positively evaluated, and now Copen supplies wood regularly to this company. Of the coaba harvesting allowance in 2009, 47% of the volume with export quality went to this market at a price of US\$7.75 per foot. Although the search for markets for other species continues, these are not profitable at the present time due to the costs of extraction, but processing options are being explored to give them a higher added value.



Protected areas in micro-basins that supply water



Broadleaf mature forest in mid to high areas of Copen



Storage of wood for transport to market

In terms of forest certification, the activities of Copen were initially certified by the FSC, thanks to the support of COSPE. However, due to the low income and high cost of maintaining the certification, it has been suspended. Instead, the community obtained chain of custody certification, according to which every piece of wood for export is tagged with a code sent by a company based in England that ensures the products meet certain environmental requirements. Despite the voluntary suspension of the forest certification, the same control mechanisms are applied in the logging processes to ensure sustainable forest management.

### Social and communal benefits

In the case of Copen, the rational use of the forest has resulted in resource conservation and the improvement of the quality of life in the community. The community organization has created an Economic Fund, consisting of an amount shared between the partners which they can use at their own convenience.

It also established a Social Fund for investment in the community and in neighbouring communities. These investments are aimed at schools and the installation and maintenance of road infrastructure. Amongst the social benefits is a collective insurance plan for accident or death.

The remaining profits, after deducting items related to savings, reinvestment, social fund, etc., are distributed among the members.

The improvement of the quality of life is reflected in that no symptoms of malnutrition have been observed in the community. Most homes have electricity for at least several hours a day with radio, satellite television and cellular telephones.

The administrative, productive and organisational skills acquired as well as higher self-esteem and confidence are also important results from this experience. In addition, the community has improved its material wellbeing as it now owns facilities and equipment for extraction, cutting and transport.

There have also been successes and lessons in terms of partnerships with other organizations and institutions such as the Plátano River Biosphere Reserve/AFE-ICF, the Green Wood Foundation, and the Ecosystems and Rain Forest Project/UNICAF. The involvement of the AFE/ICF has greatly facilitated administrative procedures in the community's annual plans.

To evaluate this experience it is necessary to consider the reality of the region and the country. Very few communities have been able to adapt to the concepts and practices of sustainable forest management as Copen has done. Copen's success demonstrates the importance of a contract for community forest management as well as institutional coordination and the value of training and technical assistance.



Management area

## Layasiksa

# AN INDIGENOUS COMMUNITY OVERCOMES CHALLENGES TO MANAGE ITS FOREST SUSTAINABLY

By César Alvarado

Location	Prinzapolka municipality, department of the North Atlantic Autonomous Region, Nicaragua
Biome	Subtropical broadleaf humid forest
Type of forest	Native
Organization	Indigenous community: <i>Layasiksa (Miskitu)</i>
Objective	Production of timber – Forest restoration - Protection of the forest - Improvement of the quality of life of the community
Area	4,664 hectares

The indigenous community of Layasiksa is comprised of 55 families of the miskitu ethnic group with a tradition of respect for the natural environment. The community has only limited experience with forest management, but it has shown the will to protect its forest while obtaining economic benefits from it through sustainable management.

This case shows the first steps taken by an indigenous community in organizing the use of its forest resources despite facing many obstacles. Two new laws have helped the community: one established the framework of communal land ownership by indigenous peoples; the other promotes conservation and sustainable development of the forestry sector in Nicaragua.

### Poverty and forest protection

The two autonomous regions of Nicaragua's Caribbean coast<sup>26</sup> comprise nearly half of the national territory, with 70% of its forests, 12% of the total population and the vast majority of the indigenous population including miskitu, creole, sumu/mayangna, rama and garífuna tribes. According to the 2005 census, the miskitu population of 121,000 represents the majority, followed by creole with 20,000 and sumu mayangna with 10,000. In the Autonomous Region of the North Atlantic (RAAN) alone, the major groups are the miskitu and the sumu mayangna.

<sup>26</sup>The Autonomous Region of the North Atlantic (RAAN) and the Autonomous Region of the South Atlantic (RAAS).

The Layasiksa community is in the municipality of Prinzapolka and is 65 km south of the most important city of the region: Puerto Cabezas or Bilwi, as it is known in the miskitu language.

The community's territory is divided into two population centres that are far from each other. The first, and oldest, known as La Laguna, is close to the Layasiksa lagoon. La Laguna is home to most of the community's population, which are mainly work in fishing or subsistence farming. The closest access to this area is by sea. The second centre was formed by emigrants from La Laguna who moved to the La Potranca area in order to claim their land rights and protect the forest from deforestation caused by illegal harvesting of broadleaf forest.

Reaching this community known as Layasiksa II requires a five hour journey by car from Puerto Cabezas (in the rainy period, eight hours). Getting to the forest takes two to three hours more.

According to a 2005 national poverty map, seven of the eight municipalities of RAAN are included in the list of the poorest 40 municipalities in the country, with levels of poverty reaching 87% in Prinzapolka (where Layasiksa is located) and extreme poverty levels at 49%.

The area has basic road infrastructure which is highly susceptible to deterioration due to the ten months of rain each year. In the coastal area, and in the wetlands, transport by river or sea is common and sometimes the only alternative.

The Layasiksa community is making efforts to overcome the unfortunate socio-economic situation affecting indigenous communities. This situation is due largely to the government's indifference to the region, illegal logging, land invasions and fraudulent businesses by so-called "*ladinos*." The communities were also hit in 2007 by Hurricane Felix, which significantly damaged existing forests.

## Obstacles to forest management

Broadleaf forest covers an area of 4,219 hectares in the community, of which 11.4% is protected and considered sacred by the miskitu. There are four tree-covered hills *Winko Prukan*, *Liwatakan*, *Wistan*, and *Wilwil* whose protection was the main reason for the creation of the Layasiksa II community.

The forest has a great diversity of species (73 in the area under management), a density of 227 trees/ha with a diameter of 10cm or more, of which 130 (57%) are species with commercial value, 78 have no commercial value and 19 belong to the group of species with potential value.



Entrance to the Layasiksa forest



Protection of riverbanks

This forest was severely affected by Hurricane Felix in 2007, which changed the structure of the forest in the community's management unit with losses estimated at 50% to 70% of tree cover.

The RAAN has 16 protected areas formed by pine forests, broadleaf forests, mangroves and wetlands, which are managed by the state.

In 2002, the community started managing the Kiwatingni forest unit covering 4,664 hectares of which 80.2% corresponds to productive forest, 10.3% to protected forest areas and the remaining 9.5% to areas without forest.

The community's organizational structure is known as the Kiwatingni Agroforestry cooperative with its own regulations and operating procedures to manage extraction activities. However, access to forests and markets has been limited so far due to a number of difficulties. In fact, the cooperative has failed to produce the volume of timber allowed in its annual cut. Part of the problem is that without the equipment needed to extract and transport wood from the forest to its final destination, the cooperative must depend on third parties (contractors) for harvesting.

Layasiksa has obtained the FSC forest certification, but it will not be able to maintain the certification due to the lack of financial resources.

## Indigenous land claims

The origins of the Layasiksa community go back to the 18th century. At that time the people lived off fishing and subsistence agriculture, largely as they do now. The community has always owned the territory, although some has been lost to land seizures and agreements with other ethnic groups, but its land title is not valid under current legal regulations.

The Communal Property law (Law 445)<sup>27</sup>, enacted in 2002, has brought about significant progress in the implementation and strengthening of indigenous land rights established in the Constitution of 1987. To facilitate the implementation of this law, the National Land Rights Commission (CONADETI), created institutional mechanisms to recognize community government and communal land rights. Of the 29 land claims registered, five miskitu and mayangna claims have been settled as well as one by the sumu/mayangna and another in the South Atlantic Autonomous Region (RAAS)<sup>28</sup>.

Unfortunately this process has been slowly applied due to lack of political will and conflicts between levels of government in the two autonomous regions (RAAN and RAAS). Currently, the FSLN-YATAMA agreement provides an opportunity to advance in settling land claims and increasing autonomy for both regions, especially since the interests of the coastal regions are represented in the administration and policies of the central government like never before.

Law 462 for the Conservation, Promotion and Sustainable Development of the Forest Sector, enacted in 2003, laid the foundations for better forest management in the country. According to the law, the landowner owns the forest growing on it and all its

<sup>27</sup>Communal Property Law for Indigenous Peoples and Ethnic Communities in the Autonomous Regions of the Atlantic Coast of Nicaragua and Ríos Bocal, Coco, Indio and Maíz, promulgated on December 13, 2002.

<sup>28</sup>Larson, A. M. y Mendoza-Lewis, J. 2009. Challenges in community forest ownership in the RAAN of Nicaragua. CIFOR/Rights Resources/URACCAN/IREMADES.

related benefits, and INAFOR has the power to monitor the sustainable use of forest resources. Forestry concessions are awarded only for state-owned lands by the Ministry of Development, Industry and Commerce (MIFIC). The law made Regional Councils responsible for the approval of concessions in the autonomous regions and states that "if the concession is on communal lands, the procedures established in Law 445 will be followed."

The law requires that all forest harvesting in natural forests requires a general management plan made by a Regente Forestal. Areas of more than 500 hectares also require an environmental impact study and an annual operating plan. The fact that this must be approved by three institutions: the municipality, the regional government and INAFOR, has made the procedure cumbersome and slow. It has also increased the costs since each institution charges their own fees; all together these fees represent 10% of the cost of the timber, without considering possible delays in approval.

Despite these advances, the uncertain land ownership situation remains an obstacle for sustainable forest management. However, it is hoped that many of the land claims will be settled this year as the communities have maintained their demands and pressure on the government for a decision.

### Shift work system

In Layasiksa II forestry activity generates about 40 jobs during the harvesting period, which benefits more than 100 community members since a shift work scheme is used. In 2009, however, the annual cut could not be completed due to lack of funds to pay for extraction and transport (activities which are carried out by third parties) and due to the poor condition of the road, which did not allow access even to the community much less to the forest. Moreover, shift work does not guarantee skilled workers will stay because unemployment in the area is high and many families have left the community for this reason.

Women do not yet participate very much in forestry work. They are expected to become more involved, however, in harvesting non-wood products and reforestation activities. For now, they have been trained in the use of forest resources for obtaining food products.



Houses in the miskita community



Sawn wood



President of the women's group

The community structure allows knowledge and traditional forestry practices to be passed on from generation to generation, especially regarding forest protection. Even though extraction and transport operations are handled by contractors, they hire people in the community to carry them out and they are regulated by the *Regente Forestal*, according to the forest management plan which is financed by the community.

The profits generated by forestry activity are distributed among the 55 families after deducting the costs of organization and investments.



A community meeting

“Roberto Bauch”

# OPERATING A FOREST MANAGEMENT TRAINING CENTRE IN THE AMAZON

By César Sabogal

Location	Paragominas municipality, Pará state, Brazil
Biome	Tropical broadleaf humid forest
Type of forest	Native
Organization	Research and training NGO: <i>Tropical Forest Institute (IFT)</i>
Objective	Set an example of reduced impact logging techniques and forest management – Provide a forest area for training and research purposes
Area	5,000 hectares

One of the main obstacles to sustainable forest management in the Amazon region has been the shortage of qualified personnel at all levels from planning and monitoring to logging and auditing. The lack of trained staff has had predictable consequences in the Amazon in terms of degraded forest areas, high levels of waste, job instability and less income for local economies. Today, Brazil still faces the challenge of generating, in the Amazon region, enough skilled professionals to improve forest management practices, especially at a time when global demand for such professionals is rising<sup>29</sup>.

Fifteen years ago a major human resources initiative aimed at forest management and applied research activities was developed in the Amazon. This initiative has been developed by the Tropical Forest Institute (IFT in Portuguese), through Brazil’s Roberto Bauch Centre of Forest Management (CMFRB).

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<sup>29</sup>The expected demand for professional staff on public forest concessions is estimated at 8,000 people in the next ten years and could reach up to 30,000 in the long term if all timber in the Amazon is produced through good management forest.

## Values and activities

The IFT was founded in 2002 as a centre of excellence in forest management in the Brazilian Amazon. It began with the *Tropical Forest Foundation* (FFT), established in 1994 as a subsidiary of the international NGO Tropical Forest Foundation. Initially, the FFT programme was developed to develop five areas with good forest management and reduced impact logging (RIL) in the Amazon within a period of three years. In 1997, the FFT became devoted to training forest management skills.

The IFT's mission is to "*promote good forest management practices that contribute to the conservation of natural resources and the improvement of the quality of life of the population.*"

### Values of the Tropical Forestry Institute

The Institute's work is based on the following values:

- **Accessibility:** The training activities implemented by IFT are accessible to people with diverse origins and levels of education. They also value the practical experience of the participants.
- **Dynamism and innovation:** Forest management must be constantly improved to better serve all sectors of the economy.
- **Sustainability:** Forest management must continually seek sustainability, incorporating new systems and technologies.
- **Ethics and justice:** The benefits of the forest and the responsibility of conservation should be shared fairly by all society as a common good.
- **Transparency:** In carrying out its mission, the IFT aims to act with transparency, particularly with regard to the use of resources generated by forest management.

The IFT's main activities are as follows:

- **Training:** This includes managers, professionals and workers in forest management concepts and practices.
- **Outreach and raising awareness:** This includes forest management events and presentations aimed at entrepreneurs, community leaders, small producers, journalists, consumers, students, researchers and professors, among others.
- **Applied research:** This is research aimed at improving forest management. For example, studies focused on the economic profitability of forest management (compared to exploitative models of forest use in the region), determining the impacts of extraction on endangered species and on future forest growth, and investigating techniques to make forest management increasingly profitable for entrepreneurs.
- **Specialized studies and technical assistance:** This is provided through technical support for rural communities, participation in public meetings and socio-economic studies.

The IFT, formerly the FFT, has received financial support from many foundations and multilateral agencies in almost 15 years of work and development<sup>30</sup>.

## Roberto Bauch Centre for Forest Management

The Roberto Bauch Centre for Forest Management (CMFRB) is located in a large wooded area in the municipality of Paragominas in the eastern Amazon region of Brazil. This is a private area of 141,000 hectares of natural forest certified by the FSC for the extraction of timber products. In 1996, the area's owner, Cikel Brasil Verde, granted approximately 5,000 ha to the FFT to conduct courses in RIL techniques.

The main objective of the CMFRB forest is to serve as a demo area to implement RIE and good forest management principles, through training (practical courses) and research.



### Who was Robert Bauch?

Robert Bauch was an agronomist, lumberjack and independent consultant in his native country, Brazil, and in Central American countries for more than 30 years. He also worked as an expert in forest management (natural and planted forests) in various technical assistance programmes in many countries. For several years he participated actively in certifying the management of forest plantations and evaluating the management of natural forests. Bauch's strong interest in the activities of the FFT, later the IFT, in Paragominas, and his contribution to strengthening capacities for forest management in the Amazon region, were sufficient reasons to name this centre of forest management in his honour after his death in June 2007.



Natural regeneration in clearings

<sup>30</sup>Among the institutions that have supported the work of the IFT are: the Moore Foundation, the International Tropical Timber Organization (ITTO), the U.S. Forest Service, the PPG-7/Pro-Management programme, Blue Moon, the U.S. International Aid Agency (USAID), the Ford Foundation, the Thinker Foundation, the Netherlands Embassy, and the British Embassy. IFT has also received donations of machinery from Caterpillar and Stihl, and logistical support from Cikel Brasil Verde.



Traditional extraction using the  
"calango" technique

The geographical context of the CMFRB is particularly significant. The Paragominas municipality in the state of Pará was one of the most important timber extraction centres in the world for two decades, with very high rates of deforestation and a marked decrease in timber stocks from natural forest. However, the company Cikel Brasil Verde preserved its forest area.

While the CMFRB represents a very small area of the Brazilian Amazon, it has been used very effectively to generate social and environmental benefits. More than 3,500 professionals, forest workers, engineers and government officials have been trained in RIE techniques. As a non-profit organization, IFT has sought financial support for courses offered to groups of forest workers and community leaders.

The careful application of RIE techniques in the CMFRB has created an excellent demo forest management area and a laboratory for forest research. The IFT is leading several studies aimed to improve RIE techniques, increase profitability, understand how forest recovery can be accelerated by silvicultural treatments and determine the ecological impacts of harvesting endangered species.

The CMFRB has a camp capable of receiving more than 400 participants per year. In the 5,000-hectare area given by Cikel, the Centre uses between 300 and 400 ha annually (split in operational units of 100 ha) for training courses, testing and studies.

The CMFRB staff is composed of 23 people: three forestry engineers, seven technicians, three chainsaw operators, three heavy machinery operators, a botanist, an instructor in community forest extraction and five support staff (drivers, assistants and a nurse). Apart from donating the land where the Centre is located, Cikel also contributes seven of its own staff including five in the field and two in the camp (cook and caregiver). In return, the company receives about 5,000 to 6,000 m<sup>3</sup> of timber per year (representing 10% of its total production); staff training (in 2009, 35 of its employees received training), and greater public exposure.

## Training and coaching

The IFT has become an example in the field of forest management in the Amazon. The training and coaching standards applied in the CMFRB are also used by other training centres in the region. Most of the companies certified in the Brazilian Amazon had some kind of IFT support in training and coaching their workers. The IFT has also made efforts to improve the practice of forest management, the development of monitoring and evaluation systems, worker safety and the implementation of measures to protect soil, waterways, and endangered species of flora and fauna.

### Teaching traditional forestry practices

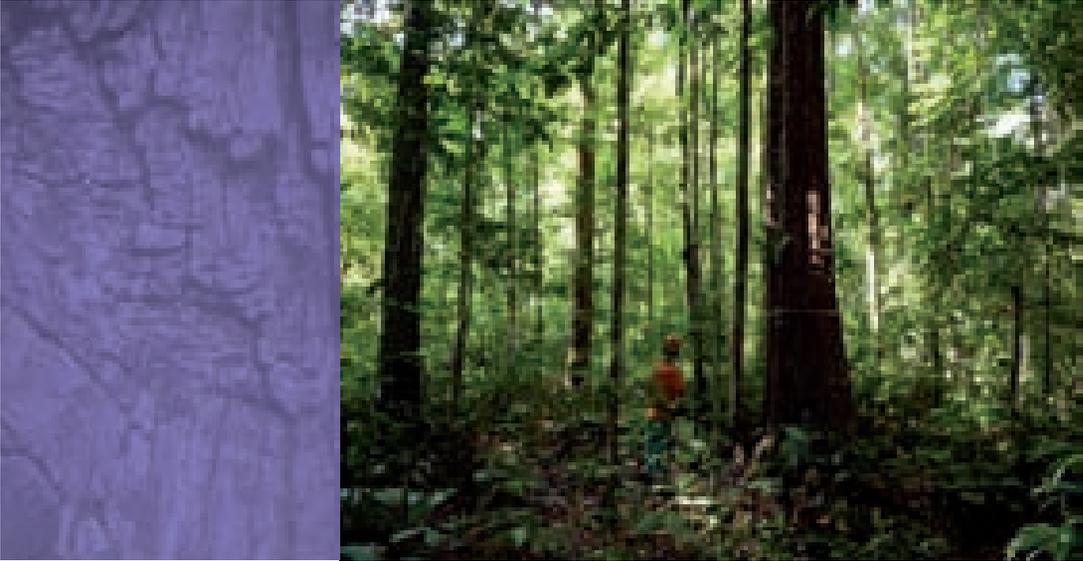
As part of its training programme, the IFT uses traditional techniques for the extraction of wood and non-wood products. The training is done in an area of 30 hectares used for this purpose alone. One of the CMFRB instructors is a member of a neighbouring rural community, and his function is to teach a traditional timber extraction system, known as *calango*, and also traditional systems of non-wood products extraction (copaiba oil and *Copaifera* among others). *Calango* is a system of manual hauling that uses a container shaped in the form of a basket, which rolls over logs laid side-by-side. Seven people normally push the basket, while one pulls it in the right direction with a rope. To facilitate the work, the part of the *calango* in contact with the logs is smeared with grease. In another part of the demo area, workers are taken on a tour past specially marked trees that can be used to harvest non-timber products.

The IFT's training and coaching programme includes all aspects of forest management, from basic logging practices and integrated forestry operations for small-scale individual and community initiatives, up to large-scale commercial production .

The programmes have been structured for different levels, from loggers and operators of heavy machinery to policy-makers, government officials, engineers, auditors and mid-level managers. The programme has incorporated lessons learned in the forest and includes the results of applied research and the traditional knowledge of the instructors. It can also be adapted to different types of forest and socio-economic contexts.

Approximately 50% of the courses offered by IFT are given in the CMFRB. The other 50% are given in forest areas authorized by state environmental organizations, especially in priority areas where government land use and planning efforts are being implemented. These courses outside the CMFRB allow a more targeted approach depending on the characteristics of the forest under management.

Outreach forest management activities are performed during the rainy season in the Amazon (December to May) when there is no timber extraction and training courses are not offered. Workshops, seminars and presentations are given in various locations in the Amazon, according to the interest of the audience. It is estimated that more than 10,000 people have participated in these awareness-raising activities since the creation of the IFT including specialized groups such as entrepreneurs, engineers and technicians as well as consumers, journalists and teachers. The IFT is also one of the institutions that has assisted the government in planning tenders for concessions in public forests.



Felling trees as part of a silvicultural experiment

## Scientific research

The IFT leads important scientific studies in the Amazon, some of which are as follows:

- **Silvicultural treatment:** Preserving trees for future harvests is one of the main silvicultural measures to increase the growth of commercially valuable species and the future economic value of the forest. In 1998, the FFT established an experiment to test this method and the results were published in 2006. Recently, the IFT repeated the study to determine the costs and benefits of this treatment, evaluating its feasibility in terms of future economic gains.
- **Plantations in clearings with canopy cover:** It is common in the eastern Amazon region that at least 15 to 20% of the landscape is composed of light canopy with a predominance of vines or reeds with few individual trees and low or no economic potential. In productive forests it is viable to recover these areas and plant species of economic value. The IFT has been conducting annual plantations in these type of clearings for research purposes. The species used have been mostly: *Parkia gigantocarpa* (faveira), *Schizolobium amazonicum* (paricá) and *Ceiba pentandra* (sumaúma), commonly used for lamination; as well as *Swietenia macrophylla* (mogno), *Cordia sp.* (freijó) *Bagassa guianensis* (tatajuba) and *Tabebuia sp.* (ipê).
- **Plantations in clearings caused by extraction:** Plantations of species in clearings caused by trees felled during extraction operations. This research seeks to measure performance and growth of certain species of economic value, as well as the economic viability of silvicultural treatments. In a 2009 test, this planting was done in medium (300 to 500 m<sup>2</sup>) and large (more than 500 m<sup>2</sup>) clearings.
- **Tree hollows:** This study seeks to determine the incidence of “hollow” trees (at the base or the first few meters of the trunk) in the species that are commercially important in Cikel’s forest area. The objective is to identify the organisms responsible for decomposition of live trees and the characteristics of the wood that determine the susceptibility of certain species to this problem.
- **Winter extraction:** This research seeks to analyse the impacts on the forest of extraction during the winter, as well as looking for ways to minimize these impacts. Logging in winter can help increase economic interest in forest management by keeping workers employed for longer and optimizing

economic interest in forest management by keeping workers employed for longer and optimizing the use of machines and equipment during the Amazonian winter months.

- **Forest re-entry for extraction:** The practice of re-entering the forest a short time after logging is common in conventional operations but is not legally permitted. The disadvantage of re-entry is the short time that the forest has to regenerate after extraction, which increases the impacts of extraction on the forest. But the research also considers possible advantages and seeks to analyse the impacts and costs of re-entry in harvested areas compared to areas harvested only once per cycle.
- **Ecology and management of the amapá:** This study, carried out by a researcher from CIFOR, seeks to understand the ecology, prospects for management and the best way of obtaining latex from the tree known as amapá (*Brosimum parinarioides*).
- **Ecology and management of other non-wood products:** Research about other non-timber products, such as the titica vine (*Heteropsis flexuosa*) and the copaíba tree (*Copaifera SP.*), which include inventories and production tests by researchers from ESALQ/USP.

The results of these studies are used to improve the quality of the courses given in the CMFRB.

IFT has published several manuals on aspects of low impact extraction and forest safety measures. It has also produced articles for scientific journals and books, and supported students with their theses.

The CMFRB is currently the only institution that offers training in forest management in the Amazon region. It is an important human resources activity that improves the implementation of forest management in the region. Among the main challenges identified by the IFT are increasing the capacity of its training centre; developing training modules for value-added processes and marketing non-wood forest products; and achieving financial stability.



Participants in a course on reduced impact logging



Classroom in the forest

# Mapu Lahual

## MAPUCHE COMMUNITIES DEVELOP AN ECOTOURISM PROJECT AND HARVEST DEADWOOD FROM THE FOREST

By Luis Chauchard

Location	Communities of San Juan de la Costa, Río Negro and Purranque, province of Osorno, Chile
Biome	Temperate broadleaf and mixed forest
Type of forest	Native mixed evergreen with pure and mixed formations of larch (alerce)
Organization	Indigenous community association: <i>Asociación Indígena Mapu Lahual</i>
Objective	Multiuse forest (dead wood, non-timber products) - Conservation of ecosystems - Ecotourism
Area	60,000 hectares (45,000 ha of forest)

The Mapu Lahual Indigenous Association (*Asociación Indígena Mapu Lahual*), comprising nine Mapuche communities on the coast of Osorno province in southern Chile, harvests dead wood from forests of larch (*Fitzroya cupressoides*), a protected species with extremely good qualities, to produce shingles and has created a network of parks to attract ecotourism.

### Land of larch

The Mapu Lahual territory (meaning “land of larch” in the local *chezungun* language) includes the communities of San Juan de la Costa, Río Negro and Purranque in Osorno province. It has an area of approximately 60,000 hectares, of which 45,000 ha are covered in forest. This is a region where the species and ecosystems are unique, mainly due to its “island bio-geography.” This condition is reflected in the high proportion of endemic species (that exist only in these forests), its unique biodiversity and the existence of large tracts of larch forests.

Mapu Lahual is one of 20 priority conservation areas globally and includes a marine area as well as its forests.

According to the 2002 census, approximately 211 families (674 people) live in the nine indigenous communities in the Mapu Lahual territory. These communities belong to the *huilliche* tribe of the Mapuche people. Their traditional activities are fishing in the sea, livestock and subsistence agriculture, and the harvesting of wood from the forest.

The use of larch by indigenous communities dates from the 17th century. During the 20th century, however, logging companies arrived in the region and practiced industrial harvesting of the species on a large scale.

The legal framework related to larch was radically changed in 1976 when this species was declared a natural treasure (Supreme Decree No. 490) and the extraction of dead-wood from larch forests is now only permitted upon presentation of a work plan and confirmation of land ownership. This legislation brought an end to the industrial exploitation of larch and led to the withdrawal of the large timber companies. Indigenous communities then returned, decades later, to the artisanal use of larch based on the abundant remains left by the previous harvesting activities.

Currently, the main stumbling block for communities is land tenure because only those with land titles can harvest larch. However, there are cases in which members of a community that does not own any land are permitted to work in the larch forests of another community that does own the land.

A central element of the Mapuche worldview is its harmonious relationship of man with nature. This notion determines the way the communities use larch. According to tradition, "*the powers of nature can weaken, sicken or threaten with death he who does not act properly.*"

The artisanal use of larch involves using deadwood or branches. These can be found on the ground or buried over time. The whole family often works to dig up a buried tree with the craft passed on from generation to generation. The main product is roof shingles. The transport is done by shoulder or horseback, which can be dangerous.

Don Anselmo Pillamanque, the head of the San Juan de la Costa community in mapuche language (lonko) said: "*The larch or lahual is a unique tree with slow growth, but it was nearly destroyed by people who*



Artisanal harvesting of dead *alerce* (*Fitzroya cupressoides*)



Transporting dead *alerce* by shoulder from the forest

*came from outside. Now we exploit what they left behind, the buried larch. Our people have used it not always for money but in return for grains, spices or food. Now there are laws that ban the use of this species, but we take the deadwood, we don't exploit the forest."*

## Management objectives

The nine communities that form the Mapu Lahual Indigenous Association, founded in 2001 are: Caleta Condor Maquemapu, Hueyelhue, Ñirehue, Loy Cumilef, Melillanca Guanqui, Maicolpi, and Maicolpué Rio do Sul. Each has a president, elected every two years, apart from the community's traditional authority, which is the *lonko*. The association basically serves to link communities with external markets, while the state agencies also have a direct relationship with each community. The association defines work plans, manages resources, establishes partnerships and executes projects. It is also part of the Council of Lonkos of the Butahuillimapu, an organization which groups indigenous communities in the provinces of Valdivia, Osorno and Llanquihue.

The main objective of the association is the sustainable management of the forest, which includes activities such as ecotourism that generate additional income for families.

The association has a general plan for the *Rewe Lafquen Mapu Lawual* (RLML) territory, aimed at improving the wellbeing of its members and protecting the environment.

The plan has the following objectives:

- **Improve living conditions for families in the territory.**
- **Guarantee the conservation of natural resources.**
- **Develop training and education programs, particularly for young people, to keep the native language and history alive.**
- **Encourage the formation of community leaders and strengthen the capacities and resources of the association.**
- **Obtain national and international recognition for indigenous peoples.**
- **Help families become self-reliant in terms of food.**
- **Develop sustainable tourism and other economic activities.**
- **Implement democratic mechanisms for community members to participate in government.**
- **Ensure the territory has the infrastructure required to carry out its plans.**

Communities have developed various activities based on these objectives, such as the following:

- **A manual of non-timber forestry products in the territory.**
- **Extraction plans for dead larch wood.**
- **A manual of good practices that is applied in three larch forests used as examples of restoration and waste management.**
- **A training programme in sustainable management and the creation of extraction areas for non-timber products.**
- **An environmental education programme including biodiversity, botany, medicinal herbs and tourism for training guides in the Pichy Mallay, Peter Loy Huaiquián and Gilberto Cumilef Quintul parks.**
- **A forest fire prevention plan.**

The training activities include courses in guiding, traditional cooking, intercultural communication and biology. The latter can be considered a process “in reverse,” as recipients of the training are public service employees working in the communities.

## Parks and ecotourism

Larch harvesting has important historical and cultural significance for the *huilliche* tribe of the mapuches. They use a system of low impact development with an emphasis on conservation and deadwood is used according to a handbook of good practices developed with the support of the Chilean forest service. In addition, one of the communities has created a cooperative, in agreement with the municipality, to market larch products, eliminate intermediaries and increase income for local families.

Five communities with land tenure have formed the first indigenous parks association in Chile. The main attraction of this project is the beauty and biodiversity of these parks, which the communities hope will increase ecotourism in the area. Visitors can walk on forest trails that connect the communities, accompanied by trained guides. The trails are marked with signs and plaques with information about points of interest. For now, the villages are equipped to receive up to six people at a time. The association is using external funding to build a shelter on one of the paths which will allow hikers to spend the night. In addition, a lodge is being built in a nearby town to receive tourists and community members. This lodge will also operate as a venue for the sale of handicrafts and a meeting point for guided tours in the region.

The Mapu Lahual Association also participates in various forest conservation activities including studies on the regeneration of larch forests, which are supported by public and non-governmental institutions. Primary forests have also been identified that have not been affected by the intensive exploitation of the last century. In 2007, the President of Chile gave the Mapu Lahual Association the Bicentennial Seal for its environmental initiatives.



Sustainable management of the forest for family subsistence



Stacked *alerce* for transport

The level of organization achieved by the nine communities, their efforts to preserve their cultural values associated with a species of high conservation value, and the development of an innovative network of parks and ecotourism activities make Mapu Lahual's experience an exemplary case.

The most fragile aspect of this experience is the uncertainty related to land ownership and access to natural resources. However, this is an aspect communities expect to be resolved by the Chilean state's indigenous land programmes.



Artisanal cutting of dead *alerce* in the forest



Coastal area of the region

## A PUBLIC-PRIVATE FORESTRY PROJECT PROTECTS THE ENVIRONMENT AND GENERATES SOCIO-ECONOMIC DEVELOPMENT

By Luis Chauchard

Location	Manizales and Villamaría (and part of Neira, Palestine and Chinchiná) municipalities, department of Caldas, Colombia
Biome	Tropical broadleaf humid forest
Type of forest	Mixed forest: Secondary native, forest plantations and agroforestry systems
Organization	<i>Chinchiná Watershed Forestry Project</i> (PROCUENCA)
Objective	Generation of environmental services – Landscape restoration – Conservation of biodiversity – Socio-economic benefits for communities – Provide areas for training and research purposes
Area	113,000 hectares (12,697 ha with natural secondary forest)

The Chinchiná watershed Forestry Project (*El Proyecto Forestal de la Cuenca del Río Chinchiná*, or PROCUENCA), in Caldas department, Colombia, is a highly exemplary case due to its institutional strength based on a public-private partnership as well as its high level of community participation, organization and environmental restoration. This case also shows how agroforestry and tourism alternatives can add value to timber production while complementing traditional activities in the area like coffee-growing and ranching.

### A cultural change

The Chinchiná watershed, covering 113,000 ha, is in the south-central area of Colombia's Caldas department. It is home to around 530,000 people in the towns of Manizales and Villamaría as well as part of the Neira, Palestine and Chinchiná municipalities. Its altitude varies, rising from 780 meters above sea level (masl) at the mouth of the Cauca River to 5,400 masl in the Nevado del Ruiz.

For nearly 200 years, the region has survived by producing two traditional products: coffee and beef. This has generated economic growth, but at the expense of causing serious environmental problems. The basin has forest cover over 68% of its surface, but much of the native forest has been cleared to grow coffee beans and create pastures for

livestock. “*Trees just get in the way,*” seems to have been the maxim of the day. What about the consequences? For a start: soil deterioration, erosion and, as a result, sediment build-up in the river. There has also been a significant loss of biodiversity caused by the destruction of forest and riverbank habitats. Making the situation worse, the crisis in the coffee and livestock markets in recent decades has resulted in economic and social hardships for the region.

PROCUENCA emerged in this scenario with the mission to build a sustainable wood production process, promote forest restoration, enhance environmental services and improve the quality of life of the population. The improvement of the production chain based on a system of shared public-private responsibility was proposed.

The project aimed to bring about a cultural change while maintaining the essence of the community and its cultural traditions (agrarian culture with emphasis on coffee and livestock). To do this, development alternatives were proposed to ensure environmental recovery while improving the quality of life of the inhabitants.

### New production opportunities

The PROCUENCA project’s goals and objectives are as follows:

- **Natural forest conservation:** Sustainable management of 15,000 ha of natural forest and restoration in critical areas.
- **Increase forest resources:** Create of 15,000 ha of commercial forest plantations.
- **Protection of water resources:** Improve water quality and regulation of the hydrological cycle.
- **Recovery of biodiversity:** Implement corridors for conservation and sustainable use of biodiversity.
- **Strengthen the production chain:** Technological innovation, business plan and production of high value timber.
- **Job creation:** 1,500 permanent jobs
- **Promotion of local partnerships**
- **Develop economic alternatives:** Sale of certified emissions reduction credits (CERs) through the implementation of a CDM (Clean Development Mechanism) carbon sequestration project.

In its early days, the project received technical assistance from the FAO, which was key to building a strong organizational base. The restoration of forest areas cleared over nearly two centuries of farming and crop cultivation involves long term processes that consider both social and political factors.

Changing social attitudes was particularly important since the deforestation was the result of clearing land for traditional farming and crops. The strategy included the development of new economic opportunities (forestry, agroforestry and tourism), without taking away traditional sources of income i.e. mainly coffee-growing and cattle grazing.

In terms of the political factor, the role of the state is critical as the coordinator of an organization involving a network of private actors with a common purpose.

## Project pillars

The PROCUENCA project's strategy is based on four main pillars:

**(1) State participation:** The state's involvement is important to promote the project and implement support mechanisms and incentives. The five municipalities involved have included the project in their long-term development plans to ensure its continuity. The project is financed by an independent municipal institute (Institute of Finance, Promotion and Development of the Municipality of Manizales, or *INF/Manizales*). This entity runs the project with funds obtained from the water service concession owned by a private company (Aguas de Manizales).

**(2) A Project Coordinator:** The Project Coordinator, PROCUENCA, was created in the framework of the agreement with INFI Manizales and with the support of FAO. It has a strong management structure and technological innovation capacity, which has made the project's management decentralized and flexible.

**(3) Allocation of funds:** PROCUENCA has implemented an interesting fund allocation mechanism known as Payment for Environmental Services (PES). This mechanism works by giving a value to the environmental processes and regulatory functions performed by different actors and distributing funds in relation to this value. Part of the funding for the project is derived (indirectly through concession fees) from payments by landowners for the community's potable water service. The landowners are then repaid with services provided in the form of incentives aimed at forest restoration, diversification and sustainable development. This method is used to recover environments for biodiversity conservation and protect water resources.

**(4) Community participation:** The Project Coordinator, PROCUENCA, has identified community members and landowners with leadership potential. These people have encouraged their neighbours to become involved in the project's initiatives as well as setting future goals and objectives. Neighbourhood committees have been established to help recover conservation areas and promote training in technical aspects of production.



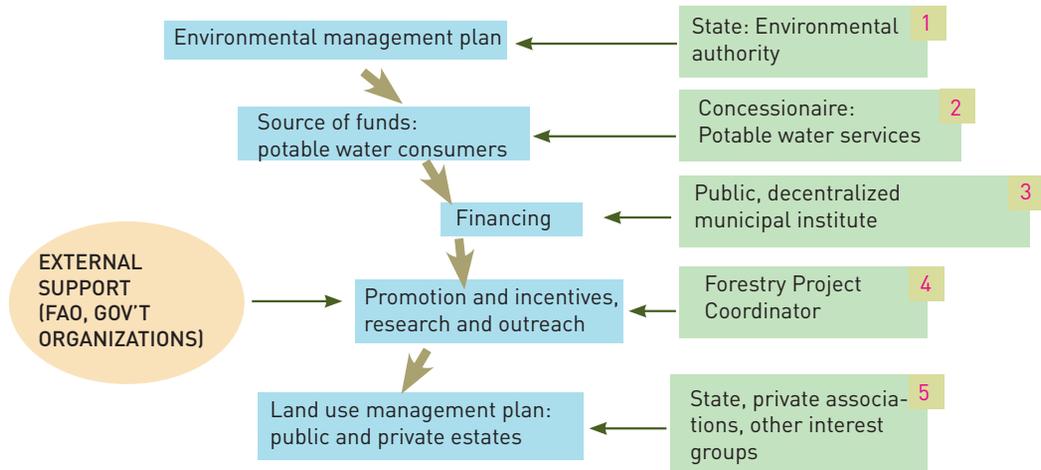
Cattle farming in the Chinchiná river valley



Sustainable forest organization of community farms

Communication has also been improved between residents and landowners, which has facilitated decision-making.

**Figure 1.** Organization of the Chinchiná Watershed Forestry Project (PROCUENCA)



Source: (1) CORPOCALDAS: Regional environmental authority, (2) Aguas of Manizales, (3) INFI Manizales (Municipal Institute of Finance), (4) PROCUENCA, (5) Agroforestry associations, PROCUENCA, neighbourhood committees etc.

The PROCUENCA project is based on the Environmental Management Plan for the Chinchiná watershed, produced between 1997 and 1999 by the Caldas department environmental authority, CORPOCALDAS. An agreement was signed between Manizales INFI and FAO in June 2001 for the first five-year phase of the project, which was later extended through August 2008. Since then, the municipality has been solely responsible for the project's management and execution.

## Strategic policies

To achieve the project goals, four sustainable development policies have been defined in the following areas:

- **Environmental policy:** To improve the quality and quantity of environmental services generated by the forest through a sustainable management model that includes raising environmental awareness in the local population. This also includes the restoration of degraded natural habitats to allow recovery of biodiversity with an emphasis on protecting water resources.
- **Harvesting policy:** To manage public and private resources to facilitate forestry activities aimed at selling value-added forest products in national and international markets. This includes diversification of forestry activities to increase family income without eliminating income from traditional activities.

- **Social policy:** To strengthen human capital, raise environmental awareness, and increase public participation in decision-making. This includes the involvement of communities in the land use decision-making process through an outreach programme. The project also promotes training for community members at all levels to increase income and improve self-management capacity.
- **Institutional policy:** To work with national and international public and private entities to expand the scope of the project activities and ensure continuity.

The project uses different methods to incorporate communities and make their activities sustainable in the long-term. Some of these are:

- **Facilitating access to financing: Systems to help community members obtain soft loans and technical assistance.**
- **Sustainable Forestry Management of Farmland (OFSF):** This mechanism helps landowners implement an environmentally sustainable forestry production plan.
- **Sustainable production systems: Agroforestry and silvopastoral activities to generate additional income for producers.**
- **Around-the-clock technical support:** This is provided throughout the duration of the contract to achieve the OFSF objectives.
- **Agroforestry organisation:** Promotion and assistance in creating and strengthening the Association of Agroforestry Producers (AGROFORESTAL).
- **Community management of water resources:** Strengthens community organizations that manage water resources based on public participation and self-management.
- **Community participation in decision-making**
- **Training and outreach**
- **Adding value in the forestry production chain**
- **Administrative and technical procedures**

## Public-private partnership

One of the strengths of the project is its public-private organizational structure which allows technical and financial independence while facilitating public participation in the management process.

The Project Coordinator (PROCUENCA) is financially independent and has the capacity to develop and evaluate projects; develop new technologies;



Land planning



Forestation of hillsides



Agroforestry systems

carry out environmental, social, and economic analysis; and involve local villagers in all processes.

The Project Coordinator has a General Director as well as directors for the project's environmental, social and production areas and for each of the river basin's four geographic areas.

The system includes project planning, implementation, evaluation, monitoring and feedback with an emphasis on monitoring and evaluation, which are often considered the weakest aspects in long-term forestry projects.

The project has established links with external agencies to provide financing and technical support for research and innovation. It has also involved local landowners and neighbourhood associations in the project. As an example, the Agreement for Regional Forestry Competitiveness includes over 40 public and private entities, which has made it possible to execute a variety of actions across many sectors.

Part of the success of the project is due to its financing mechanism. The Manizales Institute of Finance (INFI-Manizales) invests 10% of its royalties obtained from the potable water company Aguas de Manizales into the project. This money is used to provide incentives for producers to improve their processes and the environmental recovery of the forest.

These funds also benefit the community. Financial incentives are aimed at cleaning up waterways, expansion of potable water infrastructure and implementing reforestation plans on land with high conservation value.

### Increased productivity and environmental protection

The project includes the management and sustainable use of different types of forest: native secondary, forest plantations and agroforestry systems.

Reforestation and restoration activities are carried out on public or state owned land to ensure the conservation and growth of natural forests in areas of environmental vulnerability. No harvesting is permitted in native forests which are mainly second generation due to intense human activity in the past resulting from settlement and expansion of the agricultural frontier.

Forest plantations and agroforestry projects are developed on private land that was used in the past for coffee-growing and livestock production, and which now combine trees with coffee plants, crops and silvopastoralism (wood and grasses).

Landowners can carry out forestry activities on their own land, including production and conservation, in compliance with national regulations.

The project includes the creation of a Management Programme for Micro-Basin Water Resources (MIMA), which aims to ensure the sustainability of water resources in the watershed. Fifty-two micro-basins have been identified in the area, which are environmentally vulnerable due to pressure on natural forests. Twenty-nine of these have already started the process of forest restoration and environmental protection.

The project strategy has included forestry systems that overlap with, rather than replace, traditional agriculture land uses. This has enabled producers to continue cultivating crops and raising cattle while at the same time diversifying their activities to include forest management, which will generate income in the long-term (from 11 to 18 years).

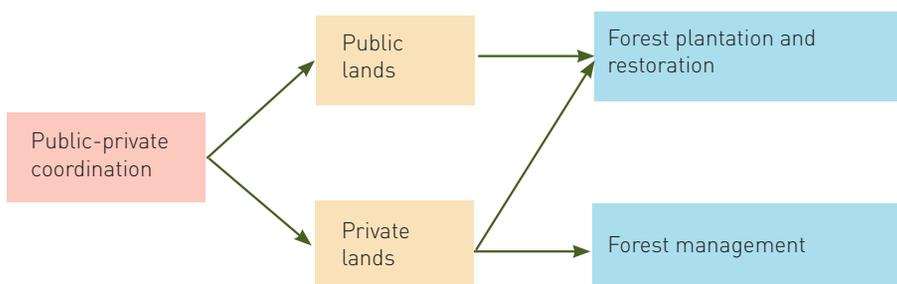
The agroforestry system also ensures that landowners do not lose their productive capacity in their traditional crops. Seedlings are planted in areas surrounded by native species, such as the nogal cafetero (*Cordia alliodora*), or exotic species (*Eucalyptus spp.* or *Pinus spp.*).

The territory is zoned for the development of biological corridors and protection of waterways. Existing native forests are protected and restored in areas that connect with forests in neighbouring areas. This has involved coordination between public agencies and private landowners to allow the protection and connectivity of these forests. Such agreements use a legal mechanism called “ecological easement,” which reserves privately owned land for conservation and restoration of wetlands and waterways. This mechanism enables public investment on private land .

In terms of restoration activities, techniques are used to promote the reproduction of native species. Many of these species have difficulty reproducing with artificial propagation, but transplanting native plants using earthmoving machinery on the roads has been tested with good results. This has helped restore mixed tropical forests in the basin’s headwaters.

## Social change

The zoning of the watershed has permitted the developed of activities in public and private lands:



Areas of community participation have been established in each area of the region, involving local communities to create a cultural change in land use and conservation and to promote self-management. The project has promoted activities through community meetings in “*veredales*”<sup>31</sup>, field visits, individual contacts, training programmes and the association of forestry producers.

There is also a School of Forestry Leadership which trains producers, workers and rural youth in partnership with public agencies (the National Apprenticeship Service, SENA) and private institutes (Institute of Higher Education, IES-CINOC), and promotes environmental education programmes in schools and rural colleges. These programmes raise awareness and create a forest culture in communities, with full-time courses for young people and part-time courses for managers and farmers. Through December 2007, 1,200 members had been trained in 52 events.

The implementation of the project has increased the value of private estates, which has encouraged many families to return to live on them. Moreover, the strategy of public participation has allowed neighbours get to know each other better through regular community meetings.

The project has succeeded in getting the government and 380 landowners so far to work towards common goals. In addition, the project’s implementation has created a cultural change in the attitudes of other landowners in the basin.

## Financial support

The project uses the following financing mechanisms:

**(a) Soft loans:** Proceeds from the water services concession are given to landowners as soft loans to create forest plantations and perform other activities such as pruning and selective logging. These loans, which increase annually in line with the Consumer Price Index (CPI), come with technical assistance and are paid back at harvest time. The loans are made through a type of agreement called “*Contrato de Cuentas en Participación*.”

**(b) Forestry Incentive Certificate (CIF):** This is based on a 1994 law to promote the establishment of commercial forest plantations. The law offers a financial incentive that is equivalent to a percentage of the costs of establishing and managing the plantation. Landowners can manage these incentives independently but for small producers the costs of performing the required studies can be high.

**(c) Forestry Capital Fund:** This is a long-term financing instrument for the sustainable management of new plantations and for the development of new processes to add value to the raw material produced.

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<sup>31</sup>The “*vereda*” is a unit of territory managed by the municipalities.

(d) Clean Development Mechanism (CDM): Since 2003, the UN's CDM mechanism has been used to generate carbon credits from forestry plantations that sequester carbon emissions. These projects must first be registered under the United Nations Framework Convention on Climate Change (UNFCCC) in order to sell Certified Emissions Reductions (CERs) from forests. Once the CERs are certified, they can be sold to foreign countries to help them meet their emissions reduction goals and each landowner involved receives a financial bonus. In April 2010, the project received approval from the UNFCCC making it the first Colombian CDM forestry project and the second large-scale project of its kind in Latin America. In July 2009, the project was awarded the "CDM Project Environmental Responsibility," prize by the Colombian Sustainable Development Foundation and the Embassy of the United Kingdom in Colombia.

After completing the first phase of the project, the Association of Agroforestry Producers has emerged as a key actor in regional development. The challenge in the next phase is to improve the economic sustainability of this association.

# Aserradero Espinoza

## A PRIVATE COMPANY MANAGES FORESTRY CONCESSIONS IN THE PERUVIAN AMAZON

By Miguel Segur

Location	Iberia district, Tahuamanú province, Madre de Dios department, Peru
Biome	Tropical broadleaf humid forest
Type of forest	Native
Organization	Private company: <i>Grupo Aserradero Espinoza</i>
Objective	Production of timber - Adding value to forest products – Harvesting of non-timber products
Area	81,129 hectares

The family-owned Aserradero Espinoza Group consists of two forestry companies (Aserradero Espinoza and Maderas Cocama) and a transport company which provides services to the other two. The Group has around 60 fulltime employees and between 50 and 100 seasonal workers. It produces tropical timber of varying degrees of quality intended mainly for export.

The Group has two outstanding features: a vertical structure that controls production from planning and planting through harvesting, hauling, sawing, quality control and shipping to the customer; the other notable feature is that all of the Group's production is certified by the FSC standard.

### **Certification: Competitive advantage**

The Group has forest concessions in the district of Iberia, Tahuamanu province, in the Madre de Dios department of south-eastern Peru. These concessions total 81,129 ha; Aserradero Espinoza has a contract for 35,155 ha and Maderas Cocama has a contract for 45,974 ha. The protected forest covers an area of 8,931 ha, which is a high value biodiversity conservation area. The entire area is bordered by the rivers Tahuamanu and Muymanu to the north and south, respectively.

The Group harvests eight species: caoba (*Swietenia macrophylla*), cedro (*Cedrela odorata*), ishpingo (*Amburana cearensis*), shihuahuaco (*Coumarouna odorata*, *Dipteryx odorata*), azúcar huayo (*Hymenaea sp.*), tahuarí (*Tabebuia serratifolia*), quinilla (*Manilkara bidentata*, *Pouteria reticulata*) and estoraque (*Myroxylon balsamun*). The diverse fauna of the area includes jaguar, tapir, harpy eagle, paujil and monkey, which are just some of the animals that can be easily spotted in the areas under concession.

The Group has a protection and monitoring plan that includes regular patrols led by a forestry ranger and a “custodian of the forest” (custodio de bosque) accredited by the National Institute of Natural Resources (INRENA).

The forest concessions are divided into five five-year periods with 20 plots for logging, but the harvesting conditions are very difficult. The presence of abundant bamboo, known locally as paca (*Guadua spp.*), hinders the movement of loggers. Transportation of timber is also laborious due to the absence of navigable rivers. The typology of the soil is very fine, which means that during the rainy season the roads leading to the Interoceanic Highway become very slippery.

Certification of management processes is valued by the companies in the Group as recognition and an incentive to improve their operations and strengthen their control and monitoring capacities to improve efficiency. Although the certification did not give the Group a competitive advantage over other suppliers in the past, it does today. Given the choice customers tend to prefer certified wood over non-certified wood. The Group considers that the certification has increased the loyalty and quality of its international customers.

## Capacity for innovation

These forest companies are exemplary in many aspects including their ability to innovate.

The family organization at the core of the Aserradero Espinoza Group has been in the local lumber business since 1968. In 1978, it established the first sawmill in Puerto Maldonado, the capital of Madre de Dios. After Law 21,147, enacted in 1975, the group began operating on small forest concessions and then later, in 2002, it obtained the concessions it currently holds. Since 2006 the Group’s forest management and chain of



Certified harvesting operations



Forest regeneration area



Sawmill and timber production

custody has been certified. The company's trajectory shows a remarkable capacity for adaptation and incorporating changes into the operation of the organization.

One of the Group's owners, Victor Espinoza, tells how he learned of the certification process and came to understand its usefulness. It was 2004 and he was looking for a used wood planer for the company. He found a vendor (a Dutch importer) that had such a machine. The price was good. Moreover, he could pay for it in timber. The only condition was that the timber had to be certified. This request opened Espinoza's eyes to the opportunities that certification, which was a new concept for him at that time, could bring. A year later, all of the group's production was certified.

### Building alliances

The Aserradero Espinoza Group maintains alliances with various organizations as part of its development strategy. Peru's National Forestry Chamber (CNF), through its regional Madre de Dios office, supported Espinoza in his efforts to formalize his concession contracts and obtain loans. This latter aspect is important because access to credit is one of the main obstacles for Peruvian forestry companies that are usually classified as high risk in the financial sector. As part of its policy to diversify the use of Peru's export infrastructure, the CNF provides support for companies (including the Espinoza Group) to give them access to the facilities at the Ilo port instead of the traditional port of Callao.

Peru's Fund for the Promotion of Forestry Development (FONDEBOSQUE) recently approved a grant enabling Group Espinoza to buy a wood drying oven. FONDEBOSQUE is a public-private institution that promotes competitive forestry businesses with social and environmental responsibility and facilitates their access to credit.

Group Espinoza also receives technical support for the certification process from the World Wildlife Fund (WWF). This international conservation organization performs research studies in the Group's concession areas, and even has a permanent pavilion in the campsite. This cooperation, which is part of a project

that monitors five species in the Tambopata biological corridor, has resulted in major advances, for example, in the knowledge of the jaguar populations present in the area.

Similarly, the Group maintains a partnership with the conservation NGO *Rainforest Alliance*. The company offers its facilities to the organization for their field visits in exchange for technical advice.

## A long-term plan

As proof of the Group's long-term vision of natural resources management, it decided not to cut down the 19 coaba trees approved in the 2009-2010 harvest plan, as a measure of restraint. The company is authorized to extract 32,000m<sup>3</sup> of wood per year, but it only produces about 11,000m<sup>3</sup>. In addition, to assess the dynamics of forest growth, the Group has installed four permanent one-hectare sample plots (PPM) out of a total of 18 it has planned.

Another of the Group's aims is to promote the regeneration of the forest. It maintains a nursery for the production of plant species, which it uses to reforest areas affected by forest harvesting (such as log piles, secondary and main roads). To date it has produced and planted 6,000 seedlings in these places.

The main activity of the Group is timber extraction. It is also exploring complementary activities, such as the use of forest waste and obtaining non-wood products. These include coal and the Amazon chestnut (a fruit of the species *Bertholletia excelsa*). In relation to coal, the Group has undertaken a process of experimental production to assess the technical and economic feasibility of this option. With regard to the chestnut, the Group has partnered with the company El Bosque, which is Peru's leading firm in the development of this resource.



Production of charcoal



Certified logs

APA, Colinas Bajas

# FROM “ENEMIES OF THE FOREST” TO MICROENTREPRENEURS

By Fernando Carrera

Location	Cotuí municipality, Dominican Republic
Biome	Subtropical broadleaf humid forest
Type of forest	Native
Organization	<i>Association of Agroforestry Producers of Zambrana-Chacuey (APA)</i>
Objective	Production of timber – Multiple uses of forest resources – Biodiversity conservation – Socio-economic benefits for communities
Area	875 hectares

The case of the Association of Agroforestry Producers of Zambrana-Chacuey (*Asociación de Productores Agroforestales de Zambrana-Chacuey, APA*) in the Dominican Republic is a successful example of how communities equipped with administrative and technical tools can develop agroforestry systems and, in less than 25 years, improve the lives of their members. In this period, the Association has converted their deforested territory with serious erosion problems to a landscape covered in forests which contribute to the family economy.

The communities of Zambrana-Chacuey are in the northeast of the country, in the municipality of Cotuí, some 102km from the capital. The territory has an approximate area of 225km<sup>2</sup>, with more than 1,700 small estates less than one hectare in size. The climate is subtropical, with an annual average rainfall of 1,800mm and an average temperature of 25.4°C.

## Historical background

**Rampant deforestation:** As the result of misguided policies, farmers and large ranchers in the Dominican Republic cut down most of the remaining forests in their concessions to secure their right of ownership, conditioned on the “effective” use or “improvement” of land which was interpreted as clearing the forest. In 1967, oversight of the General Forestry Directorate was transferred from the Ministry of Agriculture to the Secretariat of the Armed Forces.

Thereafter, the Forest Service was directed by the military. As a first step, the military decreed a complete ban on logging and a repressive forestry policy, which caused the closure of the 160 sawmills that operated in the country. Forestry was outlawed for nearly three decades, except in cases of force majeure as in the cases of Hurricane David, in 1979, and Hurricane George, in 1998, when intervention was authorized in damaged forests. As a result of these repressive policies, deforestation in the 1980s reached very high levels.

**The tree = “Enemy of the farmer”:** Rural people came to have a very negative attitude towards natural resources: trees were regarded as a potential source of problems; natural regeneration of forest species was seen as a nuisance; and planting trees, “a stupid idea.” Farmers distrusted forestry because everything to do with trees attracted the intervention of the state, and thus the risk of losing their right to the land.

**The Zambrana Farmers’ Federation:** The economy of the Zambrana-Chacuey area was highly depressed. In 1974, the Zambrana-Chacuey Farmers’ Federation was founded, which began working to ensure the access of rural people to land, food, health services and soft loans. The Association then embarked on a fight against pollution by a company which operated the Pueblo Viejo Cotuí goldmine (Rosario Dominicana).

**The arrival of Enda-Caribe:** In 1982, the organisation *Enda-Caribe*<sup>32</sup> began operations in support of the Zambrana-Chacuey communities through a research project focused on production of natural pharmaceuticals. This project has promoted the study, cultivation and utilization of more than 160 species of medicinal plants (for their fruit, leaves and bark). But farmers also needed to recover their soil fertility which had been degraded by years of intensive use, produce wood for fuel and crops for food security. In this context, agroforestry<sup>33</sup> was seen as an interesting option that could help satisfy the needs of the population.



Agricultural leaders act as agroforestry supporters



Multi-use agroforestry system

<sup>32</sup>Enda-Caribe is the regional office of Enda Third World (Enda Tiers Monde), an international environmental and development NGO, based in Dakar, Senegal.

<sup>33</sup>According to FAO, Agroforestry is a sustainable land management system that increases its performance and production of crops and forest plants and/or animals, simultaneously or consecutively, in the same unit of land and applies practices that are compatible with the cultural practices of the population.

## Making a difference

**First stage of the project (1984-88):** Introduction of agroforestry systems. In 1984, the Zambrana-Chacuey Farmers' Federation started a pilot project. The project was based on the premise that farmers were aware of the value of trees, but that circumstances forced them into indiscriminate logging. The project focused on the production of animal fodder and firewood associated with vegetables and crops for food security. Later, the project focused on planting trees, multi-purpose agroforestry (firewood, fodder, soil conservation, beekeeping, etc.) and the development of mixed orchards.

The project was designed to benefit the greatest number of farmers possible. To this end, a menu of options was proposed. Community plant nurseries were established using voluntary labour without external incentives except tools and basic infrastructure. For farm trials, the project identified potential agricultural leaders who were generally older people.

Fast-growing species were introduced into the orchards and more than 180 species were tested including plants for fodder and medicinal purposes, timber, fruit trees and crops. Farmers began to select species by their speed of growth, ease of adaptation and market potential.

One species stood out among all the others, the *Acacia mangium*, originally from Papua New Guinea and Australia. Its rapid growth, with cycles between 8 and 10 years, high quality of wood for furniture, nitrogen fixation (for soil fertility) with little or no care required, made this into "the star species." In this regard, one forest engineer said: "If we had not found a species such as the *Acacia mangium*, this project would perhaps not have achieved the success it has."

Farmers welcomed the diversity of species as an alternative to monoculture (tobacco, peanuts or yuca). Alfonso Brito, an elderly farmer and agroforestry promoter, converted his nine-hectare estate into a true "Botanical Garden," with more than 200 native and exotic species. People come from many parts of the country to buy seeds and plants from his nursery. His estate has become an agroforestry training centre where workshops are held with other farmers, students, and professionals interested in agro-biodiversity.

**Phase II (1988-92):** Expansion and diversification: In this stage, the project was expanded and diversified. The problem of a shortage of firewood was largely solved by using *Acacia mangium*. The challenge now was to recover the soil. Volunteers known as pilot farmers ("*agricultores piloto*") served as promoters of the new method. Knowledge passed from farmer to farmer helped reverse harmful practices and inadequate methods.

A small agroforestry research project was created which expanded the number of pilot communities involved from 12 to 32. Reforestation with fast-growing species created large amounts of biomass and wood. This gave rise to an initiative to establish a sustainable forest management unit with a business approach, which integrated more than 650 small-scale producers. This unit obtained the first logging licenses in the country from the state.

**Third phase (1992-98):** Forestry microenterprise. In 1992, the Agroforestry Producers Association (APA)<sup>34</sup> was founded with over 600 members, many of which only five years earlier had mocked the idea of planting trees.

The wood obtained from selective logging allowed the farmers to obtain more income from their plots than had been produced during five years of tobacco cultivation and with a smaller workforce.

That same year the Zambrana Forestry Microbusiness was launched and installed the first community sawmill in the country, which was also the first to use 100% wood from forestry plantations. Many Zambrana farmers were not convinced they could cut a tree until they saw the mill running. They had logging licenses for plantations, but doubted whether they would serve to harvest timber.

In the first five years of the project, 55,000 *Acacia mangium* trees were planted. Between 1991 and 1992, the figure increased to almost 200,000. The start-up of the sawmill more than doubled the rate of reforestation thanks to the knowledge that a tree could later be harvested for money.

### The Story of Pedro Ferreira

*"The big problem was the repression by the Foresta (forest service), because whoever cut down a tree went to prison. With the help of Enda-Caribe, non-native plants were brought in for research. Many people threw the seedlings into the river because they did not want to plant trees, they did not want to make enemies and they were against reforestation. Seedlings were given away. Some we accepted and planted by the side of the road. Most of us were producers of peanuts and tobacco, which were the only things the land produced. You couldn't plant yuca or banana because the land was degraded. People crushed little plants because they would only bring trouble.*

*"In 1987, producers of the Santiago Tobacco Institute met with the Federation because there was an impasse between the Institute, Banco Agrícola, the IAD and the Foresta. The Institute had to build ranches and had nowhere to get the timber. The Federation offered wood. At that time, the Director of Foresta, a military man, stood up and said: "Who are you to be selling this wood?" to which we responded: "It will sell it because we planted it." The man could not believe it and said: "You have to tell me where these trees are planted, because I need to see it with my own eyes." We told him they were in Zambrana Cotuí. A few days later, the Director arrived by helicopter and landed close to a model acacia plantation. All of us who had planted trees were there waiting. We said told him we had 39 similar plantations. That same day he authorized the harvesting of the first six plots. This was the first application of the use of Plantation Certificates with Logging Rights, obtained in 1989 from the National Forestry Commission. They were four-year old *Acacia mangium* trees. They also gave us permission to install a band saw.*

*"That was the first timber from a planted forest sold by the community, and possibly the first sold in the country. Then everything changed. Shortly thereafter, 300 producers started planting *Acacia mangium* on their lots next to their beans. The project expanded and the Zambrana Agroforestry Producers Association was born."*

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<sup>34</sup>The Zambrana APA is the agroforestry branch of the Zambrana Chacuey Farmers' Federation. The Federation has a core of women, artisans and landless farmers, among others.



APA sawmill



Using wood for commercial purposes

Community teams also received training in forestry aspects including planting and handling of seeds, nurseries, reforestation, pruning, and harvesting. The forestry management plan for the *Acacia mangium* was developed based on information obtained from the sample plots.

The project served as an example for other communities. The impact of knowing they could obtain a logging permit with their Plantation Certificate was important, especially since the license was not conditional on owning land deeds.

**Fourth stage (1998-2009):** Towards autonomy. In 1998, microbusinesses in the communities began the process of self-management of agroforestry. That same year, however, Hurricane George devastated much of the country and plantations that had been established with so much effort. In spite of this, the project recovered and got back on the path to self-management.

The support and supervision of *Enda-Caribe* decreased gradually as the project became consolidated. We managed to raise capital for investment, improve and expand the structure of the plant, acquire forested land and increase staff and equipment required for processing timber in the workshop and other activities. Today, the Zambrana Microbusiness Community Forestry Project is becoming a multi-service cooperative, with 300 direct partners, in which the Association of Agroforestry Producers (APA) is the largest shareholder. It has a small sawmill with a 40-inch disk and three ovens for drying wood that create work for 18 people.

## The story continues

People have noticed the improvement in the soil quality as a result of sustainable forestry and its related values in production systems. A community leader said: *“The forest in the communities is different because they have significantly improved the soil... People thought planting would damage the soil, but this is not the case, the planted plots improve the soil. If they had not yielded results, we would not have continued.”*

Thanks to agroforestry and the introduction of a large number of agricultural, fruit and forest species, there is a multi-species forest in many of the community plots. In this way, the *analogue forestry*<sup>35</sup> system has generated a more comprehensive and productive use of the forest.

The APA has become an example for students, teachers, NGOs and rural associations that want to know how to start agroforestry systems and make them profitable. The commitment made by the APA producers and *Enda-Caribe* to the project’s financiers, was to replicate this experience for free in other communities. The best method of diffusion has been field visits. Today there are plans to extend the model and integrate other actors and institutions in the area under the *Model Forest*<sup>36</sup> scheme.

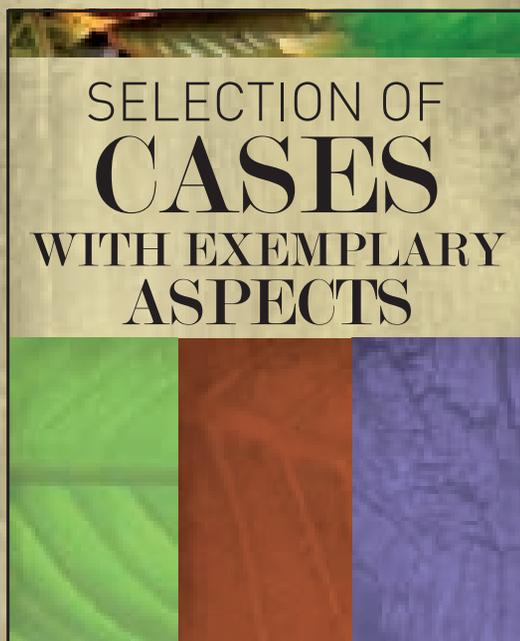


Rural villagers educated and trained by a community-based organization

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<sup>35</sup>An Analogue Forest is a highly diverse system of trees and plants, which seeks to establish an ecosystem dominated by trees analogous to the architectural structure and ecological functions of the original primary forest. This system allows the recovery of degraded areas (vegetation and/or soil), restoration of biodiversity, protection and increase in environmental services at the same time as it responds to the objectives of the owner and/or producer.

<sup>36</sup>A Model Forest is a social process whereby groups representing different actors work together towards a common vision of sustainable development where the forest plays a key role.



SELECTION OF  
**CASES**  
WITH EXEMPLARY  
ASPECTS





Female micro-business owner, Tikonel, Guatemala

# Communities and AIDER

## INDIGENOUS COMMUNITIES FORM LOCAL FORESTRY ORGANIZATIONS TO GENERATE INCOME

By Miguel Segur, Yolanda Ramírez and Pío Santiago

Location	Department of Ucayali, Peru
Biome	Tropical broadleaf humid forest
Forest type	Native
Organization	Indigenous ethnic group: <i>Shipibo-Konibo</i>
Objective	Production of timber - Production of non-timber products - Environmental services generation - Improving the quality of life of the community
Area	34,631 hectares

There are five communities of the *Shipibo-Konibo* ethnic group in Peru: Callería Preferida de Charashamaná, Puerto Belén, Curiaca and Pueblo Nuevo de Caco. They are close to the city of Pucallpa, in the Ucayali department of Peru's Amazon region. All of them have formed Productive Economic Organizations (OEPs in Spanish) that harvest the forest and generate revenue for the benefit of the organization's members and the community.

### The forest as a source of income

The total area of the territory occupied by these communities is 34,631 hectares. Of these only 8,248 has, or roughly a quarter<sup>37</sup>, are covered in forest. This is due to accelerated settlement in the region in the last century<sup>37</sup> by people from Peru's highlands, which has caused serious degradation of forest resources. As a result, most of the primary forest is gone having been replaced by secondary forest, which still has an important natural value.

<sup>37</sup>The city of Pucallpa (regional capital) grew from 1,000 inhabitants in 1940 to more than 50,000 in 1960 and almost 300,000 today.

The following table provides information about the area occupied by these five communities, their populations, the number of community members involved in OEPs and timber sales.

	Area		Population		PEO Participation		Wood sales	
	Total	Forestry	Inhabitants	Families	Inhabitants	Families	Volume 2005 (m <sup>3</sup> )	Sales 2005 (US\$ per board foot)
Callería	3,981	2,528	397	75	85	16	22	40
Preferida de Charashmaná	2,014	450	87	13	80	12	2	6
Puerto Belén	15,487	1,400	800	110	146	20	7	9
Curia del Caco	6,164	1,030	385	78	83	15	14	27
Pueblo Nuevo del Caco	6,985	2,840	458	95	66	12	3	7
	<b>34,631</b>	<b>8,248</b>	<b>2,127</b>	<b>371</b>	<b>460</b>	<b>75</b>	<b>48</b>	<b>18</b>

The five communities are primarily devoted to forestry activities. From the forest they obtain materials for the construction of their houses, medicinal plants, fruits and root vegetables for their food and raw materials to produce handicrafts. The harvesting of the forest also allows them to generate income by selling the wood in the regional market. The communities are also engaged in subsistence fishing, although in some cases fish farming projects have been developed. They produce handicrafts (fabrics, embroidery and ceramics); practice subsistence agriculture (including crops like banana, watermelon, corn, yuca, etc.); hunt sporadically and do temporary paid work.

In 2005, the communities obtained certification from the Forest Stewardship Council (FSC). Forest certification has contributed to the moral and legal recognition of their land and forest conservation, while providing new opportunities for the export of forest products. However, two of the five communities (Preferida de Charashmaná and Pueblo Nuevo) currently have their certification suspended.

## Harvesting the forest

Since 2000, the communities have received strong support from the Research and Integrated Development Association (AIDER), a local NGO whose mission is to improve the quality of life for low-income rural families using production techniques aimed at the conservation or recovery of the natural environment and its biodiversity.

AIDER has developed applied research projects which have helped to deepen the analysis of the problems facing these communities, especially Callería, and have contributed to their economic development.

A key line of action has been developing the capacity of community members in sustainable management aspects. With AIDER's support and with the aim of encouraging entrepreneurship in areas such as forestry, fishing and handicrafts, the communities have formed Productive Economic Organizations (OEPs).

An OEP is an economic entity dedicated to producing goods and services with the aim of generating revenue for its members. The organization consists of families or community representatives with a shared business and production interest. The OEP must obtain an operating license from the Community Assembly, the main authority of the community.

The OEP pays a license fee to the community which owns the resources collectively. It is also responsible for managing the forests according to a management plan. The Assembly has the duty to monitor the OEP to make sure its forest use is sustainable. There is normally more than one OEP in each community, depending on the interest of its members to form such organizations.

In the community of Callería, the forestry OEP is called *Metzabari*. In the community Preferida de Charashamaná, it is called *Jiwin Teetai Jonibo*. In Puerto Belén, *Shihuahuaco*, in Curiaca, *Monteverde*, and in Pueblo Nuevo of Caco, *Pueblo Nuevo*.

The forestry OEPs formed since 2003 in the five communities have not only engaged in selective extraction from the forest, but also created value added products, such as tables and slats, produced in small portable sawmills.

The communities, especially Callería, were pioneers by successfully applying the concept of voluntary community production organizations, which is more widespread today.

## Economic and social benefits

The following tables show the total volumes (in board feet, bt) and sale prices (Peruvian soles<sup>38</sup>) of wood produced by communities.

Community	Total volume sold (bt)	Sale price (Peruvian soles)
Puerto Belén	2,900	3,779. 00
Callería	9,539	10,234. 00
Preferida de Charashmaná	886	1,409. 00
Curiaca del Caco	5,732	6,635. 00
Pueblo Nuevo del Caco	1,316	1,316. 00
<b>TOTAL</b>	<b>20,373</b>	<b>23,373. 00</b>

Community	Total volume sold (bt)	Sale price (Peruvian soles)
Ahuaypa	2,000	600. 00
Samaría	856	1,308. 00
Vista Alegre	-	-
Junín Pablo	4,900	2,730. 00
<b>TOTAL</b>	<b>5,956</b>	<b>4,638.00</b>

Source: AIDER 2005, WWF- Peru

<sup>38</sup>In 2005 1USD = 3.20 soles

The harvesting of the forest under the associative work scheme has generated economic and social benefits for families participating in the OEP and, in general, for the whole community. In Callería, for example, the health centre and school were built by the community and subsequently taken over by public institutions. Also, through an internal agreement, the community has acquired wood from the OEP at discount prices, which has allowed it to make improvements to homes and community buildings. The OEP also gives donations of forest products to the community.

These results have enriched the forestry practice in the communities and strengthened their strategies for community development and sustainable forest management.

### Callería experience: Progress and challenges

Callería community is about 60 years old. In 1986, with the support of aid agencies, it became more aware of the need to conserve its forest resources. The attitude of community members was influenced by the negative experiences of nearby communities, many of which lost their forest resources without making much progress. In one of them, so the story goes, families reached an agreement with an external company to cut down some of their trees. Each family could extract five trees, which they quickly sold to the company. When a family member fell ill and needed to cover extraordinary expenses, he no longer had any trees and was denied support by the company. Callería members reflected on what happened to this community and decided they should try to avoid this experience in their own community.

After a 2000 inventory covering 100 hectares, Callería established an alliance with AIDER to carry out a second inventory which lasted for two years. Then began a phase of training for the community and a new inventory was performed, this time covering 2,528 hectares. This inventory yielded promising results in terms of the potential uses of timber species.

In parallel, the Callería community formed committees and three OEPs dedicated to aquaculture, handicrafts (formed by women) and forestry. The community agreed on a "Plan for Life" and a "Forest Management Plan." The ultimate aim of both was, and is, to stop the exodus of families from the community, which means generating economic activity so that people are not forced to migrate to cities or other regions to find work and better living conditions.



Solar panel

After several attempts, the forest OEP started harvesting wood in 2004. In 2005, it obtained the FSC certification, which has been maintained through the support of AIDER, and it now has operations and marketing managers.

Marketing of wood is one aspect, however, that is still not satisfactorily resolved. Traditionally, the marketing was done by intermediaries, who paid a low price for the timber. These intermediaries carried out the extraction operations directly and/or by paying community members for their labour, which caused serious degradation of high value commercial species. Communities, through their OEPs, have sought to overcome this problem with mixed results. The Callería community's experience has shown some of the difficulties faced.

The community's production of quinilla (*Manilkara bidentata*) was sold to a good customer, who bought it at 1.20 soles per board foot. At a rate of 2-3 trees (3,000 bt) a wee, the generated a gross profit for the community of 300-400 soles per tree, which was considered a good margin compared with earlier agreements of 25 soles per tree. But this customer left the market, which has forced the organization to seek market alternatives to ensure acceptable profit margins.



Conservation of rivers and "cochas": riverbanks are protected and fishermen avoid using toxic materials



River transport of certified wood

Marketing is still a weak link. Although growth in global demand for wood has increased, the lack of organizational and technical capacities, working capital and ignorance of the legal framework has not allowed communities to enter the market under competitive conditions.

The General Forest Management Plan, approved by the community, includes not just timber, but also fishing, medicinal plants and tourism uses. Progress has been made in fisheries management, in particular the paiche species (*Arapaima gigas*) in one of the "cochas" (bodies of water left by rivers) in the community territory. The main problem is the lack of a legal framework for fisheries management.

In the forest, the scale of selective extraction operations makes the visual impact practically imperceptible. The use of small hauling vehicles, temporary camps and other practices help maintain this impression. In addition, for the main species (quinilla) a minimum cutting diameter of 70cm is used, which is wider than the 60cm permitted by law. Mo-

reover, the community has created a Supervisory Committee, which, despite its lack of equipment, has seized wood in some cases and intervened in the fisheries sector.

The outlook for the future includes the sale of environmental services (carbon credits) for carbon sequestration in forests as an alternative source of income for the communities. It helps that a burgeoning market for carbon credits already exists in Peru.



Port of Pucallpa where wood is sold

## AN INNOVATIVE CONCESSION SYSTEM ALLOWS RURAL VILLAGERS TO MANAGE THEIR OWN FOREST

By Sergio Aguirre

Location	Ixiamas municipality, Iturralde province, department of La Paz, Bolivia
Biome	Subtropical broadleaf humid forest
Forest type	Native
Organization	Community association: <i>Agrupación Social del Lugar (ASL) San Antonio</i>
Objective	Sustainable management of forest resources
Area	14,986 hectares

The ASL San Antonio is a state-owned forestry concessionaire in Ixiamas municipality, Iturralde province, in the department of La Paz, Bolivia. It manages a native subtropical rainforest in the eastern foothills of the Bolivian Andes that is comprised of tall trees with a canopy that exceeds 30m in height. The most common species are: *Pouteria spp.*, *Calophyllum brasiliensis* (palo maria), *Terminalia amazonica*, *Cedrelinga catenaeformis* (mara macho), *Dipteryx odorata* (almendrillo) *Ceiba pentandra*, *Pentaplaris davismithii*, *Hura crepitans*, *Virola spp.* (gabún), and *Cedrela odorata* (cedro), among others. Other species include palms like *Attalea phallerata*, *Astrocaryum aculeatum*, *Oenocarpus bataua*, *Euterpe precatória* and *Iriartea deltoidea*.

### The ASL San Antonio

The ASL San Antonio is comprised of 20 members, including 14 men and six women. In the past they traditionally worked with wood, but did not have access to this resource until the enactment of the Forest Law No. 1,700 in 1996. Through the ASL organization the members obtained a forest concession in their municipal jurisdiction by fulfilling all the requirements of the law and the technical standards for forest management.

The ethnic origin of the members of ASL San Antonio is diverse: some of them are of the Tacana tribe (which is the dominant group), while others come from the south of Bolivia or are of quechua origin.

Activities are planned and coordinated by a five-person board and largely executed by the members themselves, who must comply with the statutes and regulations in the ASL constitution. The participation of women on the board has enabled the organization to forge a better relationship with wood buying companies and achieve transparency in its corporate governance. The presence of women on the board has also made the organization economically healthy by reducing debts with partners and buyers of wood in the area.

Between 1999 and 2003, when ASL San Antonio was in the process of being created, it received the support of the BOLFOR I project. This project provided financial support and gave advice in the creation of the General Forest Management Plan and steps for its implementation. Since 2004, ASL San Antonio has received technical assistance in forest management, accounting, marketing, and organization. The association also received a donation by the PUMA Foundation for the purchase of timber extraction machinery.

The ASL has made all its members value the importance of the forest and understand its contribution as a source of work for members and their families. The profits are shared fairly according to the constitution.

## Forest management

The ASL seeks to meet its social, economic and environmental objectives through the sustainable management of forest resources. The aim is to achieve sustainable profitability through the marketing of timber products while maintaining biodiversity.

The association's forest management plan has been approved by the national forestry regulator. The plan is based on a 20-year polycyclic silvicultural system applied in 14,986 hectares of forest, which is divided into annual logging areas that are 712 ha in size.

Approximately 5% of the forest management unit is set aside as a protected area, which includes swamps, streams, nesting areas, shelter and food for wildlife, *Ficus* trees (used as a source of food) and sites of scenic beauty. Species included in the commercial basket must be present to the degree of at least 0.25 individuals per hectare (with minimum diameter of 20cm).



### Community involvement in forestry activities

The Agrupación Social del Lugar (ASL), created by the forest law of 1996, is a legal mechanism to incorporate rural people into forestry activities. Before the law, only large companies had access to forestry concessions but overlapping rights with local communities often generated social conflicts between the companies and the communities. The Law defined a mechanism to end existing concessions and award forestry rights to the ASL in the form of long-term concessions. As a prerequisite for accessing forested lands, the Law indicates that the ASL must be comprised of at least 20 members, which should be originally from the community and demonstrate at least five years of work experience in forestry activity.

The requirements for harvesting are as follows:

- **Commercial inventory of commercial species.**
- **Minimum cutting diameter (MCD) by species.**
- **A total 20% of the species destined for harvest must be left standing to act as seed trees.**
- **Respect for waterways, both permanent and seasonal, through the planning of collection areas and roads.**
- **Prohibition of hunting for commercial purposes.**
- **The construction of temporary camps includes the safe disposal of waste and fuels (organic and inorganic).**

The extraction is performed using low impact techniques and chainsaw operators have been trained to carry out their work according to these criteria.

The ASL San Antonio sells timber to several companies in the Ixiamas municipality and its field team, headed by a forestry professional, keeps track of the impact of harvesting in order to improve future interventions.

The experience of ASL San Antonio proves that this mechanism of partnership between the state and rural residents has a positive effect on local job creation, community development and poverty reduction. This mechanism is also an innovative strategy for resolving disputes over rights of use and ownership of the forest, with a long-term vision.



Forestry team trained in reduced impact techniques



Community members and the evaluation team



A forest manager provides records and information

## WOMEN ENTREPRENEURS CREATE A SUSTAINABLE RAMÓN NUT PRODUCTION BUSINESS

By Sergio Aguirre

Location	Municipality of Flores, Petén department, Guatemala
Biome	Subtropical broadleaf humid forest
Forest type	Native (primary and secondary)
Organization	Private company: <i>Alimentos Nutri-Naturales S.A.</i>
Objective	Sustainable production of the ramón nut (Maya Nut)
Area	56.2 hectares

The ramón nut (*Brosimum alicastrum*), also called ojoche or *Maya Nut*, is a tree found in the humid subtropical zone of Guatemala and throughout Central America. It grows in forest stands with other species and in environments with large and diverse fauna including mammals, birds and reptiles. It can reach a height of 45m and a diameter of 150cm, but normally reaches 20-25m in height and 50-90cm in diameter. It is very resistant to drought and produces fruit which contains a brown coloured seed that is 1cm in diameter. It is estimated that the mature tree can produce up to 300kg of seeds per year.

The ramón nut tree is a multipurpose tree: its leaves and fruit are edible so it is used as fodder for livestock; latex is extracted from its bark for medicinal use; and its wood is used in construction to produce panels and furniture and also for firewood. The seed of this tree has been a source of human food since pre-Columbian times and it was an essential part of the Mayan diet. According to nutritional studies, the nut contains proteins of better quality than other grains, due to the high content of tryptophan. It also contains high levels of calcium, vitamins A, B2, B3, B6, C and E, zinc, iron, fibre, and low fat content. To prepare them for consumption, the seeds are boiled or roasted and eaten whole, like chestnuts. The flour of these seeds is often mixed with corn to make tortillas or is roasted and ground as a coffee substitute. The nut has been fundamental for the survival of the rural population in times of severe drought and has reduced dependence on corn production, for example.

## Rural women's association

The Women's Nutri Naturales Food Association of Flores Petén S.A. was created in 2006. It has 56 members and is aimed at their social, cultural and economic development through sustainable management of non-timber forest resources in the area.

Rural families in the community have traditionally survived on subsistence agriculture. They also produce handicrafts and leaves of the xate palm (*Chamaedorea spp.*), pepper (*Pimentadilloica*) and, above all, the ramón nut.

In 2007, with financial support from the Ministry of Economy, the National Council of Protected Areas (CONAP), and the private foundation The Equilibrium Fund, the women's association made a Management Plan for the ramón nut.

The main social benefit achieved with this initiative has been the nutritional improvement of the community members, especially children. Most of the nut production is used for food in rural schools in the area. Moreover, this has helped raise awareness about the importance of conserving the forests that produce this food. Another significant benefit has been the creation of jobs, local economic growth and strengthening the capacity of the association's members, particularly in aspects of organization and leadership.

For the association, the economic results of this activity do not constitute the most important aspect. Much more relevant, they say, is the contribution to the food security of the community, especially when other crops such as corn fail. When this has happened, the ramón nut has avoided a famine in rural families. However, although not perceived as a priority, economic achievements have improved the members' incomes through selling nuts outside the community and from the training services they provide to other groups regarding uses, recipes and processing of the ramón nut.

The development of this project has not been without difficulties, noted Erika Vohman, Executive Director of The Equilibrium Fund, a foundation which has supported the association since its inception: "One of the biggest difficulties has been educating nut harvesters about sustainable forest management since this subject was not discussed in communities, schools and families.

Ramón nut production companies have also had difficulties in obtaining financial support and local



Workshop on food preparation using the ramón nut



Women take part in a workshop

partners so that this initiative could be sustained in the long-term. Fortunately, since 2009, other agencies have joined the effort, such as Rainforest Alliance and the Association of Forest Communities of Petén (ACOFOP).”

The Equilibrium Fund is a non-profit foundation created in 2001, whose mission is to alleviate rural poverty and malnutrition and support the conservation of forests by means of training indigenous women about nutrition, uses, recipes, and processing of the ramón nut. Women are the programme’s priority because improving their conditions generally improves the wellbeing of the entire family. Women participating in the programme have improved their self-esteem and are more interested in the conservation of the forest. They have started businesses with nut products in Guatemala, Honduras, El Salvador and Mexico, which has also motivated the reforestation of areas with this species.

The programme Bosques Sanos-Niñez Sana, supported by the Foundation, supplies healthy snacks for school children made from the ramón nut, which has led to positive results in terms of improving child nutrition. Indirectly, it has also contributed to the conservation of forests and reforestation efforts with this species. Since 2003, more than 120 Guatemalan communities have been trained about the nutritional and economic advantages of the nut.

Several aspects of this experience are remarkable: the strengthening of a traditional activity, as is the harvesting of the ramón nut; improving the diet of local families; creating employment and increasing incomes for the association’s members; and contributing to local development. In addition, the management plan calls for the sustainable use of forests and the preservation of ecosystems. Also noteworthy are the association’s achievements in terms of organization and capacity building for women. The alliance with The Equilibrium Fund has been fundamental to the success of the project.

The potential to replicate this type of initiative in other places is high. In fact, similar initiatives are already being implemented in several communities in Central America and Mexico.



Ramón seed recently harvested



Ramón seed drying in ovens



Quality inspection

# INDIGENOUS COMMUNITIES SIGN A CONTRACT WITH A FORESTRY COMPANY TO MANAGE THEIR FOREST RESOURCES

By Miguel Segur

Location	Department of Ucayali, Peru
Biome	Tropical broadleaf humid forest
Forest type	Native
Organization	Community owners ( <i>Unión de Comunidades Indígenas Fronterizas del Perú</i> ) and private company ( <i>Forestal Venao SRL</i> )
Objective	Production of timber – Improvement of the quality of life in the local communities
Area	169,159 hectares (141,623 ha for forest management)

Six indigenous communities of the Peruvian Amazon have signed a contract with a local forestry company for the management of the forests in their territory. This agreement has led to a strengthening of the community organization, an improvement in household income, a series of investments in community services and, in general, a better quality of life for families.

### Shared forest management

The indigenous communities involved in the agreement are Sawawo Hito 40 Nueva Shawaya, Nueva Victoria, Flor de Chengari, El Dorado and Santa Rosa. The first four belong to ethnic group, *ashaninka*. El Dorado is *yaminahua* and Santa Rosa, *carib*. All of them are located in the northeast region of the department of Ucayali, very close (except for Flor de Chengari) to the border with Brazil. The forestry company that works with the communities is called Venao SRL. Formed in 1996, the firm processes a group of commercial species including valuable species such as coaba (*Swietenia macrophylla*) and cedro (*Cedrela odorata*), and others of value and interest to the national and international market.

The responsibility of forest management is shared by the indigenous communities that own the forest and Venao. The contractual model established between them is a joint venture. The communities provide the forest resource and monitor the activities and

operations, while its forest protection committees are responsible for monitoring the territorial limits. The company, for its part, brings the financial resources, equipment, machinery, technical and professional staff, field operators, training, monitoring and supervision of operations.

Five of the six communities are in forests classified as lowlands, under 600 meters above sea level. The type of forest here is typical of lowlands with dense and lush vegetation, a large diversity of plant and animal species and trees predominate over other forms of plant life. The upper canopy is comprised of tall trees that exceed 40m in height. The total volume of trees of more than 30cm in diameter at chest height is between 80 and 160 m<sup>3</sup> per hectare.

Flor de Chengari is the only community of the six that is in a forest of medium to high altitude on rolling plains. The forest population is stable, with trees over 35m in height and with abundant vines, reeds and epiphytes.

## A nomadic past

Families in the community of Sawawo arrived from the central jungle and settled in Brazil 50 years ago (in the late 1960s). Later, as the result of family quarrels, they returned to Peru about 30 years ago, in the 1970s.

In Nueva Shawaya, the people were formerly nomadic and moved across a large territory. Recently, in 1996, in order to protect their territory the community obtained legal recognition as an inhabited area. In 2005, they obtained the land deeds. Later they participated in the agreement with Forestal Venao and negotiated the logging rights.

Since the 1970s, Peruvian law recognizes indigenous community ownership and land titles. However, since the turn of the century communities have also started to make a rational use of their own forest resources.

Community members received training in planning and forest management from the Poverty Reduction and Relief Project (PRA) funded by the United States Agency for International Development (USAID). This project funded the first stage of the forest certification process under the SmartWood programme.



Technical staff marking wood for traceability



Polycyclic management ensures only species with a minimum cutting diameter are harvested



Associated communities have forest certification

The six communities are grouped in an organisation called the Union of Indigenous Border Communities of Peru. The forest management processes implemented through the contract with Venao have brought considerable progress for the communities in economic terms, in their level of organization and in the quality of life.

### Current state of forest management

The communities themselves have established most of the services available to their members: in the Sawawo community this includes an elementary school, a healthcare centre, a hostel, a community centre, a store, an electricity generator, cable television, a secretary's office, a radio emitter/receiver, chainsaws, outboard engines and boats. It is estimated that the life expectancy in the community may have increased by 50% in the last decade.

A Forestry Committee was created in Sawawo community in 2000, has extracted wood since 2001 and has been certified since 2007. This certification resulted in a reduction in the extracted volumes. The community saves most of its income to respond to investment needs in different activities while a part of the income is distributed among its members.

The Nueva Shawaya community is formed by 24 families, including parents, children, grandchildren and grandparents. The old rooming houses have been closed down (at least partially) and, in some cases, families have opted for corrugated iron roofs to replace the traditional palm roofs.

The community has an Assembly, a Board of Directors and a Forestry Committee. Other organizations are the Parents Committee, a Mothers Club and a Self-Defence Committee.

The Mothers Club is making a community farm in Nueva Shawaya and learning more about medicinal plants and vegetables. These activities also seek to strengthen cultural identity and pride - in this case - of being part of the *ashaninka* ethnic group.

The school was built by the municipality of Breu in 2008. Initially, the community covered the cost of the teacher's salary, but today one teacher is paid for by the regional government and another by the municipality.

The community has a rice harvester, a sawmill, electric lighting, satellite television, community farms, a hostel for visitors and a hostel for community members in Pucallpa. A fish farm and an 800-metre airstrip are under construction.

Five students from the community won scholarships to study agroforestry and aquaculture engineering in the Universidad Nacional Intercultural de la Amazonía (UNIA) in Pucallpa. Adults and children are taught to read and write by a community member paid by the state. There is also a nurse, an accountant (since 2008) and a lawyer. The community has a first aid kit but in case of serious illnesses there is a fund to pay for emergency medical evacuations and an informal agreement with the Bullón hospital in Pucallpa.

In Sawawo and Nueva Shawaya communities, the members keep a record of what animals they hunt.

The *ashaninkas* have a habit of going on trips (mainly by river) during the summer for one or two months. This practice appears to be an expression of identity that allows them to preserve customs related to their nomadic condition in combination with the new reality of life in civilization.



Amazonian forest inhabited by communities that have difficulty communicating with faraway population centres and markets

### Letter from a community member

*Dear Donato and Rodolfo:*

*I am writing to you with a few heartfelt words about the future, I hope you get them. What you can do for your communities is:*

*Have few and good children.  
Manage your finances well, be wise.  
Even the wisest man can learn since nobody knows everything.  
Become old only when you are very old.*

*Greetings from Miguel*

## Jujuy Model Forest

# A MODEL OF SUSTAINABLE FOREST MANAGEMENT FOR THE AMERICAN CHACO PLAIN

By Sergio Aguirre and Virginia Outon

Location	Serranías de Puesto Viejo, province of Jujuy, Argentina
Biome	Subtropical broadleaf dry forest
Forest type	Native
Organization	A partnership between the Jujuy Model Forest and the company Juan Minetti S.A.
Objective	Biodiversity conservation - Restoration of the landscape - Protection of wildlife, soil and water
Area	12.391 hectares (3,035 ha under forest management)

The Jujuy Model Forest (Bosque Modelo Jujuy, or BMJ) is in the Minetti estate, owned by Empresas Minetti S.A., in north-western Argentina's Jujuy province. The BMJ is in an area of major economic, social and productive importance, covering 1,300 km<sup>2</sup> with around 100,000 inhabitants.

The Minetti estate is part of the Chaco Serrano agro-climatic and geomorphological district with small hills (450 to 1,800 meters above sea level) and low terraces. The climate is warm with little precipitation in the western area (500 to 700mm/yr) but more rain in the eastern area (up to 1,300mm/year).

The primary native forest is classified as subtropical broadleaf dry forest, forming part of the Great American Chaco plain. There are also secondary forests that are the result of the land's historical usage for ranching, mining, extraction of firewood for small-scale mines, charcoal and wood. The forest covers 12,931 hectares of which 3,035 ha are currently under management, i.e. 23% of the area of the forest. The structure of the forest is relatively good in more than half of its surface, but its regenerative capacity has been affected by the extensive grazing and extraction of firewood and timber.

A 2006 study identified 587 plant species, some of them qualified as vulnerable, such as: guayacán (*Caesalpinia paraguarienses*), yellow urundel (*Loxopterygium grisebachii*) and horco quebracho (*Schinopsis lorentzii* var. *Marginata*). Other representative species are:

colorado cebil (*Anadenanthera colubrina*), black algarrobo (*Prosopis nigra*), árbol de papel (*Cochlospermum tertraporum*), aliso del cerro (*Alnus acuminata*) and yellow lapacho (*Tabebuia lapacho*). The forest is home to wild animals such as wildcats, turtles, hares, lizards, anteaters, otters and parrots, and some endangered species such as the boa constrictor, the alligator or cayman and the jaguar.



### Model Forest

Model Forest is a Canadian initiative aimed at promoting the conservation and sustainable use of forest resources and their associated ecosystems. This objective is considered part of a broader process of sustainable development based on a region's particular forest ecosystem and the integration of social, economic, environmental and cultural aspects.

## Public-private partnership

The Jujuy Model Forest programme is administered by a civil association, the Jujuy Model Forest Association (ABMJ in Spanish), that executes projects with the aim of contributing to the integral management of natural resources in the Pericos-Manantiales basin in the province of Jujuy. It is the result of cooperation between public and private organizations whose principal objective is that the multiple uses of the forest contribute to the sustainable development of the community and the environment. This form of cooperation, unprecedented in this province and region, has been operating for nearly 10 years and has resulted in numerous projects. The association currently runs 13 projects, which are operated by social organizations in the area. Indeed, the experience has shown that sustainable development is only achieved with the real commitment of people who are in daily contact with their natural resources.

The Jujuy Model Forest Association was formed in 2002 as a civil non-profit entity. It consists of an executive management team, a monitoring team, a technical team and a board consisting of 25 entities with a multidisciplinary vision. Amongst the entities that make up the board are non-governmental agencies, international organizations, development agencies, academic institutions, private companies and foundations.

## Main projects

The ABMJ implements various projects that complement each other and provide social, environmental and economic benefits to the population, including vulnerable sectors. These are projects that apply good forestry practices, ranging from seed conservation of native forest species, passing through the production of seedlings and the establishment of plantations to the management of forested areas. This is the result of nine years of work raising awareness, building trust and partnerships so take actions aimed at sustainable development of forest ecosystems. The major projects to date are:

- **Forest nursery:** This project was initiated in 1999 in order to produce seedlings of native species to be used in the reforestation of degraded forest, eroded areas, farms and public spaces. The project includes training of technical personnel and the management staff of the nursery. The nursery, which already produces 20 species with annual production of 60,000 seedlings, is financed with proceeds from the sale of seedlings.

- **Seed bank:** In 2004, the Jujuy Model Forest Association, in cooperation with the "Dr. Vincent Arroyabe" Centre for Rehabilitation, the German Embassy and Foundation Minetti, created the first seed bank in north-western Argentina with the following objectives: conservation of germplasm of tree species with forestry and environmental interest, training and the generation of employment for people with physical and mental disabilities. The project has researched information about 30 tree species and has selected seed material from more than 10 species of the region, which it aims to sell. Although some seeds have been sold with good results, the priority at the moment is to generate knowledge about treatments for germination for different species, in order to provide information to buyers. In the future, the seed bank aims to obtain certification for its seeds, which will allow it to increase its income and ensure the self-financing of the project.

- **Management plan:** The association also formulated a management plan for 12,931 hectares on the basis of a 2006 inventory and mapping data. The plan specifies areas of conservation and current and future use on the Minetti estate. It also considers measures to prevent illegal logging and for sustainable livestock management. The plan covers the mining sector (3,035 hectares), with a view to rehabilitation of the degraded zones through the restoration of forest landscape and techniques for the prevention of erosion. The trees planted are native and produced with seed material collected on the estate in order to preserve the local gene pool. Eleven sample plots in the quarries and native forest have also been marked to monitor the process of regeneration and study the dynamics of the forest.



Studies and field trips



The association's forest nursery

## An innovative experience

This case constitutes an innovative partnership between multi-sector agencies interested in the implementation of good forestry practices for the conservation of the forest, local development through job creation and the formation of skilled human resources.

The management plan, native plant nursery and seed bank are designed to achieve biodiversity conservation, restoration of the landscape in affected areas and protection of wildlife, soil and waters. The monitoring of the forest through the environmental monitoring system, which includes permanent sample plots and a network of weather stations, also contributes to the development of good practices and the achievement of the objectives.

The projects executed or in the process of execution, financed and sponsored by public and private entities, have given rise to numerous reports, studies, seminars, university theses, and scientific talks that make this Model Forest a centre of knowledge on theoretical and practical aspects of sustainable forest management. This knowledge is publicly available and can be used to improve the model in other cases, especially in the ecosystem of the Great American Chaco plain which covers an estimated 90 million hectares.

One aspect that requires improvement, however, is the generation of value-added forest products and value chains. However, if the sustainable management plan is fully implemented, the timber harvested from forest plantations could be used for this purpose in the future.



Reforestation on the estate



BMS members meet with Minetti company executives

## Parque San Marcelo

# A REMARKABLE CASE OF NATIVE FOREST RESTORATION

By Sergio Aguirre

Location	State of Sao Paulo, Brazil
Biome	Subtropical broadleaf humid forest
Forest type	Forest plantation with native species
Organization	Private company: <i>International Paper do Brazil</i>
Objective	Conservation of biodiversity
Area	187 hectares

In the city of São Paulo, in 2002, the Brazilian paper products company *International Paper do Brazil* converted 187 hectares planted with *Eucalyptus* trees into native forest with a wide variety of flora. The plantation, which follows the company's sustainable forest development policy, has been classified as a Private Natural Heritage Reserve (RPPNS in Portuguese). The RPPNS are conservation units which can only be intervened for scientific purposes, environmental education programmes and ecotourism. Due to the ecological complexity of the project, it was developed through an agreement with the Botany Institute of the State of Sao Paulo using a scientifically proven method.

### More than a hundred species planted

*International Paper* is a world leading company in the pulp, paper and packaging industry. It produces a vast range of products on which people depend on a daily basis. The company manages 102,000 hectares of forest, mainly in the state of Sao Paulo, of which 72,000 ha are intended for the cultivation of eucalyptus plantations for pulp and paper production. It has three factories in Brazil, with a production of 1 million tons of paper per year. The firm also maintains 24,000 ha for the preservation of native vegetation. The company's forest plantations are certified by the ISO 14001 standard and Cerflor (the Brazilian forest certification program).

The native species plantation is comprised of 101 species produced in a nursery and divided into two groups, according to their ecological succession, with no more than 20% of individuals per species. Results to date indicate that induced succession is happening in a similar way to natural ecological succession. Moreover, species that produce food for wildlife have contributed to increasing flora diversity and density, by increasing the dispersal of seeds in the area under restoration.

Constant monitoring and evaluation of the forest has confirmed the emergence of 13 new species through natural regeneration. Also, 11 different species of bats that live in this area have been identified. The results of the study of flora and fauna are being used to check that the technical procedures are working in the sense of developing a balanced and sustainable forest plantation.

## Replicating the model

This project has the merit of having restored the biodiversity of natural forests in areas of forest production. It has also been able to protect rare, threatened or endangered species of flora and fauna region. This has been achieved through the application of innovative silvicultural techniques in the planting of this forest, and the use of non-chemical methods to control pests and diseases, especially the common ant and harmful weeds.

The dissemination of the results of the project has included the development of environmental education programmes. In 2007, for example, 9,600 public school students participated in these programmes. Also the results obtained through this experience of native forest restoration have been widely discussed in congresses and symposia.

Similarly, it has motivated many research papers in universities and research centres, and a study on carbon sequestration is currently being developed in the forest.



Ecotourism in the company's private reserve



Restoring biodiversity of the natural forest in production areas

The economic benefits of this project can be derived from the environmental benefits of enhancing the services provided by the forest, such as carbon fixation.

According to the company's Forest Manager, *"the results of the project can be replicated elsewhere, and proof of this is that they have been considered in the elaboration of public policies for ecological restoration, which has resulted in an increase in the number of natural heritage reserves."*



Restoration of the native forest with more than 100 species produced in the nursery for scientific and educational purposes

# Las Colonias

## SMALL LANDOWNERS FORM AN ASSOCIATION TO MANAGE NATIVE FORESTS

By Sergio Aguirre

Location	Llanquihue province, Los Lagos region, Chile
Biome	Temperate broadleaf and mixed forest
Forest type	Secondary native
Organization	<i>Agrupación de Pequeños y Medianos Propietarios Sector Las Colonias</i>
Objective	Production of timber and firewood
Area	350 hectares

The area for potential development in this case is around 50,000 hectares which extends from near the town of Alerce in Llanquihue province, Chile, to the slopes of the Calbuco volcano in the Andes foothills. This is an area of semi-undulated to flat topography, with rainfall of around 2,000mm per year. The ground has a thin layer (50-80cm) of fertile soil, which is why agricultural production is very limited. It is clearly an area suited to forestry, where much of the producers are small owners who have an average forest area of 30 ha. The area's proximity to the towns of Puerto Montt and Puerto Varas makes it very attractive for marketing wood products, especially firewood for heating. Twelve small producers have formed an organization called the Association of Small and Medium-size Forest Producers of Las Colonias (*Agrupación de Pequeños y Medianos Propietarios Sector Las Colonias*), which has served as a tool to obtain support and training for the management of the native forest and financing for forest harvesting activities.

### A history of forest degradation

The natural forest that grew in this area before the arrival of the first settlers was a temperate mixed broadleaf forest that was mainly evergreen with a valuable species called alerce (*Fitzroya cupressoides*). In the 1940s, early settlers came to the area to extract alerce without sustainable management, which almost caused its extinction in this sector. In the beginning settlers lived in temporary camps but then formed small towns or settlements. They also built several sawmills to produce lumber from other species such as coigüe (*Nothofagus dombeyi*) and mañío (*Podocarpus salignus*).

During the 1960s new settlers arrived as the result of Chilean agrarian reform. Large areas of land were cleared, mainly using fire, in order to make them fit for grazing livestock. In the 1980s, the forest suffered new pressures as the source of raw material for the production of woodchips for export. However, the existence of forest laws and a forest service (the National Forestry Corporation, CONAF), which oversees forest management plans, significantly reduced the negative impact of these logging activities on the forest.

From the mid-1990s on, and due to the growing population of the surrounding cities especially Puerto Montt, the pressure increased on the remaining primary forest and secondary forest as a source of firewood. Firewood has historically been a natural product of forest extraction due to the cold and rainy climate in the area, which makes firewood the main fuel for heating and cooking in the home.

The native forest, today, is mainly a young secondary growth forest with thin trees where species like canelo (*Drimys winteri*) and to a lesser extent, the coigüe, predominate. Other species, like tepa, mañío, hazelnut and myrtaceae, are also present to a lesser degree. But after silvicultural treatments these trees have shown very good growth, especially the canelo species.



Secondary growth native forest

### Positive changes

Chile already had legislation protecting native forest in the 1970s and there was a forest service which controlled logging activities, but small and medium-size forest owners had no technical knowledge or support in the marketing of forest products, which would favour the application of sustainable resource management.

A positive change in this situation in Las Colonias occurred in 2003 when the Native Forest Conservation and Sustainable Management Project began to be implemented in this area. This project, managed by CONAF and supported by the German government's international development cooperation agency GTZ, had the following objectives: (1) contribute to the implementation of SFM in the forests of small landowners; (2) improve the economic conditions of local families through forestry activity; and (3) strengthen CONAF technical assistance for small producers.

The assistance provided by CONAF in the application of the Group Forestry Management method was key to the success of this project. According to José Luis Moneva,

head of the Forestry Department of the Llanquihue province, “it’s a way to interact with landowners that allows you to create a much closer working relationship.”

Group forestry management is based on the following principles:

- **Direct cooperation between the consultant and the landowner.**
- **Appreciation of traditions and knowledge of rural populations.**
- **Consideration of the cultural and economic aspects of community life.**
- **The forest owners are the main actors of change.**
- **It is a long term process.**

In 2006 the Association of Small and Medium-size Forest Producers of Las Colonias was formed, comprised of 12 owners of native forest with a total area of 350 hectares. In the beginning, meetings were held to learn about the reality of the local forestry producers. The work focused on four main areas:

- **Elaboration of forest management plans.**
- **Implementation of a system of forest management incentives.**
- **Implementation of a system of forestry outreach.**
- **Support for the marketing of forest products.**

The organization allowed the possibility of obtaining financial support and training from governmental agencies, such as INDAP (Chile’s Institute for Agriculture and Forestry Development) and nearby municipalities. The skills obtained have helped improve various aspects of forestry production, especially the marketing of forest products, which is one of the major difficulties facing small producers.

## **Adding value and creating jobs**

The progress achieved by this type of cooperation can be seen in the higher employment and higher income for landowners. At the same time, good management has benefited forest regeneration, which will lead to the growth of a forest with great commercial value in the future.



Temperate evergreen forest

One of the challenges for the project has been to add value to forest products (such as small logs and firewood with high moisture content). Luis Soto, a member of the association, uses an innovative technique to achieve this. With the support of the project, Soto has built firewood drying and collection centres that allow him to obtain a better price for the wood. He also produces canelo roofing shingles, which sell at a good price and has improved his income from the sale of canelo shingles, and so-called "astillas," a waste product of the harvest, which he dries, bags and sells as kindling.

This experience is highly reproducible in native forest areas where there are small and medium-sized landowners willing to work together.



Canelo (*Drimys winteri*)

# CODEFORSA

## A CIVIL SOCIETY ORGANISATION PROMOTES SUSTAINABLE FORESTRY DEVELOPMENT

By Sergio Aguirre

Location	Huetar region, provinces of Alajuela and Heredia, Costa Rica
Biome	Tropical broadleaf humid forest
Forest type	Native, forest plantation with native species and agroforestry systems
Organization	NGO <i>Comisión de Desarrollo de San Carlos</i> (CODEFORSA)
Objective	Sustainable management of the native forest
Area	3,000 ha of native forest and 2,000 ha of forest plantations

Costa Rica, like most tropical countries, faces two main challenges in terms of forest management: ensuring the conservation of natural forests and stimulating the good management of productive forests. The first protected area was established in 1963 and, currently, 20% of the country is part of the system of national parks and reserves. However, in the 1950s and until the 1990s, deforestation rates outside of these areas were amongst the highest in the world. In this period, forested lands were stripped of their forest cover for agricultural development (extensive grazing and subsistence agriculture among other activities), reaching deforestation rates of 18,000 to 42,000 hectares per year. The lowest forest cover in the history of Costa Rica was reported in 1985, when it was reduced to 1.25 million hectares.

In the past 20 years, however, as a result of public opinion, international agreements and industrial concerns about long-term wood supplies, the practice of destructive forest exploitation has changed to polycyclic forest management. The country has experienced enormous progress in forest management and conservation policies, which is reflected in the constant evaluation and analysis of forest resources, the implementation of low-impact harvesting techniques and monitoring activities. All these elements are contained in forest management plans, forest regulations, and criteria and standards for sustainable management.

In the Huetar region, in the north of the country, there is a significant area of natural forest. This forest has been harvested at least once and, with the second harvest approaching, it must be clearly defined in which forests this is permitted. Forestry NGOs supported by universities, the National Forestry Office, the Centre for Tropical Agronomy Research and Education (CATIE), the State Forestry Administration (AFE) and other institutions, are interested in providing an answer to this question and in providing technical assistance to the owners of these forests.

### Action by CODEFORSA

In 1983 a group of 14 people, aware of the major problems facing the forestry sector, created the Forestry Development Committee of San Carlos (CODEFORSA), a non-profit NGO, whose actions are aimed at the achievement of sustainable development and the provision of services, mainly in the forestry area, in the Huetar region and at the national level. CODEFORSA was formed under a policy for the creation and strengthening of forest organizations that was overseen by the then General Forestry Directorate (DGF).

In its early years, the organization represented mainly the owners of sawmills. Later, truckers and companies, engaged in the transport and harvesting of natural forests, joined in. Recently, landowners interested in reforestation and managing forests have also joined, attracted by the advantages offered by CODEFORSA in terms of channelling resources and technical assistance for the implementation of reforestation and forest management. The organization currently has more than 700 members.



La Legua management unit

The committee is managed by a 12-member Board of Directors and five subcommittees that support management. In terms of operations and administration, it has a team of forest field engineers and assistants. Its activities include reforestation, management of native forest and water resources, forest harvesting, environmental education, agroforestry and commercialization of forest plantations.

### Management of the native forest

The current silvicultural system is not the result of a law, but rather multiple factors that have put pressure to replace destructive forest exploitation with forest management. Funds from debt-for-nature swaps, as well

as the support of academic institutions and international cooperation agencies (GTZ, DFID), have allowed private organizations to develop low impact harvesting techniques and silvicultural treatments. In addition, through the granting of incentives for native forest management, the government has incorporated these procedures in forest management guidelines.

The Polycyclic Silvicultural System proposes that forest management should maintain and, where possible, improve the condition of the forest, retaining its diversity and leading to a flow of benefits to the owner of the forest, without detriment to the environmental services provided to society. Also, the system proposes keeping records of forest cover that helps avoid changes in land use and promote the sustainability of the forest. This includes monitoring and keeping records of current and future activities, which promotes long-term forest management. The forest under management is expected to maintain its role as a protector of soil and water, which should be free from contamination by solid or liquid waste arising from forest activities. This is enforced by a Code of Practice and an Operations Manual, which are instruments that regulate private management activities.

Although Costa Rica's harvest areas are relatively small (50 hectares on average), polycyclic management has yielded satisfactory results and confirms that the work has been well executed, guaranteeing the regeneration of commercial species and the presence of native species, which is achieved by decreasing the size of clearings and avoiding soil compaction on hauling roads and in wood collection areas. With the forestry development achieved in the last 20 years, the size of the area cleared by harvesting has gone from 41-56% of the forest area to just 17.6%. The figures are encouraging since they indicate that proper planning and careful harvesting of trees helps ensure sustainable management of tropical rainforests.

## Achievements and future plans

Jhonny A. Méndez, Executive Director of CODEFORSA, sums up the association's progress to date: *"The main achievement of our business after almost 20 years of promoting forest management is that more than 4,000 people have learned about our experiences. The main lesson is that the cutting of a tree is not necessarily wrong, but it should be very clear that to manage a forest properly you need to do so responsibly, which is what we do in our forest, and it gives us faith that the forest will be maintained in spite of the pressure to develop more profitable activities."*



Forest management in the northern Huetar region

Forest management and forestry activity in general has generated many jobs in the most depressed rural areas of the country. In addition, the economic benefits of forest management reach beyond the local area by creating direct and indirect jobs in areas like transport, processing and marketing, which at a national level represented 19,730 jobs in 2005.

Since CODEFORSA launched its forest management programme at the beginning of the 1990s, it has developed various projects that have included planning, enhanced harvesting techniques, training, monitoring and application of silvicultural treatments. This has generated a significant cluster of knowledge about the sustainable management of tropical forests, which has been collected in 17 publications by CODEFORSA. In addition, the programme has been the focus of theses and scientific research projects carried out by researchers at CATIE, the Costa Rican Technological Institute (ITCR) and the Universidad Nacional (UNA), among other institutions. Good forest management has led to a deep change of attitude and greater environmental awareness through field trips, lectures, conferences and campaigns in the media, among other actions.

Nevertheless, according to CODEFORSA, the implementation of this model of polycyclic management of native forest can be improved in the following aspects:

- **Given that polycyclic management reduces the impact of harvesting on the remaining vegetation, there is a high opportunity cost, and therefore a modest net income for the owner of the forest. Therefore, the environmental value of the native forest should be recognized through state subsidies. These should be in the form of Payments for Environmental Services (PSA), suspended in 2002, and which would make it possible to improve the flow of funds in the early years of a project and incorporate more forest area in this system.**
- **Eliminate excessive forest management regulation since obtaining approval for a forest management plan currently takes at least 12 months, which is amongst the longest in Latin America.**
- **To increase the profitability of forest management, the participation of the owners of the forest in the marketing process must be improved, not only in selling the wood but moving up the value chain and, if possible, to sell products with higher value added.**

# ASOKANUS

## INDIGENOUS COMMUNITIES BECOME ORGANIZED TO PROTECT THEIR FOREST AND PRODUCE TIMBER

By Sergio Aguirre

Location	Cantón de Tiwintza, province of Morona-Santiago, Ecuador
Biome	Tropical broadleaf humid forest
Forest type	Native
Organization	Indigenous community association: ASOKANUS ( <i>Asociación Artesanal Agroforestal KANUS</i> )
Objective	Sustainable timber production
Area	59,134 hectares

The Artisanal Agroforestry Association of KANUS (ASOKANUS) is a Shuar community cooperative in the Amazon region of southeast Ecuador in the province of Morona Santiago. It is responsible for nearly 60,000 hectares of forest, in which it produces timber by applying strict rules of management.

### Threatened territory

The Shuar are indigenous peoples of the Amazon region that have lived in the territory for centuries and are deeply committed to protecting the environment since they consider that the forest is their ancestral home. The forest resources on their territory, however, have been threatened by destruction due to agricultural reform which, since the 1960s, involved the clearing of large areas of forest to make way for agriculture. According to official figures, 70% of the Shuar people live in conditions of extreme poverty, without basic services such as housing, healthcare, and communications.

ASOKANUS, created in 2006, is one of the Shuar Mayaik and Santiago Associations, which are comprised of 11 and 15 Shuar centres, respectively. It has a President, a Vice-President, a Secretary and a Treasurer. For technical aspects, it has a Manager and six field staff: two specialized in forestry and four in agriculture.

ASOKANUS is responsible for handling 59,134 hectares of primary forest in the Cordillera del Cóndor, southeast of Morona Santiago: a rugged region, unfit for agriculture or livestock, which is owned by the community.

The association promotes forest management and timber production and aims to prevent illegal logging, which constitutes unfair competition in the market. It buys timber from members of the communities, especially species like seike (*Cedrelinga catenaeformis*), canelón and laurel, provided they are produced from a well-managed forest. Wood is collected in a lumberyard for storing and then later sold in the domestic market, mainly in Quito.

### Forest regulation

For the harvesting and management of native forest, the communities developed Local Forestry Regulations (RFL), based on national regulations established by the Ministry of the Environment, which were adapted and strengthened by the local communities.

The regulations stem from the community's concept about the importance of the forest and the need to conserve it. They were developed with the support of the Fundación Natura and the technical assistance of the Amazonian Forest Service, and approved by the General Assembly in 2003.

These rules, in addition to complying with legal provisions regarding the management of the forest, incorporate cultural criteria such as the protection of sacred lands and riverbanks, springs and waterfalls. It also defines standards related to hunting, according to the traditions of the Shuar people. The regulations are stricter in terms of minimum cutting diameters and the steepness of slopes where trees can be cut. The intensity of harvesting is less than 10 trees per year/family/estate.

Low impact harvesting is also used. This involves the application of the Simplified Forest Harvesting Programme (PAFsi), established by the Ministry of the environment in 2000. Simplified harvesting considers the minimum diameter and distance between trees as the main criteria for logging.



Training techniques



Selection of wood for sale

## Economic and social benefits

Controlled harvesting of native forest has generated employment for families in the community and has increased their income. The average annual income of a Shuar family associated with ASOKANUS is US\$2,012, of which 50% comes from the sale of forest products, mainly wood, 37% from other sources (e.g. mining), 8% from agriculture and 5% from animal husbandry.

The marketing of wood through ASOKANUS has allowed members to obtain a higher profit margin because the prices they receive for wood products are approximately 23% higher than they would receive from other buyers in the local market.

Training is another benefit communities have received. Being an active part of the forestry experience has increased their organizational and technical capacity for forest management and commercial skills. ASOKANUS' board has acquired significant expertise in marketing wood produced by associated communities. In addition, several members of the association have been trained in sawing techniques and other aspects of harvesting.

The experience of ASOKANUS has been highlighted in local and national events by both public and private actors. One of the outcomes has been the interest shown by the Independent Federation of the Shuar People of Ecuador (FIPSE) in establishing similar rules for harvesting their 160,000 hectares of forest.

The Vice President of the recently created National Association of Forest Managers and Conservationists is in charge of ASOKANUS. This association is an initiative that seeks to exchange good forest management experiences and promote the involvement of forest owners in national discussion about forestry policy, laws, regulations, and markets, among other aspects.



Monitoring the saw operator



Field evaluation

ESNACIFOR

## A SCHOOL AND FOREST MODEL FOR VOCATIONAL TRAINING AND RESEARCH

By Merilio Morell

Location	Comayagua department, municipality of Siguatepeque, Honduras
Biome	Subtropical humid forest
Forest type	Native conifers
Organization	Educational institution: <i>National School of Forestry Sciences</i> (ESNACIFOR)
Objective	Serve as an example of good forest management – Provide an area for training and research purposes – Harvesting of the forest – Use of forest waste – Recovery of productivity
Area	4,550 hectares

National School of Forestry Sciences (ESNACIFOR), in the town of Siguatepeque in Honduras' Comayagua department, is an educational institution that has taught students for 40 years at the national and international level in the fields of forest management, conservation of biodiversity and the transfer of technology. In addition, it manages 4,550 hectares of forest used for research purposes, providing an example of good forest management, a source of wood products and forest protection.

### Academic and business areas

ESNACIFOR was created in 1969 by agreement between the Honduras government, UNDP and FAO, with the aim of training forestry professionals. Currently, ESNACIFOR carries out teaching, scientific research and outreach activities as well as managing the Lancetilla Botanical Garden and the Forest School. It also runs programmes and projects at a national and international level.

ESNACIFOR operates as a corporate entity with two main divisions: the academic division, which offers three types of degrees, and the forest business division. This latter division manages the school's seed bank, Department of Applied Research

(DIFA), the Centre for Integrated Forestry Training (CICAFOR), Lancetilla Botanical Garden and the Forest School, as well as the nursery, the sawmill and carpentry workshop. Although some of ESNACIFOR's management units are part of the chain of production that originates in the forest, these units are managed independently and their profits contribute to the general budget of ESNACIFOR and are not directly considered part of the income of the Forest School.

In its 40 years of existence, the school has been funded by donations from the international community, often through technical assistance projects<sup>39</sup>, income from teaching foreign students (which in turn have been financed by international technical cooperation) and financing from the national budget. However, the current trend of decreasing government contributions has led to the exploration of sources for self-funding and even possible privatization. Meanwhile, external multilateral and bilateral sources of funding have decreased significantly and are not expected to increase in the medium term.

### School for forestry

The Forest School has 4,550 hectares of which 65% is managed for timber production and the remaining 35% is used for the protection of watercourses, soil and wildlife. Almost one third of the area has a slope greater than 45%, which in itself is not a constraint to the growth of pine trees, because in the more rugged areas the density is 1,200 trees per hectare, either planted or grown through natural regeneration.

The natural limits of the Forest School are rivers, creeks, ditches and firebreaks. On its perimeter, there are eight villages which have settled on land owned by ESNACIFOR. The Pan-American Highway passes through the forest in a south-western



Reduced impact harvesting using cart oxen



Division of the forest with different management strategies

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<sup>39</sup>ESNACIFOR and its Forest School have received support from various sources: from the government of Finland (PROCAFOR/CEMAPIF project) for the elaboration of management plans; from the German government (GTZ) for training and implementation of forest management activities; from the government of Japan (JICA) for forest harvesting; from the U.S. government (PDF) for management of water resources; from the governments of Honduras (AFE-COHDEFOR) and the Netherlands (LARESNAAR) for formal and informal forest education; and from the United Kingdom (ODA) for forestry research.

direction for 11 km. Due to the dire socio-economic situation of Honduras, an increasing number of families are squatting on land up to 30 meters on either side of the road, which, by law, must be left for public use. Given that there is a sort of legal vacuum in these areas, the landowner cannot act against these squatters, even though the land should not be used for this purpose. In addition, the land survey system has sometimes granted property rights within the limits of the forest.

From 1910 until 1969, the forest was harvested by the timber industry without an explicit aim of sustainability. In 1969, with the creation of ESNACIFOR, the Honduran state gave the area to the school, and since then it has been managed with the goal of sustainable productivity.

There is no official timeline in terms of the management of the forest but, broadly speaking, there have been two periods. The first, from 1969 to 1993, organized the forest into sectors and plots while focusing on the protection of resources from illegal logging and the first scientific collection of data on the situation of the forest. One of the main activities consisted of the establishment of plantations (1,241 hectares between 1871 and 1980) on cleared areas. The second period, from 1994 to 2009, was guided by the national forest authority. In this stage, more attention was given to the standardization of the forest and adoption of the principles of sustainable forest management.



Silviculture practices (thinning, selective logging, seed trees)

### A model forest for training

The Forest School works as a model for training students of ESNACIFOR in sustainable management of pine forests, as well as for purposes of research and outreach. The main objective of management is defined as the multiple use of the pine forest based on integral and sustainable use of the goods and services it provides, such as the production of wood, firewood and charcoal, seeds, scenic beauty, refuge for wildlife and protection of soil and water sources.

The forest is divided into seven sectors, each with a separate management strategy. These seven sectors include 172 stands of trees. A total 70% of the current forest cover is comprised of young, medium-size and mature trees resulting from regeneration.

The management plan includes three thinning cuts which remove less attractive or unhealthy trees that compete for space with healthier trees. The first thinning is done four years after planting, the second at age nine and the last thinning at age 15, leaving between 250 and 300 trees per hectare to grow for about 20 years. The final cut (rotation) is performed between years 35 to 41.

The allowable annual cut has grown to 5,132m<sup>3</sup>, due to silviculture treatments such as thinning, selective logging and the protection of seed trees. The state regulations require the planting of three seedlings per tree felled, plus a minimum of 15 to 25 seed trees per hectare. Above and beyond this requirement, however, ESNACIFOR performs an annual reforestation of harvested areas, planting a minimum of 1,111 trees per hectare.

Low environmental impact techniques are used such as overhead cables, tractors, oxen, "sulki" and low impact roads, depending on the characteristics of the soil. The logging and extraction of wood is performed manually; chainsaws are used for felling trees and selective logging practices are used.

Some controlled fires are used to reduce fuel in the dry season, as well as to create firebreaks in some areas. Plantations are established in sites with irregular densities and those affected by wildfires. Between 2007 and 2008 a total 33.3 hectares of forest was planted. Monitoring and prevention of forest fires is carried out with the help of two observation towers and fire fighting brigades.

Permanent plots established since 1978 in the Forest School are evaluated annually.

## Research, education and outreach

Many studies and research projects have been carried out in the Forest School on the basis of an inventory by the FAO in July 1969. Research, both pure and applied, has generated greater knowledge of the pine forest in central Honduras. Since 1999, when the forestry engineering degree was first offered in ESNACIFOR, at least four theses are conducted in the school on average per year.



Pine forests in regeneration (young, middle age, and mature)

ESNACIFOR uses different strategies for disseminating the results of forest management research produced by the Forest School, including publication in the trade magazine *Tatascán*, both in digital format and hardcopy, and also through the ESNACIFOR *Informa* quarterly newsletter. Likewise, educational tours are organized in the forest for school groups and visitors.

Short courses, workshops and seminars, are also offered to teach the forest management techniques being implemented in the forest. For the same purpose, during the year ESNACIFOR leads celebrations of important civic dates related to natural resources and the environment, such as World Tree Day, to promote its findings and educate the population.



Productive rehabilitation



Reduced impact harvesting using aerial cables

The case of ESNACIFOR's Forest School is remarkable for several reasons. The main reason is that it has maintained the productive capacity of the forest and its operation for 40 years in a national context characterized by institutional weaknesses and strong social pressure that had previously failed to maintain forests under forest management for long periods.

The Forest School has served an important role in skills training, the generation of knowledge and as a source of resources for the institution itself and for the local economy with the creation of jobs for people in at least six nearby communities and others close to the forest.

The Forest School can be seen as a green island in the middle of a desert of deforestation and it plays an important role in environmental conservation and recreation.

# State Forest Guyana

## AN EXEMPLARY LOG TRACKING SYSTEM

By Sergio Aguirre

Location	Territory of Guyana
Biome	Tropical broadleaf humid forest
Forest type	Native
Organization	Guyana Forestry Commission (GFC)
Objective	Control and certification of forest harvesting
Area	13.8 million hectares

The total area of Guyana is 21.6 million hectares, of which 18.6 million are covered with forests, representing 87% of the total area of the country. Of the forest area, 13.8 million ha are officially listed as State Forests. These include diverse forest types such as dry forests, marshes (that are regularly flooded), mountain forests (with altitudes above 900 meters), forests, mangrove forests and mixed forests (located on the lower slopes of the hills). These formations are home to a rich biodiversity of species, with more than 1,000 different plant species. There are about 30 commercial species with the most important being: greenheart (*Chlorocardium rodiei*), baromalli (*Catostemma commune*), mora (*Mora excelsa*), wallaba (*Eperua falcata*) and purpleheart (*venous Peltogyne*).

Guyana's extensive forest resources, which are mostly state-owned, required a form of management that would incorporate them into the country's economy and ensure their protection through sustainable forest management. The entity responsible for achieving these goals is the Guyana Forestry Commission (GFC), created for this purpose in 1979. The GFC is led by a board designated by Guyana's President, with responsibility for the forestry sector in the country. The board is led by the Commissioner of Forests who is responsible for the day-to-day operations, the application of laws and regulations in the sector and the granting of logging concessions, among other duties.

The management and use of state-owned forests in Guyana is achieved through the granting of logging concessions to private companies and individuals. These are granted by the GFC to those companies that meet the requirements, using different modalities:

- **Lumber sale agreements:** These are long term concessions, up to 25 years, in areas of more than 24,000 hectares.
- **Logging leases:** Up to 10 years on areas between 8,000 and 24,000 hectares.
- **State forest permits:** Up to 2 years and not more than 8,000 hectares.

### Monitoring system

Between 2000 and 2001, the GFS introduced a system to control and certify logging in the country by tracking the movements of logs, from the felling of a tree in the forest until its arrival at its final destination for processing or export. The system is called the *Log Tracking System (LTS)*.



Tracking log movements with tags

This system allows the GFS to verify the origin of forest products, so it is also used as a means to control illegal logging, which could otherwise be a significant problem given the high demand that exists for tropical timber. This procedure also enables it to assess and manage the management plan and the GFC annual budget, based on the volume of harvest expected for each cycle and by each concession in operation.

Deonarine Ramsaroop, of *Haimorakabra Logging Inc.* from East Coast Demerara, said: “With the implementation of LTS in Guyana, the lumber business has realized many benefits.” From the point of view of a concessionaire, the system is solid, user-friendly and low-cost. The system electronically stores information in one centralized location, allowing companies to monitor, track and report easily on their product movements. For H. Cort, of *Jailing Forest Industries Inc.*, “It’s a system that, if properly managed, leads to accurate monitoring of species and harvested volumes, and is a great support for the calculation of the corresponding payments.”



Centre of forestry education

Guyana is one of the few countries in the world with a procedure for log traceability. This procedure allows a potential buyer to determine exactly where the tree was cut. It uses a system of specific *tags* for each concession that are provided for free by the GFC. Half of the *tag* is placed on the stump after felling the tree, and the other half on the product to be transported, which could be logs, lumber, posts or stakes. The product is tracked until its eventual processing at a plant and this data is incorporated into the documentation necessary for export. The system has been implemented throughout the country, in state forests, on indigenous lands and by individuals.

This monitoring system is the basis for the functioning of the GFC. It operates in line with the annual management and operation plan and the system of quotas that applies to large and small concessions. In the field, it is run through 21 forest stations around the country that monitor harvest operations. This method of control lets the GFC verify that protected areas are not affected and that harvests are conducted according to the Code of Practice in harvest operations. This procedure dramatically reduces the possibility of overexploitation and its potential effect on sensitive areas and the biodiversity of areas under concession.

The method, which constitutes a chain of custody of forest products, has been recognized by several international certification bodies. To check its proper functioning, audits have been made periodically including one in 2006, supported by the ITTO (International Tropical Timber Organization) and WWF (World Wildlife Fund) to verify its effectiveness and improve the system.

### **Contribution of the forestry sector**

In the past seven years, the contribution of the forestry sector to the GDP of Guyana, which has just 739,000 inhabitants, has been 4% on average, with a maximum of 9% and 11% in 2005 and 2006, respectively. Export revenues doubled between 2000 and 2008, reaching US\$56.8 million. Sector employment figures have ranged from 20,000 to 26,000 people per year over the past 10 years.



Biodiversity of tropical forests

This boom in the forestry sector, as explained by Praadepa Bholanath, head of planning and development of the GFC, is due in large part to the use of LTS in the country's forest policy as an instrument of control in the sustainable management of forests, which has brought the following benefits:

- **The most environmentally conscious markets in the world such as the United Kingdom and the United States have shown preferences for Guyana wood due to its guarantee of origin from a forest under sustainable management.**
- **Due to the clear regulations and structures of the forestry sector, the country has managed to attract foreign investment, which has helped it to increase its exports.**
- **The ability to supply the internal and export markets with high quality products.**
- **Opening and promotion of new markets for products.**
- **Diversification in the use of forest species and incorporation of new species for export.**
- **Growth of production and export of products with higher value-added, such as furniture and construction materials.**



The tracking system allows Guyana to control protected areas and maintain biodiversity

# Parangaricutiro

## SUCCESSFUL ECONOMIC DEVELOPMENT OF AN INDIGENOUS COMMUNITY BASED ON FORESTRY ACTIVITIES

By Sergio Aguirre

Location	Nuevo Parangaricutiro, state of Michoacán, Mexico
Biome	Subtropical coniferous forest
Forest type	Native
Organization	<i>Indigenous community of Nuevo San Juan Parangaricutiro</i>
Objective	Sustainable use of forest
Area	18,138 hectares

The community of Nuevo San Juan Parangaricutiro is located in the state of Michoacán, in the extreme southwest of the central Mexican plateau. The area is volcanic and rugged, with an annual average rainfall of 806 mm and an annual mean temperature of 22°C.

The community has property titles from the Spanish crown dating from 1715, according to which the indigenous community members are the owners of the land and its forests. The main activities are forestry, agriculture, and fruit orchards. The community has 1,254 families (6,000 people in total) and the total area is 18,000 hectares including 10,400 ha of native forest under management, 1,300 ha of forest plantations and 600 ha of protected forest.

### Community organization

The successful economic development of the community has largely been due to the organization's business focus. In 1981, the community launched an organizational model, which continues today, whereby a General Manager oversees production and economic management while each community enterprise has an administrator.

There is a Community Council composed of prominent community members, which serves as a forum to analyse and discuss the problems of the community. Since 1981 the

Council has held monthly meetings. The financial statements of community companies are presented annually to the General Assembly, which determines the reinvestment of profits and authorises investment in new projects. New projects must generate social benefits for the community and include activities in different areas to reduce the pressure on the forest.

The changes to the Forestry Law of 1986 have strengthened the community, since these gave community organizations the responsibility for the provision of forestry services. This has allowed community members to become trained, including formal education in universities, and become responsible for the management, use and protection of the forest resources.

The community's growth and development prospects are very promising since it has important agricultural and forest resources, and a solid organization with human resource trained in the sustainable management of natural resources. This will allow the organization to improve its processes and products, and open up new markets for export.



Forest management through the Silviculture Development Method (SDM)



Community wood industry

### Community forestry development

The native forest mainly consists of conifers and some broadleaf trees. The main species is pino canis (*Pinus pseudostrobus*), that grows on its own or mixed with oyamel (*religious Abies*) and other pine such as pino lacio (*Pinus montezumae*) and pino chino (*Pinus leiophylla*) and broad-leaved trees of the genus *Quercus* and *Alnus*. The community has a seed area to produce quality genetic material and nurseries producing plants for its reforestation programmes and for sale.

The forest is in its third harvest cycle, and there is growing awareness among the community members about the importance of the implementation of proper silviculture for conservation.

Forestry activities have been conducted with the community's own resources and the support of government programmes like PROCYMAF (Community Forestry Development Programme) and the National Forestry Commission's PROARBOL.

The Silviculture Development Method has been used, which basically consists of three thinning cuts, a regeneration cut and a final cut. To control the implementation of this silvicultural method, 60 permanent plots have been established to monitor the impact of each treatment. The results indicate that the quality and biodiversity of the forest has been maintained. Since December 1999, the community forests are certified by SmartWood under principles and criteria of the FSC.

The indigenous community is responsible for executing all forestry processes (management, use, processing and marketing of forest products), which has given employment to 950 heads of families. Value is added to the wood with the production of furniture and mouldings, which are sold in Mexico City and elsewhere.

Community forestry activity represents 70% of the income of the municipality of Nuevo San Juan Parangaricutiro, which has allowed it to create companies to provide community services including a water purification plant, community stores, agricultural programmes, peach and avocado orchards, and implement an ecotourism project.

The community is fully aware that the sustainable management of forest resources will allow it to conserve biodiversity and its soil and water resources. To do this, it takes care to protect water sources and waterways, especially during forestry operations. There is constant monitoring to control hunting and illegal harvesting of trees and forest products, and there is a forest fire prevention programme involving 13 voluntarily fire brigades with at least 50 members.



Community meeting



The community is responsible for the entire production process, which creates permanent jobs

## San Pedro Jacuaro

# A COMMUNITY ORGANISATION MANAGES ITS FOREST RESOURCES FOR MULTIPLE USES

By Sergio Aguirre

Location	Municipality of Hidalgo, state of Michoacán, Mexico
Biome	Subtropical coniferous forest
Forest type	Secondary native
Organization	Community association: <i>Unidad de Explotación Forestal y de Uso Múltiple, Ejido San Pedro Jácuaro</i>
Objective	Production of wood - Sawmill industry - Ecotourism and recreation activities
Area	1,750 acres

San Pedro Jácuaro has its roots in the colonial era when the Spanish Crown, through the viceroy title of 1750, recognized this territory as property of a group of Purépecha villagers. In 1948, after various internal conflicts, the government gave an initial endowment of 362.5 hectares and legally recognized the Ejido of San Pedro Jácuaro.

Located in the municipality of Hidalgo, in the eastern part of Michoacán state, 90km from the state capital, the San Pedro Jácuaro Ejido has a population of 1,781, according to the 2000 census. Agriculture is the main activity with three forms of land tenure: communal, Ejido and small property.

The community has an area of 1,800 hectares, of which 1,750 ha is covered in forest at an altitude ranging from 2,000 to approximately 3,500 meters above sea level. Oyamel (*Abies religiosa*), pine (mainly *Pinus pseudostrobus* and in lower density *P. leiophylla*) and pine with encino (*Quercus laurina*, *Q. obtusata*, *Q. crassifolia*, *Q. rugosa*) and other broad-leaved plants (*Alnus acuminata*, *Clethra mexicana*, *Arbutus xalapensis* and *A. glandulosa*) constitute the dominant vegetation. Oyamel forests grow in the northern part and comprise 70% of the area. Pine forests, and pine in combination with encino, cover the remaining 30% of the area.

This Ejido has a history of exploiting the forest since the 1960s, when it sold timber products to individual merchants. In 1966, an industrial sawmill was installed, with funding from the Banco Agrario, which also took over the administration of the business. Then, in 1982, when the Ejido members were trained in forest operations and sawing, and learned to manage the business, the Ejido paid its debt to the bank and took over the management of

forestry operations (including the sawmill), supported by the Forestry Commission of the State of Michoacán. That same year the Forest Harvesting and Multiple Uses Agency (*Unidad de Explotación Forestal y de Usos Múltiples*) was formed and a tourist centre was built with resources from the sale of timber.

## A foundation for success

The objective of the Ejido San Pedro Jácuaró is to generate employment and to strengthen the production activities (especially the production of timber and tourism) of the community.

The community organization has a strong foundation thanks to the vision of its founding members. An important achievement has been to combine three distinct forms of land tenure: communal, Ejido and small property. At the beginning, as part of the discussions that gave rise to the organization, it was agreed not to sell land to people outside the Ejido and to prevent illegal logging. If someone violated these agreements, he would not receive any profits from the community and, in an extreme case, could be expelled from the Ejido.

Currently, the Ejido consists of 82 members, of which 30% are women and the newly opened water plant has prioritized the employment of women. In administration and in the tourist centre the percentage of women is higher than 60%. But forestry and harvest activities, which are tasks that require greater physical strength, are still performed by men. The capacity of women is valued and there is an explicit aim to advance towards greater gender equality.

The creation of the Forest Harvesting and Multiple Uses Agency has been an important factor in the development of the association.

The Ejido donated land for an elementary school and a high school for the village as well as land for a sports field. It has also contributed to the establishment of safe drinking water services and electricity, among other inputs for local development.

## Forest management

The forest was severely affected during the time when harvested wood was sold by individuals, since only the best quality trees were cut. Subsequently, with advice from CONAFOR (National Forestry Commission), the forest has remained in balance with a sustained production that is considered conservative since low intensity selection is used in management and harvesting



Pine and oyamel forests under management



There is a management plan for the forest, based on existing regulations and practices and customs in the community, which is reviewed and approved by the General Assembly. The person responsible for its implementation is a member of the Ejido.

More than two decades of sustainable forest management have generated direct benefits for the Ejido members; it has created greater employment and higher income derived from the proceeds, which is distributed among the members.



The community has had a timber industry since 1963. The mill has a capacity of 70m<sup>3</sup> per shift. However, the average production in recent years has been only 50m<sup>3</sup> per shift. The sawmill production caters largely to the more than 100 furniture workshops in the Ejido, and has also generated employment.

### Tourist resort

Low impact harvesting techniques guarantee conservation and recovery

In 1982, the community launched a tourism development project that takes advantage of the landscape and thermal resources of the Laguna Larga area. The tourist resort has a surface of six hectares and is located 12km from the village and at an altitude of 2,200masl. Currently, it offers hot springs, lodging, camping, restaurants and swimming pools.



Ecotourism development

The project had several setbacks in its early years, but in 1994 its facilities were upgraded and a better administrative control was established. This has helped the resort attract more than 100,000 visitors per year, which has generated significant income for the Ejido.

Currently, with the support of CONAFOR, the ProÁrbol programme and PROCYMAF, the Ejido has undertaken other projects such as bottling drinking water.



A women of the Zambrana-Chacuey community, APA - Dominican Republic

# REFLECTIONS AND LESSONS LEARNED

## Diversity of organization and management structures

Most of the cases analysed correspond to forest management processes developed by rural communities and native or indigenous communities. In cases managed by local communities, good organization has been a key step towards a successful process of sustainable forest management. The great challenge consists in choosing a suitable organizational system depending on the context, specific characteristics and scale of management. An important contribution of this study is to present the diverse types of organizations that have been successful.

In cases in which the organization responsible for management is comprised of local communities or indigenous peoples, the group's cultural identity and tradition plays an important role in the leadership structure, which facilitates the internal organization and development of rules or norms that are respected by members of the community. The presence of one or more external agents, who support the management process from the outset, is another factor that has facilitated the organizational process. Some examples of this are the cases of forest management by Mayan communities in Petén, Guatemala; the Miskita community in Layasiksa, Nicaragua; and the Shipibo-konibo tribe in the Peruvian Amazon region of Ucayali.

An interesting management structure occurs in cases where the responsibility for management rests on a network or alliance of community organizations, such as the Bosque Nacional Gualaco y Guata in Honduras, the Community Councils in San José de Ocoa in the Dominican Republic and the Association of Community Parks of the Mapu Lahual in Chile. In these cases, there has been a participatory process of decision-making and a greater commitment by the various actors involved to forest management and the benefits it generates both individually and collectively.

The eight cases where management is the responsibility of a private company show organizational structures ranging from a family business (as in the case of the Grupo Espinoza in the Peruvian Amazon) to complex organizational structures (like those shown in the Brazilian companies Orsa Florestal and Klabin). While these private sector initiatives clearly seek economic profitability and show a high level of efficiency and organization, they are remarkable for the level of social and environmental awareness and concern shown.

Another form of management that is important to highlight is the partnership between businesses and communities. Until not long ago this type of organization was virtually unthinkable. But examples of this can be observed in the cases of Rio Iratapurú and Forestal Venao, in the Brazilian and Peruvian Amazon, respectively; or in the case of Aysén, Chile. These cases show that such a partnership is increasingly common and has many advantages for both groups involved.

## Diversity of objectives

Although timber production continues to be the main goal or interest in the use of the forest, to the extent that illegal or indiscriminate logging continues and thereby reduces the value of timber in the remaining forest (mainly in tropical regions), other management objectives have arisen. The diversity of management objectives responds both to changes in the composition and condition of the forest as well as the needs and interests of the decision makers and the existence of opportunities to access new markets.

In the cases presented in this book, it is clear that communities have a broader range of objectives in managing their forests, both to take advantage of numerous non-wood forest products and to ensure that their natural resources are preserved and protected. Timber continues to play a key role in generating income and other benefits for the community, but several initiatives also include the restoration of the landscape or productive rehabilitation, which shows a long-term vision and a commitment to ensuring the sustainability of natural resources in their territory.

As was mentioned in this book's introductory chapter, the selected cases have different objectives, mainly in terms of economic-productive objectives, but also in terms of environmental and social goals. Cases of forest management by companies show a clear interest in economic aspects, preferably from timber and its processing to obtain products with higher added value. However, these companies also promote environmental and social responsibility programmes that often generate positive impacts for the communities involved. On the other hand, communities or associations of small producers develop their forest management plan from a perspective of collective benefits, which while not excluding economic factors, tends to be focused on social and environmental benefits.

Both the objectives and management processes in these cases have shown a clear evolution towards the theoretical definition of sustainable forest management. Cases of forest management focused on timber production increasingly consider the environmental benefits of good management and socio-economic development, while those that originally used the forest as a means of subsistence have evolved into business ventures that integrate the entire productive chain, providing clear opportunities for human, social and economic development.

## Exemplary aspects

The vast majority of cases visited in the field present a high degree of exemplariness in the social aspects of management, in particular for their contribution to local development and poverty reduction (MCE 1). In social aspects, 40% of the cases have incorporated various mechanisms to resolve or manage conflicts derived from management (MCE 3), as well as respect for cultural diversity and local knowledge (MCE 4). Generally, these correspond to initiatives by communities or associations of producers, but there are also companies that have adopted such practices and principles.

Exemplariness in environmental aspects of management also appears in a high proportion of cases. While the forest management plan requires the implementation of various mechanisms or practices for the conservation and protection of the forest, in most cases efforts have been made that go beyond the minimum required and show a clear concern for biodiversity and other forest services. Several cases offer examples of restoration of the landscape or productive rehabilitation in degraded areas.

Although the harvesting or silviculture techniques and practices in many cases contribute to maintaining the environmental services of the forest, it is still rare that these activities are developed in order to enhance such services. Nevertheless, it should be expected that investments in research in several cases will help to improve the design and implementation of these initiatives.

The implementation of the technical aspects of management (as described in MCE 11) should also be expected as part of a good management plan. However, a number of cases stand out as giving a greater value to developing efforts that range from establishing and implementing a system of monitoring and evaluation, sometimes with the use of sophisticated planning and control mechanisms, to investment in research, development and innovation activities, as well as training and outreach programmes.

The economic dimension of management is the aspect that shows the least number of outstanding cases. Although there is a strong concern for generating greater economic benefits from the forest through the diversification of uses and adding value to their products and services, there are still few initiatives that demonstrate a high degree of uniqueness in this respect; of the ones that do, they are generally run by companies. The challenges in terms of organization, management and access to the market at competitive prices are much higher for communities or groups of small producers. Although they may aspire to taking advantage of the multiple uses of the forest, this continues to be a goal that generally eludes them. The few cases in which one or more non-wood forest products are an important part of the economic benefits of management must be analysed in the local and institutional context in which they are developed. Similarly, the valuation of environmental services is still at an early stage; in three cases, the conservation of the forest is associated with the provision of water.

From the institutional aspect, which encompasses management and organizational processes and the existence of innovative partnerships, many cases demonstrate outstanding progress. There are cases of communities that have very participatory decision-making processes related to management or that have developed efficient organizational and technical structures, allowing a better performance in other aspects of management. Two cases are notable for having achieved outstanding levels in the development of training activities, coaching and outreach in forest management.

## Lessons learned

Each case is important not only for the results or impacts it produces, but also because it generates some kind of a lesson that can be learned by other initiatives. The case presentations in Chapter 3 include the lessons generated in each case. By analysing these lessons, some similarities can be seen that allow us to generalize some lessons learned from the implementation of forest management processes. Here are the lessons learned from the cases selected for this study:

### Organization for management and leadership

- A well-organized community-based association is essential for the success of the forest management process. When there is no strong organization or leaders genuinely engaged in the development of their own communities, it is virtually impossible to implement successful programmes with equity in the distribution of benefits.

- Leadership is a key aspect of community-based organizations since visionary individuals are needed who do not fear of change, both in qualitative and quantitative terms of forest management. Decisions must be taken with a business vision and with social responsibility throughout the process. The successful cases generally not only have a leader, either male or female, but a group of committed people that is able to maintain strong leadership over time.
- Organized communities can develop ingenious schemes of payments for environmental services, regardless of external cooperation or support.
- A constant challenge of forest management processes by communities is making community members feels more included in decision-making.
- Considering people as leaders, when they are not, simply because they hold positions of power in a community is a weakness that occurs with some frequency in local processes.

### **Role of umbrella organizations**

- For a community to advance in the management of their natural resources it is important to have an umbrella organization that combines other community-based organizations and works with total transparency, without political intervention, serving as a mechanism to catalyse the real interests and needs of communities.

### **Active participation in decisions**

- Social participation is the engine of development activities and a driver of change. The involvement of the communities is achieved when they receive a tangible benefit from forest management. In addition to the environmental services generated by the forest, the communities benefit from forest products like wood, firewood and a range of non-wood forest products.
- The communities can be great partners in conservation and resource management to the degree that their real needs are addressed by organizational schemes that enable them to participate actively in the formulation and execution of projects of common interest.

### **Contribution of external support**

- External technical and/or financial support is especially important in the process of implementing forest management. This support or assistance must occur in a timely manner and must be coordinated between the institutions involved, while bearing in mind the market and political considerations in the context in which the project is developed. Support can come from the State or non-governmental actors. This, however, does not guarantee success per se.
- In younger community organizations, it is key for them to work together with various institutions to advance the process towards sustainable forest management, from planning and its operationalization through monitoring and supervision.

## **Role of the State and institutions**

- The participation of the State, when positive, contributes to strengthening the process toward SFM.
- The role of the State is essential when working in communities. In these cases, determined and sustained support is needed for the development of capabilities in the sustainable management of their forest resources.
- Control and monitoring activities by government organizations are indispensable to ensure compliance with management plans and social and labour commitments, and to ensure that the goals and objectives are met.
- A favourable institutional and legal framework is needed for producers to respond to economic incentives. A key element is the trust between government authorities and the institution responsible for implementing the actions or projects.

## **Technological innovation and research**

- Management strengths are linked to the diversification of uses generated through technological innovation, allowing communities to add value to products and services from the forest.
- One of the activities that contribute to the sustainable management of natural tropical forests is the utilization of non-traditional timber species. Introducing these lesser-known species in the market can be done in many ways, such as through value added processing and allocating resources for research.

## **Incentives and investments**

- Forest concessions, even when they may have a predominantly business character, can combine management and harvesting of the forest and achieve a healthy balance between social, labour and environmental components of sustainability.
- Forest certification is a mechanism that, in some cases, serves as a marketing tool in support of forest management. In the context of management by local communities, the certification acts as a stimulus to increase production and make processes more transparent, while also promoting greater coordination between the various levels of organization in the community.
- The resources invested in the implementation of applied research in silviculture, management and industrial operations have a notable effect in achieving SFM, and at the same time, a positive impact on the economic and productive results.



Children in Cururú community, Bolivia

# FINAL CONSIDERATIONS AND RECOMMENDATIONS

This chapter presents some of the key recommendations that can be made based on the exemplary cases and cases with exemplary aspects in this book and the lessons learned from these experiences. These recommendations seek to improve the framework of conditions and decisions so sustainable forest management can become more of a reality than an exception. In this regard, they are strongly aimed at governments and non-governmental entities with development and support functions (such as NGOs, professional associations, universities, research and training institutions and financial entities). The following recommendations are in no specific order:

## **Strengthen forest management organizations**

External stakeholders such as governmental and social organizations, NGOs, and training centres can contribute to:

- Strengthen internal organizational structures of the community, or whichever organisation is responsible for management, so that they can exercise roles and responsibilities more efficiently;
- Support the community members in an integral and equitable way, so they are in conditions to be able to lead the organization or management unit as well as leading the community with vision and the ability to develop participatory and inclusive processes;
- Organize courses or other training activities that provide knowledge and technical and administrative tools, with a focus on building capacities for adaptation and learning for the community self-management of the forest;
- Strengthen umbrella organizations that group community-based organizations to better perform their main role of promoting and supervising the implementation of forest management by their partners, and at the same time, to increase their ability to effectively promote forest management at the community level;
- Recognize and, insofar as is possible, incorporate into legal and administrative procedures, social control mechanisms for communities, such as local rules regarding the use and protection of forest resources that have been successful in their different contexts.

## **Promote training and human resources development**

There is an unmet demand for opportunities to improve the knowledge and skills of the people who work in the implementation, promotion, regulation and control of SFM. The supply of training, technical assistance and outreach opportunities should be improved through structural measures of promotion and incentives for institutions or organizations involved in these functions. The role of governments is important to create or improve training opportunities so that those responsible for management, and those who regulate and monitor it, have personnel who are properly trained and qualified for their activities. The successful experiences of various governments, NGOs, companies and communities can and should be used to design and promote training, coaching and outreach strategies.

## **Encourage diversified and value-added forest production**

Improving the profitability and competitiveness of forest management is key for its sustainability. In this regard, initiatives by companies, communities or individual owners to add value to their forest production through the development of the wood production chain and non-wood products should be systematically encouraged. This can be done by helping them to gain market access for lesser known species, non-wood products and to use wood and forest waste more efficiently. Existing experiences should be used to design mechanisms that enhance the capabilities of those responsible for management. One opportunity for this is in facilitating the commercial partnerships between businesses and communities. Another opportunity is in the valorisation of environmental services from the forest, using payment schemes to maintain them.

## **Reducing obstacles to SFM**

One way of encouraging sustainable forest management is to reduce barriers to its proper implementation like, for example, high transaction costs and excessive technical requirements that make management practices expensive and unfeasible without external support.

## **Support research and access to information**

Existing research efforts should be strengthened to contribute more effectively to the planning, execution and evaluation process of forest management. Similarly, new investments in research are needed to solve problems identified in this process and improve the economic, environmental and social sustainability of the activity. Opportunities for promoting SFM offered by mechanisms such as payment for environmental services and the Initiative REDD (Reducing Emissions from Deforestation and Forest Degradation) require such investments. Governments can facilitate a greater and better use of research for SFM by providing institutional incentives and by taking the results into account in the formulation of policies and forest management promotion strategies. There are several promising experiences of alliances between those responsible for management and research partners that should be considered in this regard.

## **Communicate the multiple benefits of forest management**

Forest management should be more widely recognized by lawmakers, the private sector, civil organizations, and society in general as a valid option capable of contributing to sustainable development at the local, regional, national and global level. To this end, greater efforts and higher budgets are needed to communicate more effectively the multiple benefits of SFM (economic, environmental and social) and successful experiences, as well as identifying and discussing proposals to overcome the challenges facing organizations charged with forest management.

## **Apply the lessons learned**

Although the level of external support for forest management initiatives has decreased in recent years, opportunities and potential mechanisms such as REDD are helping generate a resurgence of interest in forests. The lessons learned in recent decades by government initiatives, and in some cases with external support, should be used by projects in different stages of development to act in a coordinated, strategic, timely and responsible manner. One way of implementing this recommendation is incorporating this book in forest management-related consultations and decisions related to forest management. There is already a wealth of experience about analysis and learning processes which can, and must, be taken into account.

## **Recognize outstanding SFM initiatives**

One way to motivate those involved in the development of sustainable forest management processes is public recognition for their efforts. Such recognition can have a powerful demonstrative effect to motivate other entrepreneurs, while also taking into account their experiences to review and improve the legal framework of forest management.



Management of canelo (*Drimys winteri*)- Las Colonias, Chile

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Wood of the caoba tree [*Swietenia macrophylla*] – Communities and Venao SRL, Peru

# APENDIX 1

## DEVELOPMENT OF STUDY METHODOLOGY

### First stage: Definition of Criteria and Indicators (C&I) - Nominations

#### Development of reference documents

There is no accepted global definition of sustainable forest management (SFM). These processes are not set in stone and SFM is a flexible process that can be constantly adapted according to the objectives, which in turn reflect changes in the social, institutional, biophysical and technological contexts. SFM can be defined and assessed through a series of principles, criteria and indicators (PC&I), or standards. At the international, regional and national level efforts have been made to develop standards that allow an objective assessment of progress towards sustainability and to adjust future actions.

Amongst the PC&I international initiatives, the most relevant used in Latin American tropical and temperate forests are the standards developed by the International Tropical Timber Organization (ITTO 1998, 2003)<sup>40</sup> and the Pan-European and Montreal processes<sup>41</sup>. Also included in this analysis is the generic C&I developed by the Center for International Forestry Research (CIFOR 1999), which has been adapted in various Latin American cases. Another international initiative widely disseminated and used was developed by the Forest Stewardship Council (FSC), which is an international association with the authority to certify companies<sup>42</sup>.

At the regional level, there are two important initiatives: the Tarapoto Proposal (TCA 1995, Toledo 2001)<sup>43</sup> and the Lepaterique Process (Blas Zapata 2001)<sup>44</sup>.

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<sup>40</sup>The C&I consist of seven criteria, which describe the conditions which must be met to achieve sustainable forest management. The assessment of these criteria uses 66 indicators, 57 of which apply to the FMU level. ITTO gives much greater emphasis to the C&I related to the aspects of forestry production. More information can be found on the ITTO website: <http://www.itto.or.jp>

<sup>41</sup>The Montreal Process is the "working group on criteria and indicators for the conservation and sustainable management of temperate and boreal forests." This initiative of the Canadian Institute of Forestry (CIF), was established in Geneva, Switzerland, in June 1994, with the mission of establishing and implementing internationally accepted C&I for the conservation and sustainable management of temperate and boreal forests. Four Latin American countries are signatories to this process: Argentina, Chile, Mexico and Uruguay. For more information visit: <http://www.mpci.org>

<sup>42</sup>The Forest Stewardship Council (FSC) has defined a set of nine principles and 44 criteria for the assessment of natural forests, which achieve a balance between economic, ecological and social aspects of production (FSC 1996). More information visit: <http://www.fsc.org/esp>

<sup>43</sup>The Tarapoto Proposal, which has official support of the Amazon Cooperation Treaty Organization (ACTO), defines 12 criteria, of which only four are at the level of forest management, and 23 indicators. Unlike ITTO, Tarapoto is rather a policy statement on the Amazon forests. It gives greater emphasis to the socio-economic aspects of forest management in the national and local context. Countries committed to this proposal are: Bolivia Brazil, Colombia, Ecuador, Guyana, Peru, Surinam and Venezuela. For more information visit: <http://www.otca.org/br>

<sup>44</sup>This regional process began in 1997 and has been linked to the implementation of the Forestry Convention of Central America that defines a regional policy for SFM and forest protection. Countries committed to this proposal are: Guatemala El Salvador, Honduras, Nicaragua and Panama. For more information visit: <http://www.ccad.ws/tecnicos/ccab.html>

A comparison of principles or criteria used by the above-mentioned standards reveals certain conditions and elements in common (Table 6). Except the Tarapoto and Lepaterique proposals, all principles/criteria are valid at the national level and at the level of the forest management unit.

Based on this analysis, and taking into account the guidelines followed in a similar study on cases of exemplary forest management in the Asia-Pacific region (Durst et al. 2005), a proposal was prepared based on principles, criteria and indicators for selection of exemplary cases of sustainable forest management in Latin America and the Caribbean.

**Table 6: Principles and criteria used by the major PC&I initiatives relevant for Latin America and the Caribbean**

FAO Basic principles	ITTO Criteria	CIFOR Principles	FSC Principles
<ol style="list-style-type: none"> <li>1. National policy and legal framework</li> <li>2. Security of tenure of forest resources and land</li> <li>3. Effective protection of the forest</li> <li>4. Knowledge of sustainability of tropical forest ecosystems</li> <li>5. Maintenance of site productivity</li> <li>6. Forest management planning</li> <li>7. Goals and objectives of forest management</li> <li>8. Definition of forest resources</li> <li>9. Implementation of appropriate silvicultural systems</li> <li>10. The minimisation of negative environmental impacts</li> <li>11. Consideration of the interests of forest-dependent communities</li> <li>12. Commercial sustainability and business management</li> <li>13. Monitoring of Managerial Performance</li> </ol>	<ol style="list-style-type: none"> <li>1. Conditions for sustainable forest management</li> <li>2. Forest cover and conditions</li> <li>3. Health of forest ecosystems</li> <li>4. Forestry production</li> <li>5. Biological diversity</li> <li>6. Protection of soil and water</li> <li>7. Economic, social and cultural aspects</li> </ol>	<ol style="list-style-type: none"> <li>1. Policy, planning and institutional framework contribute to sustainable forest management</li> <li>2. Maintaining the integrity of the ecosystem</li> <li>3. Forest management maintains or improves fair intergenerational access to economic benefits and resources</li> <li>4. The actors directly involved have rights and means to co-manage the forest fairly</li> <li>5. The relationship between forest management, health and culture of forest stakeholders is recognized as important</li> <li>6. Production and quality of goods and services of the forest are sustainable</li> </ol>	<ol style="list-style-type: none"> <li>1. Obedience to laws and FSC principles</li> <li>2. Tenure and use rights and responsibilities (land and forest resources)</li> <li>3. Rights of indigenous peoples and local communities</li> <li>4. Community relations and workers rights</li> <li>5. Optimize the benefits of the forest</li> <li>6. Environmental impact</li> <li>7. Management plan and its implementation</li> <li>8. Monitoring and evaluation</li> <li>9. Maintenance of high value conservation forests</li> <li>10. Environmental management of plantations</li> </ol>

**Table 6 (cont): Principles and criteria used by the major PC&I initiatives relevant for Latin America and the Caribbean**

Tarapoto Criteria	Lepaterique Criteria		Montreal Criteria
<p>At the national level :</p> <ol style="list-style-type: none"> <li>1. Socio-economic benefits</li> <li>2. Policies and legal and institutional framework for sustainable development of forests</li> <li>3. Sustainable forestry production</li> <li>4. Vegetation cover and biodiversity conservation</li> <li>5. Conservation and integrated management of water and land resources</li> <li>6. Science and technology for sustainable development of forests</li> <li>7. Institutional capacity to promote sustainable development in the Amazon</li> </ol> <p>At the level of the management unit:</p> <ol style="list-style-type: none"> <li>8. Legal and institutional framework</li> <li>9. Sustainable forestry production</li> <li>10. Conservation of forest ecosystems</li> <li>11. Local socio-economic benefits</li> </ol> <p>Services at global level:</p> <ol style="list-style-type: none"> <li>12. Economic, social and environmental services from the Amazonian forest</li> </ol>	<p>Regional scale:</p> <ol style="list-style-type: none"> <li>1. Existence of a legal, political, institutional, technical, economic and social framework to ensure and promote the sustainable management and conservation of forests</li> <li>2. Conservation and maintenance of environmental services from forest ecosystems</li> <li>3. Maintenance of the productive capacity of forest ecosystems</li> <li>4. Maintenance and improvement of the multiple social, economic and cultural benefits of the forest ecosystem to meet the needs of the different groups of people</li> </ol> <p>National level:</p> <ol style="list-style-type: none"> <li>5. Same as criteria 1 of regional scale</li> <li>6. Forest cover</li> <li>7. Health and vitality of forests</li> <li>8. Contribution of forest ecosystems to environmental services</li> <li>9. Biological diversity in forest ecosystems</li> <li>10. Productive functions of the forest ecosystem</li> <li>11. Scientific and technological capacities for the development of forest resources</li> </ol>	<ol style="list-style-type: none"> <li>12. Maintenance and improvement of the multiple social, economic and cultural benefits of the forest ecosystem to meet the needs of the different groups of people</li> </ol> <p>Scale of management unit:</p> <ol style="list-style-type: none"> <li>13. Political, legal and institutional framework for promoting sustainable forest management</li> <li>14. Sustainable forestry production</li> <li>15. Maintenance of the biodiversity of forest ecosystems</li> <li>16. Soil and water production</li> <li>17. Maintenance and improvement of the local socioeconomic benefits</li> </ol>	<ol style="list-style-type: none"> <li>1. Conservation of biodiversity</li> <li>2. Maintenance of the productive capacity of forest ecosystems</li> <li>3. Maintenance of healthy and vital forest ecosystems</li> <li>4. Conservation and maintenance of soil and water resources</li> <li>5. Maintenance of the contribution of forests to the global carbon cycle</li> <li>6. Maintenance and improvement of the multiple long-term socioeconomic benefits</li> <li>7. Legal, institutional and economic framework for conservation and sustainable forest management</li> </ol>

## Regional workshops

The project's technical team prepared a proposal with criteria, concepts, and/or elements that might be used for the selection of exemplary SFM cases and the format for a form that could be used to nominate such cases. This proposal served as the basis for two subregional workshops, which produced results and recommendations that made it possible to define the following instruments and stages for the development of the study:

- Reference document, "Principles, criteria and indicators for selection of exemplary cases of SFM," used by the Panel of Experts to evaluate the nominated cases.
- Form for the nomination of SFM cases including the criteria brought to the attention of potential applicants.
- Process for the evaluation and selection of nominated cases (subsequently reviewed by the Panel of Experts, see Table 7).

**Table 7: Stages of the evaluation and selection process**

Stage	Standards applied	Responsible	Result
(1) Nomination of cases	Form for the nomination of cases	FAO	Nominated cases
(2) Shortlist of nominated cases	Negative criteria for nominated cases	FAO	Pre-selected cases
(3) Classification of pre-selected cases	Category parameters (biomes + types of forests)	FAO	Systemised pre-selected cases
(4) Evaluation and identification of exemplary cases (and cases with exemplary aspects)	Minimum criteria of exemplariness	1st meeting of Panel of Experts	Cases evaluated
(5) Selection of exemplary cases	Joint analysis of cases, reviewed by SFM components (social, environmental, economic, technical and managerial)	2nd meeting of Panel of Experts	Exemplary cases selected
(6) Field validation and documentation of exemplary cases	Verification of key criteria for exemplariness	Consultants. 3rd meeting of Panel of Experts	Exemplary cases selected, validated, and documented for publication



Regional workshop with experts from Central America, the Caribbean and Costa Rica

## Nominations and pre-selection

The call for nominations, coordinated from the Regional Office of FAO Latin America and the Caribbean (FAO-RLC), started in March 2008 and concluded in August the same year. All nominated cases were required to use the appropriate form.

A total 41 cases of SFM were nominated from the following countries: Argentina 1; Bolivia 3; Brazil 7; Colombia 1; Costa Rica 2; Chile 4; Ecuador 1; Guatemala 5; Guyana 1; Honduras 3; Mexico 4; Nicaragua 1; Peru 4; Dominican Republic 3; and Trinidad and Tobago 1.

Nominations were analyzed by the project's team which applied the negative criteria (Table 8) and those cases that complied with the minimum requirements were pre-selected. Six cases did not provide enough information for a full analysis according to the defined evaluation methodology.

**Table 8: Negative criteria for case selection**

1) The case is no longer operating i.e. the case does not continue today.
2) The execution time is less than five years since the start of the forest management. However, this shall not apply if the case has produced results or products or changes in the behaviour of communities and social organization.
3) The case does not meet legal requirements in its own country i.e. there is no forest management plan or document duly approved by the forest authority concerned.
4) The case information is incomplete i.e. if required information is not provided or omitted.
5) The case has not generated its own resources or does not have self-management guidelines i.e. the nomination does not provide convincing and/or additional information about indicators of financial self-management or future actions to enable the generation of resources for the sustainability of the management plan.
6) The land of the forest under management does not have clear ownership rights and/or there are conflicts generated by claims on it i.e. there is no security regarding land tenure or the project does not demonstrate the use of mechanisms to resolve conflicts or complaints related to land tenure.

Following the recommendations of the selection process, the 35 pre-selected cases were classified into groups based on the following parameters: a) Biome (Source: UNEP-ECLAC, 2001), and b) Forest type: native, agroforestry system (mixed) or plantation forest.

The result of this classification according to biome was as follows:

- **Subtropical broadleaf humid forest: 12 cases**
- **Tropical broadleaf humid forest: 11 cases**
- **Tropical and subtropical coniferous forest: 7 cases**
- **Tropical broadleaf dry forest: 1 case**
- **Subtropical broadleaf dry forest: 1 case**
- **Temperate broadleaf and mixed forest: 3 cases**

The nominations were then delivered to the members of the Panel for their evaluation.

## Formation of the Panel of Experts

The Panel of Experts was established after FAO-RLC consulted the COFLAC directors about potential candidates and terms of reference. The Panel was formed by eight members from the following countries and organizations: Argentina, Bolivia, Brazil, Cuba, Honduras, ACICAFOC (Central American Indigenous and Rural Coordinating Association of Community Agroforestry), CATIE, (Turrialba, Costa Rica), and Spain's Junta de Castilla y León.

### SECOND STAGE: Methodology, evaluation and selection

The process of evaluation by the Panel of Experts took two and a half months. Two meetings were held with the full participation of its members and the project technical team (including the head of forestry at FAO-RLC): the first at the beginning of the process (mid-September 2008 in Santiago, Chile) and the second at the end of the analysis of cases (in December 2008 in Panama City).

#### 1st meeting of the Panel

The general objective was to agree and coordinate the process of evaluation and selection of exemplary cases of SFM, the analysis methodology and the C&I proposed in the reference document for evaluation and selection of pre-selected nominations. The key results were:

- It was agreed that cases should be assessed with a focus on the process of SFM, using 11 minimum criteria of exemplariness. Indicators were defined for each of these criteria (most of which were contained in the list of C&I proposed in the reference document).
- There was consensus that the project should identify the exemplary aspects of nominated cases and select as "exemplary" those that meet more fully the components of SFM (social, environmental, economic, technical and managerial) according to the C&I proposed.
- The Panel agreed to consider cases that present some aspect or exceptional, original or innovative element in the management plan, regardless of whether the case qualifies as "exemplary" according to the classification. This was done to avoid rejecting cases with lessons that may arise from an outstanding aspect of the case. For this reason, the results of the evaluation by the Panel should generate three groups of cases: 1) Exemplary cases, 2) Case with exemplary or outstanding aspects/criteria and 3) Cases not selected.
- The Panel agreed to establish minimum criteria for exemplariness and their respective indicators to be scored by the following classification: good = 3; acceptable = 2; and not acceptable = 1. The following shorthand was also used: N = not enough information (has a value of 0, which is included in the calculation of the average of all criteria for the case), and NA = not applicable or irrelevant to the case study (not counted in the calculation of the average). Using this average, a value was obtained for each of the 11 minimum criteria, which enable the quantitative assessment of each case.

- However, the qualification of “exemplary case” or “with exemplary aspects” is obtained using the average of all the evaluations by the members of the Panel (at least three members evaluated each case). Therefore, the final selection of cases corresponded to the fifth stage of the process, which took place in the 2nd meeting of the Panel (see Table 7).
- There was consensus that the exceptional, innovative or original aspect of a case should be highlighted, using the indicator which qualifies this aspect based on the identification of cases with exemplary aspects. In order to highlight this exceptional, innovative or original aspect, the indicator is marked with an “asterisk.” What is “exceptional” is highlighted in the evaluation form, but the real average for the criteria is based on the weighting of all indicators, i.e. it would not alter the “rating” (“acceptable” or “not acceptable”) but highlights an exemplary aspect which deserves attention.
- It was noted that the weighting (score) is only a “help” for the evaluator to interpret cases, and the most important thing is the qualitative interpretation by the expert of the case after completing a comprehensive analysis of the exemplary aspects presented.
- The Panel noted that the project team developed an “evaluation form” that should be applied to every case reviewed by the members, which is comprised of the following categories: minimum criteria of exemplariness (11 criteria); indicator (73 indicators); score for each indicator; average value of the criteria and average score of the case.

The second criteria, quality of employment and labour safety, and its six indicators were not referred to at this stage of the nomination process, but rather in the last stage of validation in the field.

## 2nd meeting of the Panel

The second meeting of the Panel of Experts was held once the individual analysis of cases was completed by the Panel members. The general objective of the meeting was the conclusion of the evaluation process and laying the groundwork for the third phase (last stage of the selection process), corresponding to the field validation and documentation of the cases identified as exemplary.

Panel members presented their respective evaluation forms for each case and analysed each of them together, averaged the results and agreed on the results of the selection (including cases with exemplary aspects and cases not selected).

The Panel debated the quantitative results for each of the cases and the qualitative considerations noted by each expert on the basis of the general principles of exemplariness, replicability and weaknesses detected according to the information available.

The Project Coordinator designed a table for the results of the evaluation and selection of cases of SFM:

Case	Expert	Exemplary case (final average)	Case with exemplary aspects (final average)	Case not selected (final average)	Minimum criteria for exemplariness (average values)										Average		
					C1	C2	C3	C4	C5	C6	C7	C8	C9	C10			
	Eval. 1																
	Eval. 2																
	Eval. 3																

As a result of the first stage of the assessment, 25 cases were pre-selected as “exemplary” and 10 cases identified “with exemplary aspects.”



Meeting of the Ibero-American Panel of Experts

## THIRD STAGE: Field validation of exemplary cases

The 25 cases identified as candidates for exemplary cases by the Panel were validated and documented in the field as the last stage of the evaluation process. Field missions were carried out by the members of the Panel themselves, which saved time because they already knew the background of each case which helped to make the validation and documentation more efficient and effective.

Each consultant was given 3-4 cases depending on their geographic location and experience. To validate the level of compliance by the case, the consultant used the document "Field verifiers regarding the key criteria of exemplariness," which was presented by the technical team of the project and approved by the Panel. Moreover, in this stage the "Quality of Employment" criteria were considered with the corresponding indicators to be evaluated in the field.

Prior to the start of field work, the Project Coordinator gave the consultant all the information available about the case and contact people which could help the task of validation in the field. In addition, the Coordinator prepared a "Guide for validation of exemplary cases of sustainable forest management."

Field visits were made between August and October 2009.

### Validation process

The objectives of the field assessment were as follows:

1. Verify compliance with the minimum criteria of exemplariness, using as a reference the proposed indicators and methodology.
2. Assess the degree of compliance with Sustainable Forest Management in order to determine how the case includes and integrates the following components: environmental, social, economic, technical and managerial.

In order to apply the criteria and indicators (C&I), the consultants first had to define the type of information to collect in the field. The indicators used in each case considered the method to be used and material required for the evaluation (if necessary).

The table below shows a format of the information collected during the field evaluation:

<b>Component:</b>	Corresponds to one of the following SFM components (social, economic/financial, environmental, technical and managerial)
<b>Criteria:</b>	A category of conditions, processes or aspects used to assess sustainable forest management (or well managed forests).
<b>Indicator:</b>	Quantitative or qualitative parameter used to evaluate the criteria or component
<b>Verifier:</b>	Describes the way in which an indicator or its reference value is measured or proven in the field.
<b>Method</b>	Describes how to evaluate the verifier
<b>Place/Materials</b>	Indicates what equipment and/or materials is needed for the evaluation of the verifier

For the purposes of the study it was not necessary to consider in detail the demands normally associated with sampling. The emphasis of the evaluation was reflected in the approach used in the case nomination form versus its practical implementation, highlighting the exemplariness of the case and the lessons learned from the process of implementation of sustainable forest management.

Appendix 3 presents a series of verifiers and methods for assessing the standards for the 11 minimum criteria of exemplariness, grouped according to the components of SFM.

### **Proposed for assessing the degree of overall compliance with the Minimum Criteria of Exemplariness of SFM**

The Guide to Field Validation established a simple procedure to facilitate the assessment of compliance with the minimum criteria for SFM exemplariness and indicators which apply to the case. Following the format in the table of indicators, verifiers and methods (see Appendix 3), the consultant prepared for each case a spreadsheet to verify compliance with the criteria and respective indicators.

#### **a. Degree of compliance with each standard (or indicator):**

The “qualitative assessment” for each standard analyzed by the evaluator in each case, using as a reference the proposed verifiers, was conducted in accordance with the following nomenclature:

- **Meets the standard;**
- **Does not meet the standard;**
- **Not applicable or irrelevant (not computed for the percentage value of the criteria)**

## b. Value and degree of compliance:

By assigning a weight of 100% for each of the criteria, considering the number of standards, the percentage value was calculated according to the proportional relationship of standards that meet that criterion.

The degree of compliance of the criteria for each of the components of SFM, was defined under the following categories according to the ranges in the table:

Ranges of qualitative evaluation:

CATEGORY	RANGE OF COMPLIANCE (%)
Does not comply	1 - 30
Low	31 - 50
Good	51 - 80
Excellent	81 -100

## c. Compliance with SFM:

This is determined when the minimum criteria of exemplariness for each of the components of SFM (social, economic, environmental, technical and management) used to assess each case fall within the categories of "good" and "excellent."

Objectives of field documentation

For each case visited, additional information and practices or specific experiences were documented that showed it to be an "exemplary case."

The objectives of the field documentation were:

- To obtain additional information to that provided in the nomination form of the case.
- To develop the "key message" of the exemplary nature of the case by proving the aspects identified by the Panel of Experts in the field
- Contact local actors that make it possible to identify and document any anecdotes, experiences, and additional information to help develop the main message of the case and tell its story.

## 3rd meeting of the Panel

This last meeting, held in Brasilia, Brazil, on September 28-30, 2009, had the following objectives: finalize the selection process of SFM exemplary cases to be published in the book; generate the conclusions and recommendations of the evaluation process developed by the Panel of Experts and field validation and documentation for the selected cases; and define the next stage of the study for the purposes of generating lessons that help improve criteria and strengthen the implementation of policies and strategies for forest management in the countries of the region.

As a result of the meeting and the entire process of selection, 22 cases were agreed on by the Panel as exemplary and 13 as having exemplary aspects.

The meeting obtained the following results: 1) information and stories relating to exemplary cases were defined and agreed by Panel for the elaboration of this book; (2) the recommendations to be included in the book were determined; (3) recommendations on the format of the book and terms of reference for writing and editing (for example, the book's main message, the presentation of cases, and conclusions etc.); and (4) a general profile of the follow-up project and scope of the study of exemplary cases with defined goals and results to be achieved.

#### **FOURTH STAGE: Publication of the book**

A team was formed to be responsible for writing, editing, designing and laying out the book.

Promotional activities include events in Central America, the Caribbean and South America. These events aim to stimulate debate so that the conclusions and lessons learned from the cases analyzed are considered by those responsible for the management of forests at different levels of decision-making.

## Minimum Criteria of Exemplariness (MCE) and Indicators

MCE	INDICATOR
<b>SOCIAL COMPONENT</b>	
1. Contribution to local development and poverty reduction	1.1 Formation of human resources 1.2 Social programs for the local population 1.3 Social infrastructure projects 1.4 Local employment generation 1.5. Existence of mechanisms for benefit-sharing 1.6 Number of beneficiaries of forest management 1.7 Orientation towards long-term profitability and a positive rate of return from forest management
2. Quality of employment and workplace safety	2.1 Quality of employment (hours, incentives, social security) 2.2 Compliance with labour laws; absence of child labour 2.3. Trade union rights 2.4 Existence of rules and equipment suitable for safety in the workplace 2.5 Training in occupational safety 2.6 Employment stability
3. Mechanisms to resolve, or manage conflicts arising from forest management	3.1 Strategies or mechanisms in the resolution of conflicts over the use or ownership of forest/soil/subsoil 3.2 Existence of mechanisms and systems for the resolution of conflicts within the FMU and between linked or associated groups 3.3 Mechanisms of inclusion, gender equity and trans-generational vision 3.4 Existence in the management plan of risk assessments or environmental impact studies, as well as mitigation and compensation measures
4. Respect for rights, cultural diversity and local knowledge	4.1 Application of good practices and traditional knowledge in forest activities 4.2 Protection of cultural sites 4.3 Respect for cultural-spiritual identity and not contacted peoples 4.4 Evidence of long-term land use rights (for example: ownership of land, customary rights, concession contracts, etc.) 4.5 Local communities with legal or customary tenure or use have the necessary control of forestry operations to protect their rights or resources (unless this control is voluntarily delegated to other agencies) 4.6 Giving due attention to social issues surrounding the acquisition of land for plantations, especially the protection of the rights of the inhabitants in terms of tenure, access to land and the forest

MCE	INDICATOR
<b>ECONOMIC COMPONENT</b>	
5 Diversification of uses	5.1 Diversity of products and activities 5.2 Generation of value-added forest products 5.3. Management includes the production of various goods and services 5.4. Use of forest waste
6 Adding value to products and services of the forest	6.1 Generation of value-added forest products 6.2 Innovation in value chains 6.3. Management includes the production of various goods and services 6.4 Use of forest waste
<b>AMBIENTAL COMPONENT</b>	
7. Innovative conservation and protection mechanisms	7.1 Implementation of measures for the conservation of biodiversity in forests of production. (In the case of natural forest, consider indicators 7.2, 7.7 and 7.9; for forest plantations, consider indicators 7.3 and 7.4) 7.2. Implementation of measures to protect rare, threatened and endangered species of flora and fauna as well as their habitats (e.g. nesting or feeding areas) 7.3 Design and planning of plantations that promote the protection, restoration and conservation of natural forests 7.4. Design of the plantation includes a mix of stands of different ages and periods of rotation in relation to the size of the operation 7.5 Measures for soil conservation 7.6 Measures for the protection of water sources and waterways during management activities 7.7 Establishment of protection and conservation areas, according to the scale and intensity of forest management and according to the resources affected 7.8 Implementation of liquids and solid waste disposal systems in the framework of local regulations 7.9 Maintenance, increase or replenishment of vital ecological functions, which include: a) natural regeneration and the succession of forests; b) the genetic diversity of species and ecosystems; and, (c) natural cycles affecting the productivity of the forest ecosystem 7.10 Existence in the management plan of assessments of risks or environmental impact, as well as mitigation and compensation measures 7.11 Innovative partnerships between sectors for SFM 7.12. Fire management measures taken 7.13. Measures for management of pests and/or diseases (if possible, prevention and biological control methods are used instead of pesticides and fertilizers) 7.14. Measures against illegal logging and trade
8 Initiatives to enhance environmental benefits and valuation of environmental services	8.1 Implementation of applied research activities 8.2 Establishment of protection and conservation areas, according to the scale and intensity of forest management and according to the resources affected 8.3 Maintenance, increase or replenishment of vital ecological functions, which include: a) natural regeneration and the succession of forests; b) the genetic diversity of species and ecosystems; and, (c) natural cycles affecting the productivity of the forest ecosystem 8.4 Diversity of goods and services resulting from management 8.5 Application of low impact forest harvesting guidelines 8.6 Application of silvicultural practices consistent with the needs 8.7. Management considers valuation and production of various goods and services 8.8 Agreements and alliances with research and training centres

MCE	INDICATOR
<b>INSTITUTIONAL AND TECHNICAL COMPONENT</b>	
9 Diversity in management and organization processes	9.1 Existence of board of directors or equivalent and statutes 9.2. Existence of a plan of management approved by the competent authority, where appropriate 9.3 Participation of the community in decision-making 9.4 Mechanisms of inclusion, gender equity and trans-generational vision 9.5 Development of organizational and technical structures 9.6 Training activities and outreach at different levels 9.7 Agreements and alliances with research and training centres
10 Innovative partnerships	10.1 Agreements and alliances with research and training centres 10.2 Agreements and alliances with education centres 10.3 Innovative partnerships between sectors for SFM 10.4 Innovation in value chains
11 Innovative technical aspects of forest management	11.1 Implementation of strategies and measures for the restoration of the landscape 11.2 Adoption of management systems that promote the development and adoption of non-chemical methods for the control of pests, diseases and/or fertilization 11.3 Application of an adaptive management approach with a system of monitoring and adjustment mechanisms 11.4. Existence of a system of monitoring and assessment, incorporating the results in planning 11.5 Existence of sampling systems for monitoring of the forest growth 11.6 Application of silvicultural practices consistent with needs 11.7. Implementation of measures to maintain or improve the structure, fertility and biological activity of the soil 11.8. Management considers valuation and production of various goods and services 11.9. Use of forest waste



# APENDIX 3

## Indicators, verifiers and method for the field evaluation of exemplary cases, grouped by SFM components<sup>45</sup>

MCE	INDICATORS	VERIFIERS	METHOD
<b>SOCIAL COMPONENT</b>			
<b>1</b>	<b>1.1 Formation of human resources</b>	<p>1.1.1. Company employees (levels: technician, operator, unskilled workers) are trained to perform well in their activities</p> <p>1.1.2. Number of training activities in forestry and related productive activities</p> <p>1.1.3. Number of people who participated in training activities in forestry and related productive activities (in the last year / last 3 years)</p>	<ul style="list-style-type: none"> <li>• FMP - Training plan</li> <li>• Annual company reports (last 3 years)</li> <li>• Training event reports - list of participants and materials</li> <li>• Interview employees including technicians, operators, unskilled workers</li> </ul>
	<b>1.2 Social programmes for the local population</b>	<p>1.2.1 The company carries out social programs/ activities (in transport, education, health, production, recreation, sports, communication) that are of interest of the local population and benefit them</p> <p>1.2.2 Number of people from the local population who benefit from social programmes organized by the company (in the last 3 years)</p>	<ul style="list-style-type: none"> <li>• FMP - Social development or community support plan</li> <li>• Annual operating plans (last 3 years)</li> <li>• Annual company reports (last 3 years)</li> <li>• Material produced about social programmes/ activities</li> <li>• Documentation about the development of social programmes, including financial reports</li> <li>• Interview responsible from the company and members of the local population / neighbouring community</li> </ul>
	<b>1.3 Social infrastructure projects</b>	<p>1.3.1. Company invests in the installation and/or maintenance of infrastructure that benefits the community (e.g. public roads, schools, healthcare centres, child care centres, community well, drainage system, carpentry, centre for processing and/or storage of products etc.)</p> <p>1.3.2. Total amount invested in the community (in the last 3 years) in infrastructure (living rooms, bedrooms, bathrooms, kitchens), teaching, sports, or recreation equipment</p>	<ul style="list-style-type: none"> <li>• FMP - Social development or community support plan, Investment plan</li> <li>• Annual operating plans (last 3 years)</li> <li>• Annual company reports (last 3 years)</li> <li>• Purchasing and contracting services documentation</li> <li>• Annual company financial report (last 3 years)</li> <li>• On-site verification (projects or social programmes)</li> <li>• Interview responsible from the company and representatives of the community or population</li> </ul>
	<b>1.4 Local employment generation</b>	<p>1.4.1 Number of employees in the forest and industry (at technical, operator and unskilled levels) hired locally (people living in the locality or neighbouring community)</p> <p>1.4.2 Number of the local population benefited with indirect jobs (e.g. miscellaneous services, processing products, etc.)</p> <p>1.4.3. Total expenses of the company in the purchase or hiring of local inputs and services suppliers in the area</p>	<ul style="list-style-type: none"> <li>• Employee logs</li> <li>• Personnel pay stubs</li> <li>• Tax and commercial records</li> <li>• Sales contracts</li> <li>• Interviews with local authorities, owners of commercial establishments, people from the neighbouring community/local population</li> </ul>
	<b>1.5. Existence of mechanisms for profit-sharing</b>	<p>1.5.1. The company has defined and implemented mechanisms to distribute the profits generated by their operations among its employees/partners</p>	<ul style="list-style-type: none"> <li>• Statutes or rules of the company</li> <li>• Agreement of the Board of Directors</li> <li>• Agreements for use of forest products</li> <li>• Interview responsible for the company and representatives of the employees/partners (union, association)</li> </ul>
	<b>1.6 Number of beneficiaries of forest management</b>	<p>1.6.1. Total number of people in the community or local population who benefit directly or indirectly from forest management by the company</p>	<ul style="list-style-type: none"> <li>• Company's annual reports (last 3 years)</li> <li>• Statistics at the municipal level</li> <li>• Interviews with representatives of the community / neighbouring local population</li> </ul>
	<b>1.7 Orientation towards a positive rate of return of forest management and long-term profitability</b>	<p>1.7.1. The net income that the company receives for the sale of products and/or services from the forest is greater than the costs of management and is in line with expectations (comparison of actual results with results forecast)</p> <p>1.7.2. Income received by the company is increasing or remains at high levels</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• Annual company financial reports (last 3 years)</li> <li>• Documentation of costs and benefits of the company (for the most number of years possible)</li> <li>• Interview the person responsible for the management and administration staff</li> </ul>

<sup>45</sup>Abbreviations used: AHA = Annual Harvesting Area; FMA = Forest Management Area; FMP = Forest Management Plan

MCE	INDICATORS	VERIFIERS	METHOD
<b>SOCIAL COMPONENT</b>			
<b>2</b>	<b>2.1 Quality of employment (hours, incentives, social security)</b>	<p>2.1.1 The forest camp facilities are suitable: sufficiently spacious bedrooms, well ventilated, protected from rain, safe and located in a quiet site; clean and functioning sanitary facilities; clean kitchen, located away from deposits of rubbish; drinking water is collected in a clean place and then filtered or boiled</p> <p>2.1.2 Employees health is good: infrequency of diseases (such as dengue and malaria); annual medical check-ups (general, vision, hearing) for all employees; existence of a nursing assistant in the camp during field operations; existence of a small pharmacy with medicine to combat the most common diseases in the camp and other facilities</p> <p>2.1.3 Number of hours worked per week and duration and frequency of days off</p> <p>2.1.4 Bonus system not only relies on productivity, but also on the quality</p>	<ul style="list-style-type: none"> <li>• Rules or statutes of the company</li> <li>• Documentation (reports, statements, etc.) relevant to the conditions of employment by the company</li> <li>• In-situ verification</li> <li>• Interviews with employees of the company at various levels</li> </ul>
	<b>2.2 Compliance with labour; laws absence of child labour</b>	<p>2.2.1 The company pays all benefits in accordance with labour laws</p> <p>2.2.2 The company does not employ children under age</p>	<ul style="list-style-type: none"> <li>• Country's labour legislation</li> <li>• Personnel payroll</li> <li>• Interviews with employees of the company at various levels</li> <li>• Verification in situ (camp and forestry operation areas)</li> </ul>
	<b>2.3. Trade union rights</b>	<p>2.3.1 The company recognizes and values the participation of employees in trade union movements and the rights afforded to these by law</p>	<ul style="list-style-type: none"> <li>• Statutes or rules of the company</li> <li>• Interview representatives of trade union movements, employees and the company</li> </ul>
	<b>2.4 Existence of rules and equipment suitable for safety in the workplace</b>	<p>2.4.1. The company implements standards or procedures to ensure the safety and health of employees at various levels (technical, operator, unskilled worker)</p> <p>2.4.2 Field staff owns and uses helmet, boots with steel toes and appropriate clothing (in accordance with the rules of the company)</p> <p>2.4.3 The chainsaw and machinery operators possess and use helmet with visual and auditory protection</p> <p>2.4.4 A vehicle is permanently available near the operations in the field in case of accident</p> <p>2.4.5. The company has ways to ensure employees comply with the legislation in force</p> <p>2.4.6 Field staff participates in meetings with those responsible for operations and their criticisms and suggestions are discussed openly</p> <p>2.4.7 The company keeps a record of accidents as part of an awareness campaign</p>	<ul style="list-style-type: none"> <li>• Rules or procedures for worker safety</li> <li>• Reports by work teams and team meetings</li> <li>• Verification in situ (camp and forestry operation areas)</li> <li>• Interview with employees of the company at various levels</li> <li>• Accident statistics (also applies to indicator 2.5)</li> </ul>
	<b>2.5 Training in occupational safety</b>	<p>2.5.1 Hazardous equipment operators (chainsaws and heavy machinery) and those who work with chemicals are trained to operate them and are trained in first aid</p> <p>2.5.2 Employees are informed about the dangers in difficult or dangerous situations and how to proceed in case of accidents at work</p> <p>2.5.3 The person responsible for safety at work is permanently available in the forest during field operations: there are warning signs or informational boards in logging and machinery traffic areas; a vehicle is always available near the operations in the field for accident cases; field teams carry first aid kits</p>	<ul style="list-style-type: none"> <li>• FMP - Training plan</li> <li>• Rules or procedures of the company on occupational safety</li> <li>• Company's annual reports (last 3 years)</li> <li>• Training event reports - list of participants in events and materials used in training</li> <li>• In-situ verification</li> <li>• Interview the person responsible for safety at work and employees at all levels</li> </ul>

MCE	INDICATORS	VERIFIERS	METHOD
<b>SOCIAL COMPONENT</b>			
2	<b>2.6 Employment stability</b>	2.6.1. The company looks to reduce forest employee turnover and offers conditions for greater employment stability 2.6.2 A percentage of employees are hired locally and kept for more than a year in the company	<ul style="list-style-type: none"> <li>Company's annual reports (last 3 years)</li> <li>Staff</li> <li>Company statistics</li> <li>Interview employees [at different levels]</li> </ul>
3	<b>3.1 Strategies or mechanisms in the resolution of conflicts over forest use/property rights/ soil / subsoil</b>	3.1.1. The company and the local population have defined strategies or make use of formal and/or informal mechanisms that allow them to negotiate and to resolve disputes over rights of use or ownership of the forest/ground/subsoil	<ul style="list-style-type: none"> <li>Documentation [e.g. Board of Directors agreement, Assembly agreement] of negotiation and conflict resolution</li> <li>Interview the person responsible and representatives/leaders of trade unions [associations]</li> </ul>
	<b>3.2. Existence of mechanisms and systems for the resolution of conflicts within the UMF and between related groups</b>	3.2.1. The company and the community or local population maintain regular communication channels to develop relationships and discuss how to resolve potential conflicts between parties or third parties 3.2.2 Professionals or persons duly prepared to contribute to dialogue and resolution of conflicts are used when necessary	<ul style="list-style-type: none"> <li>FMP</li> <li>Rules or guidelines of the company</li> <li>Interview responsible for the company and the staff responsible for social aspects as well as leaders and other members of the community or neighbouring population</li> </ul>
	<b>3.3 Mechanisms of inclusion, gender equity and transgenerational vision</b>	3.3.1. Women, the young and elderly are represented in meetings and participate in discussions 3.3.2. Women have equal opportunity to be employed in the different productive activities of the company 3.3.3 There is an established system to incorporate women in the process of planning and decision-making 3.3.4 For indigenous communities, their customs are respected regarding the issue of gender according to their cultural context 3.3.5 There are initiatives to incorporate youth in management, as part of a training process	<ul style="list-style-type: none"> <li>Minutes of meetings</li> <li>Company payroll</li> <li>Interview with person responsible and women, youth, children and the elderly in the local population or neighbouring indigenous community</li> </ul>
	<b>3.4 Existence in the management plan of assessments of risks or environmental impact, as well as mitigation and compensation measures</b>	3.4.1. The main environmental impact risks of forest management operations have been identified 3.4.2 Mitigation and compensation measures for the major environmental impact risks are defined 3.4.3. The company has a FMP that guides annual activities	<ul style="list-style-type: none"> <li>FMP</li> <li>Relevant documentation [e.g., study of environmental impact, regulations or guidelines]</li> <li>Annual operating plans (last 3 years)</li> <li>Company's annual reports (last 3 years)</li> <li>In-situ verification</li> <li>Interview the person responsible, technical staff, leaders of the community or neighbouring local population and/or the applicable public organization.</li> </ul>
4	<b>4.1 Application of good practices and knowledge in forest activities</b>	4.1.1. The company knows and incorporates best practices and traditional knowledge applied by communities or local populations in its forest activities 4.1.2 Mechanisms exist to recover traditional knowledge that the company is incorporating in their activities 4.1.3. The company has defined best practices for forest management	<ul style="list-style-type: none"> <li>FMP and other planning, management and control documents</li> <li>Statutes or other documentation relevant to the company (including records of the Board of Directors)</li> <li>In-situ verification</li> <li>Interview technical personnel and operators (particularly botanical identifiers) and members of the community or neighbouring population (older adults in particular, church members and people who work with health and education)</li> </ul>
	<b>4.2 Protection of cultural sites</b>	4.2.1. The company has identified and protects sites of cultural value in the FMA	<ul style="list-style-type: none"> <li>FMP and other planning documents</li> <li>Maps of the FMA and at the level of AHA with the location of cultural sites</li> <li>Company's annual reports (last 3 years)</li> <li>In-situ verification (with the help of logging maps in the AHA)</li> <li>Interview field staff</li> </ul>
	<b>4.3 Respect cultural-spiritual identity of local people and not contacted peoples</b>	4.3.1. The company provides conditions for employees or people from neighbouring communities linked to the company to maintain their cultural-spiritual identity 4.3.2. No signs of discrimination or marginalization by the company for reasons of race, creed or social position are detected	<ul style="list-style-type: none"> <li>Statutes or other documentation relevant to the company (including records of the Board of Directors)</li> <li>Interview field personnel of the company and members of the community or neighbouring local population</li> </ul>

MCE	INDICATORS	VERIFIERS	METHOD
<b>SOCIAL COMPONENT</b>			
4	4.4 Evidence of long-term land use rights (for example: ownership of land, customary rights, concession contracts, etc.)		<ul style="list-style-type: none"> <li>Documents recognized by the national authorities / locals demonstrate their long-term right to the land</li> </ul>
	4.5 Communities with legal or customary land tenure or use maintain the necessary control over the forestry operations to protect their rights or resources (unless this control is voluntarily delegated to third parties with adequate knowledge)		<ul style="list-style-type: none"> <li>Community FMP</li> <li>Relevant documentation</li> <li>Interview with leaders of the community, local authorities and, if applicable, third parties (businesses, NGOs, etc.) related to forest management by community</li> </ul>
	4.6 Giving due attention to social issues related to the acquisition of land for plantations, especially the protection of the rights of the inhabitants of the town in terms of access to land and forest		<ul style="list-style-type: none"> <li>Planting FMP</li> <li>Relevant documentation</li> <li>Interview responsible in the company and leaders of the neighbouring local population</li> </ul>
<b>ECONOMIC COMPONENT</b>			
5	5.1 Diversity of goods and services resulting from management	5.1.1 Number of products extracted (timber, wood waste left by harvesting, non-timber products) 5.1.2 Number of species extracted 5.1.3 Number of services provided (i.e.: ecotourism, lodging, recreation, etc.) 5.1.4 Costs and benefits of the use of various products and services and their distribution (who incurs the costs and receives benefits)	<ul style="list-style-type: none"> <li>FMP</li> <li>Annual operating plans (last 3 years)</li> <li>Company's annual reports (last 3 years)</li> <li>Statistics on production and marketing of the company</li> <li>Relevant accounting documentation, e.g.: on the origin of products, the sale of products or services (tax receipts or invoices)</li> <li>Interview the person responsible for management (e.g. reasons to diversify) and administrative personnel</li> </ul>
	5.2 Generation of value-added forest products	5.2.1 Number of manufacturing processes of products extracted 5.2.2 Proportion of added value to raw material extracted from the forest, considering the company's direct responsibility 5.2.3 Multiplication factor of added value on the value paid for forest products (considering only the company's responsibility or third parties)	<ul style="list-style-type: none"> <li>FMP</li> <li>Annual operating plans (last 3 years)</li> <li>Company's annual reports (last 3 years)</li> <li>Statistics on production and marketing of the company</li> <li>Relevant accounting documentation</li> <li>In-situ verification (processing plant)</li> <li>Interview the person responsible for the management, administration and technical staff</li> </ul>
	5.3. Management includes recovery and production of various goods and services		<ul style="list-style-type: none"> <li>FMP</li> <li>Company's annual reports (last 3 years)</li> <li>In-situ verification</li> <li>Interview person responsible and technical staff</li> </ul>
	5.4. Use of forest waste (also applicable to criteria 6)	5.4.1 Quantification of harvesting waste (such as remains of branches, stumps and logs) for use in secondary manufacturing processes or as a source of energy 5.4.2 Percentage of extracted wood that is actually used by the company 5.4.3 Analysis of costs and returns of the use of forest waste 5.4.4. Assessment of impacts of the use of forest waste	<ul style="list-style-type: none"> <li>FMP</li> <li>Annual operating plans (last 3 years)</li> <li>Company's annual reports (last 3 years)</li> <li>Relevant documentation (studies, assessments)</li> <li>In-situ verification (extraction areas, log piles, processing plants)</li> <li>Interviews with technical staff of the company (e.g. reasons to harvest waste, use of waste)</li> </ul>
6	6.1 Generation of value-added forest products	6.1.1 Number of manufacturing processes of products extracted 6.1.2 Proportion of added value to raw material extracted from the forest, considering the company's direct responsibility 6.1.3 Multiplication factor of added value on the value paid for forest products (considering only the company's responsibility or third parties)	<ul style="list-style-type: none"> <li>FMP</li> <li>Annual operating plans (last 3 years)</li> <li>Company's annual reports (last 3 years)</li> <li>Statistics on production and marketing of the company</li> <li>Relevant accounting documentation</li> <li>In-situ verification (processing plant)</li> <li>Interview the person responsible for the management, administration and technical staff</li> </ul>
	6.2 Innovation in value chains	6.2.1 Processed product lines using lesser known commercial species 6.2.2 Processed product lines using forest waste 6.2.3 Processed product lines derived from non-wood resources: e.g. oil extracts, resins, fruit, shells, leaves	<ul style="list-style-type: none"> <li>FMP</li> <li>Annual operating plans (last 3 years)</li> <li>Company's annual reports (last 3 years)</li> <li>In-situ verification (processing plant)</li> <li>Interview the person responsible for the management and technical personnel</li> </ul>

MCE	INDICATORS	VERIFIERS	METHOD
<b>ECONOMIC COMPONENT</b>			
6	<b>6.3. Management includes valuation and production of various goods and services</b>		<ul style="list-style-type: none"> <li>• FMP</li> <li>• Company's annual reports (last 3 years)</li> <li>• In-situ verification</li> <li>• Interview person responsible and technicians of the company</li> </ul>
	<b>6.4 Use of forest waste</b>	<p>6.4.1 Quantification of harvesting waste (such as remains of branches, stumps and logs) for use in secondary manufacturing processes or as a source of energy</p> <p>6.4.2 Percentage of extracted wood that is actually used by the company</p> <p>6.4.3 Analysis of costs and returns of the use of forest waste</p> <p>6.4.4 Assessment of impacts of the use of forest waste</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• Relevant documentation (studies, assessments)</li> <li>• In-situ verification (extraction areas, log piles, processing plants)</li> <li>• Interviews with technical staff of the company (e.g. reasons to harvest waste, use of waste)</li> </ul>
<b>ENVIRONMENTAL COMPONENT</b>			
7	<b>7.1 Implementation of measures for the conservation of biodiversity in production forests: For natural forest, see indicators 7.2, 7.7 and 7.9; for forest plantations, see indicators 7.3 and 7.4.</b>		<ul style="list-style-type: none"> <li>• FMP</li> <li>• The FMA with the results of the micro-zoning map</li> <li>• In-situ verification</li> <li>• Interview technical staff of the company</li> </ul>
	<b>7.2 Implementation of measures to protect rare, threatened and endangered species of flora and fauna as well as their habitats (e.g. nesting or feeding areas)</b>	<p>7.2.1 Occurrence of groups of species of wild fauna in the FMA</p> <p>7.2.2 Registration of sites and habitats included in the forest census (inventory at 100%) and protected during harvesting operations</p> <p>7.2.3 Map of endangered and protected tree species documented and existence of measures to prevent these from being cut or damaged during harvest operations</p> <p>7.2.4 Criteria exist for the protection of species of low population density</p> <p>7.2.5 Species and habitats with high conservation value and/or at risk are identified</p>	<ul style="list-style-type: none"> <li>• FMP and other planning documents</li> <li>• Rules or guidelines of the company</li> <li>• List rare, threatened and endangered species of flora and fauna</li> <li>• Company's annual reports (last 3 years)</li> <li>• Database system for monitoring</li> <li>• In-situ verification (with help of forest census data and logging maps from the AHA)</li> <li>• Interview with operator and technical staff (mainly botanical identifiers) of the company</li> </ul>
	<b>7.3 Design and planning of plantations that promote the protection, restoration and conservation of natural forests</b>	<p>7.3.1 Planting does not take place in areas where there is natural primary or secondary forest</p> <p>7.3.2 The design and planning of plantations relies on a zoning plan of the area</p> <p>7.3.3 Planting promotes the protection and conservation of natural forests, in particular areas rich in biodiversity</p> <p>7.3.4 The plantation area has wildlife corridors with native vegetation</p> <p>7.3.5 Measures for the protection of key species and special habitats</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Maps of the FMA with the results of the micro-zoning</li> <li>• Rules or guidelines of the company</li> <li>• In-situ verification</li> <li>• Interview technical staff of the company</li> </ul>
	<b>7.4. Design of the plantation includes a mix of stands of different ages and periods of rotation in relation to the size of the operation</b>	<p>7.4.1. In medium to large scale operations the planted area is not uniform (same species of the same age), it consists of a mix of stands of different ages and periods of rotation</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Maps from the FMA</li> <li>• Rules or guidelines of the company</li> <li>• In-situ verification</li> <li>• Interview with technicians from the company</li> </ul>
	<b>7.5 Measures for soil conservation</b>	<p>7.5.1. Erosion and other forms of soil degradation are minimized by the company</p> <p>7.5.2 Roads (primary, secondary) are constructed following standards or technical guidelines developed or adopted by the company</p> <p>7.5.3 Roads to be used during the rainy season are protected to prevent their deterioration and erosion</p> <p>7.5.4. Erosion of roads does not cause a significant impact on their quality</p> <p>7.5.5 Towed machinery travels on specially signposted lanes or roads</p> <p>7.5.6 Logs are hauled raised up at one end</p> <p>7.5.7. Out of use earthmoving machinery moves with the shovel raised in order not to remove the organic layer from the surface</p>	<ul style="list-style-type: none"> <li>• FMP and other planning documents</li> <li>• Rules or guidelines of the company</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• In-situ verification</li> <li>• Interview responsible for the company and its technical staff and field</li> </ul>

MCE	INDICATORS	VERIFIERS	METHOD
<b>ENVIRONMENTAL COMPONENT</b>			
<b>7</b>	<b>7.6 Measures for the protection of water sources and waterways</b>	<p>7.6.1 Roads include construction of culverts and bridges, where necessary, avoiding blocking waterways</p> <p>7.6.2. As a consequence of the construction and use of roads, no water courses are blocked, dammed or vegetation submerged</p> <p>7.6.3. There is no evidence of obstruction of watercourses and springs by log hauling lanes or roads</p>	<ul style="list-style-type: none"> <li>• FMP and other planning documents</li> <li>• Rules or guidelines of the company</li> <li>• Company's annual reports (last 3 years)</li> <li>• In-situ verification</li> <li>• Interview responsible for the company and technical and field staff</li> </ul>
	<b>7.7 Establishment of zones of protection and conservation, according to the scale and intensity of forest management and according to the affected resources</b>	<p>7.7.1. The protection and conservation areas appear clearly marked in the maps of the FMA</p> <p>7.7.2. The protection and conservation areas are marked in the field</p> <p>7.7.3. The protection and conservation areas show no evidence of felled trees or signs of extraction (stumps, logs left) or hauling tracks</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Map of the FMA and AHA with the micro-zoning information</li> <li>• Standards or policies of the company</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• In-situ verification (based on logging maps)</li> </ul>
	<b>7.8 Implementation of liquid and solid waste disposal systems in the framework of local regulations</b>	<p>7.8.1. The personnel of the company knows and implements the measures taken by the company regarding waste disposal</p> <p>7.8.2 Instructions are clearly visible at all waste disposal locations</p> <p>7.8.3. The waste produced in the forest is collected, destroyed or adequately stored outside of the forest</p> <p>7.8.4 Solid waste is properly packed and broken down</p> <p>7.8.5 Non-organic waste (plastic, glass, metal and paper) produced in the forest and the camp are collected and deposited correctly</p> <p>7.8.6 Residues of hazardous chemicals and packaging of these products are stored within the company area in containers to avoid contact with the ground</p> <p>7.8.7 Fuels and lubricants are handled and stored properly, as described in the instructions</p> <p>7.8.8 Used oil from equipment and vehicles is emptied into an appropriate container and never on to the soil</p> <p>7.8.9 Log waste leftover is deposited on the edges of the lumberyard</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Standards or policies of the company</li> <li>• In-situ verification (camp, waste deposits, roads, lumberyards, places of collection and disposal of waste, treatment or recycling of garbage, etc.)</li> <li>• Interviews with company staff</li> </ul>
	<b>7.9 Maintenance, increase or replenishment of vital ecological functions including: (a) natural regeneration and the succession of forests; (b) the genetic diversity of species and of ecosystems; and, (c) natural cycles affecting the productivity of the forest ecosystem</b>	<p>7.9.1 Percentage of forest area impacted by forest harvesting: estimated in accordance with the area opened up by felled trees and hauling lanes</p> <p>7.9.2 Representation of forest types in protected areas: percentage of representative ecosystems of the natural landscape areas placed on protection (minimum of 5% of the management area)</p> <p>7.9.3 Seed trees are clearly identified, marked and protected</p> <p>7.9.4 Regeneration processes are monitored in harvested areas</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Rules or guidelines of the company</li> <li>• Relevant documents (reports, studies, assessments)</li> <li>• In-situ verification</li> <li>• Interview technical and field staff</li> </ul>
	<b>7.10 Existence in the management plan of assessments of risks or environmental impact, as well as mitigation and compensation measures</b>	<p>7.10.1 Identified the main environmental impact risks of forest management operations.</p> <p>7.10.2 Defined mitigation and compensation measures for the major environmental impact risks</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Relevant documentation (e.g. study of environmental impact, regulations or guidelines)</li> <li>• Annual operating plans (last 3 years)</li> <li>• Interview technical personnel of the company</li> </ul>
	<b>7.11 Innovative partnerships between sectors for SFM</b>	<p>7.11.1 There are agreements with other companies, communities or other types of entities to plan and/or develop and evaluate processes, technologies or activities that contribute to increased profitability and that result in less environmental or social impact of SFM</p>	<ul style="list-style-type: none"> <li>• Agreements or other appropriate documentation</li> <li>• Material documenting the type of process, technology or activity in the partnership</li> <li>• Progress reports</li> </ul>

MCE	INDICATORS	VERIFIERS	METHOD
<b>ENVIRONMENTAL COMPONENT</b>			
<b>7</b>	<b>7.12. Fire prevention/control measures</b>	<p>7.12.1. The company has a plan of fire prevention and/or standards or guidelines</p> <p>7.12.2 There is a team of people trained to fight fires and with the necessary equipment or tools</p> <p>7.12.3. The company maintains belts of dense vegetation around the FMA or established strips of vegetation along the edges of the FMA and keeps them clear during the dry period</p> <p>7.12.4. The company holds meetings with the community or neighbouring local population (particularly farmers or ranchers) during the preparation of the area and the maintenance of pastures, to guide them on care related to intentional fires</p> <p>7.12.5 Warning signs have been placed on the limits of the FMA about the dangers of flammable materials that could cause fires</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• Plan, standards or guidelines for the prevention and control of fires</li> <li>• Documentation of training events (list of participants, material used)</li> <li>• In-situ verification (fire fighting equipment, warning signs, etc.)</li> <li>• Interviews with staff of the company and the community or local population (about their knowledge or whether they receive adequate information on fire prevention and control)</li> </ul>
	<b>7.13. Measures for management of pests and/or diseases (if possible, prevention and biological control methods are used instead of pesticides and fertilizers)</b>	<p>7.13.1 Uses biological methods of prevention and control to manage pests and/or diseases in the area under management</p> <p>7.13.2 When pesticides are used to control pests or diseases, they are legally permitted and employ standards or measures of prevention and safety recommended by legislation and those defined by the company</p>	<ul style="list-style-type: none"> <li>• Rules or guidelines of the company</li> <li>• Company's annual reports (last 3 years)</li> <li>• In-situ verification (planting, storage areas, camp sites)</li> <li>• Interview the person responsible and technical and field staff</li> </ul>
	<b>7.14. Measures taken against illegal harvesting and trade</b>	<p>7.14.1 The limits of the FMA, as well as the road network, are regularly patrolled</p> <p>7.14.2 Warning signs are placed in multiple strategic points of the FMA</p> <p>7.14.3 There is some kind of agreement or arrangement with the neighbours of the FMA to assist in the detection and/or control of illegal activities by third parties</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Company's annual reports (last 3 years)</li> <li>• In-situ verification</li> <li>• Interview person responsible and technical and field staff, as well as members of the community or neighbouring population</li> </ul>
<b>8</b>	<b>8.1 Implementation of applied research activities</b>	<p>8.1.1. The company carries out or supports research (studies) for a more efficient implementation of management operations resulting in lower impact</p> <p>8.1.2. Number of studies (research) performed by the company or that the company supported in the FMA</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Annual operating plans (last 3 years)</li> <li>• Reports (last 3 years) plan</li> <li>• Documentation (proposals, progress reports, publications) on studies or research supported by the company</li> <li>• In-situ verification</li> <li>• Interview technical manager of the company, personnel and external agencies involved</li> </ul>
	<b>8.2 Establishment of zones of protection and conservation, according to the scale and intensity of forest management and according to the affected resources</b>	<p>8.2.1. The protection and conservation areas appear clearly marked in the maps of the FMA</p> <p>8.2.2. The protection and conservation areas are marked in the field</p> <p>8.2.3. The protection and conservation areas show no evidence of felled trees or signs of extraction (stumps, logs left) or hauling tracks</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Map of the FMA and AHA with micro-zoning information</li> <li>• Standards or policies of the company</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• In-situ verification (based on logging maps)</li> </ul>
	<b>8.3 Maintenance, increase or replenishment of vital ecological functions including: (a) natural regeneration and the succession of forests; (b) the genetic diversity of species and of ecosystems; and, (c) natural cycles affecting the productivity of the forest ecosystem</b>	<p>8.3.1 Percentage of forest area impacted by forest harvesting: estimated in accordance with the area opened up by felled trees and hauling lanes</p> <p>8.3.2 Representation of forest types in protected areas: percentage of representative ecosystems of the natural landscape areas placed on protection (minimum of 5% of the management area)</p> <p>8.3.3 Seed trees are clearly identified, marked and protected</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Rules or guidelines of the company</li> <li>• Relevant documents (reports, studies, assessments)</li> <li>• In-situ verification</li> </ul>

MCE	INDICATORS	VERIFIERS	METHOD
<b>ENVIRONMENTAL COMPONENT</b>			
<b>8</b>	<b>8.4 Diversity of goods and services resulting from management</b>	8.4.1. Number of products extracted (timber, wood waste left by harvesting, non-timber products) 8.4.2 Number of species extracted 8.4.3. Number of services provided (i.e.: ecotourism, lodging, recreation, etc.) 8.4.4 s and benefits of the use of various products and services and their distribution (who incurs the costs and receives benefits)	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• Statistics on production and marketing of the company</li> <li>• Relevant documentation, e.g. on the origin of products, the sale of products or services (tax receipts or invoices)</li> <li>• Interview the person responsible for management (e.g. reasons to diversify) and personnel of the company</li> </ul>
	<b>8.5 Application of low impact forestry guidelines</b>		<ul style="list-style-type: none"> <li>• Rules or guidelines of the company</li> <li>• In-situ verification</li> <li>• Interview with head of the company, and technical and field staff</li> </ul>
	<b>8.6 Application of silvicultural practices consistent with needs</b>	8.6.1 Silvicultural treatments are planned and tested (such as cutting branches after harvesting, cleaning up the undergrowth, selective logging, enrichment plantations, management of natural regeneration)	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Company's annual reports (last 3 years)</li> <li>• Relevant documentation</li> <li>• In-situ verification</li> <li>• Interview technical and field staff</li> </ul>
	<b>8.7. Management includes valuation and production of various goods and services</b>		<ul style="list-style-type: none"> <li>• FMP</li> <li>• Company's annual reports (last 3 years)</li> <li>• In-situ verification</li> <li>• Interview person responsible and technical personnel</li> </ul>
	<b>8.8 Agreements and alliances with research and training centres</b>	8.8.1. Number of agreements or alliances between the company and an external institution to develop research and training activities 8.8.2 Total invested by the company in research and training activities carried out in agreement or partnership with other institutions (in the past three years)	<ul style="list-style-type: none"> <li>• Conventions or other formal documents</li> <li>• Reports of the company or other documentation describing the agreements or alliances established</li> <li>• Reports of activities of the company, including financial reports (last 3 years)</li> <li>• Interview the person responsible for the company and those responsible for training and research centres (e.g. results, improvements, benefits of a partnership, level of commitments)</li> </ul>
<b>TECHNICAL AND MANAGERIAL COMPONENT</b>			
<b>9</b>	<b>9.1 Existence of Board of Directors or equivalent and statutes</b>		<ul style="list-style-type: none"> <li>• Records with resolutions of the Board of Directors</li> <li>• Statutes of the company</li> </ul>
	<b>9.2. Existence of an existing management plan approved by the competent authority, where appropriate</b>	9.2.1 Forest Management Plan (FMP) approved and valid 9.2.2 Annual Operating Plan (AOP) for the current or previous year's harvest approved	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Annual operating plans (current or previous harvest)</li> <li>• Consulting forestry authority records (via the Internet, if possible)</li> </ul>
	<b>9.3 Participation of the community in decision-making</b>	9.3.1 There are effective mechanisms for regular communication between the company and the neighbours (e.g. meetings with the community, regular visits of an employee of the company to the community) 9.3.2 Protocols and agreements of the issues are duly signed by the representatives of the community and the company	<ul style="list-style-type: none"> <li>• Protocols and agreements</li> <li>• Records with resolutions of the Board of Directors</li> <li>• Minutes of community meetings</li> <li>• Interview members of the community or local population (Information about their activities and problems, respect and appreciation for their contributions)</li> </ul>
	<b>9.4 Mechanisms of inclusion, gender equity and trans-generational vision</b>	9.4.1 Women, young and the elderly are represented in the meetings and participate in discussions 9.4.2 Women have equal opportunity to be employed in the different productive activities of the company 9.4.3 There is an established system to incorporate women in the planning process and decision-making 9.4.4 The customs of indigenous communities are respected regarding the issue of gender according to their cultural context 9.4.5 There are initiatives to incorporate youth in management, as part of a training process	<ul style="list-style-type: none"> <li>• Minutes of meetings</li> <li>• Company payroll</li> <li>• Interview with relevant personnel and women, youth, children and the elderly in the local population or neighbouring indigenous community</li> </ul>

MCE	INDICATORS	VERIFIERS	METHOD
<b>TECHNICAL AND MANAGERIAL COMPONENT</b>			
9	<b>9.5 Development of organizational and technical structures</b>	9.5.1. The company invests in technical and organisational structures to improve productivity 9.5.2 Amount spent by the company on infrastructure (meeting rooms, warehouses, laboratories, etc.)	<ul style="list-style-type: none"> <li>• FMP – Investment plan</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• Documentation related to purchasing and services</li> <li>• Annual company financial reports (last 3 years)</li> <li>• In-situ verification</li> <li>• Interview the person responsible for the company</li> </ul>
	<b>9.6 Training and outreach activities at different levels</b>	9.6.1 Type and number of training events organized by the company (in the last 3 years) 9.6.2 Number of employees (at the technical, operator and unskilled levels) who participated in training events (in the last 3 years)	<ul style="list-style-type: none"> <li>• FMP – Training plan</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• Training event reports - lists of participants in events, materials, etc.</li> </ul>
	<b>9.7 Agreements and alliances with research and training centres</b>	9.7.1. Number of agreements or alliances between the company and an external institution to develop research and training activities 9.7.2 Total invested by the company in research and training activities carried out in agreement or partnership with other institutions (in the past three years)	<ul style="list-style-type: none"> <li>• Agreements or other formal documents</li> <li>• Reports of the company or other documentation describing the agreements or alliances established</li> <li>• Reports of activities of the company, including financial reports (last 3 years)</li> <li>• Interview the person responsible for the company and those responsible for training and research centres (e.g. results, improvements, benefits of a partnership, level of commitments)</li> </ul>
10	<b>10.1 Agreements and alliances with centres for training and research [see CME 9]</b>	10.1.1. Number of agreements or alliances between the company and an external institution to develop research and training activities 10.1.2 Total invested by the company in research and training activities carried out in agreement or partnership with other institutions (in the past three years)	<ul style="list-style-type: none"> <li>• Agreements or other formal documents</li> <li>• Reports of the company or other documentation describing the agreements or alliances established</li> <li>• Reports of activities of the company, including financial reports (last 3 years)</li> <li>• Interview the person responsible for the company and those responsible for training and research centres (e.g. results, improvements, benefits of a partnership, level of commitments)</li> </ul>
	<b>10.2 Agreements and alliances with education centres</b>	10.2.1 The company cares about improving the level of education of its staff	<ul style="list-style-type: none"> <li>• Mechanism implemented to improve education of personnel and their families</li> </ul>
	<b>10.3 Innovative partnerships between sectors for SFM</b>	10.3.1 Agreements with other companies, communities, or other entities to plan and/or develop and evaluate processes, technologies or activities that contribute to increased profitability and result in less environmental or social impact of SFM	<ul style="list-style-type: none"> <li>• Agreements or other appropriate documentation</li> <li>• Material documenting the type of process, technology or activity occurs in the partnership</li> <li>• Progress reports</li> </ul>
	<b>10.4 Innovation in value chains</b>	10.4.1 Processed product lines using lesser known commercial species 10.4.2 Processed product lines using forest waste 10.4.3 Processed product lines derived from non-wood resources: e.g. oil extracts, resins, fruit, shells, leaves	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• In-situ verification (processing plant)</li> <li>• Interview the person responsible for the management and technical personnel</li> </ul>
11	<b>11.1 Implementation of strategies and measures for the restoration of the landscape</b>	11.1.1 Identification and assessment of areas to restore 11.1.2 Species and restoration techniques 11.1.3 Extension of the area restored (considering the density or minimum vegetation cover)	<ul style="list-style-type: none"> <li>• FMP and other documents for planning (including diagnostics or field studies)</li> <li>• The FMA map with the location of areas to be restored</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• Rules or guidelines of the company</li> <li>• In-situ verification</li> <li>• Interview the person responsible for the company and its technical personnel</li> </ul>

MCE	INDICATORS	VERIFIERS	METHOD
<b>TECHNICAL AND MANAGERIAL COMPONENT</b>			
<b>11</b>	<b>11.2 Adoption of management systems that promote the development and adoption of non-chemical methods for the control of pests, diseases and/or fertilization</b>	<p>11.2.1 Biological methods used to combat pests and diseases</p> <p>11.2.2 The use of organic fertilizers is favoured in establishing and managing plantations</p> <p>11.2.3 Species that are not susceptible to pests and diseases present in the area have been chosen</p> <p>11.2.4 Planting strategies have been used to help prevent or control the occurrence of pests and diseases (e.g. planting trees of different ages, mixing different species or plantations with natural vegetation)</p>	<ul style="list-style-type: none"> <li>• FMP or other planning documents</li> <li>• Company's annual reports (last 3 years)</li> <li>• Updated banned chemicals list</li> <li>• In-situ verification (warehouse, laboratory, nursery, plantation areas, lumberyards)</li> <li>• Interviews with technical and field staff</li> </ul>
	<b>11.3 Application of an adaptive management approach with a monitoring system and adjustment mechanisms</b>	<p>11.3.1 The management planning takes into account the regulatory framework, resource availability, operational capacity, commitments with the social actors and the risks and uncertainties that may occur in the development of the plan</p> <p>11.3.2 Forest resources are managed according to available knowledge, following guidelines derived from individual experience, traditions and scientific knowledge</p> <p>11.3.3 There is a regular adjustment of management activities based on the results of the monitoring</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Annual operating plans</li> <li>• Interview responsible for the company and its technical and field staff, and representatives of the community or local population</li> </ul>
	<b>11.4 Existence of a system of monitoring and assessment, incorporating the results in planning</b>	<p>11.4.1 Management activities are systematically documented using forms that are duly archived and updated</p> <p>11.4.2 There is a daily log of the use of machines and parts and materials used by the operators</p> <p>11.4.3 There is a person in charge of the monitoring system</p>	<ul style="list-style-type: none"> <li>• FMP – Monitoring plan</li> <li>• Documentation (rules or guidelines) describing the system of monitoring used by the company</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• Database system for monitoring</li> <li>• In-situ verification</li> <li>• Interview person in charge of the monitoring system and/or other technical and field staff</li> <li>• Interview operators and leaders of field teams</li> <li>• Interview the person responsible for the company</li> </ul>
	<b>11.5 Existence of sampling systems for monitoring of the forest growth</b>	<p>11.5.1 There is a system of permanent plots or other mechanism for determining the growth and production of the forest</p> <p>11.5.2 Plots are monitored according to the protocol established or adopted by the company</p> <p>11.5.3 Results of the monitoring of the development of the forest are used by the company</p>	<ul style="list-style-type: none"> <li>• FMP – Monitoring plan</li> <li>• Documentation (rules or guidelines) describing the system of monitoring used by the company</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• Database and measurements of permanent plots or other mechanism adopted reports</li> <li>• The FMA with the location of permanent plots mapped</li> <li>• In-situ verification</li> <li>• Interview person in charge of the monitoring system and/or other technical and field staff</li> <li>• Interview operators and leaders of field teams</li> </ul>
	<b>11.6 Application of silvicultural practices consistent with needs</b>	<p>11.6.1 Silvicultural treatments are applied (such as cutting branches after harvesting, cleaning of the undergrowth, selective logging, enrichment plantations, management of natural regeneration)</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Company's annual reports (last 3 years)</li> <li>• Relevant documentation</li> <li>• In-situ verification</li> <li>• Interview technical and field staff</li> </ul>

MCE	INDICATORS	VERIFIERS	METHOD
<b>TECHNICAL AND MANAGERIAL COMPONENT</b>			
<b>11</b>	<b>11.7. Implementation of measures to maintain or improve the structure, fertility and biological activity of the soil</b>	<p>11.7.1 Minimizing damage to the soil by harvesting operations [e.g. tractors not in use move with their shovel raised in order not to remove the organic layer of the soil]</p> <p>11.7.2. Use of leaves and other waste of trees, manure, compost or other organic fertilizers to provide nutrients to the soil</p>	<ul style="list-style-type: none"> <li>• Standards or guidelines on soil conservation measures</li> <li>• Relevant documentation</li> <li>• In-situ verification</li> <li>• Interview with technical staff</li> </ul>
	<b>11.8. Management includes valuation and production of various goods and services</b>		<ul style="list-style-type: none"> <li>• FMP</li> <li>• Company's annual reports (last 3 years)</li> <li>• In-situ verification</li> <li>• Interview person responsible and technicians</li> </ul>
	<b>11.9. Use of forest waste</b>	<p>11.9.1 Quantification of harvesting waste (such as remains of branches, stumps and logs) for use in secondary manufacturing processes or as a source of energy</p> <p>11.9.2 Percentage of extracted wood that is actually used by the company</p> <p>11.9.3 Analysis of costs and returns of the use of forest waste</p> <p>11.9.4 Assessment of impacts of the use of forest waste</p>	<ul style="list-style-type: none"> <li>• FMP</li> <li>• Annual operating plans (last 3 years)</li> <li>• Company's annual reports (last 3 years)</li> <li>• Relevant documentation [studies, assessments]</li> <li>• In-situ verification [extraction areas, log piles, processing plants]</li> <li>• Interview with technical staff of the company [e.g. reasons to take advantage of the waste, use or destination of the waste]</li> </ul>



# APENDIX 4

## Selected cases grouped by compliance with minimum criteria for exemplariness

Exemplary cases grouped according to minimum criteria of exemplariness with a *good* or *exceptional* level of compliance.

		EXEMPLARY CASES																						
		Group I				Group II				Group III				Group IV										
COMPONENT	MINIMUM CRITERIA OF EXEMPLARINESS (MCE)	San Andrés	Forestal Aysén	Empresa Manoa	La Gloria	Tikonel	El Choloque	San Diego Tezains	Gualaco y Guata	Cururú	Iratapurú	ADSEJO	Orsa Florestal	Klabin S.A.	Kobalchaj	Copen	La Chonta	Layasiksa	Chinchina	Mapu Lahual	Aserradero Espinoza	Colinas Bajas (APA)	Roberto Bauch	
SOCIAL	1 - Contribution to local development and poverty reduction																							
	2 - Quality of employment and occupational safety																							
	3 - Mechanisms to resolve, or manage conflicts arising from the management																							
	4 - Respect for rights, cultural diversity and local knowledge																							
ECONOMIC	5 - Diversification of uses																							
	6 - Adding value to products and services of the forest																							
ENVIRONMENTAL	7 - Innovative conservation and protection mechanisms																							
	8 - Initiatives to increase the environmental benefits and valuation of environmental services																							
MANAGERIAL-TECHNICAL	9 - Diversity in management and organization of management processes																							
	10 - Innovative partnerships																							
	11 - Innovative technical aspects of forest management																							

 MCE with exceptional level of compliance

 MCE with good level of compliance

Cases with exemplary aspects grouped according to minimum criteria of exemplariness with a *good* or *exceptional* level of compliance.

COMPONENT		CASES WITH EXEMPLARY ASPECTS												
		Group I		Group II		Group IV								
		Communities and AIDER	Communities and Venao	ASL San Antonio	ZA Reserva Maya	ESNACIFOR	Bosque Modelo Jujuy	Parque S. Marcelo	Las Colonias	CODEFORSA	ASOKANUS	Paragaricutiuro	San Pedro Jacuaro	State Forest Guyana
SOCIAL	1 - Contribution to local development and poverty reduction	■	■		■					■	■	■		
	2 - Quality of employment and occupational safety													
	3 - Mechanisms to resolve, or manage conflicts arising from the management	■		■						■		■		
	4 - Respect for rights, cultural diversity and local knowledge	■	■	■	■					■		■		
ECONOMIC	5 - Diversification of uses					■							■	■
	6 - Adding value to products and services of the forest	■							■			■		
ENVIRONMENTAL	7 - Innovative conservation and protection mechanisms		■			■		■						■
	8 - Initiatives to increase the environmental benefits and valuation of environmental services			■		■	■	■		■		■		■
MANAGERIAL-TECHNICAL	9 - Diversity in management and organization of management processes	■	■	■	■	■	■	■		■	■	■	■	
	10 - Innovative partnerships					■	■		■	■				
	11 - Innovative technical aspects of forest management		■			■	■			■				■

■ MCE with exceptional level of compliance

■ MCE with good level of compliance



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“In Search of Exemplary Cases of Sustainable Forest Management  
in Latin America and the Caribbean”

FAO Regional Office for Latin America and the Caribbean  
Av. Dag Hammarskjöld 3241. Vitacura, Santiago, Chile.  
Telephone: 56-2-9232100  
[www.rlc.fao.org](http://www.rlc.fao.org)

Web site of the publication:  
<http://www.rlc.fao.org/bosques/manejo/default.htm>

Four million hectares of native forest disappear each year from Latin America and the Caribbean as the result of deforestation that continues at an alarming rate, while bringing economic, social and environmental consequences on a massive scale.

Despite this depressing scenario, there is a light in the woods. In the last two decades an alternative forest management system, known as Sustainable Forest Management (SFM), has been gaining ground in the region. Unlike traditional management systems that tend to overlook long-term forest sustainability, this new system allows companies, local communities or state institutions to produce goods and services from the forest while conserving it for future use. Sustainable forest management is already used in many countries of the region by different actors in different contexts and on varying scales. These experiences show the impressive economic, social and environmental benefits of this system, but such cases are generally not well known outside their local community.



Based on a study by the Food and Agriculture Organization of the United Nations (FAO), these cases have been identified, organized and published in this book with the aim of drawing attention to the progress that has been made in forest management in Latin America and the Caribbean. The study highlights 35 cases in 14 countries where sustainable forest management represents a practical and highly competitive option for local communities.

The lessons learned from these experiences should act as a guide for other forest management initiatives, not only in the region but also in the rest of the world. To be successful, however, policies are needed that address land use and tenure issues while promoting more inclusive forms of production and enabling rural families to maintain their way of life and work in harmony with the environment. The knowledge generated by the experiences analyzed in this book can help to meet these challenges and to formulate effective strategies to mitigate climate change.

