



A report prepared for the project

Lessons Learnt on Sustainable Forest Management in Africa

LESSONS FROM LATIN AMERICA AND THEIR RELEVANCE TO SFM IN AFRICA

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of the United Nations (FAO)

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by

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(September 2004)

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LIST OF ABBREVIATIONS

ASLs	Site Social Group (<i>Agrupación Social del Lugar</i>)
B\$	Bolivian Currency (<i>Boliviano</i>)
BNDES	National Bank of Social and Economic Development (<i>Banco Nacional de Desenvolvimento Econômico e Social</i>)
BOLFOR	Sustainable Forest Management Project (<i>Proyecto de Manejo Forestal Sostenible</i>)
CCMSS	Mexican Advisory Group for Sustainable Silviculture (<i>Consejo Civil Mexicano para la Silvicultura Sostenible</i>)
CERTFOR	Chile's Forest Certification (<i>Cerfificación Forestal del Chile</i>)
CNPT	National Centre for Traditional Populations (<i>Centro Nacional de Desenvolvimento Sustentado das Populações Tradicionais</i>)
CONADI	National Commission for Indigenous Development (<i>Comisión Nacional de Desarrollo Indígena</i>)
CONAF	National Forest Corporation (<i>Corporación Nacional Forestal</i>)
CONAFOR	National Forestry Commission (<i>Comisión Nacional Forestal</i>)
CONAMA	National Commission for the Environment (<i>Comisión Nacional del Medio Ambiente</i>)
CORFO	Chilean Economic Development Agency (<i>Corporación de Fomento de la Producción</i>)
CORMA	National Wood Corporation (<i>Corporación Nacional de la Madera</i>)
CSA	Certificates of Environmental Services (<i>Certificados de Servicios Ambientales</i>)
DED	German Development Service (<i>Deutscher Entwicklungsdienst</i>)
DL 701	Decree Law 701 (<i>Decreto Ley de Fomento Forestal</i>)
ER	Extractive Reserve (<i>Reserva Extrativista</i>)
FDI	Foreign Direct Investment
FECON	Costa Rican Federation for Nature Conservation (<i>Federación Costarricense para la Conservación de la Naturaleza</i>)
FMP	Forest Management Plan
FONAFIFO	National Forestry Finance Fund (<i>Fondo Nacional de Financiamiento Forestal</i>)
GEF	Global Environment Facility
GNP	Gross National Product
GTZ	International Cooperation for Sustainable Development (<i>Deutsche Gesellschaft für Technische Zusammenarbeit</i>)
ha	hectare
IADB	Inter-American Development Bank (<i>Banco Interamericano de Desarrollo</i>)
IBAMA	Brazilian Institute of Environment and Renewable Natural Resources (<i>Instituto Brasileiro do Meio Ambiente e Recursos Naturais Renováveis</i>)
IDF	Institutional Development Fund
INDAP	Agriculture Development Institute (<i>Instituto de Desarrollo Agropecuario</i>)
INFC	International Network of Forests and Communities
INFOR	Forest Institute (<i>Instituto Forestal</i>)
IRR	Internal Rate of Return
ITTO	International Tropical Timber Organization

KfW	Reconstruction Loan Corporation (<i>Kreditanstalt für Wiederaufbau</i>)
LKS	Lesser Known Species
MINAE	Ministry of Environment and Energy (<i>Ministerio de Ambiente y Energía</i>)
MMA	Ministry of Environment (<i>Ministério do Meio Ambiente</i>)
NCRT	National Rubber Tappers Council (<i>Conselho Nacional dos Seringueiros</i>)
NFP	National Forest Policy
NGO	Non-Governmental Organisation (<i>Organização Não Governamental</i>)
NPV	Net Present Value
NWFP	Non-Wood Forest Products (<i>Productos Non Maderables/Productos Forestales Non Madeirables</i>)
PEFC	Pan European Certification System
PNTTF	National Program of Forest Technical Transfer (<i>Programa Nacional de Transferencia Técnica Forestal</i>)
PPG7	Pluri-annual Plan – G7 (<i>Plano Pluri-anual do G7</i>)
PROCYMAF	Community Forestry Project (<i>Proyecto de Conservacion y Manejo Sustentable de Recursos Forestales en Mexico</i>)
PSA	Payment for Environmental Services (<i>Pago de Servicios Ambientales</i>)
PSP	Private Service Providers
PyMES	Small and Medium Forest Companies (<i>Pequeñas y Medias Empresas Forestales</i>)
SEMARNAT	National Environmental Agency (<i>Secretaria del Medio Ambiente, Recursos Naturales y Pesca</i>)
SFM	Sustainable Forest Management (<i>Manejo Forestal Sostenible/Manejo Florestal Sustentável</i>)
SIF	Forest Investment Society (<i>Sociedad Inversora Forestal</i>)
SNASPE	National System of Protected Wildlands (<i>Sistema Nacional de Áreas Silvestres Protegidas del Estado</i>)
TCOs	Communal Land Originator (<i>Tierra Comunitaria de Origen</i>)
UNCED	United Nations Conference on Environment and Development (<i>Conferencia de las Naciones Unidas sobre Medio Ambiente y Desarrollo</i>)
UNFCCC	United Nations Framework Convention on Climate Change (<i>Convención Marco de las Naciones Unidas para Cambio Climático</i>)
USAID	US Agency for International Development
USD	United States Dollar
WFP	Wood Forest Products (<i>Produtos Florestais Madeireiros/Productos Forestales Madeirables</i>)
WTO	World Trade Organisation

INTRODUCTION

1. Background of the study

The KSLA together with FAO and the AFORNET/AAS are carrying out a project entitled “Lessons Learnt on Sustainable Forest Management in Africa” aiming to:

- analyse and establish what lessons have been learnt from positive and negative experiences of various initiatives, projects and programmes aiming at sustainable management, use and conservation of forests in Sub-Saharan Africa;
- analyse and establish what the ecological, economic, social and other pre-requisites are necessary for extending positive lessons to wider use (to more people, larger areas, other countries, etc.); and
- based on the outcome of the above analyses, identify the major issues and concerns for Africa to draw the attention of the various international processes.

As part of this project, it is important to know the experience from developing countries of SFM implementation, taking into account some lessons that can be applicable and replicable for Africa. Latin America and the Caribbean (LAC), for instance, have made important efforts towards adopting SFM, particularly in areas like management, production and trade of wood and non-wood forest products, environmental services, and ecotourism, among others. A successful initiative was the establishment of large-scale plantations in several countries in South America (Argentina, Brazil, Chile and Uruguay) supporting a globally competitive forest industry, which have provided economic, social and environmental benefits for the society. Moreover, several countries, such as Brazil and Mexico, have implemented innovative community forestry programmes that have a potential to enhance income to rural populations. The LAC region also has a substantial know-how on forest-based environmental services and is in the forefront of utilising support under CDM. Analysing the performance of some of these initiatives, considering their social, economic political and institutional approach involved can be significantly relevant to SFM in Africa.

Within this context, FAO assigned Dr Ivan Tomaselli to carry out a study in initiatives undertaken in the LAC region towards SFM adoption and implementation, taking into account different experiences on selected issues (community participation, management of natural forests for wood production, industrial forest plantations by the public and private sector, management of NWFP by local communities, and forest management for the provision of environmental services), bringing some lessons to SFM in Africa. The present document is the final report.

2. Objective

The main objective of the present study is to identify and analyse relevant initiatives on SFM in LAC, considering its adaptability and replicability for forests in Sub-Saharan Africa (SSA). Taking into account the main objective, the study aimed to answer the following questions according to the TOR:

- What are the major accomplishments in areas such as (i) community participation initiatives, (ii) management of natural forests for wood production, (iii) industrial plantation initiatives by the public and corporate sectors, (iv) management of non-wood forest products (NWFPs), especially by local communities, and (v) forest management for the provision of environmental services?
- What are the conditions that facilitated the above initiatives in Central and South America?
- What are the lessons that could be learnt from the varied performances (successes or failures) of initiatives under the above and to what extent can successes be replicated in and adapted to SSA?
- What are the implications of the findings from the Central and South American experience to SSA?

3. Structure of the report

This report is structured in three parts: Part I (Overview), Part II (Case Studies), and Part III (Major Findings, Lessons Learnt, and Recommendations)

Part I covers an overview of the forest sector in LAC, and major initiatives related to SFM.

Part II presents five case studies, which cover different initiatives related to SFM in selected LAC countries.

They are:

- *Case Study 1*: Community participation and the SFM initiatives in Mexico;
- *Case Study 2*: Impacts of SFM adoption at the forest and the mill in Bolivia - La Chonta Company;
- *Case Study 3*: Public and private initiatives to promote industrial plantations in Chile;
- *Case Study 4*: Extractive reserves and SFM in Brazil; and,
- *Case Study 5*: Payment for forest environmental services in Costa Rica.

Each case study is structured in terms of the initiative's background, objective and scope, initiative description, outcomes, analysis of the factors contributing to the performance of the initiative, overall assessment of the initiative, and final remarks.

Part III covers a discussion of the previous parts, including the main findings, lessons learnt and recommendations, taking into account the adaptability and replicability of LAC's SFM initiatives for forests in SSA.

PART I – OVERVIEW OF THE FOREST SECTOR IN LATIN AMERICA AND THE CARIBBEAN

1. Recent trends and concerns on SFM

1.1 Forest cover

According to FAO, the LAC region has the largest area under forest cover in the world, 964.4 mill ha, accounting for almost 26% of the global forests and half of all tropical forests. Most of its natural forests are located in Brazil, a total of 544 mill ha (56% of the regional forest cover), followed by Peru (65 mill ha), Mexico (55 mill ha), Bolivia (53 mill ha), Colombia (50 mill ha), and Venezuela (49 mill ha).

Natural forests are predominant in the LAC region, represented mostly by tropical forests. The largest concentration of tropical forests is associated with the Amazon rainforest, considered the world's most bio-diverse and richest ecosystem.

The forest plantation area in LAC is small compared to natural forests, contributing with 1.2% of the regional forest area. Regarding the world's forest plantation, LAC contributes with 6.3% (11.7 mill ha). Forest plantations are concentrated in the Southern Cone countries (Brazil, Chile, Argentina, and Uruguay). These countries represent nearly 73% of the regional plantation forests.

Both natural forests and forest plantations in LAC are of global importance due to their size and biodiversity, playing important roles both in maintaining the ecological diversity and functions worldwide and in the global wood products trade and economy.

1.2 Deforestation and its causes

In the past few decades, the LAC region has been seriously affected by deforestation and forest degradation. Despite recent efforts to revert this situation, the natural forest area, mainly tropical forests, continue to decline.

According to FAO data from 2000, the annual change in forest cover (deforestation) in LAC countries is estimated to be around 4.1 mill ha a year, being heavily influenced by the large areas of deforestation in Brazil (average of 2.3 mill ha/year) and Mexico (average of 631,000 ha/year). In terms of annual rate of forest cover change, Haiti, El Salvador, and Nicaragua have the highest negative rates, with 5.7%, 4.6%, and 3.0%, respectively, although the area in absolute terms is negligible.

Deforestation has been associated with multiple causes that vary in importance by place. In fact, the reasons for regional deforestation in LAC are complex and deeply rooted in the social, economic, and ecological situation and unique realities of the region. The main driving forces of deforestation are basically associated with the expansion of agriculture and permanent pasture, logging, and expansion of infrastructure. Deforestation also results from unilateral decisions by governments, high levels of rural poverty, serious conflicts in some countries, and pressure to convert forest land to other uses. The pressures of development, such as roads and civil constructions, dams, and mining, are of significant importance in the fragmentation of the forest land in LAC.

It is worth noting that the effects of deforestation represent a permanent loss of the potential capacity of forest resources to generate economic benefits. Obviously, such impacts are more severe in some countries than others. Most Caribbean countries, for instance, have depleted their forest resources so much that they must now import forest products, creating an additional need for foreign exchange. On the other hand, in countries with extensive forest resources, such as Brazil, Peru, and Bolivia, deforestation has had less overall impact, though at the local level the impact can be significant.

1.3 Land tenure and law enforcement

A large share of LAC's forests, particularly natural forests, is nominally state-owned (*de jure* property rights). Public ownership of forests is generally based on failure of markets to achieve social efficiency in forest allocation and production (Loomis, 1993).

Bolivia and Peru are typical examples where all natural forests, according to their constitution, belong to the State. On the contrary, in Brazil, natural production forests are predominantly private. Currently, the adoption of a forest concession model in Brazil has been defended as a way to facilitate access to the resource by the private sector. Defenders of the process have two major arguments:

- The private sector is largely composed of small- and medium-size companies, under capitalised, with limited capacity to invest and maintain sufficient forest areas as required to implement SFM;
- Implementation of SFM in private areas would concentrate private land ownership, creating a potential risk of increased social conflicts;

These arguments are no doubt valid, and the combination of two models, having private and government land under SFM might be, in the case of Brazil, a better solution than the existing system (Tomaselli, 2004). In fact, the model to be used is a constant part of the agenda in discussions between the State and the private sector in most LAC countries. It is also a point of disagreement despite the property rights model under SFM. The crucial problem relates to how SFM is going to be implemented, especially considering that, as the concept of sustainability develops, the requirements for SFM (and thus costs) increase, and how the country and its population will benefit from the forest resources use (Tomaselli, 2004).

Land tenure and, in particular, lack of well-defined property rights are a disincentive for SFM in the region. As there is no guarantee that an investor will continue to have access rights to the same concession area in the future, this encourages excessive logging and other unsustainable practices. Indeed, it would appear that there is an entrenched culture of forest extraction and utilisation within the industry rather than a commitment to enhancing the productivity or value of the forest left after harvesting (ITTO, 2003). In fact, resolutions of the conflicts over tenure and land property rights law enforcement are, in most LAC countries, such as Bolivia, Guyana, Peru, and Suriname, pre-requisites for achieving SFM.

1.4 Forest policy and legislation for SFM

Since the United Nations Conference on Environmental and Development (UNCED) held in Rio de Janeiro in 1992, several countries in LAC have undertaken actions to orient their national forest policies towards conservation and sustainable management of their forest resources.

Measures forbidding or limiting conversion of forest land, incentives for afforestation and natural forest management, the creation and maintenance of large protected wild areas, the promulgation of various legal standards aimed at protecting or regulating the use of resources, strengthening protection programmes against fires, studies on sustainable management indicators and forest certification, and the formulation of national forest programmes, among others, are nearly the common denominator in the forest policy of most of the countries of the LAC region.

An important element of forest policies in LAC is the increasing incorporation of multiple groups of interest in their formulation, including NGOs, ethnic groups, rural communities, ecological groups, and international organisations, among others. This evolution has come about as a response to the growing interest of society in forests, natural resource use and in associated environmental benefits. As a result, subjects such as payment for environmental services, carbon sequestration and others, which transcend the sphere of the traditional stakeholders of the forest sector, have become increasingly important.

Moreover, interesting advances are identified in the LAC region. Suriname, for instance established in 2003 a National Forest Policy (NFP). It is a balanced and active policy for achieving SFM. Guyana and other LAC countries are on a similar path. In 2003, Guyana's National Forest Policy was reformulated. In Bolivia, a new

Forest Law was approved in 1996. It established that forest concessions can be made available to the private sector by an open bidding process. Other forms of forest concessions were specially designed to accommodate local communities Site Social Group (Agrupación Social del Lugar - ASLs) and indigenous populations Communal Land Originator (Tierra Comunitaria de Origen - TCOs). Although Peru has no formal forest policy, it recently developed and adopted a new forest legislation which implicitly describes the country's forest policy. In other LAC countries the situation is not different.

Despite efforts to implement forest policies and legislation towards SFM in LAC, it is important to take into account that one of the greatest problems faced by countries in the region is the difficulty to put their forest policies into practice. Efforts have been made in the last few years to close this gap by seeking support through an increased participation of society in the processes, generating forest and environmental policies, especially to the people living in the forest.

A few LAC countries have made efforts to create adequate legal and economic conditions to achieve the objectives of their policies. For this purpose most countries are reviewing their National Forest Programmes, restructuring their institutions and using different legal and financial instruments to enable them to place larger forest areas under sustainable management and production, ensure protected area systems, stop deforestation, increase the planted forest areas and recover deforested areas. The strategies are based on general standards, promotion and incentive systems, and specific projects (*Tomaselli, 2004*).

Although many LAC countries have established National Forest Policies in order to promote SFM, the actions to implement them have been modest. Governments should prepare a plan for the implementation of different issues provided by the Policy.

1.5 Initiatives and financing mechanisms for SFM

For some LAC countries, such as Brazil, Chile, and Uruguay, the incentives and financing mechanisms for establishing forest plantations are practically a solved problem. Incentives made available by governments have played an important role and catalysed the process. In Brazil, the flow of private capital into forest plantations is expected to increase in the future, and the National Development Bank (BNDES) has credit lines available to support the expansion of plantations.

By contrast, there are few or no incentives and financing mechanisms available in LAC for natural forest management. Despite several problems that have and will continue to inhibit the private sector from investing in SFM in natural forests, most of the financial resources flowing into SFM have been private. In fact, the private sector is already a major investor in SFM, but governments have a role to play in attracting more private funds to further improve forest practices. Some lessons can be learned from programmes developed and implemented to support the expansion of forest plantations.

Governments in the region have failed to put in place proper mechanisms to make environment concerns and development policies compatible. Low managerial capability is the main problem, not likely to be solved in the next few years. The solution requires coordination among stakeholders, i.e. governments, international cooperation, the private sector, and civil society. It should be recognised that the private sector is already playing an important role in financing SFM, but can do more. The private sector needs to work towards continuous improvements in forest and industrial operations to gain productivity.

There is no simple solution envisaged, but the basic principle is clear: if the private sector has to increase its contribution to financing SFM, governments and other stakeholders need to create the necessary environment for investments. Such investments are needed to improve performance and competitiveness in the market, which is, in the end, the main source of funds to finance SFM.

Incentives need to be developed to catalyze adoption and to enhance performance, but other, conditions need to be met to sustain the process. These conditions include appropriate, stable and transparent regulations, economic and political stability, and guarantees of access to forest resources and to markets.

2. Overview of major initiatives on SFM

A number of initiatives and financing mechanisms for SFM have been put in place in LAC. They vary in objectives, scope, source of funding, target groups, and, consequently, in the level of success. In general, the major initiatives and financing mechanisms for SFM can be grouped into the following categories: community participation, management of natural forests for wood production, industrial plantation initiatives by the public and private sectors, management of NWFP by local communities, and forest management for the provision of

environmental services. Such initiatives and financing mechanisms are discussed below.

2.1 Community participation

Rural communities are closely associated with forests and other natural resources in many LAC countries. In most cases, they own a large portion of the country's forest resources. Mexico, Guatemala, Honduras, Nicaragua, and Panama, in Central America, and Brazil, Chile, Bolivia, and Guyana, in South America are typical examples of countries where rural farmers and indigenous communities have legal rights over significant areas of forests.

Major initiatives for SFM related to community participation have been taken in Mexico (see Case Study 1) and in other Central and South American countries. Through pilot programmes in selected states, Mexico has strengthened indigenous communities to manage their forest resources in a sustainable manner.

Guatemala, Honduras, and Brazil are some examples of other LAC countries that have designed and implemented their own initiatives, trying to balance the situation and needs of rural communities with each country reality and perspectives. Guatemala and Honduras, for instance, have provided some communities or rural cooperatives with long-term forest concessions and support to their demands.

2.2 Management of natural forests for wood production

As for initiatives related to the management of natural forests for wood production, countries such as Bolivia and Brazil have relevant experiences. In Bolivia, wood production has been regulated by its Forestry Law (1996), which promotes SFM in natural forests, although it has affected private sector competitiveness (see Case Study 2). In Brazil, the initiative has been a result, to a large extent, of recent private investments to sustainably exploit the enormous timber potential from tropical forests, although legal regulations on the natural resource use have also played a role for companies' decisions to pursue this initiative.

2.3 Industrial plantation initiatives by the public and the corporate sectors

Industrial plantation initiatives carried out by the public and the private sectors in LAC have been of particular importance in the Southern Cone countries such as Brazil and Chile (see Case Study 3), which implemented this strategy in the past decades. Their experiences with subsidies and fiscal incentive programmes for forest plantations (notably with pines and eucalyptus) were used as a model to other countries in the region to develop and implement their own mechanisms. Argentina, Uruguay, Venezuela, Colombia, Peru, and Ecuador for instance, have put into practice programmes to promote and expand forest plantations, with some positive results in terms of planted area and development of a forest industry.

Currently, forest plantations in LAC reach 11.7 mill ha (42% located in Brazil), with a significant portion based on subsidies and incentive programmes. Most of it is considered for industrial purposes. Without doubt, subsidies and incentive programmes were important to attract investments from the private sector to the forest industry, increase employment and revenues, generate taxes, and contribute to revert the deforestation process.

2.4 Management of non-wood forest products by local communities

In several LAC countries, NWFPs play an important role in the livelihood of local populations. NWFPs are of significant importance for local and regional economies, and also due to the high degree of endemism of some commercial species. Major initiatives contemplating the SFM of NWFPs by local communities are found in some LAC countries with significant forest cover and community forests. Brazil has implemented a significant programme involving communities managing natural forests in the Amazon to produce primarily NWFPs (see Case Study 4). Some positive results have been found, mostly in terms of forest area covered under the programme and number of beneficiaries. Some promising experiences with NWFPs produced by local communities are found in Peru, Bolivia, Colombia, Chile, Guatemala, and Cuba. Other relevant initiatives are found in Mexico with community forestry, although NWFPs have been only one of the components of the initiative.

2.5 Forest management for the provision of environmental services

Forests are closely associated with a broad range of intangible but valuable environmental services, including recreation, carbon sequestration, biodiversity conservation, and watershed protection. The development of

markets for previously non-traded forest environmental services is one of the innovative market-based instruments developed in recent years and potentially available for LAC countries.

The most promising initiative related to the provision of these services has been provided by Costa Rica with its PSA programme (see Case Study 5). The PSA concept is based on the principle of internalising positive externalities, by making actual payments to landowners for environmental services provided.

Other LAC countries have relied on different economic instruments to account for such services, including taxes and compensation funds. Ecuador has established a water fund and the Brazilian State of Sao Paulo has applied a water consumption tax to finance the administration and conservation of water catchment basins. In Brazil, charges are levied for the use of natural resources (petrol, minerals and water), with companies paying a tax proportional to the economic value of the exploited resources, and revenues distributed to the government and the states where the exploitation takes place.

2.6 Other initiatives

There has been a range of other innovative initiatives and mechanisms in place to promote SFM in LAC. Among them it is worth mentioning the debt for nature swap, the CDM mechanisms – carbon fixing/sequestration, ecologic tax, among others. Each mechanism has been developed and applied within specific contexts and scopes, aiming to address specific objectives. Such initiatives are not detailed in this report, since they are not covered within the scope of this study.

PART II – CASE STUDIES

Introduction

This chapter presents some initiatives carried out in the LAC region towards adoption and implementation of SFM, covering issues such as community participation, management of natural forests for wood production, industrial plantations by the public and corporate sectors, management of NWFPs by local communities, and forest management for the provision of environmental services. For each of the five selected issues, a case study was prepared, taking into account its relevance and potential application to SFM in SSA.

Case study 1 covers a Mexican initiative oriented to strengthen indigenous communities to manage their forest resources considering sustainable practices. The initiative is based on the Community Forestry Project (*Proyecto de Conservación y Manejo Sustentable de Recursos Forestales en México* – PROCYMAF), which brought important contributions to the improvement of natural forest management and conservation, strengthening social capital, and consolidating the forest development process in communities based on sustainable and diversified uses of forest resources.

Case study 2 deals with the management of natural forests for wood production in Bolivia. It shows that, as a result of the new Forestry Law enacted in 1996, the national timber industry became engaged in efforts to achieve SFM. However, SFM adoption by the industry affected its competitiveness, which required different measures to be taken to overcome the situation. This case study is based on a previous study “SFM Adoption at the Forest and the Mill - Case Study on La Chonta” carried out by *Antelo & Tuoto (2004)* for the ITTO's report “Sharing of Information and Experiences on Private Sector Success Stories in Sustainable Forest Management – The Latin America/Caribbean Region”.

Case study 3 presents the strategy of the Chilean Government to promote forest development based on a programme of incentives for the establishment of industrial forest plantations. The study shows that a combination of government policies to promote plantations and private sector investments over the past few decades has resulted in a strong and solid forest sector, with a forest plantation area of over 2 mill ha and a diversified forest-based industry. Its forest sector has become the second most important in the country, supporting the Chilean economic development, with important contributions to the national employment level and, to some extent, improvement of the environment, with soil protection and recovery of degraded and marginal lands.

Case study 4 covers the management of NWFPs by local communities in Brazil, taking into account an innovative form of property rights arrangements. The Brazilian Extractive Reserves initiative was created to promote the joint objective of forest conservation and socio-economic development in designated areas by granting the use rights of its multiple resources in a sustainable way for settled communities.

Case study 5 focuses on forest management for the provision of environmental services. It considers the Payment for Environmental Services (*Pago de Servicios Ambientales - PSA*) programme implemented in Costa Rica, by which small landowners of natural forests and forest plantations receive direct payments for the environmental services that their forests provide to society and to the world at large.

CASE STUDY 1 – COMMUNITY PARTICIPATION AND THE SFM INITIATIVES IN MEXICO

1. Background

Since the 1930's, most of the forest land of Mexico has been transferred to *ejidos*¹, a land tenure arrangement that entitled landless peasants and gave them the legal right to petition for expropriation of private estates (*Moros and Solano, 1995*; cited in *INFC, 2004*). *Ejido* property laws were reformed in 1992. Under the new system, land redistribution through Government expropriation was prohibited, and *ejido's* land could be rented to anyone from farmers to multinationals. Corporations and commercial associations could now hold agricultural land. New *ejido* claimants could no longer exercise the right to petition for land.

The law reform was made to encourage investment and increase productivity through a more secure land tenure system. The 1992 reforms assigned ownership to *ejidos* already managed communally, allowing them to be sold for the first time (*Chavez 1995*; cited in *INFC, 2004*).

Currently, 80% of 55.2 mill ha of the Mexican forests are owned by some 8,000 *ejido* indigenous-communities (*Klooster, 1998*; cited in *INFC, 2004*). Many of the forest communities are very poor and lack the tools to make good use of the resources on their lands (*World Bank, 1995*).

Following a diagnostic study of the Mexican forestry sector, carried out by the World Bank in 1995, the Government of Mexico requested the Bank support to develop a national forest plan focusing on indigenous communities and *ejidos* with significant forest resources. As a result, the Community Forestry Project (PROCYMAF) was designed to define mechanisms to strengthen community forestry that would provide direct support to communities and *ejidos*, and generate methodological, technical and operational instruments to strengthen the policies for the Mexican forest sector (*World Bank, 2004*).

This community forestry project, developed by the National Forestry Commission (CONAFOR) has changed forest management schemes. The plan has provided funds for communities to encourage them to manage forests for local income. PROCYMAF concluded its Pilot Project in 2003 with important contributions to the improvement of natural forest management and conservation, strengthening of social capital, and consolidation of the forest development process in communities and *ejidos* based on sustainable and diversified uses of forest resources (*CONAFOR, 2004*).

As a follow-up activity, with the purpose of extending PROCYMAF's benefits to other forest regions, CONAFOR begun in 2004 a second programme, namely the Community Forestry Development Project (PROCYMAF II).

2. Objective and scope of the initiative

The objective of PROCYMAF was to assist indigenous communities and *ejidos* in selected Mexican States to strengthen community/*ejido* ties, better manage their forest resources, diversify forest-based production, create and support community enterprises, and increase their income.

The scope of the initiative, as defined at the project design and inception, considered the implementation of a community forestry project in the Mexican State of Oaxaca, focusing primarily on supporting and strengthening forest communities to manage their natural resources in an ecologically and financially sustainable manner. Later, its geographical coverage was expanded to a total of six States.

¹Mexican legislation does not define an *ejido*; however, generally accepted characteristics include: a) the *ejido* is a product of a legal endowment, at whose origin there is no purchase; b) the beneficial use of the *ejido* is subject to a large number of restrictions and limitations that attempt to reproduce the traits of communal property; to be part of the endowment, an individual must reside in the locality for at least six months, and no member may own an area of private land equal to, or greater than, the entire *ejido* endowment; and c) *ejido* property is subject to numerous and complex State and para-State institutions (*Chavez, 1995*; cited in *INFC, 2004*). *ejidos* is considered an ancient system of land management and ownership dating back to the Aztec Civilisation (*INFC, 2004*).

3. Initiative description

Although the objectives of PROCYMAF were clearly defined, its coverage gradually expanded from one State to several States with forest resources with commercial potential: Oaxaca, Guerrero, Michoacán, Jalisco, Durango and Chihuahua.

Oaxaca was selected as the first place due to its favourable environment for the project implementation, which included: (i) strong and well organised forest communities and *ejidos*; (ii) high biodiversity in forest areas under community management; (iii) experience by communities with private providers of forestry services; and (iv) strong support from the State Governor.

After implementation started, the project expanded to Guerrero and Michoacán, where favourable conditions were also identified, with full-scale implementation initiated in 2001. In 2003, Jalisco was also integrated into the programme. In Durango and Chihuahua, the scope of project execution was limited to promotional activities for forest products diversification.

In the recently approved PROCYMAF II, the scope will include the States of Durango, Guerrero, Jalisco, Michoacán, Oaxaca and Quintana Roo (*World Bank, 2004*). The choices of the participating States took into account the existence of indigenous groups, relevant areas for conservation and the existence of species with protection status (*CONAFOR, 2004*).

In order to achieve sustainable benefits, the project provides technical assistance and professional services for forest management, put in place SFM practices, including the conservation of water quality and biodiversity, development of NWFPs, encourages product diversification and markets for environmental services, and strengthens local and regional institutions (*World Bank, 2003*).

The initiative was implemented considering four components:

Component A - assistance to communities and ejidos. This component aimed to channel resources to forest communities and *ejidos* for technical assistance and training in improved forest management, conservation and sustainable use of natural resources with high environmental value, and improved management of forest enterprises. It financed primarily (i) promotional activities, including participatory appraisals and a regional fora; (ii) technical assistance provided by private providers under contracts with the participation of the communities and *ejidos*; and (iii) training courses by academic institutions, individual trainers, and by community-to-community seminars. This component involved an investment of USD 10.3 mill. Funding for timber production was not considered.

Component B - strengthen the capacity of private service providers. The aim of this component was to broaden the range, to increase the quality and availability of technical services offered by Private Service Providers (PSP) to forest producers in the States of Oaxaca, Michoacán and Guerrero. The component supported training to prepare PSP to work with communities and *ejidos* in integrated SFM practices, multiple-use forestry, reforestation technologies, silviculture, innovative and environmentally sound technologies, forest protection, and nursery practices. The total investment under this component reached USD 1.6 mill.

Component C - promotion of NWFPs. The main goals of this component were to identify, promote, and demonstrate market opportunities for potentially tradable NWFPs in community and *ejido* forests, and having these options of products integrated into management plans. This component was designed to be carried out in the six states and involved pine-oak forests, and financed: (i) diagnostic studies; (ii) grants for the purchasing of tools, materials, equipment, technical assistance and limited inputs for the development of NWFPs; and (iii) salaries, consultants, equipment, materials, and publications for evaluation and dissemination of results. A total of USD 3.2 mill was invested to support this component.

Component D - institutional strengthening. This component aimed at strengthening federal and state institutions working in forest conservation and development. It was designed to support capacity building of: (i) federal institutions to carry out normative and enforcement activities with a direct impact on community forestry; (ii) State Government institutions in the priority states in preparation for the eventual decentralisation of resources and responsibilities; (iii) Project Management and Project Implementation Units in SEMARNAP (later CONAFOR); and (iv) federal and state institutions to monitor activities and prepare similar projects. A total of USD 8.5 mill was invested to cover these activities.

4. Outcomes

An assessment made points out that most PROCYMAF activities were successfully implemented. As a result of

the project, significant progress was made in empowering poor communities to improve the management of their forest resources and expand their options for income generation. Its strategy, which combined capacity building of communities, *ejidos* and PSPs, has laid down a foundation to enable them to take decisions at a collective level and to conduct strategic planning based on solid information and technical inputs made available by service providers.

PROCYMAF made a significant contribution in the areas where it was implemented, raising the forest area under new or revised management plans from 500,000 ha in 1995 to 900,000 ha in 2002. The project contributed to build up PSP technical skills and increase the availability of their services to communities and *ejidos*, whereas previously, such providers were primarily oriented to timber production instead of integrated forest management. Additionally, the project implementation entailed interaction between the project team and beneficiaries and communities, helping re-establish trust between indigenous communities and government programmes (*World Bank, 2004*).

Throughout the project cycle, a total of 599 communities and *ejidos* (304 in Oaxaca, 107 in Michoacán, 90 in Guerrero, 36 in Durango, 31 in Chihuahua, and 31 in Jalisco) received support from PROCYMAF. Moreover, several community forestry enterprises were created or strengthened, bringing economic and social benefits to the communities. The outcomes of PROCYMAF by component are detailed in the World Bank's final report of the project (*World Bank, 2004*) and the major results are summarised as follow:

Component A - assistance to communities and *ejidos*.

This component was ranked as highly satisfactory in the project's final appraisal. Project activities under this component focused on diagnostic and participatory planning exercises, helping communities and *ejidos* to define development strategies aimed at self-management, in accordance with their social and natural capital and needs.

The project classified the beneficiary communities and *ejidos* into four types according to their forest management schemes:

Type 1: Owners of commercially viable forest stocks but lacking authorised Forest Management Plans;

Type 2: Owners of forest stocks practicing forestry through concessions to third parties without participating in management;

Type 3: Owners of forest stocks with authorised Forest Management Plans involved in one or more phases of forest management;

Type 4: Owners of forest resources who add value to forest products and market them directly.

The number of communities and *ejidos* that received support for technical assistance studies by type and selected state are shown in *table 1*.

Table 1. Number of communities and *ejidos* that received support for technical assistance studies by type and state

STATE	TYPE 1	TYPE 2	TYPE 3	TYPE 4	UNION ⁽¹⁾	TOTAL
Oaxaca	68	52	28	24	4	176
Guerrero	8	9	3	7	1	28
Michoacán	14	19	-	8	1	42
Jalisco	-	1	-	2	-	3
TOTAL	90	81	31	41	6	249

⁽¹⁾ group of beneficiaries consisting of different types of communities/*ejidos*

Source: PCU Final Report (*World Bank, 2004*)

Although not defined as a project objective, some communities and *ejidos* moved up to higher levels in the typology during the project implementation. The project was directed to communities and *ejidos* that own commercially valuable forest resources. However, there are often many residents living in or near the community's lands who do not directly share in the ownership of community resources (*avecindados*). They may actually outnumber the *ejidatarios* and *comuneros*, but are not considered as community members and do not participate in community decision-making.

Even though the project did not directly address gender issues, it brought significant benefits to women and contributed to greater gender equality. Women have traditionally been excluded from decision-making, and from holding important community offices and occupations.

As for natural resource management, PROCYMAF supported 71 studies specifically aimed at conservation and forest resource management, as well as training activities. Forest land under improved community forestry management plans substantially expanded from 60,623 ha in 1998 to 271,731 ha, while 535,685 ha of forest land were newly placed under community land planning. The total coverage of forest land, supported by PROCYMAF by State is presented in *table 2*.

Despite the fact that the project has made substantial progress in helping to raise the area of forests under management plans, the rate and extent of deforestation and forest degradation in Mexico, particularly in areas yet untouched by PROCYMAF, is still as high as 680,000 ha/year (*World Bank, 2003*), emphasising the fact that the project after all was relatively small when considering the size of the country. The efficiency of timber and other forest-based industries is low, particularly with respect to the forests activities under communal and *ejido* management.

Table 2. Coverage of forested land supported by PROCYMAF.

STATE	FOREST LAND (ha)	FOREST LAND UNDER IMPROVED MANAGEMENT (ha)	CERTIFIED FOREST LAND (ha)	FOREST LAND WITH COMMUNITY LAND PLANNING (ha)
Guerrero	5,281,116	32,161	25,447	39,251
Michoacán	4,206,451	12,426	5,463	23,872
Oaxaca	7,059,653	227,144	116,404	472,562
TOTAL	16,547,220	271,731	147,314	535,685

Source: PROCYMAF database (*World Bank, 2004*)

An indirect result of the project was the certification of significant communities and *ejidos* forest areas for SFM. With an investment of USD 250,000, the programme financed evaluations that led to certification of 147,314 ha, involving four communities/*ejidos* in Guerrero, four in Michoacán and sixteen in Oaxaca. According to the Mexican Civil Council for Sustainable Silviculture (CCMSS, a local partner of the Rainforest Alliance), the twenty- four producing units supported by PROCYMAF account for 22% of the certified area in the country and 15% of the national certified timber production.

Furthermore, PROCYMAF established a cooperative agreement with NGOs interested in promoting certification among communities and *ejidos*. Certification has made it possible to improve the relationships among forest producers, civil society and the government and has provided recognition of the communities' and *ejidos*' capacities to manage their own resources in a sustainable manner (*World Bank, 2004*).

Component B - strengthen the capacity of private service providers.

This component contributed to diversify services and strengthen the professional qualifications of PSPs, being rated as highly satisfactory by the Bank. The project substantially increased the availability of PSPs, building up a roster of 254 professional consultants, including individual specialists, small firms, and NGOs, who participated in a PROCYMAF training course as a condition to membership in the roster. These professionals were trained in a number of different technical programmes.

Many service providers also participated in a PROCYMAF-sponsored continuing education programme that offered scholarships to qualified PSPs to strengthen their knowledge skills in specific areas demanded by communities and *ejidos*. During the project implementation, PSPs became the major direct beneficiaries as they gained business opportunities to carry out technical assistance for communities.

During the project development, it was found that PSPs were not usually prepared to work with indigenous communities and *ejidos*. The PROCYMAF experience has validated the need for specialised and ongoing training for service providers so that they meet the communities' needs in a culturally sensitive manner. The project has also encouraged the idea that technical service provision is an investment that can yield dividends (*World Bank, 2003*).

Component C - promotion of NWFPs.

This component was rated satisfactory in the project's final evaluation due to some shortcomings corrected along the process. With component C, PROCYMAF aimed at generating employment and income particularly for community members who lacked such opportunities. The results of the technical assistance studies raised expectations in communities and *ejidos* and encouraged them to diversify their sources of income.

During 1998-2003, the project co-financed 43 pilot projects. Successful NWFPs sub-projects include the production of bottled spring water, pine resin processing, cultivation of edible mushrooms, medicinal plants and ecotourism. Spring water bottling proved to be a promising alternative due to growing demand in the market for bottled water, with women and youth representing 70% of the employees. Pine resin, which benefited from a USD 730,000 investment, had only one case with positive effects on employment and income generation (475 jobs in Oaxaca).

A significant portion of PROCYMAF funds was spent to carry out studies of potential investment projects, done by technical PSPs, NGOs, or consulting companies. Only in a few cases did the project provide support for the development of NWFPs. However, PROCYMAF's support for technical assistance to communities and *ejidos* demonstrated the feasibility of investments in NWFPs projects, and as a result the demand for investments increased. This, in turn, facilitated communities to seek additional resources from other federal, state, and municipal programmes, as well as to invest their own resources (*World Bank, 2004*). Spring water bottling and pine resin processing were two promising NWFPs alternatives financed by PROCYMAF, providing alternative returns to communities.

This component of the project also provided support to the development of the Non-Wood/Non-Traditional Forest Products Information System, an internet-based catalogue of information of forest resources developed to strengthen the strategic planning of sustainable use of forest ecosystems. The database includes information on 2,231 timber and non-timber species of the participating states, providing data on their biology and distribution, and marketing information.

Component D - institutional strengthening.

Under this component, a significant contribution to reinforce the capacity of institutions at federal, state and local levels was made to implement integrated and participatory public policies to promote SFM. This component was considered influential in helping to shape legislation. For instance, an international seminar on community forestry sponsored by PROCYMAF in 2002, contributed to shaping national forestry policy and particularly the National Forestry Law passed by Congress in 2002.

PROCYMAF's influence was stronger in some states. Michoacán was probably the most receptive to the community forestry model, having established a number of programmes and mechanisms that reproduced, at a state level, the approach taken by PROCYMAF at a national level. As a result, the component was ranked satisfactory in the final appraisal.

The capacity of SEMARNAT/CONAFOR for administration and management of its regulatory responsibilities was enhanced, especially with PROCYMAF support to develop an Automated System of Evaluation and Monitoring Forest Management Procedures and a Decision Support System. PROCYMAF support was crucial to the development of the National Forest Information System.

Another positive social result of the project was, in fact, related to its contribution in capacity building. The broad participation and the demonstrated success of the project measures give promise for the future of the project. Many communities that benefited from technical assistance and organisational strengthening will certainly be able to continue on the path to autonomy and improved income with or without continuous assistance from PROCYMAF (*World Bank, 2003*). Although the project experience has been considered as highly positive, there were some bottlenecks during its implementation. The initial period of the project implementation was 5 years (1997-2001); however, partly because the reduced availability of timely funding, the closing date was extended to December, 2003.

PROCYMAF II, a second Community Forestry Project, consists of a follow-up activity. The World Bank approved it and an agreement was signed with the Government of Mexico to become effective at the end of IBRD's 2004 Fiscal Year. The new project will assist 200 additional communities and *ejidos* on a demand-driven basis, and continue assistance to some of the 300 initial communities in the States of Guerrero, Michoacán and Oaxaca (*World Bank, 2004*).

5. Analysis of the factors contributing to the performance of the initiative

5.1 Overall socio-economic and environmental context

The socio-economic context in which this initiative has been developed considered the existence of community forestry and rural populations dependent on natural resource uses, poverty pressure, communal property rights, and low technological level. Within this context, a need was also identified to integrate social demands with economic development, while maintaining environmental sustainability and an opportunity to diversify forest production based on NWFPs.

On the environmental context, the initiative gained support in view of the pressure on natural resources, high rates of deforestation and continuous depletion of forest resources under the control of communities and *ejidos*.

A major factor contributing to the success and performance of the initiative was the recognition that the only way to achieve SFM of Mexico's forest resources, conservation, and protection of environmental services, was by building the capacity of communities and *ejidos* to manage their own resources in a sustainable way, linked to the improvement of socio-economic conditions of local populations. The alternative chosen, the development and implementation of a forest management plan to strengthen community forestry, became politically feasible and a successful strategy.

5.2 Policy, legal and institutional environment

The requirements to integrate natural forest management with conservation needs and improvement of life conditions of indigenous communities and *ejidos* in a single policy have been outlined in the Forestry Law of 1986 and reinforced in the 1992 Forestry Law. The legislative changes provided for deregulation of forestry activities, liberalisation of forest technical services, and promotion of producer associations in communities and *ejidos*.

At institutional level, the initiative performance was influenced by CONAFOR, a commission linked to SEMARNAT, the Environmental Agency (*World Bank, 2003*). In 1997, SEMARNAT initiated the first national sectoral programmes: the Forestry Development Programme (PRODEFOR, which, incidentally, incorporated many of the principles first introduced in the PROCYMAF project), the Commercial Forest Plantation Programme (PRODEPLAN), and the National Reforestation Programme (PRONARE) with the objective of incorporating forestry activities into national development and farmers' economy in a profitable and sustainable way (*World Bank, 2004*). Strong commitment and action within the implementing agency can be pointed out as a positive factor contributing to the initiative performance.

5.3 Economic factors

Several economic factors have played a significant role for the success of the initiative. The opportunity to obtain substantial economic return by investing seed money in a community forestry project, such as PROCYMAF, was an important factor that contributed to its success.

Moreover, the prospect to obtain positive returns from communal forest production (timber and NWFPs) to the communities and *ejidos* and the expectation that benefits accruing to production would be captured by the communities themselves were promising factors that created incentives for community participation.

Another contributing factor was the early recognition that diversification of income sources for rural populations is highly desirable and that forest based products could play a major role in achieving this (*World Bank, 2003*). The importance of multiple-use forests has been increasingly recognised as a response to the general economic deterioration in rural Mexico. Thus, commercial forestry could address the need to create alternatives to rural forest-based communities to increase their income.

5.4 Environmental factors

The strengthening of national environmental policies in the last years, to reduce deforestation and resources depletion, contributed to the performance of this initiative.

The fact that the project focuses on forest-based communities had several environmental implications that positively contributed to its overall performance. A major positive factor is that in Mexico the vast majority of the forest resources are owned by communities and *ejidos*. Therefore, programmes addressing SFM in forest-based communities have a potential to be successful and attain environmental sustainability. Another important

factor is that indigenous communities' forest management practices tend to be more conservation oriented than recommended from a sustainable production perspective and significantly more than traditional management practices.

A key factor contributing to the positive performance of the initiative relates to the project design. The relatively small scale of the project interventions and the built-in participatory mechanisms requiring assembly approval of all activities in the communities were strong factors against adverse environmental impacts.

5.5 Social factors

Among major social factors contributing to the performance of the PROCYMAF project, is the long established social structure of Mexican communities and *ejidos*, together with cultural aspects and links to natural resources. Local social particularities were taken into consideration at the initial stage of the initiative design. The project was based on diagnostic studies and public consultations, which significantly helped to build confidence among the stakeholders. Integration with all the participants, primarily with communities and *ejidos* was a key factor that enabled the project to satisfactorily accomplish its targets. It should be recognised that PROCYMAF is a highly people-centred project that aims primarily at improving the conditions for the poor, empowering local communities and *ejidos* to take decisions in respect to the nature, extent and timing of the SFM practices.

6. Overall assessment of the initiative

The Mexican Community Forestry project has been recognised as a successful initiative as it achieved the objectives established. The initiative was found to be an effective instrument to promote sustainable rural development and create important social, economic and environmental benefits. The project developed social capital (based on traditional and communal forms of governance), natural capital (forest resources with commercial and protective value), and technical and administrative capacity (human capital).

An important feature of the initiative was the strong interaction among stakeholders. The inter-community technical and commercial relations contributed significantly to strengthen community management to achieve a minimum level of scale and capacity to add value to resources. The interaction among communities and *ejidos* at different levels of organisation and levels of sophistication stimulated the creation of a technical cooperation network and formation of alliances and organisations with the objectives of production and commercialisation of timber and NWFPs. This implies a new stage of maturity of community forestry, following a model that seeks to achieve economic scale, greater integration of productive chains, enabling communities to confront the challenges of increasingly competitive and specialised markets (*World Bank, 2004*).

This project contributed to increase the forest area under improved management and with community land planning, reducing deforestation and resources depletion rates. It also helped the forest communities to become certified in 147,314 ha of forest land.

It was identified that the frequent interventions of promoters and the strong technical support by the implementing agency, including the involvement in community and *ejido* assemblies and their efforts to disseminate support options, have provided significant benefits in strengthening community institutions, and building up broader and more democratic social participation in decision making. Moreover, it has contributed to generate or re-establish the trust of community groups toward government institutions that operate programmes in the rural sector.

The project experience shows that development of *ejido* and community forestry has not been linear, with those experiencing limitations in the natural resource base or availability of capital, showing slower progress, if any at all. A high percentage of local producers cannot easily transit from one level to another in the context of an economic scale if their alternative products are limited to utilization of NWFPs. The solutions afforded by PROCYMAF also do not readily apply to communities with degraded or very little natural endowments (*World Bank, 2004*). Based on the project evaluation, the need to address access to investment funds to complement feasibility studies of NWFPs has been pointed out.

Even considering the participatory process since the initiative design phase, it was found to be difficult to have a full control on conflicts among indigenous communities and *ejidos*. These conflicts, frequently land-related and dating back many years, have made it extremely difficult or impossible to develop project activities in disputed areas in some communities.

The decision made by the project to avoid involving communities engaged in land conflicts was correct. This decision deprives a significant number of communities engaged in land conflicts of the programme benefits. A

risk in not attempting to bring such communities into the project is the possibility of creating a gap among communities. The project also did not include people who live in or near communities, but are not members of them, as direct beneficiaries. Although *avecindados* may receive indirect benefits in the form of employment and enhanced public services, the project does not address their needs directly. This issue also raises questions about exacerbating gaps between richer and poorer, and leaving significant numbers of poor people behind in the development process.

Although indigenous communities and *ejidos* have long traditions of communal resource management and democratic decision-making procedures, many are beset by poverty, out migration, factional conflicts fanned by party politics and religious schisms, and other problems that are corrosive to a traditional social structure. There is also a legacy of previous government policies that leave many communities distrustful of new programmes and policies. These difficulties also lower the capacity of communities to take sound decisions regarding management of their communal resources. The linkage between communal ownership, weakened organisation and poorly articulated markets made it necessary to strengthen the social organisation of indigenous communities and *ejidos* as a precondition for better resource management and acquisition of technical knowledge required for market competition (*World Bank, 2003*).

It has been noted that the viability of community forestry enterprises depends on their capacity to compete in a new global market context. The experience with private and State companies has left many communities with reluctance to be involved in partnerships with the private sector. As communities strengthen their capacity for governance and technical skills, it is expected to be possible to establish linkages with private organisations based on mutual respect and advantage.

Although no economic analysis was carried out at the PROCYMAF appraisal, an economic evaluation was made at the preparation of PROCYMAF II. The assessment considered the internal rate of return (IRR) and the communal distribution of “value-added”, defined as gross income, less depreciation and input costs. While the IRR provides an indicator of the viability of communal forest production, the calculation of value added and its distribution reveals the extent to which each community captures the benefits, which accrue to production.

The assessment pointed out that for a 20-year time period the models yield a satisfactory IRR, ranging from 16% to over 50%, which in all cases surpasses the prevailing opportunity cost of capital. As for the value added, in all cases, the community captures the bulk of the economic value. For NWFPs, pine resin extraction and spring water bottling holds IRR respectively of 25% and 26% (*World Bank, 2004*). Details of the analysis are provided in *Annex 1*.

As in several projects of this type and dimension the shortage of budget funds as well as problems with their timely release were negative factors explaining the relatively low pace of development of the activities. In addition, a negative factor was that the only investment funds available under the project were for NWFPs. The size of this component and the funds available for NWFPs investments may have been lower than actual demand.

7. Final remarks

The Mexican Community Forestry Program was the first large-scale initiative to address the problem of empowering poor communities to manage their own resources. Overall, the project can be considered successful as it demonstrates that these communities can generate significant income through the systematic management of natural resources.

The initiative deviated from a production-oriented approach to forestry focusing mainly on the forest-owning communities and *ejidos*, seeking to strengthen their capacity to take sound management decisions in a communal context while increasing their living standards through improved forest management.

The Mexican PROCYMAF project is an innovative initiative addressing SFM, based and centred on community participation. The first phase of the initiative has been highly successful to the stakeholders, primarily the forest *ejidos* and communities of selected States. The well-designed and implemented initiative has addressed important sustainability issues. Although designed to address specific Mexican community conditions, PROCYMAF has a structure that could be adapted to other regions of the country and the world where natural resources are managed communally or are associated with rural communities.

The main lesson of PROCYMAF was to demonstrate that communities could manage their own forest resources sustainably. They can develop organisational capacity and acquire the skills needed through the provision of suitable technical services and assistance in the formation of community enterprises. The requirement of full community and *ejido* participation in the design and implementation of programme interventions has been one of

the key contributors to the success.

It also seems that the project oriented community development need to consider a strong consultation process at the preparation phase. Even having considered this, the implementing agency needs to be prepared to accommodate pressures resulting from local conflicts.

CASE STUDY 2 - IMPACTS OF SFM ADOPTION AT THE FOREST AND THE MILL IN BOLIVIA: “LA CHONTA COMPANY”

1. Background

Bolivia is a landlocked country, located in central South America, with an area of 1.1 mill km². Bolivia ranks eighth in the world in species richness and biodiversity. Forest is the most representative biome covering 50% of the country's area, followed by high Andean grassland plains (30%), savannahs (20%) and wetlands (1%). As in other developing countries, deforestation takes place as a result of land conversion for agriculture and cattle raising (*Bojanic and Bulte, 2002*).

Although wood has been an important commercial product in Bolivia for centuries, the most important recent development of the timber industry took place in the 1970s, when the country became an important mahogany producer and exporter. As this species became less abundant in the 1990s, and as a result of the Forest Law 1700, passed in 1996 after a long process of consultations, industry was forced to shift to a wider range of species (*USAID, 2002*).

The forest sector contribution to Bolivia's GNP is around 3%, equivalent to USD 220 mill. The sector is directly responsible for approximately 90,000 jobs, representing 4% of the economic active population. Data available points out that if direct and indirect employment is considered the forestry sector accounts for 150,000 jobs.

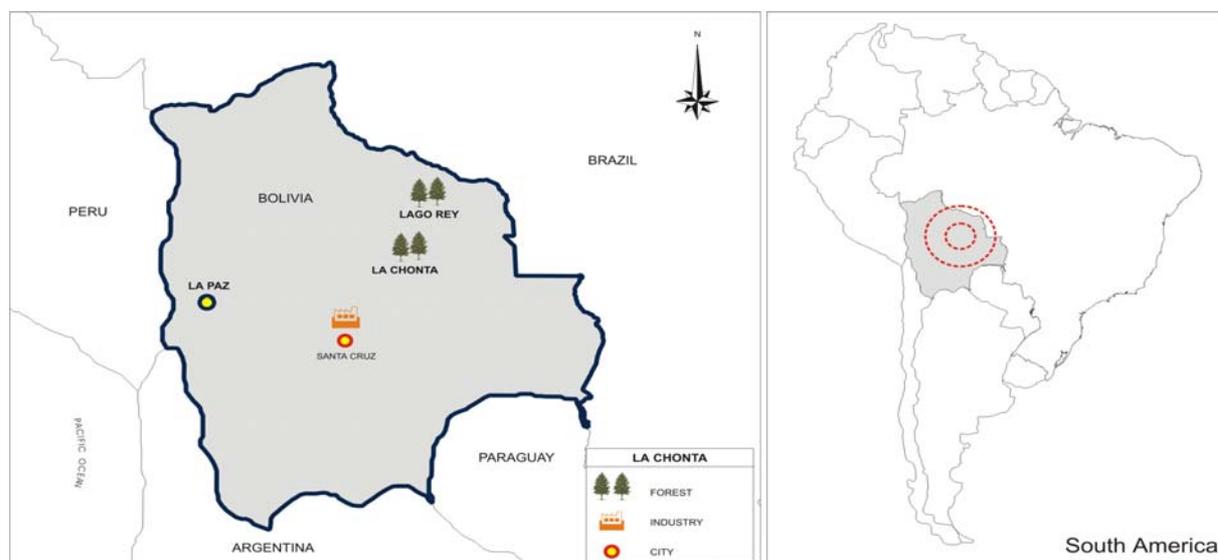
Forestry products, including timber and NTFPs (mainly Brazil nuts and palm hearts), are also important export items. In recent years, exports of forest products have been around USD 100 mill a year, representing between 9 and 11% of total Bolivian exports. In the past, exports were mainly based on mahogany lumber. As a result of the 1996 Forestry Law, and limitations imposed by selective and unsustainable harvesting, production and exports of mahogany declined rapidly in the late 1990s. Bolivia's timber industry has been slow in finding alternatives to recover export levels back to those of the middle 1990s, when exports reached over USD 130 mill.

In the late 1990s, as a result of the new Forestry Law and support of the international cooperation, a representative portion of the timber industry became engaged in an effort to reach forest certification. In 2001, there was an unprecedented 61% increase in certified forest product exports. This was expected to help promoting Bolivian forest products on international markets, but, with the exception of Brazil nuts and furniture and other value added products, forest exports have declined and forest products enterprises continue to slide. The main problem seems to be related to the fact that production costs continue to rise, making most Bolivian wood products non-competitive in foreign markets (*USAID, 2002*).

La Chonta is a Bolivian privately owned company established in 1974. The business involves three separate enterprises: Agroindustrial La Chonta Ltda, Aserradero Lago Rey Ltda and Bolivian Forest Saver. The first two are responsible for managing forest concessions and for wood processing facilities and operations, while the Bolivian Forest Saver is the group's trade branch. The three companies jointly employ approximately 350 people and generate total annual revenues of USD 4 mill.

In the past, the company was one of the main producers and exporters of Mahogany timber, basically primary products. After 1997, the company decided to embark on a new forest management approach and the forest concessions began to be managed in a sustainable way (*Antelo and Tuoto, 2004*). This required the company to completely restructure from forest to market operations.

Currently, La Chonta manages two concessions, La Chonta and Lago Rey, both located in the North Eastern part of the Department of Santa Cruz (see *figure 1*).

Figure 1. Location map of La Chonta's concessions.

The total forest area currently managed by La Chonta is 220,000 ha. Of this, around 164,000 ha are considered production forests (see *table 1*). The concessions have been certified under the Forest Stewardship Council (FSC) scheme, and, based on the current management plan, the company has established an annual allowable cut of around 40 thousand m³.

La Chonta has two sawmills located close to the forest concessions. The sawmills are small and make intensive use of labour. In 2003, the company invested on automation of one sawmill as well as on a power plant based on wood residue for electricity and steam generation. Recent investments in the sawmills include new kilns.

Sawmills located close to the concessions produce timber for the secondary processing facilities located in Santa Cruz. The company produces high-quality forest products based on tropical timber, mainly for the international market. The main focus is now on value added products (such as mouldings, flooring, doors, semi-finished furniture, and sidelights) and introduction of LKS.

Table 1. La Chonta's forest concessions

FOREST CONCESSION	TOTAL AREA (ha)	PROTECTION FOREST		PRODUCTION FOREST	
		ha	%	ha	%
La Chonta	100,000	28,800	28.8	71,200	71.2
Lago Rey	120,000	27,099	22.6	92,901	77.4
TOTAL	220,000	55,899	25.4	164,101	74.6

2. Objective and scope of the initiative

The objective of the Government of Bolivia in adopting Forestry Law 1700 was to create a new mechanism to promote SFM, aiming at the sustainable use of the resources and the protection of forest ecosystems to benefit present and future generations, balancing the social, economic and ecological interest of the country.

The La Chonta initiative was in line with environmental and operational conditions created as a result of the new Forestry Law. The company decided to review its forest operations, which required changes in the industrial operations and in trade.

The initiative scope was quite broad, starting at the review of the concession agreements by the Government of Bolivia and ending at the forest products market. The challenge was to fulfil a new legal requirement, adopt

SFM, while at the same time ensure the economic sustainability of the business.

3. Initiative description

The Bolivian Government enacted forestry Law 1700 in 1996, aiming at the adoption of SFM of the country forest resources. The Forestry Law established provisions to assign the right of use of the State forests by the private sector, based on long-term concession agreements.

Besides strengthening the concept of sustainable management and requiring a technically sound forest management plan, the new Law introduced several changes, including: payment by area (in the past it was made by volume harvested); priority for assigning public forest land to social groups; making state forestry institutions more accountable to the public; assigning 20% of the public forest areas to municipal governments as forest reserves; and strengthening the forest government organisations.

Although the law also provides for a process of international auction of concessions through which the market price would be established, for several reasons the process did not work, and a fixed price of USD 1/ha/year has remained as the value charged to concessionaires (*USAID, 2002*).

Among the important measures prescribed by the Forestry Law is a 20-year felling cycle for concessions and a 40-year lease period of forest lands to private companies. As prescribed, a concession must in principle be divided into 20 equally-sized “annual allowable cut areas”, and only one of these areas may be exploited in any given year. After exploitation, the area must be left to rest for 19 years, implying that firms may only use 1/20th of the entire concession area per year (*Bojanic and Bulte, 2002*).

Based on this concept, and taking into consideration a fixed fee per area of USD 1.00/ha/year charged to the concessionaire, it is expected that timber companies would be encouraged to make a better use of the resources, and this would include increasing the number of species harvested. Under the old system, in contrast, tax payments were related to the quantity harvested, which stimulated the concentration on more valuable species

The primary motivation to review the La Chonta operations was to sustainably manage the forest as required by the new Law, and also reduce costs in view of the new form of payment for the concession. The company also noticed that when operating with a larger number of species, the volume per unit of harvested area increased and thus had a positive impact on the reduction of harvesting costs. Additionally, it was necessary to adjust the area of the concession. In view of the form of payment, La Chonta and most other timber companies operating in Bolivia had concession areas well above their needs.

In the early stage of implementing the Law requirements, it was noticed that the preparation of a comprehensive management plan implied the collection of a huge amount of data, representing a significant cost. The technical regulations related to the plans include a list of harvestable timber species, annual volumes, and cutting cycles; identification of actions to avoid loss of threatened and key wildlife species; actions to prevent soil and water degradation; fauna inventory; definition of ecological reserves where logging is prohibited; detailed area maps; and monitoring and evaluation plans for identifying forest response to logging and silvicultural treatments (prepared by D. Ruiz based on *BOLFOR, 2001*, cited in *USAID, 2002*).

In implementing the initiative, La Chonta, as well as other timber companies operating in Bolivia, counted with support from international cooperation agencies in the preparation of management plans, improving human capacity, preparation for forest certification, and other actions needed to improve forest management and industrial operations.

In fact, the implementation of the initiative was facilitated by the experience gained in the past. In 1994, therefore, two years before the new Forest Law was enacted, La Chonta decided to establish a trial forest management plan in a 20,000 ha piece of forest land to investigate different management regimes. In the trial management, the forest harvesting based on selective logging of a few valuable species considered a very low removal (less than 1 m³/ha). Despite this fact, operations could be economically justified based on the high market price of the harvested species. Under the trial plan, a forest inventory of the total area and a census were carried out, but unfortunately, one year after the work was completed, the forest was affected by fire and the information was lost.

By the end of 1996, taking into account the lessons learnt and the new Forestry Law, the company decided to embark on a new forest management approach and the forest concessions began to be managed under sustainable principles. Together with improved silviculture practices the company started to improve forest harvesting operations and adopted low impact logging practices. Significant changes were also gradually introduced in industrial operations and trading practices, including the search for new markets.

As a result of the initiative, mahogany and other precious species, well known and highly priced at international markets, became only a minor part of the production, and new species had to be considered. This required substantial changes in the industrial process, development of new products (with focus on value added products), acquisitions of new equipments, and specially opening up of new markets. La Chonta also decided to embark on forest certification. This required improvements in performance in several areas, including workers' safety and health, social benefits, environment monitoring, public relations, and other aspects.

4. Outcomes

The 1996 Forestry Law had several impacts on the Bolivian forest sector. First, it significantly reduced the area under concessions, and, although Bolivia has large areas that could be used as production forests, currently only around 5 mill ha are involved in production under the concession scheme. The main reasons for this reduction are associated with economic and political instability. One strong economic factor is that under the new arrangement the payment made by the concessionaires is based on the area under concession, not by harvested volume as in the past.

In fact, the reduction of the forest areas under concession became a problem to the Government. The most immediate effect was a reduction in revenue collected from the forest sector, and the Government had to find other ways of financing the public forest administration. Also, the reduction of the forest concessions in the hands of the private sector means more land to be protected by the State. As the Government structure is limited, forest areas became more vulnerable to deforestation and illegal logging.

In the first stage, private stakeholders strongly opposed the new law, claiming that it had a high negative impact on costs and the competitiveness of the timber industry. The industry argued that the combination of the impact of the new Law with high transportation costs and low prices for many LKS would drive firms out of business. Furthermore, the timber industry claimed that other forms of access to the resources provided in the law, benefited communities and created an unfair competition environment.

The Government initiative was supported by the international community. An ITTO Mission to Bolivia (*ITTO, 1996*) made an assessment of the forest sector and several recommendations were incorporated into the new Law and to the complementary regulatory measures. Other international organisations cooperated with the Government and directly with the private sector (for example the BOLFOR project) to enhance their capacity to comply with the new Law and improve forest management practices and industrial and trade efficiency.

La Chonta was one of the first companies to understand the need to change, and took advantage of the international cooperation to move in a new direction. To comply with the law and adopt SFM practices, La Chonta had to assess the concession forest resources, make inventories of the area to quantify the main forest products, access regeneration, reduce harvesting and transportation impacts, and take other actions in order to prepare a technically sound forest management plan.

To compensate for the cost increase, the company worked to increase the number of species harvested and thus the volume removed by unit area. This allowed La Chonta to reduce the size of the concession. Two immediate positive economic effects were noticed: (i) the harvesting cost decreased significantly; and (ii) the amount paid to Government as royalties for the concession decreased.

Other alternatives to finance SFM were tried such as the production of NWFPs. In spite of the efforts, La Chonta concluded that NWFPs could not be economically harvested, and timber remains the only source of revenue up to the present.

Actions taken at the forest level were not sufficient. In fact, the increase of the number of species (basically LKS) created a problem at the mill and mostly important in the trade. Strong market limitations for LKS have been experienced by La Chonta since SFM was adopted.

La Chonta was fast to identify that their industrial and trading operations had to change. The main problems identified were:

- Markets for timber products are very traditional, and the introducing a new species is usually difficult. Pricing is the main instrument to facilitate the trade of new species;
- In view of Bolivia's location and high transportation and logistics costs, trade of LKS in the form of primary products, as done in the past with the traditional highly valuable species, is not possible for low priced timber.

To overcome the problem, La Chonta decided to work with value added products and forest certification aiming to obtain a price premium. In fact it was later found out that the price premium was limited, but forest

certification facilitated opening new markets.

The development of new and value added products was not an easy task for La Chonta. Investments were required in developing new products, upgrading the industrial facilities, and market research. At an early stage, investments were made to adjust the technology for LKS processing. This also included procurement of new equipment for the industry.

As a result of the initiative, La Chonta seems to be in a better position than most other Bolivian companies. The company still suffers from funds shortage but is gradually improving the situation through strategic planning, which includes debt negotiation, investments to increase production of value-added products, and introduction of LKS in the market.

To improve product distribution and market promotion, a new trading company (Bolivian Forest Saver) was created. It concentrates the group's commercial transactions and is responsible for promoting, identifying and opening new markets for LKS. Some gains have been achieved, but the problems with LKS are far from a solution.

5. Analysis of the factors contributing to the performance of the initiative

5.1 Overall social- economic and environmental contexts

In proposing the Forestry Law 1700 the Bolivian Government took into consideration the concept of sustainability of the resources, and therefore environmental and socio-economic aspects were taken into due consideration.

The over-harvesting of a few species (mahogany and others), and the consequent reduction of species availability, created a general perception that changes were needed. On the other side, the Bolivian society's awareness of environmental aspects was also a factor contributing to the initiative.

5.2 Policy, legal and institutional environment

As a result of the new Law, public organisations were strengthened and law enforcement improved. Within the institutional context, the law established three national regulatory and financing bodies: (i) a Directorate General of Forests in the Ministry of Sustainable Development and Planning, responsible for the preparation of forestry regulations; (ii) the Forest Superintendence, enforcing these regulations; and (iii) FONABOSQUE to help financing forestry investments. The Law also gives the departments responsibility for implementing programmes and projects of public investments related to the forestry sector and developing programmes for strengthening the municipalities' institutional capacities. Within their jurisdiction, municipal institutions are allowed to issue permits to individuals, companies, colonists and indigenous groups to obtain forest concessions (*USAID, 2002*).

These were important factors contributing to the performance of the initiative. Also La Chonta, in particular, felt that property rights were better defined which was important to create a better investment environment.

5.3 Economic factors

Bolivia is rich in forest resources, but is an economically poor country. Forests make an important contribution to the economic development, but the new Law no doubt created some problems. Most of the timber industry in Bolivia has faced difficulties due to economic and political instability in the 1980s and 1990s. The macro-economic reforms in the 1980s reduced inflation, but restricted credits and reduced national and international investments.

For many years, the Bolivian timber industry was financed by international traders. This source of capital was withdrawn when the new Law limited mahogany harvesting. Without this source of capital and also credit restrictions in the banking system, part of the timber industry faced strong financing problems.

La Chonta was not an exception, but the company was one of the first to react and try to find market based solutions. The financial, technical as well as institutional support of international organizations, although limited, was an important factor to facilitate the implementation of the initiative.

5.4 Environmental factors

It is recognised that large industrial concessions, properly managed, such as La Chonta's, can contribute to the

preservation and conservation of tropical forests, maintaining the integrity of large and continuous undisturbed areas, biodiversity, water and soils. To have this understood by the society was a factor indirectly contributing to the performance of the initiative.

On the other hand, initiatives such as the one implemented by La Chonta are affected by strict and demanding environmental regulations. Lack of financial and human resources creates difficulties to reach high standards. This seems to have taken place in Bolivia, where standards were highly influenced by the international community. This aspect has affected the La Chonta initiative. The adoption of certification criteria contributed, at least in part, to the solution of the problem. The main benefit that certification provides is a form to internalise a mechanism for monitoring and evaluating the process.

5.5 Social factors

By creating mechanisms to consider traditional land ownership and involve a number of different social actors, the new Law accommodates social pressures in the forest areas. Among the mechanisms are the ASLs and the TCOs, basically forest land held by local communities and indigenous groups. In spite of the fact that the private sector has argued that ASLs and TCOs are favoured when compared with “industrial concessions”, it seems that the provision made in the law made an indirect positive contribution to the social performance of the initiative.

Again, the process of forest certification adopted by La Chonta paid its contribution. Forest certification helped to take into due consideration the involvement of communities in forest management decisions; in the implementation of mechanisms for the effective distribution of incentives and fair and equitable sharing of costs and benefits among the parties; and in the implementation of procedures to ensure the health and safety of forest workers, releasing pressure at the concession in surrounding areas.

The La Chonta approach of involving local communities was considered adequate. By gaining the confidence of local populations, forest management practices were facilitated, and risks (such as forest fires, illegal encroachments and others) were mitigated.

6. Overall assessment of the initiative

The Forestry Law 1700 was an important initiative of the Bolivia Government to put in place policies and the legal framework to promote SFM. The action taken by the State also improved law enforcement. There is no doubt that the Government initiative was an important driving force to make La Chonta adopt SFM.

To comply with the new Forestry Law, La Chonta moved towards better practices, including low impact harvesting, addressing ecosystem sustainability and maintaining its forest productivity in the long run. The company has also taken social aspects into account, and in this process forest certification played an important role.

Nevertheless, La Chonta and other Bolivian companies have suffered from the lack of financial sources to support investments required for the SFM adoption. This indicates that, although SFM has been achieved, the economic sustainability remains to be solved, and this was the main lesson learned by La Chonta in implementing the initiative.

Adopting SFM and complying with a complex legislation have imposed a high burden on La Chonta. In fact, there are practically no financial instruments or other incentives to effectively support the implementation of SFM in Bolivia. There is also a limitation in the number and adequacy of skilled professionals. Several technical questions remain to be solved, and the Bolivian Government has demonstrated a low capacity to support forest companies in transition towards SFM.

In view of these limitations, the main challenge to La Chonta has been to find ways to finance the additional costs resulting from SFM. International cooperation was important, but it did not ensure the economic sustainability.

The success of La Chonta initiative is therefore mainly dependent on its capacity to search for a remunerative market. For this reason, La Chonta has to focus continuously on increasing the efficiency in its forest, industrial, and trade operations. It seems that, in the case of La Chonta, there are a few strategic options to be considered to increase productivity and therefore competitiveness in the market. In fact, La Chonta has adopted such options, and this has differentiated the company from other Bolivian competitors. In short, the actions needed include: to increase the volumes removed by incorporating a larger number of species, move towards secondary processing, and reduce costs in the production chain.

Cost reductions imply gains in efficiency in forest operations, transportation, industry, and in product distribution to the market. To do so, it is necessary to invest in human capital, technology, industrial facilities and marketing. The La Chonta initiative moves in this direction. In the past, the company considered other alternatives to finance SFM, such as a premium paid by certified products, increase revenues by marketing NWFPs or remuneration for forest services. These options are not considered important by La Chonta anymore.

The economic challenge faced by La Chonta is reflected in a study on the effect of the Forestry Law on private businesses. The study concluded that the law limits profitability of commercial forestry, reducing the Net Present Value (NPV) by 20 to 50% (*USAID, 2002*). Such reduction is important when considering that operational margins of the tropical timber industry in Bolivia have been traditionally low.

7. Final remarks

This case study shows that initiatives taken by the private sector (in this case represented by the La Chonta Company) can be strongly influenced by national policies. In the case of Bolivia, the new Forestry Law, and its complementary regulatory measures, together with actions taken to ensure law enforcements, was important to drive La Chonta towards SFM adoption. Nevertheless, other factors also need to be simultaneously considered. The tropical timber industry in developing countries needs support to develop human capital, introduce new technology, and improve their operations and facilities.

In the case of La Chonta, the coordination with the international cooperation seems to have played an important role, but in fact the success of the initiative is mostly based on the company's own efforts at high risks. Options investigated to increase revenues, including a premium for certified products and payment for environmental services do not seem to be realities at the moment.

The initiative also shows that the basic economic lesson remains unchanged. Companies need to focus on the forest products market to survive. This means that SFM will only be a reality if companies are capable to invest in order to increase their efficiency, allowing them to be competitive on the global market.

The La Chonta initiative is considered strategic in order to increase the volume removed per unit area, introduction of new species and trade of value added products. In a broader sense this applies to most tropical timber industries in developing countries, but each company or country needs to find its individual solution.

To manage forests sustainably means to ensure that their capacity to continuously produce goods and services are not jeopardized and thus the economic, social, and environmental sustainability are maintained. In order to accomplish this task, the industry has a major role to play.

CASE STUDY 3 – PUBLIC AND PRIVATE INITIATIVES TO PROMOTE INDUSTRIAL PLANTATION IN CHILE

1. Background

Over the past decades, Chile has implemented a programme to promote industrial plantations and manage its forest resources. As a result of the initiative, the country was able to attract investments and became an important player in the international forest products market.

Between the 1930s and the early 1970s, the Chilean economy benefited from a stable but restrictive policy focused on internal growth and trade protectionism. Forest products industries, as well other economic sectors, were able to reap the benefits from strong trade protection measures against foreign competition.

Between the mid-1960s and the early 1970s, forest plantation-based industries experienced a substantial growth. However, despite all effective protection, much of this growth was due to an increasing participation of the state in major facilities. In fact, the protectionist policy adopted by the country was not enough to encourage the private sector to invest.

During this period, political uncertainties affecting property rights, a low technological level of forest industries (mostly based on primary products), and the lack of markets for young plantations (small diameter logs) made private companies and investors show little interest in investing in forest plantations (*Seve, 2000; IADB, 2004*). As a result, the annual rate of planting declined, and the State had to play a major role in forest plantation activities.

Starting in 1974, Chile implemented a new national forest management strategy. This strategy limited the

Government's role to three areas: regulations affecting the forest sector, promotion of forest-related activities developed by the private sector, and management of protected areas and other lands under the National System of Protected Wildlands (SNASPE) (*Neira, Verscheure and Revenga, 2002*). Within this framework, two major activities took place: (i) a privatisation process that transferred the State's forest-based industrial facilities and some forests to the private sector, and (ii) a programme of incentives to support the national programme of forest plantations, based on the Decree Law 701.

The combination of government policies to promote plantations and the private sector's investments over the past few decades has resulted in a strong and solid forest sector, based on a fast growing plantation area of over 2 mill ha and a diversified forest-based industry. The sector became an important element to support Chile's economic development, contributed to increase employment and, to some extent, helped to improve the environment, protecting soils and recovering degraded and marginal lands.

The country's comparative advantages and favourable macro-economic environment for investments have also played major roles in the process. This case study focuses primarily on the incentives and actions implemented in the past decades in Chile, in particular on DL 701 as a major supporting instrument for the development of a strong forest sector based on industrial plantations.

2. Objective and scope of the initiative

The strategy of the Chilean Government to promote forest development was largely based on the programme of incentives for the establishment of industrial forest plantations. The main objective was to make available mechanisms to prepare the forestry sector to corroborate with the national economic development strategy.

The pivotal instrument of the initiative was the Decree Law 701/1974 (DL 701). The main objective was to create an appropriate environment to establish a profitable, efficient and competitive forest sector based on industrial plantations. The scope of the national forest strategy had two basic components: a privatisation process that transferred the State's forest-based industrial facilities and plantation forests to the private sector, and the establishment of a legal and institutional framework for the provision of forest plantation subsidies. The coverage of DL 701 is nationwide; however, given the availability of land, the diversity of soils and other conditions, the planted area varied throughout the country, and some regions have concentrated the plantations more than others.

Law 19561/1998 modified DL 701 by focusing on the objective of regulating forest activities mainly on aspects related to land use. Among the new regulatory measures introduced was to restrict forest plantations to some regions and areas, including degraded lands, selected as priority areas for forest use. The new Law also gave emphasis to the promotion of forest plantations among small landowners and prevention of soil degradation and protection.

3. Initiative description

The Chilean Government has played a dominant and consistent role in developing and implementing the initiative. The main elements considered in the strategy are the following:

- Reducing the State involvement in forest operations, through the transfer of forest facilities and plantations under the State control to the private sector;
- Designing and implementing financial incentives for industrial forest plantations;
- Providing the necessary conditions for the development and structure of a strong forest sector based on industrial plantations.

The most important component of the initiatives has been the DL 701 and its successor Law from 1998. Beside these legal instruments, mainly focussing on development promotion, other factors played key roles, including: (i) a comparative advantage of the country based on macroeconomic factors that were fundamental to attract national and foreign direct investments (FDI) and (ii) other mechanisms implemented to provide the benefits of DL 701 to forest landowners. A more detailed description of the mechanisms is presented in the following paragraphs.

Decree Law 701/1974 and Law 19561/1998. The DL 701 is basically a forest development legislation. It was enacted in 1974 and maintained for a 20 year-period. It incorporates important legal measures and subsidies to promote commercial forest plantations. It established that forest lands could not be expropriated, guaranteeing the property rights to investor in plantations.

The subsidies provided through this legal instrument up to 1994 considered a rebate of 75% of the investment made in the plantation establishment, management and administration. The Decree also introduced tax exemptions and reductions of land taxes and taxes on utilities derived from the use of natural and planted forests. Under DL 701, the subsidy was provided based on the area effectively planted.

In 1998, Law 19561 modified DL 701 by changing its objectives and extending the benefits up to year 2010. This new forest development and plantation promotion Law has more emphasis on regulatory measures, administrative procedures, practical standards, judicial procedure and general dispositions that regulate the forest activity in lands suitable for forest activities (*García and Sotomayor, 2002; Venegas, 2004*). Law 19561 also has a provision to give preference on incentives to small and medium landowners, and favours plantations in degraded lands with low productivity and suitable for forest activities.

Specific payments for small landowners are defined for plantations, the first pruning and harvesting operations. The payments are as follows: (i) for the first 15 ha planted, 90% of the costs are covered, while for additional areas payment covers 75% of the costs; (ii) for the first pruning and harvesting operations, the percentage of the costs covered is 75%. The net costs are based on estimates prepared by the National Forest Corporation (CONAF) and updated annually (*García and Sotomayor, 2002*).

To be entitled to the benefits of DL 701, it is required that the area is officially categorised as suitable for forest activities and a management plan for the forest is approved by CONAF. To effectively achieve the plantation and forest management goals, the benefit is paid only after the tasks and activities have been accounted and a minimum number of trees has been planted and survived.

The Law also regulates logging (through a system of permits and authorisations), and defines sanctions for violations (*Neira, Verscheure and Revenga, 2002*). Moreover, forest landowners who deforest natural forests or forest plantations in land suitable for forest activities are mandated to reforest, usually, in the same land and with the same species, an equal area under conditions contemplated in the management plan.

Additional factors relevant to the forest sector development. Beside the Government incentive to promote industrial plantations, forest development in Chile has benefited from a set of macroeconomic measures that enhanced the competitiveness of the sector. Among the main ones are:

- *Comparative advantages:* This includes land availability suitable for forest growth; strategic location; competitive price; good adaptation of fast-growing species; low labour and energy costs; technologies for industrial production of goods with high trade barriers; and development of a large trade network and international contracts;
- *Free trade opportunities:* To maximise the Chilean forest potential, a free trade macroeconomic policy has been implemented, favouring exports of diversified products and creating competitive companies. The elimination of bans on roundwood exports gave a significant incentive to the forest sector. Nowadays, current domestic prices reflect international prices, favouring the business in the forest sector;
- *Promotion of non-traditional products exports:* Export diversification has been an important factor in the development of the Chilean forest sector, as domestic demand and per capita timber consumption are lower than in some developed nations. Thus, promoting exports of non-traditional forest products became a major incentive to the forest sector. For instance Law 18480/1985 allows a 10% refund on the FOB price of non-traditional products exported. This policy has allowed small and medium companies to access external markets. However, given current World Trade Organisation (WTO) regulations, the elimination of this incentive is under study;
- *Exchange rate policy:* The level and stability of the exchange rate have favoured the free trade and supported the effort for export promotion. The behaviour of the Chilean exchange rate has increased the trade of forest products to over 80 countries. Soon after the Central Bank liberalised the exchange rate, the Chilean currency was devaluated with 14%, improving the sector performance and the competitiveness of exported-oriented small and medium companies;
- *Road and port infrastructure:* Although Chile has enjoyed the advantage of producing low cost wooden material, its location far from major consumer markets and road and port infrastructure deficiencies have affected its competitiveness. To mitigate this situation, public and private investments in road and railway networks and in port facilities have been made. The public and private sectors have joined efforts and invested in strategic infrastructure. The privatisation of the railway network and road construction has also been a stimulus to the forest sector.

All these initiatives were important in creating a good investment environment. As a result, Chile has been able to attract substantial national and foreign direct investments.

Other mechanisms providing DL 701's benefits. DL 701 and Law 19561 require that forest activities are effectively carried out prior to landowners applying for the benefits. As most landowners are not capitalised nor have liquidity, a number of financing mechanisms are in place, from private or public sources, to provide funds and credit lines for individuals or companies interested in forest plantations (*Venegas, 2004*). These mechanisms include:

- **INDAP's Forest Credit:** It is a credit line for INDAP's beneficiaries with land suitable for forestation. The mechanism is a bridge credit line to finance forest plantations while the corresponding DL 701 forest promotion benefit is obtained;
- **BancoEstado's Forest Credit:** This is a financing instrument accounting for DL 701 benefits, channelled through the "Micro-companies' platform" of BancoEstado. Potential beneficiaries are small and medium landowners, individuals or firms, who must be enrolled at or subject to some Government programs and studies as a guarantee;
- **Credits from Commercial Banks:** There have been several commercial banks financing reforestation through their credit lines. They correspond to general credits for companies, for labour capital and operations;
- **Forest Securitisation:** It is an innovative tool for landowners without capital for establishing plantations. It is implemented by the Forest Investment Society (SIF), a branch of the Chile Foundation. The forest securitisation programme aims to solve the lack of initial capital and cover the long period without returns of forest investments, mainly for small and medium producers. The programme is currently in its pilot phase;
- **CORFO's Solidarity Caution:** It is a financing mechanism to stimulate the use of DL 701's benefits, allowing small landowners to ask for a credit from a private bank, offering a real guarantee of 60% of the total credit. Small landowners or agents with forestation rights can ask the Chilean Economic Development Agency (*CORFO*) for a payment guarantee, making it easier for the bank to approve operational credits, which is cancelled as the landowner starts receiving benefits from DL 701;
- **CONAF's Participative Subsidiary Forestation:** This category provides material and technical support for the establishment of forest plantations. It is focused on landowners with less than 5 ha operating in marginal forest areas and interested in plantations for the production of fuelwood, wind brakes and/or productive plantations in poor and indigenous communities without land titles. This category has promoted social inclusion for landowners without alternatives for forest plantations;
- **Natural Forest Conservation and Sustainable Management Project:** Under this mechanism the German Development Service (*DED*), the Reconstruction Loan Corporation (*KfW*), and the International Cooperation for Sustainable Development (*GTZ*) have come together to develop a SFM project for natural forests, which started in 1997 and lasted for five years. The second phase runs from 2003-06, offering technical assistance for SFM and benefits to small landowners for plantation or natural forest regeneration;
- **National Programme of Forest Technical Transfer (*PNTTF*):** It finances forest management of plantations through the Reforestation Programme of Small Landowners, who are not able to access DL 701's benefits. *PNTTF* also provides technical support and training to small landowners, farmers and agents.

Another important mechanism attracting direct investments to the forest sector (primarily used by forest companies) has been the stock market. The good performance of some large forest companies in the stock market, nationally and internationally, has driven large investments to the forest sector. For small and medium forest companies and the public sector in general, the main mechanism for credit access has been the Forest Securitisation (*IADB, 2004*).

Chile has also a number of other subsidy programmes in place. For instance, a duty drawback system which covers specific commodities such as poles, pilings, posts, softwood lumber, temperate hardwood veneer, plywood, and particle board. Exporters receive a 3 to 10% duty drawback on exports based on the total value of exports. No drawback is given if the total value of the exported product exceeds USD18 mill (*Salamone, 2000*).

4. Outcomes

Overall, the national forest strategy has been considered highly successful. This has basically been a result of Government subsidy programmes complemented with the creation of a credible environment for investment, guaranteed private property, and stable "rules of the game" (*Castellanos, 2001*). As a result of the governmental policies and the actions taken by the public and the private sectors in Chile during the past decades, the forest sector has become highly competitive in the international market and one of the leading sectors of the economy.

The major outcomes related to forest plantations, the forest industry, and to the socio-economy of the forest sector are presented below:

Chile has significantly **increased its forest plantation area** as a result of DL 701 and other actions. In a 30-year period, the forest plantation area increased from 220,000 ha in 1973 to currently almost 2.1 mill ha. The main species planted is radiata pine (*Pinus radiata*), comprising 73% (around 1.5 mill ha) of the total plantations. *Eucalyptus* covers 19% (387 thousand ha), while other species accounts for 8% (172 thousand ha).

An analysis of the incentives for reforestation carried out in 2000 indicated that DL 701 had been responsible for a plantation area of 1.04 million ha, representing a present value of USD 518 million, with 64% representing investments in plantations and the remaining in silvicultural intervention and administrative costs. The stumpage value of these plantations has been estimated as 10 times higher than the amount invested by the State (*IADB, 2004*). From the Government standpoint, this has been a successful policy, responsible for creating an important asset and generating significant revenues for the country and the participants. Moreover, the State is expected to have a full recovery of the investment through taxes, social benefits and higher levels of economic activity in the now existing forestry and forest industry cluster.

The annual planting rate in Chile increased from 30,300 ha in 1973 to 130,400 ha in 1992. As a result of the Government withdrawal from the forest sector, as part of the national privatisation and forest strategy, plantations after 1974 started to be carried out by the private sector. While in 1973, CONAF accounted for 91% of the plantations, its participation decreased to only 0.1% in 1981, ending in entirely by 1986 (*IADB, 2004*).

Chile has enormous comparative advantages for establishing forest plantations, but to some extent similar conditions exist in other Southern Cone countries (Argentina, Brazil, Paraguay and Uruguay). The comparative advantages of Chile include land availability suitable for reforestation, relatively low land prices and proper climatic-soil conditions for fast-growing forest species. However, in recent years, higher land prices and reduced land availability have limited new plantations. As a result, some Chilean companies have increased investments in other countries of the region, especially in Uruguay, Argentina, and Brazil.

In order to account for plantation and forest management activities and to pay the benefits, the promotion law requires that forest activities and interventions are executed or implemented prior to the participants accruing their benefits. This demand imposes a limitation and permanent restriction to forest development as many forest landowners lack liquidity and capital for investment, especially small landowners and farmers (*Venegas, 2004*). To overcome this problem, Chile has been able to develop appropriate financing mechanisms.

While the initiative has been considered highly successful by the Government and the private sector due to its contribution to the country's economic performance, there are some questions related to possible negative social and environmental impacts. The Chilean forest model, based on promotion of large-scale forest plantations, has been said to be implemented at the expense of the environment, and local communities have been excluded of the development process.

The **Chilean forest industry** is of a regionally very significant size and became the country's second largest industry (*Castellanos, 2001*). Industrial roundwood consumption in Chile comes almost exclusively from large-scale private plantations, and harvesting reached 25.5 mill m³ in 2002. In the past 10 years, the consumption grew at an average rate of 3.4% a year, whereas in recent years it remained stable. Pine is the main species, accounting for almost 80% of the timber consumption.

Large pulp and paper companies with a strong vertical and horizontal integration dominate the Chilean forest industry. These companies own large plantation areas that supply important industrial complexes, including pulp and paper, lumber, wood panels, and remanufacturing mills (*Venegas, 2004*).

Medium and small companies are basically sawmills and remanufactured products mills. This wood processing industry is considered efficient, although relatively fragmented, with an estimated 2,500 sawmills (*Venegas, 2004*).

Even with a large number of small sawmills, the majority of the production is carried out by 10-12 large international firms. The two most important products for the Chilean wood industry are wood panels and softwood lumber. The panel industry produces around 1.5 mill m³ annually, of which 800,000 m³ are exported. Substantial growth in the wood panel sector is expected in the near future and there are several investments foreseen to modernise production facilities and install new lines. If the modernisation process continues, growth rates of 10% can be expected. Production of softwood lumber is also expected to increase as many plantations will reach maturity along the next years (*Salamone, 2000*).

National and foreign companies have done significant forest investments in the past 10 years. During the 1990s, foreign forest investments have surpassed USD 4 billion, mostly in the wood pulp and manufacturing segments. The forest industry has also invested in port infrastructure to improve logistics.

In fact, foreign capital inflow has been reduced as compared with the 1980s. Reasons for the reduction in foreign investment in the sector are associated with environmental restrictions that are decreasing the availability of land for plantations. As the size of plantations is not expected to grow in the next years, many companies have diverted investments to neighbouring countries (Brazil, Uruguay and Argentina). Even with this limitation, about USD 3.6 billion of new investments have been announced by the forest industry to be invested up to 2010.

The *forest sector contributes significantly to the Chilean socio-economy*. Its contribution in 2001 to the GDP and to the level of employment reached 3.7% (USD 2.5 billion) and 2.2% (117,000 people), respectively (see *table 1*).

Between 1966 and 2002 the forestry sector GDP in Chile has experienced a significant growth: an average of 5.9% a year. This is higher than the Chilean GDP growth of 3.7% a year (*IADB, 2004*). In 2002, the sector accounted for around 12% of the value of Chilean exports and only 3% of the total imports, resulting in a positive trade balance of almost US\$ 1.7 billion.

Table 1. Major variables of the Chilean economy and the forest sector (2001).

Variable	National	Forest sector	Forest sector (%)
PIB (USD million)	67.236	2.510	3,7
GDP change - 2001/2000 (%)	3,0	-2,9	-
Employment (1,000 people)	5.421	117	2,2
Total exports (USD million)	18.300	2.206	12,1
Total imports (USD million)	16,8	521	3,1
Trade balance (USD million)	1,5	1,7	-

Source: Chile's Central Bank and Forest Statistics, cited in *Cerda (2003)*, adapted by *STCP (2004)*

The Chilean forest industry has contributed about 3% of the total GDP over the last 15 years, accounting for about 10% of all country exports and a significant 2% (specially considering the size of the productive forest area) of the world trade in forest products. Their primary products consist mainly of roundwood, lumber, fibreboard, particleboard, wood chips, pulp, and newsprint. The importance of NWFPs production, such as sweetbriar rose, soapbark tree, and *boldo*, is hard to estimate due to fragmentation of the production and trade, but they also contribute to exports and may offer alternatives for SFM.

The Chilean forest sector is primarily export-oriented. Chile is a country with a relatively small domestic market, and it is thus fundamental to be competitive on the international market. The major forest products exports are chemical wood pulp from forestry plantations (39% of exports), lumber (8.8%), and wood chips (3.8%) (*INFOR, 2002; Neira, Verscheure and Revenga, 2002*).

The forest sector in Chile is responsible for 2.2% of the total national employment, representing 117 thousand direct jobs. About 12% are employed in the service business, 54% within the industry and 34% in silvicultural activities (*Cerda, 2003*). As a result of the sector dynamics the employment level was expected to grow, but along the last few years reduction was faced. This is basically a result of gains in productivity of forest-industry operations (*IADB, 2004*).

Although the Chilean initiative was generally positive, there are concerns that the small and medium landowners and forest companies have not been able to fully capture the benefits. The increase in productivity was mainly in large companies and the PyMES have suffered (*Cerda, 2003*). These concerns have been partially addressed in the recent change of DL 701, which focuses on small landowners, aiming to bring them to the productive sector.

Economic studies revealed that the fiscal incentive programme for forest plantations achieved an attractive rate of return over the investments. The national forest strategy attracted substantial amounts of private capital, increased employment and revenues, and tax returns to the Government. Considering all these aspects, the internal rate of return (IRR) of fiscal incentives for plantation forests was around 15%, higher than most investments made in the country during the last decades (*Tomaselli, 2001*).

5. Analysis of the factors contributing to the performance of the initiative

5.1 Overall socio-economic and environmental context

Decree 701 has been a major tool for the promotion of forest plantations in the last 30 years in Chile. It made it possible to establish, with limited investment from the private sector, a significant planted area, which has been the base for the development of the forest industry.

The socio-economic context of the national forest strategy has been defined by the government's interest to withdraw from the forest operations in the early 1970's and its decision to implement sector policies to promote economic development. This included improving property rights and reducing political imbalances that restricted private investments, industrialisation, market interaction, and strengthening the country's comparative advantages.

The changes in DL 701 focused on social and also environmental aspects, which, to some extent, were not fully considered when the initiative was first established. Motivation for change came from government policies that were influenced by pressure from social and environmental groups.

5.2 Policy, legal and institutional environment

Chile was one of the first developing countries to establish appropriate policies to develop the forestry sector based on fast growing plantations. The main instruments have been DL 701 and Law 19,561. The components of these Laws provided not only the real incentive for the promotion of forest plantations and development of the forest sector, but also the legal basis to support the institutions involved in the process.

Among the stakeholders involved in the implementation of the initiative are the State (through various state agencies), the institutions linked to the forest industry (also large landowners), trade associations, small/medium landowners, and NGOs, all of which have played important roles.

The State's main role has been to promote the management of natural forests and forest plantations, implement legislation, and administer the SNASPE. The forest industry has played important roles through ownership and management of extensive planted lands, and through increased contribution to the country's GDP through industrialisation and exports. Small landowners hold a significant share of forest land, with their use restricted mostly to fuelwood and seasonal shelter for livestock. Environmental NGOs' main goals have been to promote forest stewardship, develop conservation plans, and act as a supporter of ecosystem protection for the civil society (*Neira, Verscheure and Revenga, 2002*).

Nowadays, the State operates through a number of organisations responsible for different activities and regulations. The institutional framework within which the forest sector operates is determined by the Ministry of Finance and the Ministry of Agriculture. The latter administers the state agency in charge of forests (CONAF) and Chile's Forest Institute (INFOR). The National Commission for the Environment (CONAMA) also has a role with respect to forest use and conservation through the setting and implementation of environmental norms and regulations. The National Wood Corporation (CORMA) brings together forest sector companies dedicated to improve industrial development. The organisation plays a key role as the forest industry representative in all government-related matters. CORMA has considerable political influence and is led nationally by officials of the largest forestry plantation companies. CONAF is responsible for conservation, protection, control, increase, and management of the country's forest resources, besides administering 14 mill ha of SNASPE (*Neira, Verscheure and Revenga, 2002*).

Chile is well positioned among other LAC countries in terms of rights, justice and law enforcement, which has favoured its economy by creating a prosperous environment for direct investments (*IADB, 2004*). Chile's attractive environment for investments include its policy in support of a continued high economic growth rate, a market-oriented economy, well-diversified international trade, well-established State institutions, democratic government, and ethical and relatively well-qualified labour force (*Gardner and Eastin, 2004*).

5.3 Economic factors

The national forest strategy has a number of features that play a significant role to the sector's economic performance. The initiative was favoured by Chile's comparative sector and macro-economic advantages.

The most important factor for the initiative performance has probably been the provision of monetary incentives to cover forest plantation and management costs incurred by the participants. As for the State involvement in this

process, it is worth noticing the magnitude of the real transfers to the private sector. In absolute values, the subventions accounted for an average of USD 6 mill a year between 1977 and 1996. Adding the benefits of forest management, administration and tending, it reached USD 8 mill a year (*Cerda, 1998*). From the public sector standpoint, this policy has been praised as highly successful, considering that all investments provided through subsidies have been recovered through revenue generation, job creation or tax collection.

Funding mechanisms and other forms of incentives put in place by governments are, at least for plantations, an important factor in starting a process that ends up attracting new funds from the private sector, used both to enlarge forest plantations and to develop the potential represented by the forests (industrial investments). Additional private funds, and revenues from the investments, will sustain the process (*Tomaselli, 2001*).

From the macro economic point of view, perhaps the most important changes took place after 1973. At that period the country started to move away from socialism towards the enhancement of private property rights, a market economy with free pricing mechanisms, opening to foreign trade and a confinement of the State's role to activities that would not be properly carried out through private initiative (*Wisecarver, 1988*; cited in *Seve, 2000*). While the majority of the plantations established in the 1970s and the 1980s benefited from DL 701's rebate, large areas were also planted without such incentives. The confidence in a consistent overall policy environment and the respect for property rights have been key factors in leveraging both the natural economic advantages of forest plantations as well as specific incentives (*Seve, 2000*).

5.4 Environmental factors

The start of the initiative was not influenced by environmental factors – instead, the economic development was the main contributing factor. In any case, plantations established on degraded and marginal lands have protected soil and reversed natural erosion processes, therefore becoming a significant positive environmental factor. Protection is also provided by plantations to river basins, reducing surface water running, a relevant environmental aspect for a mountainous country such as Chile.

The reasons for the change in the originally proposed initiative have been the benefits identified, global environmental concerns, increasing awareness of the Chilean society, criticism by local and international environmental NGOs and new mechanisms developed in the past few years (such as carbon sequestration). For instance, some groups argue that the national promotion strategy has been carried out at the expense of the country's biologically diverse natural forests, as the large-scale forest plantations often implied ecosystem conversion. Some plantations were also established on indigenous people's lands, with impact on their resources.

As a result of the criticism, and in order to ensure market access, the Chilean forest sector has gradually moved towards forestry certification. The experience gained with forest plantations by the Chilean forest companies has become a major factor that allowed Chile to develop its own certification initiative, named Chile Forest Certification Scheme (*CERTFOR*), which has received mutual recognition from the Pan European Certification System (PEFC), and therefore created an additional incentive for SFM practices.

5.5 Social factors

The national strategy of the 1970s did have a primary concern for social factors. The social component was inserted in the economic development programme as it ultimately was expected to increase employment and revenues, and thus release social pressures.

The original initiative favoured large companies, and had a negative impact to small and medium landowners. The forestry development programme ended up concentrating too much land in the hand of a few large companies, which, favoured by subsidies, increased their competitiveness and put many small companies out of the business.

For instance, by not addressing needs and demands of some indigenous populations, the original strategy has become a negative factor to this group. The few land tenure conflicts in Chile have usually been associated with indigenous people, and frequently concern forest plantation lands claimed as ancestral lands. A major conflict involves the Mapuche community and some forest companies. As an alternative to solve the problem, these communities have received land titles from the Government, within a policy framework implemented by the National Commission for Indigenous Development (CONADI). Part of this land is forested, bought from forest industries with government funds set aside for this purpose, but despite this policy implementation, conflicts have not been resolved (*Neira, Verscheure and Revenga, 2002*).

Conflicts between indigenous people and forest companies were mentioned by 30% of participants in a field interview as a major factor affecting legal security and, consequently, inhibiting the level of attraction of forest

businesses. From the private sector standpoint, this problem has created a climate of insecurity and inhibited forest plantations and new investments in the forest industry.

As social pressures have increased in the past few years, the government has revised the strategy. Under the new Law, social factors have been incorporated, and as a result landowners have a better treatment in relation to subsidies.

6. Overall assessment of the initiative

In the past 30 years, a number of initiatives and policies have been in place in Chile to promote forest plantations and develop a strong forest sector, as part of a national forest strategy. The DL 701 has been the fundamental tool in this process. Since its implementation in 1974, it has contributed substantially to the establishment of over 2 mill ha of fast growing and competitive forest plantations. The Decree was also important in structuring forest legislation and in the creation of a solid institutional framework. These aspects provided the necessary environment to establish a solid forest industry, as well as contribute to mitigate environmental and social problems.

However, the success of the initiative was also largely dependent on macroeconomic reforms that attracted national and international direct investments. In the last 20 years or more, Chile has been committed to a policy of international integration, with the purpose of reducing its geographic isolation and limitations imposed by a relatively small domestic market. Its political and economic stability, associated with investments in port and infrastructure has been crucial to guarantee the Chilean competitiveness in the international markets, acting as an inductive mechanism of direct investments, of particular importance to the forest sector.

DL 701 has contributed to improve forest management practices. It introduced the concept of management plans that must be in place and approved by CONAF prior to harvesting native forests or plantations. Thus, the plan becomes a tool to regulate the use of forest resources. On the other hand, it is also true that DL 701 resulted mostly in the promotion of large-scale industrial plantation forests, primarily with exotic species (*Pinus* and *Eucalyptus*) with a little effect over SFM of natural forests.

These results created some social problems, as small landowners were excluded from the process and forest industrial development was concentrated in the hands of a few large companies. By not addressing some issues, such as the demands of indigenous people, a relatively small problem became a major problem.

In any case, when analysing the problems, it should be recognised that the initiative was born around 30 years ago, in a different context. Law 19,561 is a complementary initiative and an attempt to adjust the programme by taking into consideration new social and environmental demands. Chile will certainly be able to gradually improve its legal framework related to forests in order to adjust to a new reality.

Even considering the problems there is no doubt that the initiative was successful, especially from the economic point of view, with positive impact on the country's socio-economic development. Chile currently is an important player in the international market of forest products, and investments made by the Government in the form of subsidies to start the process have brought returns for the benefit of the society.

7. Final remarks

Chile and some other countries, following different paths, have generated satisfactory results in establishing industrial forest plantations. In Chile's case, the existence of incentives for forest plantations was only an additional, although significant, factor in the development of an economically strong forest sector. The country's comparative advantages and overall favourable economic environment for investments played a key role in the process.

Chile's experience indicates that governments have options to promote industrial plantation and developing and structuring a nationwide forest sector that is competitive on the international market. A major lesson from this study is that each country must define its own strategy based on the characteristics of its economic, social, political, financial and fiscal system as well as on natural resources endowments, on conditions for forest activities, and on goals set for the development model.

An important aspect to consider at the time of creating financing mechanisms and incentives is the institutional, political and economic situation of each country. Key variables are the political and macroeconomic stability; the level of trade liberalisation; well-defined property rights; government and institutional credibility; institutional capacity to enforce laws and administer possible incentives; suitable natural conditions for forest growth; and

availability of proper technologies and basic infrastructure in order to favour investment decisions. They are in fact fundamental to create a good investment environment that will attract national and international investors that, in the end, are those who will ensure the economic sustainability of the process.

The main lesson from Chile's experience is that the public and the corporate sectors can work together to create a significant forest resource base for industrial use, with important economic aspects that contribute to reach established criteria related to social and environmental considerations. Under the current environment, the development of similar initiatives needs to consider the stakeholders' demands. This will facilitate the understanding and thus take into consideration social and environmental demands of the society.

CASE STUDY 4 - EXTRACTIVE RESERVES AND SFM – AMAZON REGION, BRAZIL

1. Background

The Brazilian Amazon contains some of the world's most biologically diverse ecosystems that generate significant global benefits as a source of various potentially commercial products as well as important environmental services. Based on the importance of the Amazon forest, preserving this ecosystem became a national and international priority. On the other hand, its preservation represents a high opportunity cost on the socio economic development of the country, in particular, for local populations.

Among traditional groups living in the Amazon are the rubber tappers, a group formed during the rubber boom in the late 19th century, when workers from other regions of the country came to Amazon to collect rubber. With the end of the rubber boom, many rubber barons - owners of the rubber estates - abandoned the areas. The rubber tappers who stayed went on collecting rubber, practicing subsistence agriculture and selling the produce to small traders (*Cardoso, 1998*).

In the 1970s, the Brazilian Government encouraged agriculture and cattle ranching in the Amazon as part of the country development policy. The Government development programmes generated a number of new settlements in the region, and the population increased rapidly. The demand for agriculture and pasture land increased the rate of deforestation and in many cases forced traditional populations living in and of the forest to move to urban areas (*Goeschl and Iglori, 2003*).

Many of the rubber estates became cattle farms or agriculture land. New owners tried, often successfully, to expel tappers living in their newly purchased lands, often relying on violent means (*Cardoso, 1998*). The clearfelling of natural forests faced the resistance of rubber tappers. The conflicts escalated in the 1970s leading to the establishment of the rubber tapper movement. This movement increased in importance in the 1980s, gaining international recognition with its demands put forward by one of its leaders, Francisco Mendes. One of the main outcomes of the rubber tapper movement was the creation of the National Council of Rubber Tappers (NCRT) around the proposal of extractive reserves. In 1989, the legal framework for the creation of extractive reserves was developed and proposed to Brazilian authorities (*Goeschl and Iglori, 2003*).

Extractive reserves have been an innovative form of property rights arrangements in parts of the Brazilian Amazon and a distinctive initiative in the context of SFM by local communities. This case study deals with the creation of these reserves, based on Decree 98,997/1990, with emphasis on the Amazon region.

2. Objective and scope of the initiative

The extractive reserves were created to promote the joint objective of forest conservation and economic development in the designated areas by granting the use rights of its multiple resources in a sustainable way for settled communities. Three aspects of the extractive reserve model are expected to contribute to this joint objective:

- Income generated through resource exploitation allows the populations to remain in the forests and prevent alternative uses that rely on land conversion;
- Public ownership of land solves property rights uncertainty over the areas involved, encouraging the conservative use of its resources;
- Restriction of economic activities to NWFPs and limited wood products contribute to ecosystem maintenance and the sustainable use of the resources.

Moreover, the proposal considered that "the extractive reserves could also represent dynamic laboratories for investigating both traditional and innovative forms of human interaction with the Amazonian environment" (*Allegretti, 1990* cited in *Goeschl and Iglori, 2003*).

The scope of this initiative involves the creation of particular natural forest areas designed as a special case of public lands considered as "Conservation Units", through a legal mechanism that clearly defines the property rights and the rights over the use of the natural resources, represented mainly by NWFPs, for the benefit of local communities.

3. Initiative description

Decree 98,997 of the Brazilian Government created this initiative in 1990. The Decree provided the basic legal framework for the creation of extractive reserves, each established through specific legislative measures.

Extractive reserves are based on a distinctive property rights structure. The land and the biological capital stock located on the land remain government property. On the other hand, property rights over the flow of NWFPs (and some wood forest products - WFPs) generated by the biological capital stock are available for harvesting to traditional communities living in the area. Long-term concession and property rights are assured as long as they live in the designated area and exploit its natural resources in an environmentally sustainable way.

As established by the Decree, extractive reserves are considered territorial spaces of particular ecological and social importance for the country. In order to concede the right of harvesting NWFPs (and some WFPs) in public lands, the federal government requires the approval of a land and resource use plan prepared by the participant communities.

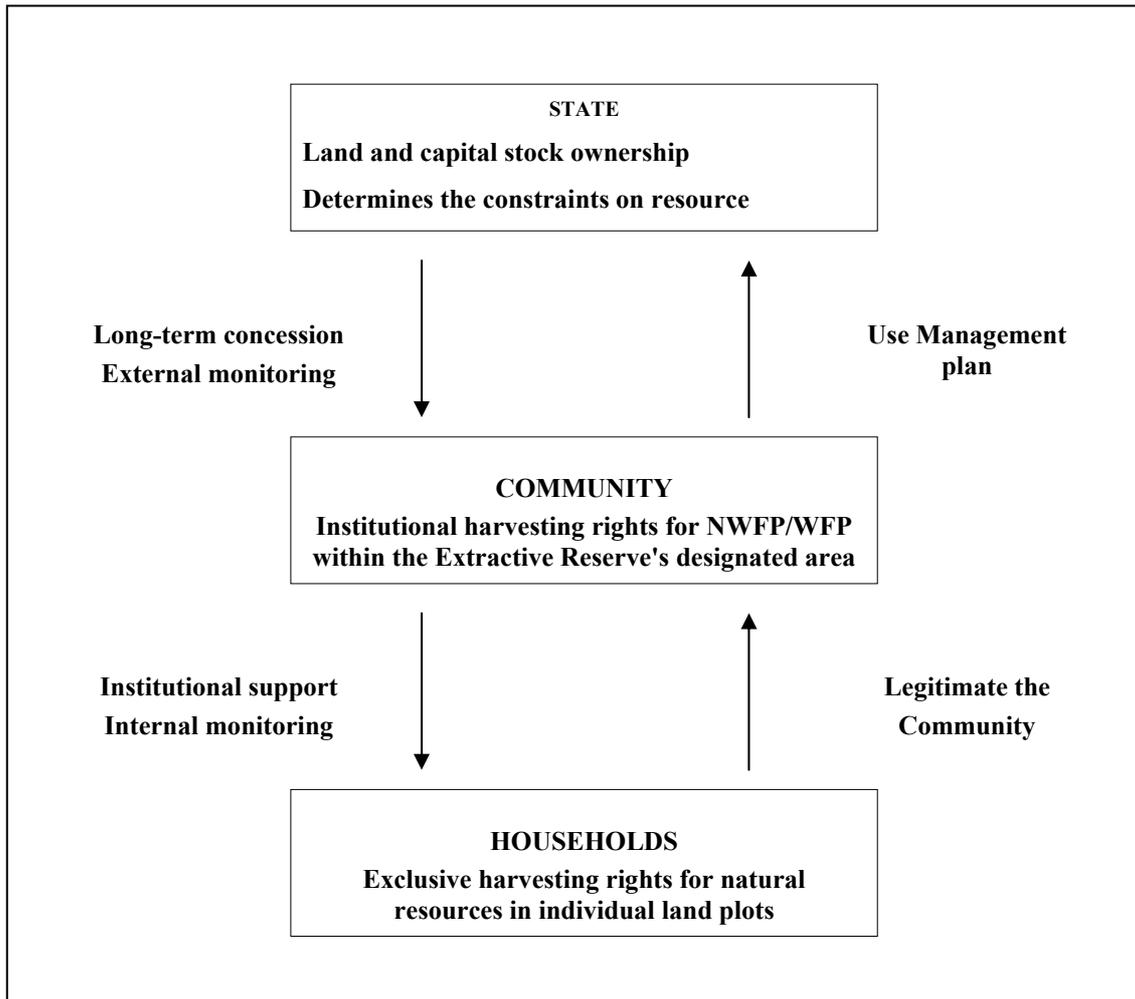
The ER's property rights model has a three-part structure and can be understood as a co-management system involving the federal government, a forest-based community, and individuals (*Goeschl and Iglori, 2004*). The roles of the parties involved can be summarised as:

- **Government:** the State owns the land and regulates the exploitation of the natural resources, giving concessions to the communities, approving a land and resource use and management plan, and monitoring its implementation;
- **Community:** each community is responsible to prepare the use and management plan, receive the long-term use concession of natural resources, and respond for the full implementation of the plan. Communities also negotiate with the government the construction and management of health and education facilities in the concession;
- **Households:** each household is responsible for resource exploitation carried out within individual land compartments. Each household organises its extraction activities and cultivation of subsistence crops. Cooperation between households depends on particular interests, but the results and revenues are privately appropriated.

The rights of individuals to use resources within an extractive reserve are exclusive, subject to the sustainable use of the resource, and cannot be transferred. The exploitation of the rubber tappers' stands is conducted by the family, subject to the rules of the reserve, which are set up by the forest dwellers themselves, the associations representing them, and the state agency responsible for the reserves (National Centre for the Sustainable Development of Traditional Populations - CNPT). The administration of common areas, such as forests paths, lakes, and common facilities, is carried out by the community. The administration of the reserve as a whole is mainly performed by local rubber tappers' organisations in cooperation with CNPT, with the support and increasing participation of forest dwellers (*Cardoso, 1998*). The CNPT was created by the Brazilian Institute of the Environment and Renewable Resources (IBAMA) in 1992 to organise the initiative and support its implementation.

Originally, the rights of extractive reserves concessionaires included only access to NWFPs. This changed in 2003 when timber harvesting became possible, provided that sustainability of timber resources is ensured (*IBAMA, 2003*). Based on this new decision, households can sell and fully appropriate the value of their production of extractive products, now including both NWFPs and timber. However, they can neither sell the land nor the harvesting rights. *Figure 1* shows the property rights structure in a typical extractive reserve.

Figure 1. Property right structure in an extractive reserve.



Source: *Goeschl and Iglioni (2004)*

The government provides guidelines and information, through the IBAMA, to support communities, government agencies, and NGOs interested in participating in the creation and legalisation of extractive reserves. Guidelines cover the steps to be followed by the participants, describing among others: required documents and information, management/ resources use plan, potential human interventions in the reserve, concession contract for the use of the reserve, social and community organisation, among other dispositions (*IBAMA, 2004*).

Under the proposed initiative, although land is basically ruled by the community, the economic benefit of the production stays with the individual who produces it. Thus, it is possible to say that the typical efficiency mechanisms associated with private property structures are considered under this initiative. Since members have no rights over other members' production there is no possibility for "free rides" and consumption possibilities are connected with individual efforts. On the other hand, households can benefit from collective initiatives to store, process, and market the products (*Goeschl and Iglioni, 2004*).

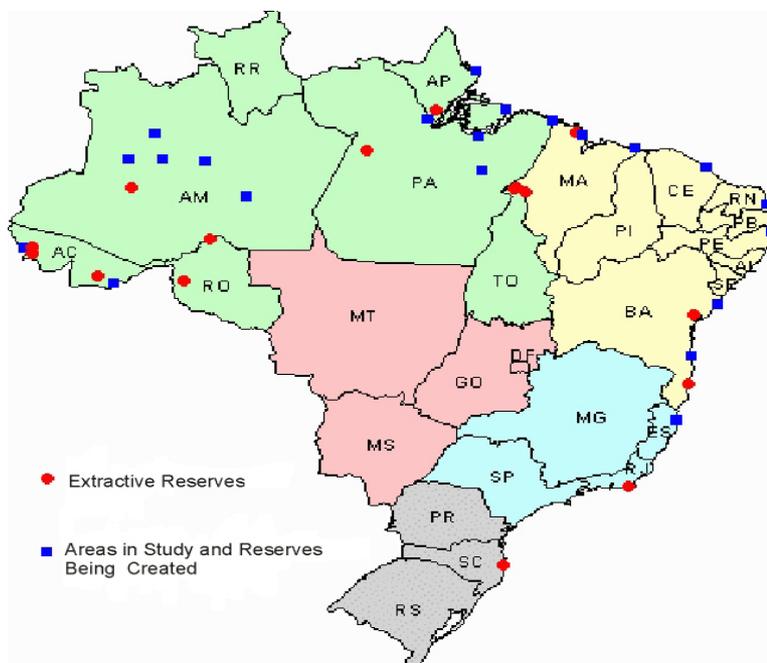
4. Outcomes

The major outcome of this policy initiative was the creation of a legal framework and the establishment of Extractive Reserves (*ER*) in different regions of Brazil, primarily in the Amazon region.

As a result of this initiative over the past 14 years, 17 extractive reserves were established, 13 located in the Amazon region and four marine reserves in other regions, with a combined area of 3.4 mill ha (97% in the

Amazon). In addition, 30 areas are under study to become extractive reserves (23 of which in the Amazon). Their location is shown in *figure 2*.

Figure 2. Extractive Reserves and areas under study in Brazil. Source: *IBAMA, 2002*; adapted by *STCP (2004)*.



The high number of potentially new reserves indicates the preference of participating communities for them as a development model, especially in the Amazon region

The first reserve was created in 1990 in the Xapuri region of Acre State. It bears the name of Chico Mendes, a rubber tapper who campaigned for the rights of forest people and was murdered in 1988 (*IBAMA-1, 2003*). The officially listed extractive reserves in the Amazon are shown in *table 1*. Chico Mendes ER is the largest with almost 1 mill ha of forest land, followed by Alto Juruá ER, Tapajós-Arapiuns ER, and Rio Cajari ER, each with above or close to 500 thousand ha.

Table 1. Extractive Reserves in the Brazilian Amazon

ER NAME	STATE	YEAR EST.	AREA (ha)	POPULATION	MAIN PRODUCTS
ER Alto Juruá	AC	1990	506,186	4,170	Rubber
ER Chico Mendes	AC	1990	970,570	6,028	Brazil nuts, copaiba and rubber
ER Alto Tarauacá	AC	2000	151,199	-	-
ER Rio Cajari	AP	1990	481,650	3,283	Brazil nuts, copaiba, rubber, andaçaí palm heart
ER Rio Ouro Preto	RO	1990	204,583	431	Brazil nuts, copaiba and rubber
ER Lago do Cuniã	RO	1999	52,065	400	Fish

ER Extremo Norte do Tocantins	TO	1992	9,280	800	Babaçú palm seed and fish
ER Mata Grande	MA	1992	10,450	500	Babaçú palm seed and fish
ER Quilombo do Frexal	MA	1992	9,542	900	Babaçú palm seed and fish
ER Ciriáco	MA	1992	7,050	1,150	Babaçú palm seed
ER Tapajós-Arapiuns	PA	1998	647,610	4,000	Rubber, fish, oils and resins
ER Médio Juruá	AM	1997	253,226	700	Rubber and fish
TOTAL			3,303,411	22,362	

Source: *IBAMA-1, 2003*, adapted by *STCP (2004)*.

Due to the economic importance for local populations, and also taking into consideration cultural aspects, the concept of ER was originally structured around the rubber extraction from native rubber trees (*Hevea brasiliensis*). The extraction of latex from rubber trees is, in many parts of the Amazon region, the main activity among extractive NWFPs. A typical family produces on average 900 kg of rubber annually (*Brown and Rosendo, 2000*). The income derived from rubber sales is not constant throughout the year. In the wet season, rubber harvests decline considerably, since the rubber trees tend to be concentrated on floodplains. Although rubber is the economically most important product in ER, Brazil nut (*Bortholletia excelsa*) and oils (such as Copaiba oil from *Copaifera* spp) are locally important sources of revenue. Nowadays, an average of 30% of the household income comes from different extractive activities. Agriculture, animal ranching, hunting, and fisheries complement their income (*Goeschl and Iglori, 2003*).

As a result of the creation of ERs, social pressures in the area of influence declined and deforestation rates diminished significantly. Experience shows that linking property rights over the resource to conservation objectives has also reduced non-sustainable activities in the reserves. The creation of ERs also involved several institutional changes in the context of the Brazilian legislation: recognition of communal rights to land; inclusion of environmental concerns as a motive for reserving land; acknowledgement of extraction of NWFPs as a potentially viable economic activity; and establishment of areas where conservation and sustainable livelihood are combined objectives (*Cardoso, 1998*).

The ER initiative has brought more social equity for communities and individuals compared to other land use options and the previous system that relied on rubber barons. People in ERs have their rights to natural resources guaranteed by law and receive financial assistance for their needs (e.g.: equipments for their production systems, home construction).

The Brazilian ER project was supported by Pilot Program G7 (PPG 7), a programme designed to support sustainable development of the tropical rain forest with the support of the G7 countries. The development of the programme over the 1995-1999 period (first phase) was carried out by an independent consulting company (*STCP/INDUFOR, 2000*). Four reserves were chosen for this appraisal: the Chico Mendes, Alto Juruá, Ouro Preto, and Cajari ERs). The four ERs cover a total of 2.17 mill ha of protected forest in a highly threatened biome, involving 15,600 people (107 districts² and 1,718 families). Results of the first phase were considered highly successful, motivating the implementation of a second phase of investments. Positive experiences were applied in other reserves, while maintaining high levels of environmental conservation. The use and management plans, which formalised the household's intention for using natural resources were prepared and implemented with broad community participation, currently serving as a base for monitoring activities (*Aragón et al., 2004*).

Some of the positive experiences from the ER project implementation in the four reserves assessed were:

- Over 200 leaders receive training to manage their associations and reserves;
- A total of 102 schools were built or remodelled and a partnership with local governments was established;

²Districts are centers for community organisation, managing their demands and helping with the environmental education of households.

- Funds for improving trade of products have been transferred to associations;
- Research on new technologies has been funded by IBAMA and carried out by research institutes;
- Storage facilities have been built in districts to avoid losses of produces and facilitate their commercialisation;
- Small manufacturing units have been installed to add value to production;
- Feasibility studies for ecotourism and sale of 55 NWFPs were made possible through partnership with different institutions;
- Infra-structure, a major bottleneck in the commercialisation process, has been improved through acquisition of radio communication systems, new equipments (boats, solar plates, motor engines, others) and technologies; new bridges and 2,000 km of forest trails have been built;
- Technical assistance to families for subsistence agriculture, forest nurseries, sanitation, among other benefits.

The relatively balanced and symbiotic association with the forest has not, however, fully solved a number of problems, including: transport limitations to reach markets, price instability of NWFPs (e.g. rubber), competition with plantation production, disadvantages when trading products intermediaries, lack of training in manufacturing, high level of illiteracy among the community members, and restricted access to health programmes.

To mitigate these problems, the NRTC signed a USD 10 mill contract in 2003 with the National Bank of Social and Economic Development (BNDES). The resources are expected to be applied in 30 extractive reserves throughout Brazil over the period 2004-2007 to improve the quality of life of the reserve populations through the development of productive activities with a sustainable base and improvement of the existing infrastructure.

The main objective of BNDES is to support the execution of management plans, which are fundamental to improve economic response. ERs in the State of Acre, where two of the above studied reserves are located, that will benefit from this project are Alto Tarauacá ER, Cazumbá/Iracema ER, Chico Mendes ER and Riozinho da Liberdade ER, receiving a total investment of USD 1.5 million (*IBAMA-2, 2003*).

Although rubber is still the main product of ERs, its production in the Amazon region has been constantly declining as a result of reduced prices, low productivity, distance to consuming markets, scale of production, among others. Even subsidies of the Government to rubber producers have not been able to solve the problem. In fact, most of the rubber production in Brazil comes from plantations, mostly located in the Southern part of the country. Plantations are highly productive, disease-free, and located close to consuming centres, making natural rubber lose its competitiveness.

In fact, the experience points out that ERs can generate long-term revenues based on NWFPs, but the production scale is small and some NWFPs have problems to compete in the market. Based on these evidences, the inclusion of timber as part of the production of ERs, adopted after 2002, seems to be important to make the initiative regain its dynamics.

5. Analysis of the factors contributing to the performance of the initiative

5.1 Overall socio-economic and environmental contexts

A trade-off between environmental protection and socio-economic objectives has usually been associated with development models related to the use of natural resources. The importance of balancing this trade-off has been increasingly recognised in Brazilian development policies in the past decade. While the 1960s and 1970s were characterised by clearing of vast areas in the Amazon for agriculture and pasture land under ambitious development programmes, Brazilian development policies have shifted to take into due account ecosystem and biodiversity preservation objectives (*Goeschl and Iglioni, 2003*).

The overall socio-economic and environmental contexts are set by a combination of peculiar characteristics of the Amazon region, in particular, and the existence of national development programmes and macroeconomic policies in place. The regional scenario is characterised by the existence of vast natural forest areas with fragile and complex ecosystems and rich biodiversity; a low population density; traditional populations and communities dependent on natural resource uses; social conflicts and pressure over the resource use; economic isolation; and regional, development programmes. The national scenario is characterised by an unbalanced

economic distribution and national development policies, and the need of the country to design and implement winning strategies that balance social, economic, and environmental components. These conditions set the environment to orient the definition of policy-related measures, such as the ER initiative, addressing regional sustainable development.

5.2 Policy, legal and institutional environment

This initiative was developed in the context of a Governmental policy, counting with strong legal and institutional support. The process that led to the creation of ERs was strongly influenced by national policies. At the national level, the Brazilian Government created ERs, first in the context of land reform, in 1987, and later, in 1990, as part of its environmental policy addressing important socio-economic aspects and demands of Amazonian populations. At the international level, rubber tappers' organisations established alliances with an environmentalist movement, which, as part of a campaign against industrial countries' financing of environmentally destructive projects in the developing world, exerted pressures on the Brazilian Government to revise policies and legislation aiming at reducing deforestation in the Amazon region. (*Cardoso, 1998*).

Decree 98,897 provided the legal framework for the initiative, which was finally strengthened when IBAMA created the National Centre for Traditional Populations (CNPT). The CNPT was important to create a proper institutional environment, and also to support the execution of the ER initiative, including the preparation and implementation of land and resources management plans, programmes, projects and actions demanded for Traditional Populations through its representative entities, the constituted governmental bodies for this purpose, and by NGOs.

The existence of the National Integrated Policy for the Legal Amazon, which gives special attention to isolated communities, extending to them basic services for their development and training for their planning and community management (*Aragón et al., 2004*), is an important factor allowing the insertion of the ER policy in a broader regional development policy. Furthermore the institutional support received from some State Governments, particularly in the case of the State of Acre, was an important factor contributing for the performance of initiative.

5.3 Economic factors

The development model adopted by the Brazilian Government in the 1970s had a strong effect for the rubber tappers. Many lost their lands and source of revenues. The result was an increase in rural poverty and migration to urban centres, which created social pressures both in the countryside and in the cities.

Social movement in fact often had an economic motivation, and this forced the development of a process to search for an alternative economic development model. The initiative in fact is based on the existence of a resource that could be allocated to local communities, to generate revenues and thus improve their livelihood and reduce social pressures.

5.4 Environmental factors

The global concerns on the deforestation and the focus on the Amazon region in the 1980s and 1990s contributed to the development of the initiative. In developing the proposal, the Brazilian Government took into due consideration the fact that besides having a new model that could mitigate social problems in the region, this could be combined to reduce pressures at international level related to environmental concerns and help the country to sustainability manage its tropical forests.

As a result, the ER concept strongly relies on the maintenance of environmental sustainability as impacts over the forest resources are considered to be kept at a minimum level. In an ER, not more than 10% is allowed to be deforested. The principle of the initiative is that by practicing SFM, people living on extracting NWFPs maintain the forest cover and the forest biodiversity. This helped the initiative to gain national and international support and thus contributed to its performance.

5.5 Social factors

As a result of poverty and the continuous deterioration of life conditions, rubber tappers started to organise social movements, especially in the State of Acre. Social pressure started at the local level, it involved peaceful demonstrations in forest areas to be cleared by rubber-tappers. Over time, it gained the support of several actors,

such as workers' unions, politicians, environmental groups and others, and became a national and international issue.

Thus, social pressure was a strong contribution in the design and development of the initiative, which also included cultural aspects of local communities. The fact that rubber tappers were involved in social movements since the early 80s, created some degree of organisation in the communities, contributing to improve the performance of the initiative. The social focus of the initiative also facilitated the establishment of alliances with national and international groups and organisations, opening new perspectives to improve the initiative performance.

The creation of ERs has been based on intense community participation at local, national and international levels. An analysis of the Chico Mendes ER suggests that three factors were crucial for the success of the rubber tappers' struggle and the implementation of the initiative (*Cardoso, 1998*):

- The emergence of leaders among the rubber tappers who were familiar with the customs of the tappers and affected by the ranchers arrival. They could thus more easily encourage member of their community to resist expulsion from their lands;
- External support received in education, information, organisation skills, publicity and contacts with other organisations that could help them;
- International concern with deforestation transformed a local struggle into a national issue with implications at the local, national and international levels.

6. Overall assessment of the initiative

The Brazilian ER scheme is a novel initiative combining economic development, social justice and inclusion, and environmental conservation. It is based on a model considering that the combination of public property with collective communal use in selected forest areas can generate competitive and sustainable use of natural resources. This initiative was originally proposed by communities themselves and not by policy makers, therefore fulfilling the requirements and needs of traditional populations relying on natural forests.

In this initiative, the property rights system is distinctive. Each of the rights involved is grounded in historical, political, economic and social factors that have been specific to the rubber tappers case. Some of these factors, and in particular, the international concern with deforestation in the Amazon, are perhaps not easily replicable in other cases. Not all local communities practice activities that involve the conservation of a highly valued forest. Nevertheless, the implication that wider national and international contexts may influence local communities deserves careful examination when designing strategies for enhancing community-based natural resource management. The role of external actors in contributing to the success of the tappers' struggle suggests that local and outsiders' knowledge may be not mutually exclusive, but complementary (*Cardoso, 1998*).

A major factor contributing to address environmental sustainability is that ERs combine a severe restriction regarding the choice of production technologies with abundance of biological capital (resources). With respect to NWFPs production, ERs are distinctive because the government, not the community, owns the biological capital stock. It grants free use of that stock to the community subject to the condition that the stock is not depleted.

This type of property rights arrangement constitutes an important factor guaranteeing communities to exploit commercial products and reap the economic benefits from their sale. For ERs to offer an answer to the development-conservation trade-off, the economic activities permitted within the reserves need to generate revenues above subsistence levels over prolonged time periods (*Goeschl and Iglori, 2003*), and this has not really been achieved yet. This led to the introduction, starting in 2003, of timber as part of the products to be harvested. It is expected that the change will help to solve the economic side of the equation, and reduce the need for external support.

The economic sustainability has been a core element for criticism against ERs. Variables such as distance to markets, transportation restrictions, lack of commercialisation channels, product quality and availability, besides prices are all factors that affect NWFPs production and the economic feasibility of the initiative. However, these variables are heavily centred in the product, not in the situation of the extractive economy as a whole. It has been mentioned that the components of sustainability should include not only the monetary income of products but also the broad range of activities that generate real benefits to households, most of them not accounted by the markets.

The criticism of the lack of economic feasibility of ERs in the Amazon region do not take into consideration the economic performance of other alternative land uses nor of recent social changes aiming at improving the

efficiency of economies based on NWFPs. Cattle ranches and intensive agriculture also provide low to negative financial returns.

In the case of ERs, the analysis should not only be based on pure economic returns. Other aspects, such as social and environmental costs and implications of non-sustainable practices also need to be considered. Moreover, economic efficiency measures, based on a strict monetary approach, tend to skew conclusions as they do not include the value of biodiversity and environmental services provided by the forest. The recognition that the economic part of the equation needs to be solved has motivated the introduction of changes in the initiative. The inclusion of timber as a product will have a positive economic impact in some ERs.

An additional factor that has been questioned is the potential environmental impacts due to the concentration of harvesting in specific sites and of certain types of resources. This factor can cause potential loss of biodiversity in the reserve. In fact, some studies have shown that NWFPs production can be very concentrated in a few sites of extraction. Previous interventions or degradation in these sites, with domination of a few commercial species, sometimes lead to the formation of “quasi-plantations”, as a result of natural growth combined with management practices to eliminate competitive vegetation (*Wunder, 1999*, cited by *Goeschl and Iglioni, 2003*). In spite of the concern it seems that this is a local effect, and the area affected is relatively small.

7. Final remarks

ERs combine important economic, social, and environmental elements related to the sustainable development of local communities dependent on natural resources management. It has become a model of development that replaced previous models that did not address the major environmental and social issues and specific concerns of local communities.

The concept of ERs, developed to solve conflicts associated with land and resource use rights of local communities, has demonstrated that mobilisation and political will can work together to address sustainable development and SFM initiatives for forest-based communities. The initiative has the potential to be applied in regions where communities manage natural resources in a communal way, depending on the cultural, social, economic, and political situation.

The suitability of such a combination of rights to the case of tappers, suggests that property rights regimes in other situations need not necessarily be private property or state property - or even common property regimes. On the contrary, to encourage the emergence of community-based institutions the policy environment should be open to diverse systems of property rights that address the demands of local communities in accordance with regional and national policies.

The success of the ER model depends on a broad integration of stakeholders, in particular the communities and individuals directly involved in the process, but also on economic sustainability. It seems that NWFPs can be important in generating revenues, but their abundance, capacity to compete in the market and remunerative prices for the products play vital roles. As it seems that these parameters are not fully satisfied, at least in most ERs, timber harvesting based on sustainable management becomes an important element to solve the economic side of the equation.

CASE STUDY 5 - PAYMENT FOR FOREST ENVIRONMENTAL SERVICES IN COSTA RICA

1. Background

Several mechanisms have been created in recent years to remunerate the wide range of benefits associated with environmental services. Among such mechanism are those related to payment made to forest landowners as a form of compensation for their conservation efforts and the environmental benefits they provide. In LAC, Costa Rica has been one of the first countries to implement a system for payment of forest environmental services.

Costa Rica is a small country that has experienced serious deforestation after the 1940s. In the 1970s, as a result of the development model adopted, the deforestation rate reached 50,000 ha a year. In the late 1970s, the Costa Rican Government became concerned with this situation and introduced an initiative to promote reforestation, aiming primarily to ensure industrial wood production and to revert the deforestation trend. To implement the initiative several innovative financial mechanisms were developed (*MINAE, 2002*).

The nation's Forest Law 7575/96 and its associated regulations established financial mechanisms to benefit landowners interested in protecting and managing forests sustainably. The mechanisms considered incentives to enhance natural regeneration of degraded areas as well as the establishment of forest plantations (*FONAFIFO-2, 2004*).

The Forest Law included economic compensation for provision of environmental services, recognising four kinds of services: mitigation of greenhouse gases, water conservation, ecosystem protection, and scenic beauty. The initiatives considered the Payment for Environmental Services (PSA) programme, by which small landowners of natural forests and forest plantations receive payments for the environmental services that these forests provide to Costa Rican society and to the world at large (*Gamez-1, 2002; FONAFIFO, 2004*).

Even though Costa Rica has a long history of natural resources conservation and developing incentive mechanisms for rehabilitation of woodlands (*Arias and Castro, 1997, cited by Zúñiga, 2003*), it took years of policy debate and consensus building to arrive at the approach of paying for environmental services.

2. Objective and scope of the initiative

The main objective of the Costa Rican PSA initiative is paying forest landowners for the environmental services their forests provide to society. In a broader context, the initiative is an effort to bring sustainability to the management of the forest resources for multiple uses and maintain the country's forest cover.

The scope of the initiative involves the implementation of a programme of incentives based on a strong legal and institutional framework, with a government agency receiving funds from various sources and providing payments to landowners to compensate for the environmental services generated by their forests. Although the programme has a nationwide coverage, it has also external interfaces through agreements and support through international cooperation.

3. Initiative description

The PSA in Costa Rica has its roots in the 1992 Rio Convention agreement, ratified by the country and shaped by the National Forest Law 7575/96, which recognises environmental services from natural forests and forest plantations (*FONAFIFO, 2004*).

In general, the concept is based on the principle that forest landowners receive direct payments to compensate for the benefits these forests offer to the Costa Rican society and, to a large extent, to the world. The environmental services recognised by the Law are:

- Mitigation of greenhouse gases - carbon reduction and sequestration, absorption, fixation and storage, avoiding its accumulation and leading to reduction of their effects;
- Water protection for urban, rural or hydroelectric purposes, in terms of regularity of the water cycle and sediment reductions in dams;
- Protection of biodiversity for conservation, sustainable, scientific and pharmaceutical use, research and genetic improvement for the current and future generations, and protection of ecosystems and all life forms;
- Preservation of natural scenic beauty, primarily for tourism.

The payments are not considered subsidies, rather a fair payment for the aggregate economic value of environmental services provided by natural forests and plantation forests, beyond the commercial value of the wood. They are directed to priority areas and applied to conserve high biodiversity habitats, protect water catchments of socioeconomic and environmental importance, and unite biological corridors that connect conservation areas and existing biological reserves.

The programme is promoted by the National Forestry Finance Fund (FONAFIFO), a decentralised institution within the organisational structure of the forest administration of the Costa Rican government, under the Ministry for Environment and Energy – MINAE. The FONAFIFO has legal status and is authorised to do all types of legal and non-speculative businesses required for the proper administration of its resources, including the establishment of trusts. FONAFIFO is the leading national financial institution focusing on environmental and forest promotion, with financing mechanisms for the development of markets of goods and services for forest ecosystems. As for its PSA programme, the main objective of FONAFIFO is to attract funds and financing for the payment for environmental services as well as to implement other necessary activities to strengthen the development of the natural resources sector.

In addition to the PSA initiative, FONAFIFO also finance small and medium forest producers through credits or other development mechanisms to support the establishment of forest plantations, forest management (natural forests and plantations), agro forestry, forest nurseries, forest industrialisation projects, forest management plans and feasibility studies, integrated projects, and labour capital.

The main source of funding for the Costa Rican environmental compensation fund is a tax charged over fossil fuels. Other sources of funding include payments by utility companies and voluntary carbon emissions mitigation purchases. The financial resources to FONAFIFO's PSA come from the following sources:

- **Fuel tax:** taxes on fuel and other hydrocarbons and fossil fuels, paid by all Costa Ricans and transferred to FONAFIFO from the Ministry of Finance;
- **Environmental services agreements:** payment collected by the sale of other environmental services at local and international levels, such as protection of water resources and carbon fixing. These resources are allocated to PSA according to the Forest Law, for the activities of forest protection and establishment of forest plantations. So far, FONAFIFO has established agreements with hydroelectric companies as well as some other companies, and sold voluntary carbon emission mitigation certificates to countries such as Norway and the Netherlands;
- **International cooperation projects:** funds from a World Bank loan (USD 32.6 mill) and a GEF donation (USD 8.0 mill) have set up the Ecomarkets Project, which will support the conservation of forests in high-priority areas of the Mesoamerican Biological Corridor (CBM). In addition, funds from a KfW donation are earmarked for high-priority zones in the Huetar Norte Conservation Area and the Volcánica Central Conservation Area;
- **Funds from the Certificates of Environmental Services (CSA):** a financing mechanism issued and put in the market for voluntary contributions by individuals, businesses and institutions interested in PSA. Buyers of certificates can allocate forest areas to receive the funds.

There are also other mechanisms, including some private schemes that coexist with and are complementary to the PSA programme (*Gamez-1, 2002*). These are mainly applied to watershed management, providing compensation for people living in the upper parts of watersheds. It is basically a value added to water tariffs, charged by public utilities and transferred to providers of environmental services. The value charged is considered to have a low financial impact on end users, but generate high overall benefits.

Currently, PSA includes three basic schemes: forest protection, forest plantations, and agro- forestry system. Until 2002, PSA also included forest management, but this option was discontinued in 2003 after a strong public and political debate in which the Costa Rican Federation for Nature Conservation (FECON) requested MINAE to eliminate PSA for this option. Its main argument was that a profitable activity, such as forest management, should not receive payments for environmental services and that PSA should be an incentive directed mostly to forest conservation. As a result, in 2003, the forest management scheme was excluded from the PSA programme considering it did not fulfil the definition of environmental services contained in the Forest Law (*State of the Nation, 2002*).

The forest plantation scheme has two options: new plantations (establishment of forest plantations) and already established plantations. The main categories of PSA, according to the current schemes, are shown in *table 1*. Payments vary according to each scheme, with the highest amount paid for reforestation projects.

Table 1. Distribution of the PSA per scheme - amount paid and percentage/year.

Scheme type	Amount paid (USD/ha)	Distribution				
		1 st year	2 nd year	3 rd year	4 th year	5 th year
Establishment of forest plantations	560	50%	20%	15%	10%	5%
Established plantation	220	20%	20%	20%	20%	20%
Forest protection	220	20%	20%	20%	20%	20%
Agroforestry systems (SAF)	0.80/tree	65%	20%	15%	0%	0%

Source: *FONAFIFO (2004)*, adapted by STCP

Compensation to each landowner is made in a single payment distributed over 5 years, which is the length of the contract. The principle involved in the payment to landowners is theoretically based on the opportunity costs of the land. Considering that the main competition of forest conservation is cattle, the compensation must be greater than the cost of renting the land for grazing (*Gamez-I, 2002*). The PSA implementation is subject to resource availability assigned for a given period by the Government, or from the resources that FONAFIFO raises as a result of the services sale. The payments are made through money checks.

Every year, FONAFIFO updates the criteria for project allocation in terms of scheme priorities, strategic locations and amounts available. Landowners interested to apply for PSA funds need to submit an application including a management plan, a survey of the environmental services, and an area map. Moreover, all landowners benefiting from PSA must forfeit to FONAFIFO their rights on carbon sequestration. Under the forest protection and the reforestation schemes, areas above two ha and one ha respectively qualify for incentives. A maximum of 300 ha is allowed for each landowner, except for indigenous reserves with up to 600 ha allowed per scheme (*FONAFIFO, 2004*). After evaluating the characteristics of the properties, FONAFIFO negotiates a 5-year contract with the owner, who is responsible for satisfying a number of protection norms according to the applicable schemes, subject to verification (*MRE, 2004*).

4. Outcomes

The Costa Rican PSA has been regarded as a successful and efficient initiative in terms of public participation and as a novel source of funding for environmental services, which has resulted in increased forest cover and natural resources conservation.

During 1998-2002, the fuel tax generated a cumulative total of USD 36.3 million, increasing from USD 4.9 million in 1998 to USD 8.9 million in 2002. FONAFIFO's agreements with the four hydroelectric companies made available USD 5.6 million for investments (*MINAE, 2002*).

The international community has placed a high degree of confidence in the programme and in its institutional framework. For instance, a credit line from the World Bank and a grant from GEF have helped to finance the Ecomarkets Project and to strengthen FONAFIFO, SINAC and the local NGOs involved in the programme implementation.

Between 1997 and 2003, the programme paid for environmental services from 325,000 ha of protected forests and over 23,000 ha of forest plantations, reaching almost 5,500 beneficiaries (*FONAFIFO, 2004*). *Table 2* indicates the total beneficiaries and the area allocated under PSA per year. Most of the area was allocated for forest protection purposes (86.3%). Forest management and forest plantations (both new plantations and established plantations) accounted for 7.5% and 6.2%, respectively. With the end of the forest management scheme in 2003, the area under PSA in that year was distributed among forest protection (94.6%) and forest plantations (5.4%).

Table 2. Total beneficiaries and area under the PSA programme per year and financing types (1997-2003).

YEAR	Forest protection (ha)	Forest management (ha)	Establishment of plantations (ha)	Established plantations (ha)	Agroforestry systems (ha)	TOTAL (ha)	Number of beneficiaries
1997	88,830	9,325	4,629	-	-	102,784	1,531
1998	47,804	7,620	4,173	319	-	59,916	1,021
1999	55,776	5,125	3,156	724	-	64,781	925
2000	26,583	-	2,457	-	-	29,040	501
2001	20,629	3,997	3,281	-	-	27,907	406
2002	21,819	1,999	1,086	-	-	24,904	329
2003	63,330	-	3,255	327	109,419	66,911	755
TOTAL	324,771	28,066	22,036	1,370	109,419	376,246	5,468

Source: *FONAFIFO, 2004*

In terms of budget allocation by source of funds from 1997 to 2002, a total estimated USD 80.6 mill had been allocated among the PSA schemes (see *table 3*). Most of this total was allocated to forest protection (USD 56.4 mill).

Table 3. Total amount paid by project scheme during 1997-2002 (USD 1,000).

Year	Forest protection	Forest management	Forest plantation	Forest plantation with own capital	Total
1997	20,280	2,934	2,849	-	26,063
1998	10,338	3,341	2,556	52	16,288
1999	11,842	1,965	2,303	84	16,194
2000	5,583	-	1,368	-	6,952
2001	4,545	1,374	1,851	-	7,771
2002 ¹	3,853	1,541	1,889	-	7,284
TOTAL	56,443	11,156	12,818	136	80,554

⁽¹⁾ Total budgeted for year 2002. The 2002 data are subject to contracts and information from protected areas as in mid-2003 FONAFIFO had not consolidated

Source: *FONAFIFO, 2002*.

The programme has faced a high demand, both at national and international level, with the involvement of local stakeholders and international funding agencies. Moreover, natural forests and important ecosystems have been protected, deforestation has been reduced, and forest cover on private land has increased (*Gamez-1, 2002*). Costa Rica's 1998 State of the Nation reported that the national forest cover had decreased from 56% in 1960 to 32% in 1990, but with the implementation of programmes such as PSA, the forest area increased to 40.3% in 1998 (*MREC, 2004*).

An important question related to the programme is who gets the benefits at the local, national and international levels. The initiative addresses this issue by providing different levels of benefits to different stakeholders. At the local level, direct payments are paid to small private landowners and local communities, with primary focus on indigenous groups. Locals involved with forest plantations also benefit from sustainable wood production. The Costa Rican society as a whole benefits from the services the forests provide (mostly in terms of water for different uses, scenic beauty for tourism and soil protection) or risks avoided (deforestation, land degradation, and erosion). At the international level, benefits include carbon fixation, soil protection, prevention of natural disasters, and the maintenance of the country's rich biodiversity.

As an additional benefit, paying for environmental services has also generated new sources of income to the participants, helping to support local and regional economies. The payment is made in exchange for a particular land use. Considering that the PSA contract period is five years and started in 1999, the country is currently facing renewal of contracts for its payment programme.

Despite the success of the programme, its implementation has encountered some obstacles, including financial bottlenecks, evaluation and targeting problems, and understaffing for monitoring. According to *Gamez-2 (2002)*, the programme does not have a formal monitoring system. A number of procedures and actions have been recommended in order to monitor potential negative impacts, including carrying out forest inventories (with some efforts already taken by the country) and generating geographic information system (GIS) data. The coordination of the activities among different institutions, such as the Ministry of Finance and the Ministry of Environment, is still a challenge, considering that they currently operate in a fragmented way. The international cooperation with the World Bank and GEF will address institutional strengthening. Costa Rica will need more systematic data and information management systems to carry out programme evaluation (*Gamez-2, 2002*).

As for financial bottlenecks, only one third of the “dedicated fuel tax” revenues were reported to be allocated each year for the purpose it was created. In terms of evaluation and targeting, competition between opposing goals (e.g. conservation vs. production), as well as limited participation possibilities and transaction costs, have been observed (*Gamez-1, 2002*).

The programme has shown a recessive trend in recent years. This is thought to be a result of the application of macroeconomic strategies in the national development policies, reducing the payments and changing the specific direction of the application of fuel tax to PSA and to forest development.

However, the PSA programme demonstrates that the strategies of valuation and the mechanisms of payment of environmental services have managed to develop a more efficient use of the natural resources, promote new capacities of organisations, social innovation and transference of knowledge and learning. In addition, new private initiatives of PSA have been generated, through voluntary agreements or local initiatives (*Soto et al., 2003*).

In 2003, an IADB survey was carried out to measure the impact of investments in, and profitability of, the forest business in Costa Rica, with some important findings for PSA (*IADB, 2004*). Major findings related to the programme are:

- A total of 41% of the respondents ranked the existence of PSA as an important factor that attract direct investments in sustainable forest businesses;
- PSA funding is much more important for *Gmelina* growers than for teak growers, as teak reaches higher international prices, generating higher profitability. Moreover, teak is planted in areas usually larger than 300 ha (maximum for PSA benefits);
- PSA seems to be more important for domestic investors affecting positively their businesses;
- PSA affects the dynamics of the forest activity affecting mostly the small forest owner, given the characteristics of their business: small scale, low technology, and difficult access to credit lines/financing.

5. Analysis of the factors contributing to the performance of the initiative

5.1 Overall socio-economic and environmental context

This initiative addresses and effectively balances important social, economic and environmental aspects of sustainable development in Costa Rica, integrating protection and use of the country’s rich forest resources.

This initiative benefited from the relative political and economic stability, and the institutional development in the energy and the forest sectors of Costa Rica. The country’s tradition with environmental policies and development models associated with ecosystem protection, a widespread land distribution, and the importance to recognise and pay for the efforts of small and medium landowners on forest conservation were important features in the process. Some of these characteristics have lent the country credibility and made it attractive to foreign investments (*Cuéllar et al., 1999*).

5.2 Policy, legal and institutional environment

Key factors related to the success of this initiative have been the institutional and legal strength of the programme. The pivotal Government participation in creating the necessary institutions and a positive environment for the implementation of the initiative has been a major factor in this process. As a result, the development of a market was facilitated. The Government’s role has been important in promoting the trade of environmental services, particularly in facilitating the link between suppliers of the benefit (private landowners) and consumers (fuel tax payers, companies, international agencies, others).

The legal and institutional frameworks for environmental services payment in Costa Rica has received support at national, regional, and international levels. The Forest Law 7575/96 provided the legal basis for the recognition of environmental services and the introduction and implementation of the PSA programme, which became a major factor associated with the success of the initiative.

The concept of environmental services is clearly defined in the Forest Law as “those provided by forests and forest plantations and that directly impact the protection or the improvement of the environment” (*MINAE, 2002; Zuñiga, 2003*). Moreover, the Biodiversity Law outlines Costa Rica’s contribution to safeguarding biodiversity conservation as a global common, in accordance with decisions of the 1992 UNCED (*Zuñiga, 2003*).

Furthermore, Costa Rica was able to make use of international agreements, such as UNFCCC, its Kyoto Protocol, and CDM, to serve as references to enable the country to take a leading role in the prevention of global climate change through internationally financed projects in natural forest management and conservation as well as in plantation forestry, with particular emphasis to small landowner participation. With this programme, Costa Rica has linked its legal obligations to UNFCCC with the domestic potentials of fostering SFM in an innovative fashion.

The institutional framework provided by the Public Services and the Regulatory Authority Law was another important factor that contributed to the performance of the initiative. FONAFIFO broadened the scope of the legislative process by embracing the objective of attracting financing for the PSA programme as well as developing other activities to strengthen the development of the country's forest sector.

With different agencies involved in the process, coordination becomes a key factor. As for monitoring and evaluation of the programme, the importance that the Ministry of Finance keeps control of the fuel tax revenues has been stressed, so that control of funds is kept separated from both executing agencies: the Ministry of Environment and the Ministry of Forestry.

5.3 Economic factors

This initiative combines a number of important economic features associated with sustainable development policies. A major economic principle involved is the monetary incentive generated and effectively paid as a compensation for landowners committed to the PSA schemes.

An important economic factor associated with the PSA programme, one that contributed to improve the performance of the initiative, was Costa Rica's recognition that the aggregate economic value of the environmental services provided by its forest resources constitutes a huge financial potential beyond the commercial value of the wood. The implementation of the PSA programme became an economic factor that has helped to attract direct investments in sustainable forest businesses to the country.

In the design of this initiative, the fact that the national providers of electricity and water for consumption are monopolies constitutes an additional factor that increases the possibility to transfer the payment for conservation to the users by incorporating the cost in the consumers' bills.

5.4 Environmental factors

Environmental protection and services are the core aspects of this initiative as its ultimate objective is to promote forest protection and increase the country's forest cover. A positive factor that has contributed to the implementation and overall success of the PSA initiative is the recognition of environmental benefits from forest ecosystems by the Costa Rican Government, through its Forest Law. Notably, the law identifies as environmental services the mitigation of greenhouse gases, water protection, protection of biodiversity and ecosystems for different uses, natural scenic beauty and its attributes.

Another environmental factor that played a major role in the programme results is the fact that Costa Rica has placed its forest resources as a national priority by enacting its Forest Law and passing supporting legislative measures for funding forest protection and conservation. The country's previous long history of conservation initiatives has provided the experience needed to design and implement the PSA programme.

Furthermore the initiative was started at the correct moment. In the 1990s, international concern on global environment issues gained importance, and the Costa Rican programme is in line with international efforts related to biodiversity conservation, carbon sequestration and other proposed trans-national environmental actions.

5.5 Social factors

The PSA initiative involves a number of stakeholders who play important roles in the implementation of the programme. The broad participation and involvement of small landowners, local communities and the Costa Rican institutions and society has been pointed out as key factors for the success of the initiative.

The opportunity for small and medium landowners to participate in the programme, increasing their income and thus raising the standard of life of rural communities can be considered as a positive socio-economic factor.

Another social factor that can affect the programme implementation either positively or negatively is the existence of grassroots movements in the country. Some have positively contributed to the debate that has

reshaped some objectives of the initiative in recent years. The fact that the target group is comprised of small and medium size landowners (indigenous communities included), who own forest land and were willing to consider forest conservation efforts, is an additional factor contributing to the PSA programme success.

6. Overall assessment of the initiative

Costa Rica has succeeded in supporting SFM and conservation, and in increasing national forest resources by means of direct payments to forest owners. The country has defined its national market for environmental services by creating a demand through legislative measures and determining the value of services by political decisions. In addition, Costa Rica has aggregated different services, making it possible to generate relatively high payments, which are used to promote not only plantation forestry, but also regeneration of secondary forests and other degraded landscapes.

The experience of Costa Rica shows how a local sustainable development framework and decisive government participation in creating the necessary institutions can make it possible to capitalise on new trade opportunities, such as those linked to the environmental services market. The example shows the relevance of an institutional framework for creating international trade opportunities for environmental services and domestic compensation through payments to producers. With a local and global institutional framework in place, it is possible to create innovative mechanisms for achieving environmental goals and to collect the benefits produced by such mechanisms.

The fact that sources of funding were diversified, involving a system of charges, international cooperation funding, and voluntary contributions by companies and individuals was an important factor to the implementation of the programme. The funding incorporated important and new economic concepts, and internalises externalities represented by non-accounted benefits. It does so by considering the general “pollutant-pay principle” (whoever pollutes, must pay) for all fossil fuel consumers and for private companies acknowledging to benefit from environmental services in their productive processes (*MRE, 2004*). Although the “pollutant-pay principle” has been introduced in some developed countries, mostly for emission control, the Costa Rican initiative is innovative as it applies to environmental protection and conservation, charging whoever benefits from environmental services and compensating those who produce it.

Another contributing factor to the overall economic performance of the programme results from the aggregate payments made to landowners. The payment for environmental services circulates within the national economy, positively affecting the overall economic performance of the local communities and the country as a whole. Moreover, the payment to landowners favours economic aspect of the forest business, making forest landowners to continually invest in the activity.

In addition, the programme had positive multiplier effects as other economic sectors benefited from PSA. One is tourism, which in Costa Rica is highly associated with natural environments (ecotourism), rewarding the efforts taken during the last decades on conservation of the country's natural resources. The tourism sector in Costa Rica has blossomed in the past decade, accounting (together with commerce) for 21.3% of the country's GDP, making this aggregate sector the second most important in the country.

Although PSA initially encompassed forest management as one of its schemes, this practice ceased to be funded in 2002. However, forest management can continually benefit from the expanded forest cover resulting from the programme, both in plantation and natural forests. Other countries interested in such initiatives should learn from the Costa Rican experience and balance how SFM could be incorporated into the process.

Despite its success, the programme faces administrative and financial difficulties and constraints that can jeopardize its future. Among the problems are the erratic country policy framework and, to some extent, under-funding (*Segura, 2000*).

Although the legal framework of PSA is complex, there is a perception that limitations and lack of a broad view of environmental services and valuation methodologies can create problems over a longer period. Different social actors also show concerns about the urgent need to integrate the PSA with the commercial chains, as well as with renewed agroforestry strategies, which are the basis of rural and indigenous economies. Producers, community leaders, employees of private companies and public institutions of other sectors lack enough information or have a partial view of the valuation processes of environmental services and PSA (*Soto et al., 2004*).

Despite the successful implementation of PSA in the past few years, this novel programme faces particular challenges in terms of overall governance, financial administration and development of political will for

continued implementation. Continuous adjustments in the programme are necessary to maintain high participation levels, guarantee that the objectives are fulfilled, and keep its financial sustainability.

A major challenge is to continuously search for markets of environmental services, nationally and/or internationally, guaranteeing the continuous flow of funds to the programme. Monitoring and evaluation are also key elements for its long-term success, and adjustments involving local demands and additional propositions need to be properly addressed.

7. Final remarks

There is no doubt that the PSA is a novel financial mechanism attempting to support sustainable development by combining forest protection (maintenance and expansion of the forest cover) with payments for environmental services provided. This initiative has made Costa Rica one of the pioneer countries in designing and implementing financial mechanisms for charging, collecting and paying for environmental services, integrating in a broad sense the social, economic and environmental aspects of sustainable development.

The PSA concept has received significant attention as an innovative tool to finance investments in SFM in some LAC countries. This experience has demonstrated that the positive impacts of PSA can be impressive in a local forest-based economy, despite some shortcomings.

PSA is linked to the institutionalisation of a new way of viewing the forest as a provider of environmental services and not only as a source of wood raw material. The functioning of the programme, that represents an evolution in the way of internalising positive externalities of forest conservation, is supported by a well-defined series of technical, financial, and organisational innovations, at the national level.

A great number of agencies, governments and organisations of the civil society, has considered this option as a strategy to eliminate rural poverty and to protect the environment. Nevertheless, the implementation of this alternative depends on the existence of markets for environmental services, which are still incipient. The concept offers an enormous potential, not only to Costa Rica but also to countries interested in similar programmes.

PART III – CONCLUDING REMARKS

1. Main findings

The five case studies presented in this paper are important initiatives in implementing SFM, covering several approaches, from community forestry to large-scale industrial plantations, and from timber production focus to environmental services. In all case studies, positive and negative outcomes have been identified.

Community forests, as shown in the Mexico and Brazil case studies, have an important role to play in promoting SFM. Nevertheless, local specific pre-conditions significantly influence the success or failure of a community forestry initiative, including: (i) communities need to have a minimum degree of organisation to facilitate mobilisation towards a common objective, and (ii) cultural links to the land and its natural resources. This is clear in the case of communities and ejidos in Mexico and the rubber tappers in Brazil.

The design of community projects requires facilitation to establish an appropriate legal and institutional framework to support implementation. The project should be structured in such a way to facilitate that actions are taken to ensure property rights over the resources (a fundamental pre-requisite to have support of local communities) and a strong training and education component.

The assessment made of the Mexican initiative points out that investments should be directed mostly to capacity building. The Private Service Providers (PAP) scheme has been found to be efficient, but training and educational programmes need to be taken into account due to consideration of local situations and demands to avoid conflicts.

Consultations with local communities during the design and preparation of the project are of outstanding importance. This will help to mitigate conflicts and to lower expectations related to benefits from the initiative. In general, there is a risk of over-expectation related to economic returns. In fact, in both initiatives related to community involvement on SFM (Mexico and Brazil) the economic side of the equation has not been fully solved. The main reason, mostly in the Brazilian case, seems to be associated with two factors: (i) lack of business management capacity by the stakeholders, and (ii) the focus on NWFPs was not the most appropriate.

Thus, improving capacity in business administration and including wood products seems to be important

components. In fact, the initiative related to the ERs in Brazil recognised that timber had to be considered, and that NWFPs should be a complementary source of revenue. Of course, this aspect depends on local conditions, both in terms of resources and markets.

The Bolivian case study is an interesting initiative on management of natural forests for wood production. It shows that Governments can play a vital role moving toward SFM by developing a proper legal and institutional framework and especially by creating mechanisms to ensure law enforcement. The 1996 Bolivian Forestry Law established clear forest management criteria, made timber companies change forest practices, improved property rights, took into consideration social aspects (through the creation of community and indigenous forest areas), and contributed to avoiding depletion of valuable forest resources.

On the other side, the Government initiative did not consider a transition period nor did it create appropriate financial mechanisms to facilitate the move toward the new situation. As a result, the timber industry suffered, and many companies did not survive.

Although environmental gains have been achieved, the new Forestry Law created more costs to the timber industry. This aspect, together with the country's macro economic and political instability, result in limited capacity to attract new investments to the forest sector. A strong expectation was that the reformed forest concession system would attract FDI. Within this adverse environment, the La Chonta company initiative had a relative success. The company survived by investing in efficiency and marketing. The change started at the forest level, where harvesting had to consider a larger number of species in order to manage the resources in a sustainably manner.

La Chonta soon found that by increasing the number of species, besides fulfilling the new Law requirements, the costs of harvesting declined. However, this initiative creates other problems as the new, less known species (LKS) had market limitations. To solve the problem the company moved towards value added products, which increased the need of capital for investments in product and market development and to improve industrial facilities.

The main finding related to the La Chonta initiative is that SFM of natural forests is possible, but to ensure its economic sustainability it is necessary to have associated investment capacity to make quality products available to markets at competitive costs.

La Chonta, and other Bolivian companies, have suffered from the lack of appropriate financial mechanisms to comply with the Government initiative to take the country towards SFM. In some aspects, international cooperation played an important role, e.g. by supporting companies in forest certification, although this does not seem to be sufficient.

The Chilean case study on plantations is a good example on how Governments can play an important role in developing a strong forestry and forest industry sector. In fact, other LAC such as Brazil, Argentina, and Uruguay have implemented initiatives with a similar concept.

The most important finding related to the industrial plantation programme is that direct investments and subsidies by Governments are important components to establish large-scale industrial plantations. In fact, Government investments in forest plantations have also been implemented in other parts of the world (New Zealand is one example).

In the case of Chile, the assessment also identified that, in the period the initiative was developed, environmental and social aspects played less important roles, and so the emphasis was on the economic side. Despite the fact that subsidies played an important role in the establishment of plantations, other elements need to be in place to create a proper investment environment over time and ensure the economic sustainability of the process. In fact, the success of the initiative seems to be closely associated with the ability of Chile to attract large and strong players, capable to compete on the international market.

This was only possible because Chile was able to create a proper investment environment at a macroeconomic level (through a series of reforms including privatisation and trade liberalisation) and at extra and intra-sector levels (by improving land tenure and property rights, and creating several development support mechanisms). Another important finding is that the initiative needs to consider social, economic and environmental dynamics, and this requires constant adjustments. For instance, the Chilean government understood that some new social and environmental aspects needed to be incorporated into the programme, and changes have been introduced to the Law.

The Costa Rica case study has been regarded as an interesting example of a mechanism that remunerates forest landowners for environmental benefits they provide. The assessment pointed out that such an initiative requires a strong legal and institutional framework to be effective. It was also noticed that the success of such an initiative is highly dependent on the society's perception. Costa Rica probably has one of the most environmentally aware

populations in Latin American, and this played a major role in the understanding of the proposal and also in the support of its implementation. The basic concept of the initiative, that payments are not considered as subsidies but a fair payment to aggregate economic value of environmental services provided by natural forests and plantations, beyond the commercial value of wood, was well taken up by the society. It seems that, for instance, a tax increase resulting from the initiative (fuel tax) was an aspect debated and accepted by the society.

Despite the fact that the initiative has developed several funding alternatives, fuel taxes have been by far the major source of funds. The flow of external funds has been limited, showing that Costa Rican society is paying for most of the services provided, although some are said to be global. On the other hand, the project outcomes show a concentration in the forest protection scheme, so direct economic benefits are not expected from the initiative.

In any case, it seems that the initiative helped to reduce deforestation and the area of protected ecosystems has increased. It should also be recognised that although no significant direct economic benefits is expected to be generated, the initiative had some important extra effects. The increase in protected areas and the environmental image of Costa Rica helped, for instance, to increase tourism, a major economic sector of the country.

2. Lessons learnt

LAC countries have made significant progress toward SFM in the areas of management of natural forests, management of forest plantations, nature-based tourism, involvement of communities, production and trade of non-wood forest products and other areas. The case studies presented in this document show that several lessons could be learnt from the different initiatives to help other regions, such as Africa, to improve SFM.

From the community-based projects, it was learned that one of the most important aspects is project design. The participatory process needs to be addressed already at the project design stage, strengthened during the inception stage and adjusted during its implementation. This aspect ensures that local particularities are taken into consideration and helps to mitigate conflicts. In fact, the ability to manage conflicts with project promoters is enhanced.

In dealing with community-based projects, it was also learnt that efforts and most of the investments should be concentrated on training and education. Training in business administration is of vital importance. Although a certain degree of organisation in the communities is a pre-requisite to the success of an initiative involving communities, their ability to improve their organisational skills is fundamental.

As income generation is a major expectation for communities, the focus should be directed to the economic sustainability of the initiative. The lessons learnt point out that in the case of Brazil (rubber tappers initiative) the focus primarily on NWFPs, even though cultural and environmental aspects were taken into account, has created economic limitations to the participants. It seems that NWFPs can be part of the solution, but in forestry-based projects, timber plays an important role to ensure the economic sustainability of the process.

In sustainable management of natural forests for wood production, the La Chonta initiative in Bolivia is a good example of how Governments can play a vital role in SFM. The Bolivian example shows that the establishment of a legal and institutional framework and specially law enforcement can make a difference.

The main lesson learnt from La Chonta is that there are long-term risks associated with the process. The case study points out that in spite of some gains, initially environmental and, to some extent, social gains, the lack of a transition period and proper financial mechanisms can create serious problems to the private sector. In the long run, this can offset environmental and social gains. This consideration is particularly important in countries where the economic environment is not adequate to attract FDI and the local industry is not capitalised. This seems to be the case of most African countries.

Africa can benefit significantly from lessons learnt from LAC initiatives in promoting forest industrial plantations. The main lesson learnt is that direct investments and subsidies by Governments are important to start the process, but other factors, at macroeconomic and sector levels are fundamental to sustain the process and bring broad benefits to the country. Most of the factors are related to a positive business environment that becomes crucial to any long-term investment.

The initiative also shows that in developing industrial plantations, Africa needs to consider scale and productivity. To attract investments to make use of the resources, and thus to ensure the continuation of the process, there are also other requirements. For instance, plantations need to have high yield and the size should allow a production of sufficient wood volume to ensure the supply of an economic scale industry.

These aspects are related to the competitiveness of the local production on the international market. It seems that

the focus on the international market is another important factor to be considered, especially in poorly developed economies where the local demand is low and international prices are more remunerative. This seems also to be the case of most African countries.

The Costa Rican initiative of payment for environmental services is, at least in LAC, unique and the lessons learnt can help African countries to design similar initiatives. From the assessment, it is also clear that only if a strong legal and institutional framework is in place and the local society is willing to pay for the environmental services will the initiative work.

In any case, it seems that some, not all, African countries have the pre-conditions to take advantage of the payment for environment services mechanism. One alternative would be to design a similar initiative taken into consideration game and other types of local reserves.

3. Recommendations

The main lesson learnt from the case studies presented is that there is no single solution to address SFM. Local economic, social and environmental conditions are determinant in designing a successful initiative. In view of this need, the process of project formulation should consider a strong (and usually long) process of consultation involving as many stakeholders as possible. Although this recommendation is particularly important in programmes involving communities, it applies in all cases.

Impacts are only relevant to SFM when the initiative has “sufficient size”. The concept of size applies to the scope, geographical coverage, time duration, and resource allocation. This is basically because SFM involves too many and complex factors, and also environmental and socio-economic impacts in many cases are not immediately perceived.

In developing their strategies towards SFM, African countries should avoid isolated and small size projects. The design of successful initiatives should be based on strategic thinking. Identifying the main factors creating constraints to implement SFM and the options to overcome the problems, based on local possibilities, are of outstanding importance. Public consultations are also important in the process, but stakeholders need to be aware that consultations and consensus building also mean commitments and obligations from all parties involved, not just benefit distribution.

Finally, it is recommended that in designing SFM initiatives, African countries need also to consider the economic sustainability as an important part of the process. The principle is that only economically sustainable projects can ensure that environmental and social criteria set by the society can be satisfied and maintained over time.

International support, local government subsidies and other forms of investments are important and should be available at initial stages, but in the long run, the initiative needs to be efficient and competitive. This basically means that it is required to have goods and/or services to offer to the market, and that the market is willing to pay for what is offered.

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ANNEX 1 – ECONOMIC VIABILITY ANALYSIS OF FOREST PRODUCTION AND NTFPS

Under PROCYMAF, demand-driven investments were studied in some pilot projects in the States of Guerrero, Michoacán and Oaxaca, whereby eligible communities/*ejidos* had access to funds for feasibility studies, market analysis and development of NTFPs. The results, summarised below are drawn from an economic analysis of PROCYMAF in Oaxaca (*World Bank, 2004*).

A) Economic viability of pilot productive sub-projects

Forest production was assessed in four communities in Oaxaca. In three of them (Santiago Lachivia, San Antonino, San Pedro El Alto), comuneros engaged in the sale of air-dried lumber, using traditional sawmills, which produce from 6,000 to 10,000 board-feet daily. In a fourth community (Pueblos Mancomunados), the production technology is more advanced, the lumber is kiln-dried, and daily production can reach 20,000 board-feet, with noticeable gains in quality in comparison with the other three communities. Major characteristics of the four communities are given in *table 1*.

Table 1. Summary characteristics of sampled communities, Oaxaca.

COMMUNITIES	SANTIAGO LACHIVÍA	SAN ANTONINO	SAN PEDRO EL ALTO	PUEBLOS MANCOMUNADOS
Type of communities ⁽¹⁾	Type 3	Type 3	Type 4	Type 4
Inhabitants	190	400	450	1,9
Forest area (ha)	2,8	5,4	28	5
Forest area/capita (ha)	14,7	13,5	62.2	2,6

⁽¹⁾ Type 3 communities are those which own forest stocks, have authorised Forest Management Plans, and are involved in one or more phases of forest management. Type 4 communities (in addition to Type 3 characteristics) engage in value-added activities of forest products and market them directly.

Source: *Merlet, et al. 2003*, cited in *World Bank, 2004*

In all communities, competition from external suppliers, such as Chile and the United States, is particularly critical. Both countries market lumber in Oaxaca at prices below those of local community mills. Furthermore, imported lumber is uniformly kiln-dried and often considered to be of higher quality than locally obtained lumber. Therefore, the challenge is to reduce production costs and improve product quality through efficiency gains from new technology.

Detailed models of communal forestry production were compiled for each community sampled. The economic analysis focuses on: (i) IRR; and (ii) communal distribution of “value-added”, defined as gross income, less depreciation and input costs. A time horizon of 20 years was considered. Annual timber extraction is assumed to be equivalent to the overall growth rate of the forest area managed by each community.

The models yield satisfactory IRR in all communities, in excess of the prevailing opportunity cost of capital. In three communities, the value-added captured by the community exceeds 85% (*table 2*). In all cases, the community-at-large and individuals capture the bulk of the value-added. The value-added per ha becomes a proxy for the state of technology utilised by each community. For instance, Pueblos Mancomunados, with its modern sawmill, is able to generate a value-added per ha of forest twice that of San Pedro el Alto – also a Type 4 community, even though the latter has 30 times more forested area.

Table 2. Financial assessment, community forestry production.

PARAMETER	SANTIAGO LACHIVÍA	SAN ANTONINO	SAN PEDRO EL ALTO	PUEBLOS MANCOMUNADOS
Total investment (USD)	1,320,000	932,400	35,270,000	23,730,000

Net present value - NPV (\$) - Per hectare (\$/ha)	1,872,777 3,362	23,510,492 4,354	61,343,616 3,408	23,628,226 4,726
Internal rate of return - IRR (%)	21	>50	24	16
Value-added - VA (\$) - Per comunero (\$/individual) - Per ha of forest (\$/ha)	493,694 2,598 176	2,243,244 5,608 415	12,619,205 28,043 451	5,422,178 2,854 1,08
Value-added (% gross income):	74	90	94	86
Individuals	26	20	40	37
Community-at-large	48	70	54	49
Labour (outside of community)	8	4	7	3
Technical services	11	4	2	1
Financial costs	7	1	2	9
Taxes	0	1	2	1

Source: Merlet et al. (2003) cited in *World Bank, 2004*.

B) Non-Timber Forest Products (NTFPs)

Under PROCYMAF, training of resin producers and a feasibility study for a resin processing plant in Oaxaca were financed. Pine resin production has several positive attributes, namely: (i) rural employment generation; (ii) value-added to tropical pine forests that otherwise typically produce inferior quality lumber; (iii) stabilisation of the agricultural frontier; and (iv) incentives for forest parcelling, considering the producers' interest to maintain control over a given stock of trees. Moreover, land-use planning has led to protection of springs and other freshwater sources, and water bottling has become an opportunity to capture possible returns. Summary results for these two types of NTFPs are presented in *table 3*.

Table 3. Results of economic analysis, NTFPs.

PARAMETER	RESIN EXTRACTION	WATER BOTTLING
Total investment (\$)	9,750,000	1,954,487
Net present value (\$)	28,169,893	4,744,510
Internal rate of return (%)	25	26

Source: Merlet et al. (2003) cited in *World Bank, 2004*.