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ENVIRONMENT NETWORK

Consulting service:

“Environmental goods and services: non-traditional markets, financing mechanisms and good practices in Latin America and the Caribbean.”

Summary of activity 1:

Profile of markets for certified green products, derived environmental services, and financing mechanisms.

Final version

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TABLE OF CONTENTS

1. GENERAL INTRODUCTION	3
2. BEST MANAGEMENT PRACTICES FOR ENSURING THE PROVISION OF ECOLOGICAL SERVICES IN AGRICULTURAL AND FOREST SYSTEMS IN LATIN AMERICA	4
2.1. <i>Introduction</i>	4
2.2. <i>Ecological and ecosystem services</i>	5
2.3. <i>Provision of ecosystem services in the forest and agricultural systems</i>	5
2.4. <i>Effects of the management strategies on the provision of ecosystem services in forest and agriculture ecosystems</i>	6
2.5. <i>Ecological principles and best management strategies that may help improve the provision of environmental services by the agricultural and forest ecosystems</i>	6
2.6. <i>Approaches currently used to promote the sustainable management of agricultural and forest systems</i>	7
2.7. <i>Conclusions about best management practices</i>	8
3. PROFILE OF THE MARKETS FOR CERTIFIED GREEN PRODUCTS	9
3.1. <i>Introduction</i>	9
3.2. <i>Principal market trends</i>	9
3.3. <i>General structure of the productive chains</i>	11
3.3.1. Productive chain of agricultural ecoproducts	11
3.3.2. Productive chain of forest ecoproducts	12
3.4. <i>Potential and competitiveness of the Region</i>	13
3.5. <i>External determining factors</i>	14
3.6. <i>Determining national and local factors</i>	15
4. PROFILE OF PAYMENT MECHANISMS FOR ENVIRONMENTAL SERVICES TO SUPPORT SUSTAINABLE FOREST AND AGRICULTURAL PRACTICES	17
4.1. <i>Introduction</i>	17
4.2. <i>Conceptual framework of the systems of Payment for Environmental Services</i>	17
4.3. <i>Profile of the PES Systems</i>	18
4.3.1. Operating model	18
4.3.2. Objectives	18
4.3.3. Differences in markets according to types of environmental services	18
4.3.4. Modes of payment	19
4.3.5. Types of collection and payment mechanisms	19
4.4. <i>Effectiveness of PES Systems</i>	19
4.4.1. Regulatory and institutional framework	19
4.4.2. Evaluability and monitoring	20
4.4.3. Sustainability of financing sources	21
4.4.4. Cost-effectiveness	22
5. GENERAL CONCLUSIONS	23

1. GENERAL INTRODUCTION

This consulting service attempts to set forth the principal opportunities available to the countries of the region of Latin America and the Caribbean in relation to the sustainable generation of environmental goods and services (EGS). Specifically, emphasis will be placed on how the non-traditional markets and the financing mechanisms, such as payments for environmental services, are useful tools for the permanent adoption of good environmental practices.

This consulting service consists of three main activities. This report addresses activity 1, the objectives of which are to describe in detail the profile of the markets for certified green products, describe the environmental services offered by sustainable forest and agricultural practices and, finally, present the payment mechanisms that can support the implementation of these practices. The two reports that follow will refer to specific cases of applying financing mechanisms for the provision of environmental services and will present a summary of the major tasks and opportunities for the public sector in terms of guaranteeing the financing and the sustainable supply of environmental services in the region.

The opportunities to maintain or increase the supply of environmental goods and services are affected, in large part, by the economic incentives that the owners or users of land with potential to generate this supply can receive. The basic idea is that these incentives may serve as signs and mechanisms of direct support for the sustained use of the best agricultural and/or forest practices at the level of the productive unit.

In line with the foregoing assertion, one of the important determinants of the production of environmentally certified goods is associated with the generation of appropriate value chains and marketing mechanisms that guarantee access to markets with differentiated prices for these products, which ensures, at the end of the day, environmentally-friendly agricultural or forest production that is also profitable for the producers who choose this alternative. The use of ecological principles and the best management strategies for agricultural and forest ecoproducts offers a higher-quality alternative to consumers and, even more important, enables the productive units to generate beneficial environmental services on a local, regional, and even global scale.

Similarly, the adaptation of productive units for the specific purpose of increasing the qualities they need in order to generate environmental services may be accelerated and maintained over time thanks to specific institutional arrangements, such as payments for environmental services (PES). The basic idea of these schemes is to include, in the decision making processes, at the level of the agricultural and/or forest productive units, a monetary payment (in most cases) that recognizes the cost of generating environmental benefits at the social level.

It is important to point out that these financial incentives are not mutually exclusive, but, in many cases, are ideal complements of a comprehensive strategy for guaranteeing the availability of environmental goods and services in the local, national, and regional context. In this respect, the role of the State is fundamental in fostering an environment conducive to producing and marketing ecoproducts and, at the same time, creating an appropriate climate

for the development of initiatives involving direct compensation for the provision of environmental services at various levels.

Below is a summary of each objective of activity 1 of this consulting service. For more details about the content of this summary, the reader may consult a more extensive version in the appendices to this document.

2. BEST MANAGEMENT PRACTICES FOR ENSURING THE PROVISION OF ECOLOGICAL SERVICES IN AGRICULTURAL AND FOREST SYSTEMS IN LATIN AMERICA

2.1. Introduction

Ecosystems provide a wide variety of goods and services that enhance human life and maintain the conditions for life on earth. Humans depend on ecosystems for the supply of food, drinking water, forests, and other products, and for regulation of the earth's climatic patterns, soil formation, mitigation of natural hazards (such as floods or droughts), and disease control, to mention just a few of the services ecosystems provide (Daily 1997b, MEA 2005 a,b,c). Humans may also derive spiritual satisfaction, esthetic pleasure, and recreational opportunities from natural ecosystems. Moreover, ecosystem services contribute directly to global employment and economic activity through industries based on agriculture, timber planting, sea fishing, aquaculture, recreational hunting and fishing, botanical medicines, and other products extracted from the natural ecosystems. Ecosystem services also help maintain agricultural production and other industries that depend on the ecosystems' goods and services as raw material. In short, ecosystem services not only maintain human life, but also help enhance human well-being.

Approximately 60% of the services of world ecosystems have been negatively affected by human activity, including the supply of drinking water, waste treatment and disintoxication, the fishing industry, air purification, and the regulation of erosion, natural hazards, and pests (MEA 2005 b). In some cases, the damage to ecosystems may be irreversible.

International agreements, such as Agenda 21, the Convention on Biological Diversity, and the Kyoto Protocol, call on the governments to promote healthy ecosystems and adopt sustainable management practices that ensure the continuity of ecosystem services (United Nations 1992, Heywood and Watson 1995). Moreover, improving the management of ecosystems is considered a prerequisite for achieving many of the Millennium Development Goals, due to the strong ties between healthy ecosystems and enhanced human well-being (MEA 2005 b). In the international efforts to maintain ecosystem services, special emphasis has been placed on identifying and implementing "the best management practices" that enable human beings to extract the products and services they need from the ecosystems without harming those ecosystems' ability to continue providing ecological services in the future (McNeely and Scherr 2004, Clay 2004). The need for best management practices is particularly urgent in the agricultural and forest ecosystems, since these ecosystems

dominate the world's land surface and involve the largest arena for improved ecological management.

To identify the best management strategies, it is important to understand that ecosystem services are obtained from different types of ecosystems and how the alternative management strategies affect their ability to provide the desired services. Consequently, the objective of this section is to explore how the different management practices affect ecosystem service provision in the agriculture and forest systems. It also tries to identify the best management practices and approaches that could improve the sustainability of those ecosystems and their services.

2.2. Ecological and ecosystem services

Ecosystems are defined as “dynamic and complex systems of plants, animals and microorganism communities living in a particular location and their non-living environment, all interacting as a functional unit within a defined physical location” (Daily 1997a). Since ecosystems consist of living organisms (that is, the biodiversity) present in an area as well as the physical components (rocks, soil, etc.) of the area, preservation of the biodiversity is a necessary prerequisite for maintaining the ecological processes and services.

Ecosystems provide a large number of functions that make life on earth possible. Everything that directly maintains and supplies human life is considered an “ecosystem service.” More simply, ecosystem services are “the benefits people obtain from ecosystems” (MEA 2005b). These services may be divided into four major types: 1) provision services (which lead to the production of food or water); 2) regulation services, which affect the climate, floods, disease, waste, and water quality; 3) cultural services that provide spiritual, recreational, esthetic, and **cultural services [sic]**, and 4) support services such as soil formation, photosynthesis, and the cycles of life-sustaining nutrients (MEA 2005)¹.

2.3. Ecosystem service provision in the forest and agricultural systems

The different ecosystems' capacity to provide ecological services depends on the type of ecosystem and how it is managed. While the focus has traditionally been on environmental services provided by the natural ecosystems (that is, forests, wetlands), there is growing recognition of the fact that managed ecosystems (such as forest plantations and agricultural land) can also provide very valuable services, although they usually differ in coverage and type with respect to the natural ecosystems. For example, while the natural systems tend to provide a wide variety of regulating products and services, the managed systems or those intervened in by man are designed and administered specifically to provide certain products (such as food or wood), and this production often comes at the cost of other services².

¹ For more details see table 1 in the support document for activity 1.1., page 3.

² For a comparison of services provided by natural forests, managed forests, planted forests, permanent cropping systems, annual cropping systems, pasture land used for livestock production, and wetlands, see table A2, page 20, in the appendix for activity 1.1.

2.4. Effects of the management strategies on ecosystem service provision in forest and agriculture ecosystems

The ways in which ecosystems are managed may have a significant effect on their capacity to provide ecological services. So the conventional management practices used in the forest, agricultural, or livestock production systems affect the provision of the various ecological services.

The management practice that has the strongest effect on forest ecosystems and ecosystem services is conversion to agriculture or other land uses. In the agricultural systems, the provision of environmental services is affected by a wide variety of management practices (Clay 2004, Harvey *et al.* 2005), many of which are associated with preparing the land for the sowing of crops³.

Given the foregoing, it is necessary to stress the importance of discouraging the conversion of forest to agricultural or stockbreeding uses, ensuring, as far as possible, that land use is in accordance with its capability. But this does not mean that forest land which is currently and has for many years been used for stockbreeding or agriculture cannot be improved. The most important of these improvements is natural regeneration or the establishment of forests with local species. Other improvements include the use of soil conservation practices, reduction of agrochemicals, and so forth.

2.5. Ecological principles and best management strategies that may help improve the provision of environmental services by the agricultural and forest ecosystems

Since conventional management practices in agriculture often have a negative effect on ecosystems and ecosystem services, there is growing interest in identifying and promoting management practices and approaches that reconcile the goals of agricultural productivity with ongoing maintenance of the ecosystem services (Clay 2004, McNeely and Scherr 2004). These best management practices are related to basic ecological principles: 1) maintenance of healthy, productive soil; 2) adoption of integrated nutrient strategies; 3) improved management of water sources and hydrologic cycles; 4) diversification of the agriculture and forest management systems; 5) management of pests, weeds, and disease using biological processes; 6) reduction of air, water, and soil pollution caused by agrochemicals and waste; 7) minimization of climatic change, controlling the production of greenhouse gases; and 8) retention and reestablishment of the natural vegetation in sown fields⁴.

This does not detract from the importance of preventing forest conversion and the use of land with forest capability for agriculture. Preventing both is a priority.

³ For more details on these management practices and their effects, see table A3, page 21 in the appendix for activity 1.1.

⁴ For more details on these management practices and their effects, see table A4, page 23 in the appendix for activity 1.1.

2.6. Approaches currently used to promote the sustainable management of agricultural and forest systems

The best management practices described above are promoted in various agricultural and forest systems. Some of these alternatives are presented below.

Organic agriculture. Organic agriculture is a “type of farming that relies on the earth’s own natural resources to grow and process food,” minimizing the use of external inputs (McNeely and Scherr 2004). Unlike conventional production, organic production does not use pesticides, herbicides, inorganic fertilizers, or other synthetic chemicals in crop production, and it prohibits the use of antibiotics and hormones in livestock production (El-Hage and Hattam 2004, El-Hage and Williamson 2004).

In Latin America, organic agriculture is growing rapidly due to the demand in western countries for organic products and more opportunities in international markets. There is currently a total of >189,800 organic farms and > 6.2 million hectares of land certified as organic in the region (Willer and Yussefi 2005). This includes the organic production of meat, cacao, sugar, fruit, vegetables, basic grains, and coffee, among other products. In addition, there are many other areas that have not yet been certified, but are under organic management and/or in transition to organic production. However, in most of the Latin American countries, organic agriculture represents less than 1% of the total area of agricultural production, with the exception of Belize (where it represents 1.19%), Argentina (1.58%), and Uruguay (5.11%), and there are many opportunities to increase the area under organic production. In the regions in which organic agriculture has been promoted, visible improvements in soil and water health, in addition to a significant reduction in pesticide use, have been noted.

Agroforestry. A second approach that is very promising for preserving the ecosystems and their services is the agroforestry approach (Beer *et al.* 2003). Agroforestry is defined as “a land use system that intentionally combines the production of herbaceous crops, tree crops, and animals, simultaneously or sequentially, to take fuller advantage of resources” (McNeely and Scherr 2004). Agroforest systems vary from perennial to annual crops sown in the shade (for example, agroforest coffee and cacao systems) to trees planted in living fences, windbreaks, or crop areas to multi-species home gardens and silvopastoral systems (combinations of trees in pasture land).

In Latin America, agroforestry has been adopted for many crops, but especially in cacao and coffee production systems and in combination with livestock production in pastures (in silvopastoral systems; Murgueitio 2005). It is estimated, for example, that approximately 60% of the area devoted to coffee growing in Latin America is cultivated under agroforest systems (Perfecto *et al.* 1996). These systems are especially common in Mexico, Guatemala, El Salvador, Honduras, Nicaragua, and Panama. Similarly, the adoption of silvopastoral systems – such as living fences and trees scattered in pastures – is common in the region, with well-known examples from Argentina to Mexico.

Integrated pest management. Integrated pest management (IPM) is another agricultural approach that adopts many of the best management practices described above. Integrated pest management refers to “the use of all appropriate techniques of controlling pests in a coordinated manner that enhances, rather than destroys, natural controls” (McNeely and Scherr 2004).

Integrated pest management practices are well known in the Latin American region, especially for certain specific pests such as the white fly and for certain specific crops, such as cabbage, bananas, and tomatoes, among others. But there are no specific data on the area of agricultural production under integrated pest management in the region that would make it possible to compare the importance of this approach in different countries or identify specific opportunities to increase its implementation.

Sustainable silviculture. Ecological principles are also the basis of sustainable forest practices (Putz *et al.* 2001, El-Hage Scialabba and Williamson 2004). Sustainable silviculture is a low-impact approach to forest management that seeks to ensure the current demand for forest products and services in order to avoid jeopardizing the capacity to provide this service for future generations. The main focus of sustainable silviculture is reducing the negative effects of felling on forest structure, composition, and soil.

In Latin America, sustainable forest production is growing significantly every year. It is estimated that there are currently a little more than a million hectares of natural forests and approximately 600,000 hectares of plantings under forest certification, with Argentina, Bolivia, and Brazil having the most total certified area (WRI 2000). Forest certification is also extremely important in Mexico, Belize, and Guatemala, where indigenous communities have subjected their community forests to sustainable, certified management (see **Box 3** for an example).

2.7. Conclusions on best management practices

The forest and agricultural systems play important roles in providing services in the ecosystem, but conventional management practices are degrading these systems and compromising their long-term generative capacity. To stop the loss of services in the ecosystem, the adoption of new approaches to ecosystem management is urgently needed. The general principles for sustainable management of ecosystems and their services are 1) maintaining healthy, productive soils, 2) adopting integrated nutrient strategies, 3) improving the management of water resources and the hydrologic cycle, 4) diversifying the agriculture and forest management systems, 5) managing pests, weeds, and disease using biological processes, 6) reducing contamination of the air, water, and soil by agrochemicals and waste, 7) minimizing climate change by controlling greenhouse gas production, and 8) retaining and restoring natural vegetation in agricultural areas.

There is a wide variety of management practices that permit the sustainable use of ecosystems. Many of these practices are already being promoted in organic agriculture, agro-silviculture, integrated pest management, and sustainable forest approaches; but adoption of these approaches and practices on a larger scale is needed if we are to reverse the loss of services in the ecosystem. To have a significant effect, the best management practices will have to be applied on multiple scales, from the level of lots and farms to the level of the countryside. The large-scale implementation of these practices is also important because the ecosystems in a region are highly interconnected, so that changes in one ecosystem invariably affect (and are affected by) neighboring ecosystems. Consequently, if the best management practices are adopted in just one part of the countryside, the benefits of these practices may be diluted. Therefore, it will be necessary to carefully consider the strategies for applying the best management practices

to ecosystems and the dynamic relationships between the different parts of the countryside or region and the plan at the countryside or regional level.

3. PROFILE OF THE MARKETS FOR CERTIFIED GREEN PRODUCTS

3.1. Introduction

In the past two decades, the demand for green products has experienced substantial growth, especially in the European Union (EU), the United States (USA), and Japan. Green products, hereinafter agricultural and forest ecoproducts, are defined as products generated under environmentally-friendly methods or practices. Also, some of these products are produced with practices favorable to human health (e.g., organic agricultural products) and/or with social benefits for the producers (fair trade). To ensure that these products can be differentiated in the international and domestic markets, they require certification by an independent entity which is, in turn, also accredited by one or more internationally-recognized systems.

The attempt is made to offset the costs associated with certification with a surcharge and/or greater access to certain market segments or niches. In the agricultural ecoproduct sector, the surcharge generally ranges between 20 and 40%, since the consumer relates consumption of the product with attributes that are favorable not just to the environment but also to his or her health. Recently there has been a trend toward combining organic and fair trade certification⁵, which guarantees the consumer environmentally-friendly and socially beneficial production. On the other hand, in general terms, a surcharge for certified products has not materialized in the forest sector; rather, certification is a prerequisite for access to certain markets.

3.2. Principal market trends

The information about markets for agricultural and forest ecoproducts is meager. The interpretation with respect to opportunities for ecoproducts from developing countries should be handled with care. Particularly, there is a tendency to conclude that a high and growing demand for agricultural and forest ecoproducts in the EU, USA, and Japan automatically implies a high demand for products from developing countries. But, although the demand for agricultural and forest ecoproducts has reached high levels in those markets

⁵ According to FINE – an umbrella that coordinates the four fair trade networks: Fairtrade Labelling Organisations International (FLO), International Federation for Alternative Trade (IFAT), Network of European World Shops (NEWS), and European Fair Trade Association (EFTA) – fair or solidary trade is defined as follows: "Fair Trade is a mode of trade alternative to conventional trade. It is a partnership whose goal is the sustainable development of marginalized and disadvantaged producers. It seeks to achieve this by offering better trade conditions, raising awareness, and undertaking campaigns."

(1 to 5% of the respective market segment), the vast majority of the supply comes from these very countries⁶.

3.2.1. Agricultural ecoproducts

Demand. The amount of worldwide commerce in agricultural ecoproducts tripled, jumping from US\$ 11 billion in 1997 to approximately US\$ 34 billion in 2005, equivalent to a growth rate of 15.1% per annum. The principal markets for agricultural ecoproducts are the European Union and the United States, with current values of US\$ 16 and 13 billion, respectively. The largest market in the EU is Germany, followed by France and the United Kingdom,⁷ with growth rates of around 10%. The emergence of specialized supermarkets, known as organic supermarkets, in the EU (e.g., Alnatura), USA (e.g., Whole Foods Market, Whole Oats Markets), and, recently, in Japan, is part of this dynamic.

Unlike the EU, USA, and Japan, the demand for agricultural ecoproducts in the developing countries is still very incipient. In Latin America and the Caribbean, the principal countries in which that demand is starting to appear are Brazil, Argentina, Uruguay, Chile, Mexico, Peru, and Costa Rica. Currently, Brazil and Argentina are the tropical countries with the highest internal demand for organic products. The estimated amount of the domestic market for agricultural ecoproducts in Brazil was US\$ 100 million in 2005.

In addition to the favorable growth of the market for agricultural ecoproducts in different regions of the world, it is important to emphasize that agricultural ecoproducts usually generate attractive surcharges that can provide an incentive for conversion from conventional agriculture to organic agriculture. Most consumers of these products are willing to pay a surcharge of 20 to 30%. Often the surcharge collected by wholesalers and retailers is higher still, but experience shows that, when a surcharge exceeds 50%, demand decreases drastically. As the market matures, the surcharges paid to the organic producers tend to decrease without completely disappearing, although part will always remain with the retailers.

Supply. In 2005, worldwide, approximately 26 million hectares, distributed over almost a half million farms, was devoted to organic agriculture. Latin America and the Caribbean has a significant share of the world's surface area devoted to organic agriculture (23.5%), and it is noteworthy for being the region with the highest number of organic farms in the world, especially for the tens of thousands of small producers of organic coffee and cacao.

The principal producers of agricultural ecoproducts in Latin America and the Caribbean are Argentina, Mexico, Brazil, the Dominican Republic, Ecuador, Colombia, Chile, and Peru. Although the domestic markets for agricultural ecoproducts in the region are growing,

⁶ For the European market, the world's principal market for agricultural and forest ecoproducts, the most current and reliable information includes the data provided by the Centre for the Promotion of Imports from Developing Countries (CBI, by its Dutch acronym).

⁷ In France, sales of agricultural ecoproducts through organic supermarkets (see below) are growing at the rate of 17% per annum. While Switzerland is a small country with a relatively small population, the Swiss are world champions in organic product consumption, consuming US\$ 125 worth per capita per annum. On the other hand, an average consumer in Germany and the United States consumes organic products worth the equivalent of US\$ 53 and 44 per annum, respectively.

the principal destinations of these products remain the European Union, the United States, and Japan. The principal organic products exported by the Region include:

- Coffee (especially from Mexico, Peru, Guatemala, Costa Rica, and Colombia)
- Honey (especially from Mexico, Guatemala, and Chile)
- Sugar (especially from Paraguay, Ecuador, Argentina, and Brazil)
- Bananas (especially from the Dominican Republic, Ecuador, Costa Rica, and Colombia)
- Other fruits (Brazil, Chile, Colombia, Honduras, the Dominican Republic, Argentina, Mexico, and Costa Rica)
- Cacao (especially from the Dominican Republic, Peru, Bolivia, Ecuador, Panama, Costa Rica, Nicaragua, Honduras, and Belize)
- Fresh/dried vegetables (Argentina, Brazil, and Chile)
- Grains (especially from Paraguay, Argentina, and Brazil; quinoa from Bolivia and Peru)
- Meat (Argentina)
- Seeds (Argentina).

Except for meat, sugar, and a few fruits and vegetables, there is little competition among the organic producers in Latin America and the Caribbean and their counterparts in Europe, the United States, and Japan. But there is growing competition with organic producers in other tropical regions, especially Asia. To keep its position in the respective markets, the region of Latin America and the Caribbean will need to enhance the efficiency of ecoproduct production, processing, and transport. This requires strong support from the State in order to improve the local producers' competitiveness at all levels (the State's role in this regard will be explored later).

Despite the positive overall outlook, the following risk factors related to the trade in agricultural ecoproducts must also be considered:

- New phytosanitary and nutrition standards may drastically change some products' competitiveness and market access.
- The trend toward reduction of surcharges in the most mature markets jeopardizes the profitability of organic production.
- Failure to meet the organic standards and norms by some producers, and media dissemination of information about this failure, may negatively affect more producers, even if they are meeting the standards and norms.
- The "buy local" trend may reduce opportunities for agricultural ecoproducts transported over long distances.

3.3. General structure of the productive chains

3.3.1. Productive chain of agricultural ecoproducts

The productive chains of organic products vary in their complexity, according to the end market and the degree of processing involved. Unlike direct marketing to the local end consumer, there are different intermediate links between the producer to the end consumer. For a general overview of the distribution channel for agricultural ecoproducts, see Figure 1.

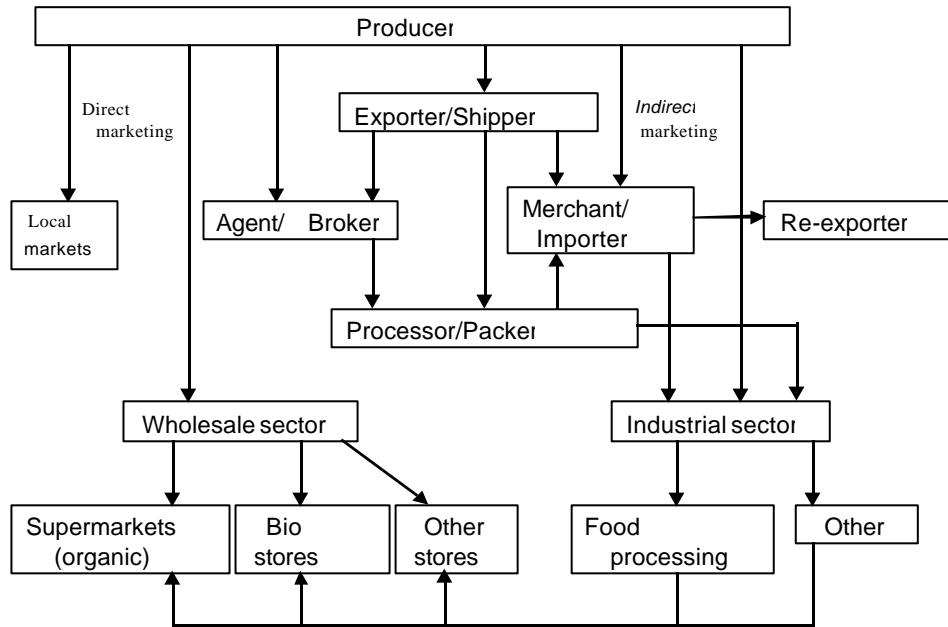


Figure 1. Distribution channel for agricultural ecoproducts (adapted from CBI 2005)

3.3.2. Productive chain of forest ecoproducts

The links in the productive chain of timber-yielding forest products are different, depending on the degree and place of processing and type of product (Figure 2).

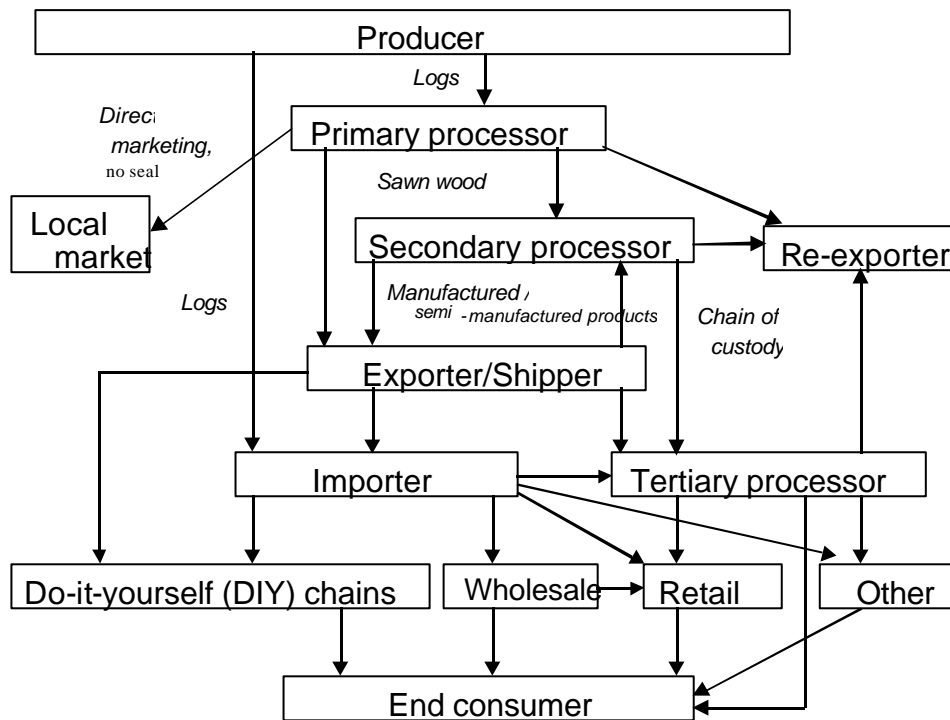


Figure 2 – Distribution channel of timber-yielding forest ecoproducts

In Latin America and the Caribbean, there is a large number of community forest companies certified under the FSC system, with their own sawmills (primary processing) or even carpentry shops (secondary processing). In addition to the productive chains of timber-yielding forest products, there is a multitude of productive chains of non-timber-yielding forest products (NTFP). NTFP includes, among other products, a large number of edible forest ecoproducts, such as wild fruit and nuts, palmetto, bamboo shoots, and edible oils, which can be marketed with organic certification and/or fair trade seals. The structure of the distribution channels is similar to that of the agricultural ecoproducts shown in Figure 1.

3.4. Potential and competitiveness of the Region

The Region of Latin America and the Caribbean has the following comparative and competitive advantages:

- *agroecological conditions* with vast potential for organic production in most of the countries, particularly for coffee, cacao, sugar, bananas, and other fruits and vegetables
- vast *availability of forest resources* in most of the Latin American countries (albeit less in the Caribbean)
- good *access to sea transport* in most of the countries
- good level of *organization of small producers* in most of the countries
- *their own organic certification systems* in several countries
- predominance of a *single forest certification system* (Forest Stewardship Council (FSC) system), which facilitates communication with customers and consumers

- availability of *providers of inputs and services*, among others.

At the same time there is in the Region a set of factors that limit the competitiveness of the eco-friendly agricultural and forest sector. These include:

- ◆ *high transaction costs* for the establishment of a small or medium-sized enterprise and exports, related to an excess of bureaucratic procedures
- ◆ *poor road system* in remote areas suitable for eco-friendly forest and agricultural production
- ◆ *lack of connectivity* with the new communication and information technologies in many rural areas
- ◆ *uncertainty of land ownership*, especially in areas with high forest coverage
- ◆ *limited access to credit* due, among other things, to the lack of guarantees which may, in turn, be related to the uncertainty of land ownership
- ◆ *lack of business development service providers*, due to the mainly technical training and orientation of the outreach workers and other providers of rural services.

3.5. External determining factors

The free trade agreements will have more impact on the agricultural sector than the forest sector. The forest sector tends to not be affected by tariff barriers. The European Union's efforts to combat illegal felling will probably create a favorable environment for commerce in certified wood. At this time, there is a voluntary certification initiative (FLEGT) that requires companies subject to that certification to submit certificates of origin for their wood. Given that the controversy over illegal felling is centered on tropical wood and wood from some states of the former Soviet Union, pressure will grow on the suppliers of that wood to have a certificate of origin. In this respect, forest certification under internationally-recognized systems such as FSC or PEFC will help to position the wood with these seals in the European market.

The effect of the free trade agreements on organic products is more difficult to predict. While it is unlikely that the United States, the EU, and Japan will export large volumes of organic products to the countries in Latin America and the Caribbean, it is true that the exportation of certain conventional products to those countries will put pressure on the prices of the conventional domestic products, thus making it difficult to develop the domestic markets of organic products or at least jeopardizing part of the surcharge organic producers need to offset their higher labor costs and lower yields.

Some international agreements could affect trade in agricultural and forest ecoproducts. CITES, for example, mentions mahogany wood (*Swietenia macrophylla*) in its Appendix 2, which involves monitoring of its trading. There is some pressure to include mahogany in CITES Appendix 1 to prevent its international trading. It remains to be seen whether, in this case, forest certification could function as an institutional arrangement that could still permit it to be marketed. The same could occur with certain non-timber-yielding forest products although, for the moment, none of major commercial value is affected.

The phytosanitary and innocuousness standards are increasingly pertinent and will affect conventional and organic agricultural products alike. The spread of bird flu, for example, will very likely entail placing certain restrictions on exports and imports of poultry, whether organic or conventional. Principally voluntary systems of certification, such as the Hazard Analysis and Critical Control Point (HACCP), will play an increasingly important role, not just because of the importers' requirements but also because of the tendency to convert some voluntary certification systems to mandatory systems (e.g., seafood imported to the United States and EU). Organic certification will not replace this type of certification, underlining the growing importance of multiple certifications. Depending on the product and market, certain companies may benefit from multiple certifications. In the case of coffee, for example, there are four different options: organic, fair trade, bird-friendly, and shade-grown. If the buyer asks for it, it may be worth having three or even all four certifications, provided that each adds value to the product.

The international standards are also subject to rapid change. Unpredictable events, such as the 2001 terrorist attacks on the United States, may create changes in regulations, reflected, for example, in the so-called Bioterrorism Act, which requires any company wishing to export food products to the United States to register with the Food and Drug Administration (FDA).

3.6. Determining national and local factors

State policies, laws, and regulations significantly affect the production, processing, and marketing of agricultural and forest ecoproducts. Incentives for environmentally-friendly production may give strong impetus to the eco-agricultural and eco-forest sectors. In Bolivia, for example, the forest patente [royalty] to be paid for a forest concession is decreased by 20% for the certified lumber companies. In Nicaragua, in public biddings, the payment of a 5% surcharge for wood with a certificate of origin is permitted. In Guatemala, the Multi-Use Zone of the Maya Biosphere Reserve was opened to sustainable forest management on the condition of certification in accordance with the FSC system within three years of the granting of a forest concession. In this respect, the following recommendations are made for creating and strengthening a political-legal and institutional environment favorable to the production, processing, and marketing of agricultural and forest ecoproducts:

- ? *harmonization of environmental laws and laws to strengthen industry and commerce (e.g., Environmental Law, Agricultural Law, Forest Law, Law on Small and Medium-sized Enterprises)*
- ? *specific stipulations on agricultural and forest ecoproducts in the bilateral and multilateral free trade agreements*
- ? *incentives for eco-friendly production and penalties for environmentally-unfriendly modes of production: adjustments to the tax systems; policies to encourage eco-friendly exports; preferential rates for certified forest concessions (Bolivian example)*
- ? *stipulations for the accreditation and certification of organic agriculture and forest certification, with emphasis on certificates of origin for timber-yielding products*

- ? Improve aspects related to the *certainty of land ownership*
- ? *simplification of bureaucratic procedures* for the establishment of small and medium-sized enterprises in general and eco-small and medium-sized enterprises in particular
- ? facilitation of *access to market information*

Clearly, the human resources available in the rural areas are key to the successful development of the environmentally-friendly agricultural and forest sectors. Although knowledge related to organic production and sustainable forest management has improved significantly in Latin America and the Caribbean, the technical processing capacities and the management capacities of the rural eco-small and medium-sized enterprises are very limited. Also, there is limited access to formal loans, forcing these groups to resort to lenders who charge high interest rates. The strengthening of the technical, business, and financial capacities of the rural eco-small and medium-sized enterprises requires better coordination of technical, business, and financial services. In this context it will be extremely important to promote the providers of business services, which are now the Achilles' heel, since the technical and financial services are better developed. Some of the factors to consider in promoting the training of human resources for the production, processing, and marketing of agricultural and forest ecoproducts are:

- ? *strengthening of environmental education at all levels of formal and informal education, based on the use of different methods*
- ? *training of the personnel of the respective state agencies (e.g. Ministries of Agriculture, Environment, Economy, Commerce and Industry, Sustainable Development)*
- ? *concentrations in agricultural and forest ecoproducts in the agricultural and forestry engineering curricula*

It is also clear that the development of the rural sector requires a basic infrastructure, including a functional road system, communications, electricity, and drinking water. The new communication and information technologies may play a key role in accessing market information, distance education, and communication with customers and service providers. The centers where agricultural ecoproducts are stocked also require acceptable hygienic standards. Stimulation of the internal demand for ecoproducts is also required. The following recommendations are related to these factors:

- ? *improvements of the road system in the organic agricultural production and sustainable forest management areas*
- ? *better connectivity: Internet access in rural areas; opportunity to participate in distance education*
- ? *expansion of the electricity system*
- ? *“green supply” policies: preference for wood from sustainable forest management, with certificate of origin (Nicaragua example); purchase of organic products, such as dairy products, bananas (Bolivia example), and other fruits for free distribution to schools*
- ? *consumer awareness programs*
- ? *facilitation of access to agricultural and forest ecoproducts in each country's tourist areas*

4. PROFILE OF PAYMENT MECHANISMS FOR ENVIRONMENTAL SERVICES TO SUPPORT SUSTAINABLE FOREST AND AGRICULTURAL PRACTICES

4.1. Introduction

The alteration and destruction of ecosystems that provide environmental services (ES) is due, essentially, to the fact that those who use the land have no financial incentive to take into consideration the ES their land generates when deciding on land use. The most-used solution for reversing this situation has been the application of legal measures that regulate the type of use to which the land can be put. But this “command and control” approach has proven to be ineffective – particularly in the developing countries – since it is difficult to effectively enforce the regulations and because the costs to the rural poor of complying with them may be high. This has led to the development of conservation mechanisms based on the market approach, in which those who use the land receive financial compensation from the beneficiaries of the ES the land provides, thus making private interests compatible with those of society as a whole. In this context, the “payment for environmental services” (PES) schemes are an example of this new approach.

4.2. Conceptual framework of the systems of Payment for Environmental Services

Although there is a wide range of PES models, most have a basic structural design. This consists, essentially, of three components that make it possible to coordinate the flow of funds from the beneficiaries to the users of the land and the flow of environmental services from the users of the land to the beneficiaries (Pagiola, S. and G. Platais, 2002). They are: (i) a financing mechanism, (ii) a payment mechanism, and (iii) an administrative mechanism⁸.

The first component collects and manages the funds from the beneficiaries, with the basic objective of assuring a continuous, stable flow of revenue for the long-term financial sustainability of the PES system. The second component is a payment mechanism for delivering the funds to the users of the land who generate the ES⁹. Finally, the administrative mechanism is a structure that oversees the operation of the PES system as a whole. This structure may be represented by state entities at the local level (Program of the Municipality of Río Blanco, Nicaragua) or at the national level (FONAFIFO in Costa Rica), or may be constituted by national and international NGOs, such as agencies that certify environmentally-friendly forest and agricultural products. The administrative mechanism must operate with low transaction costs and guarantee transparency and credibility of the procedures used.

The structure of the PES system described above corresponds to the “traditional” PES schemes. However, PES systems associated with schemes for certification of environmentally-friendly products differ from the traditional model in certain aspects of their institutional framework. The main difference is that, in the certification schemes, the emphasis is basically on channeling information rather than on managing funds, since there is no intermediary to pay the ES providers. Consequently, its institutional

⁸ For more details see complete Activity 1.3 document, page 2.

⁹ The transactions for that purpose with those who use the land are handled jointly through the establishment of a contract.

structure consists of (i) an information transfer mechanism and (ii) a monitoring and certification mechanism¹⁰.

4.3. Profile of the PES Systems

Below we present various descriptions of PES systems, which provide elements of context for better understanding of the description of the principal factors that impact on the effectiveness of the PES, discussed in section 4.4.

4.3.1. Operating model

The PES systems differ in accordance with their public, municipal, mixed, or private nature. In the public models, the state administers the scheme, provides the institutional framework, and invests directly in it. In the private models, the buyers pay the ES providers directly without the direct need for state intervention. These models include voluntary certifications and green labeling, payments for land management, and direct payments for the value of non-use of countryside (including its cultural components). Moreover, in the mixed models, the state may work out agreements under which the administration of the scheme is shared with private sectors and sectors of civil society.

4.3.2. Objectives

The PES schemes may be aimed at the preservation of ecosystems which already provide ES, the transformation of ecosystems so that they may provide ES, or both. In the former case, the payments are intended to compensate the ES providers for not modifying ecosystems (mainly forested areas) or for leaving areas for natural generation out of the productive process. The payment received by the landowners, then, represents compensation for the conservation opportunity costs they incur for “not touching” the ecosystem that generates the ES. This is the type of mechanism most preferred by the ES providers, as attested to by the high percentage of participants who choose the forest protection option in Costa Rica’s FONAFIFO system¹¹. In the case of transformation of ecosystems, the payments are intended to promote environmentally-friendly forest and agricultural practices (e.g., agroforest and silvopastoral systems, sustainable forest management, and so forth) and the restoration of degraded landscapes (e.g., planting trees in deforested or treeless areas)¹².

4.3.3. Differences in markets according to types of environmental services

While it is recognized that ecosystems provide many environmental services, the vast majority of existing PES schemes are related to the development of markets for four environmental services: (i) protection of water resources, (ii) protection of the biodiversity, (iii) carbon capture, and (iv) scenic beauty¹³.

There are differences in the geographic scope, composition of the demand, and level of organization of the markets for the different ES. Unlike other markets, the markets for the water resources are generally local, since the transactions are conducted within the sphere of a watershed.

¹⁰ For more detail see complete activity 1.3 document, page 4.

¹¹ See Distribución de ha por modalidad por año en el período 1997–2004 [Distribution of hectare by modality by year, 1997–2004], SIAP-FONAFIFO.

http://www.fonafifo.com/paginas_espanol/services_ambientales/sa_estadisticas.htm, consulted January 18, 2006.

¹² For more detail see Activity 1.1. report, page 5.

¹³ This is a common classification of ES. For a more thorough discussion, consult complete Activity 1.1 document, page 3.

4.3.4. Modes of payment

The modes of payment can be classified in two broad categories:

PES schemes based on payments per unit of area. Under this mechanism, the payments are applied by unit of surface area, based on the principle that each unit of surface area generates a certain amount of ES, directly associated with the type of land use present and the mode of production. In this case the payments may be fixed or variable. A fixed payment per unit of surface area means that it is assumed that the amount of environmental service generated per hectare does not vary spatially or over time. FONAFIFO, in Costa Rica, applies this type of scheme nationwide and pays the participating farmers approximately US\$40/ha/year to preserve their forests. On the other hand, variable payments per unit of area assume variations in the generation of the ES, both spatially and over time. For example, the PESIME¹⁴ project uses an ecological index to estimate the increases in ES generation (biodiversity and carbon) per hectare due to the incorporation of silvopastoral systems when converting from one land use to another.

PES schemes based on payment for certified practices. In this case, the ES is paid for by means of a premium on top of the market price of the good produced using environmentally-certified agricultural or forest practices (e.g., shade-grown or biodiversity-friendly coffee in Mexico and El Salvador).

4.3.5. Types of charges and payment mechanisms

Compensation to users involves cash payments, non-monetary compensation, or a combination of both. Some factors that would seem to have a certain effect on the mode of compensation include: the objectives of the scheme, the source of financing, the type of user, and the type of service. Cash payments include direct public payments, direct private payments, and transfers via prices.

Charges may be “in kind,” taxes, charges of fees, and charges via prices. The type of charge affects financial sustainability, although there are sources of financing that do not depend on direct charges of the beneficiaries (see section 4.4.3).

4.4. Effectiveness of PES Systems

Several characteristics of the PES systems may impact on their effectiveness as conservation tools for promoting environmentally-friendly forest and agricultural practices. This section describes the effectiveness of various aspects of the PES on the basis of five main factors: (i) regulatory and institutional framework, (ii) evaluability and monitoring, (iii) financial sustainability, (iv) cost-effectiveness, and (v) achievement of environmental objectives.

4.4.1. Regulatory and institutional framework

PES systems require an environment of favorable policies and regulatory frameworks if they are to be used as an effective conservation tool. Also, PES must not conflict with other policy instruments related to land use.

¹⁴ Integrated Silvopastoral Approaches for Ecosystem Management Project implemented in Nicaragua, Colombia, and Costa Rica.

Although it may sometimes be necessary to modify a country's legal or fiscal framework to favor the development of a PES scheme¹⁵, this is not necessarily a prerequisite for starting the process. In fact, some municipios in Guatemala and Honduras have undertaken PES initiatives without the need for changing the domestic legal frameworks. Nevertheless, in these cases it is important for the municipios to enjoy sufficient decision-making autonomy.

Contracts that require many conditions may represent a barrier to access for impoverished users of land who do not have the means to comply with them¹⁶. As an alternative, there have been experiments with collective contracting to reduce transaction costs in impoverished or indigenous communities (e.g., the Scolel Té project in Mexico).

Also, the implementation of PES schemes requires an institutional arrangement to manage the transactions between ES buyers and sellers and to carry out contract monitoring and control activities, which, in some cases, require the creation of new institutions intended specifically to support PES schemes or public programs, as has occurred with FONAFIFO in Costa Rica, CONAF in Mexico, and Ecoservicios in El Salvador, among others.

In the cases of PES schemes related to voluntary certifications, the organization structures are simpler because, since there is no need to administer the funds for paying the ES providers, they are represented by certifying agencies (generally international, which, to cut costs, may have local representative offices) that perform only the tasks of monitoring the certification criteria. It is important for the design of those institutional agreements to minimize the transaction costs and to be able to adequately manage the asymmetries of information between buyers and sellers as transparently as possible. This point is important for building confidence in the system in order to ensure that both the ES providers and the beneficiaries are willing to participate in the PES scheme.

Finally, it is essential that the institutional framework create communication channels between suppliers and beneficiaries to facilitate the operations of the PES system, facilitate the participation of those actors, and provide an atmosphere of transparency and credibility in its operation.

4.4.2. Evaluability and monitoring

The availability of the beneficiaries to invest in PES schemes is based on the capacity to assure them that they are actually receiving the ES for which they are paying. Consequently, PES schemes must have a strong monitoring system to guarantee that.

¹⁵ For example, the 1997 reform of Costa Rica's Forest Law enabled the ES providers to receive payments for specific land uses associated with ES generation, established a gasoline tax to finance the system, and established FONAFIFO as the entity responsible for managing the PES system.

¹⁶ The successful implementation of PES systems requires the existence of clear, firm land ownership systems. If there are land ownership conflicts, long-term ES provision cannot be assured.

Having information for monitoring is neither easy nor cheap¹⁷, since most ES are relatively complicated to quantify in practice, which may lead to the transaction costs associated with acquiring that knowledge making the system non-viable. This has resulted in the PES models based on payment per unit of area using indirect estimates of the amounts of ES generated by various land uses. That is, instead of quantifying the ES generated by a specific use of the land, it is assumed (based on the best available information) that it generates a certain amount of ES of interest. Although this tactic decreases the level of exactness of knowledge about the amount of ES provided, it avoids the high costs that a direct measurement of ES would entail.

4.4.3. Sustainability of financing sources

The development of an adequate financing mechanism that assures a continuous flow of funds over time is necessary for the operation of any PES system. The PES system's financial sustainability is highly dependent on the type and origin of its source of financing. The principal sources of financing for PES include:

Taxes. The state may earmark a portion of certain taxes to finance specific conservation activities. For example, in Costa Rica a percentage of the gasoline tax is earmarked to finance the national PES program. The taxes can generate a continuous, relatively stable cash flow; however, there is the risk that the funds may be allocated to uses other than those initially intended.

State subsidies. These are intended fundamentally to finance the establishment and initial development of the system. The problems in terms of long-term financial sustainability are that they may be contingent on changes of administration and policy reforms and, moreover, may be subject to the power of political interest groups.

Donations and subsidies from international sources. The support from these sources is generally for a limited period of time. Financial support from international sources may create excessive dependence on it, limiting the long-term sustainability of the PES scheme in the event that the international source is withdrawn and there is no parallel financing strategy.

*Fee payments*¹⁸. These are common in the PES schemes associated with water resources, since the systems of fees for water use are generally in effect for the various beneficiaries. PES programs financed through this source include Empresa de Servicios Públicos de Heredia (Costa Rica), Fondo Nacional del Agua (Ecuador), and Programa de PSA de Río Blanco (Nicaragua), among others. These types of sources have high potential for sustainability over time, since the beneficiaries are easily identifiable and organized and there are prior institutional mechanisms that make effective collection of the funds possible.

Voluntary payments. These are a type of direct payment negotiated with beneficiaries who are willing to pay for the services provided. One such case involves users of irrigation water in Valle del Cauca, Colombia, who pay a voluntary fee to invest in the

¹⁷ Gobbi *et. al.* 2005. *op. cit.*

¹⁸ Also known as royalties, charges, or "user fees."

protection of the watershed highlands. Other examples include the Scolel Té project in Mexico, where the International Motoring Federation bought 5500 tons of carbon, and the payments by Florida Ice and Farm in Costa Rica for five years of forest protection. The long-term sustainability of this source of financing depends on the type of service negotiated and the beneficiaries involved.

Voluntary mechanisms of international accreditation. The beneficiaries pay for the environmental services provided by means of a premium on the market price of the good that has been certified as environmentally-friendly. Ideally, the sustainability of this source of financing would depend on two principal factors: (i) the availability of payment from the consumers and (ii) the land user's ability to meet the criteria for international certification and accreditation (see section 3 of this summary). These mechanisms could represent a sustainable source of financing to the extent that markets with a strong and growing demand for products certified as environmentally-friendly, associated with the generation of ES, are developed.

The voluntary schemes for international accreditation may be aimed at certification of a product (e.g., FSC forest certification), processes (e.g., ISO 14000 for environmental management systems), or organizations.

Payments in kind. This method of charging may occur in PES schemes at the local level in low-income communities with a strong interest in preserving the service (e.g., PASOLAC¹⁹ experience in Nicaragua and Honduras). This mode of financing the necessary investments has been particularly helpful in small-scale schemes associated with water resources. In these cases the beneficiaries provide hours of work in order to invest them in improvements in the priority intervention areas.

4.4.4. Cost-effectiveness

The effectiveness of the PES systems as tools for achieving conservation objectives may be evaluated by means of the transaction costs associated with their operation. These costs include those directed at the creation of the system and those directed at defraying the administrative and monitoring expenses. In this case it is assumed that the funds invested are well-directed, in other words, the scheme is effective in achieving the objective of maintaining or increasing the availability of ES.

The transaction costs in the PES systems will be subject to various factors which, in turn, are interrelated: (i) the requirements of the regulatory framework and the type of institutional arrangement, (ii) the level of state participation, (iii) the type of market for the ES, and (iv) the mode of payment (fixed or variable).

As to the transaction costs related to administration and monitoring, the PES systems administered by the state tend to have higher transaction costs due to the need for a contractual basis which is sometimes complex and due to the broader scale (national) of application. The PES systems associated with localized ES markets, as in the case of water, require lower transaction costs, because the supply and demand of ES are easily identifiable and they generally have a level of organization that facilitates management of the mechanism's implementation (local governance, cooperativism, etc.).

¹⁹ Program for Sustainable Agriculture on Central American Hillsides.

4.4.5. Effectiveness in achieving conservation objectives

PES systems may sometimes not be the most appropriate tools for achieving the proposed conservation objectives. In general terms, the applicability of the PES systems as conservation tools depends on the cost-benefit relationship for generating the ES.²⁰ The conditions under which the PES systems are the optimal tools occur when the conservation opportunity cost is low and the benefits of conservation are high. If the actual situation is the reverse, that is, the conservation opportunity cost is high and the benefits of conservation are low, the PES are not the appropriate tool to use. This situation may come about when there is an attempt to conserve areas of low importance in terms of environmental service generation, but with high productive potential that may be transformed to highly profitable land uses.

Moreover, there may be circumstances under which the benefit of devoting an area to conservation is very high but the conservation opportunity costs are also very high. In this case, the implementation of a PES system is possible, since it could be justified in terms of the benefits of conservation, but very difficult because of the high amount the users would pay. Finally, the opposite situation may exist: an area where the conservation opportunity costs are low and the benefits of the conservation – in terms of environmental services generation – are also low. Consequently, the implementation of a PES system would be possible due to the relatively low amounts that would be required to compensate the users, but not very useful in terms of the environmental return of said action.

5. GENERAL CONCLUSIONS

This document contains the conceptual bases for the design of state policies that encourage the environmentally-sustainable management of land devoted to agriculture, stockbreeding, and forestry. In all cases, the adoption of best management practices is left in the hands of private agents who respond to clear financial incentives resulting from schemes of payments for environmental services or surcharges related to the marketing of ecoproducts. From the standpoint of a social planner, the objective is to take advantage of a win-win situation in which the environmental service providers find it privately profitable to adopt environmentally-sustainable practices and the beneficiaries of environmental services are assured of a sustainable flow of the environmental services.

The first part of the document identified the general principles required for sustainable management of production and described comprehensive productive systems that maximize environmental service generation in the context of countryside devoted to agricultural production: sustainable silviculture, integrated pest management, agrosilviculture, and organic agriculture. Examples are provided to emphasize the point that the productive systems described are applicable to all the countries of Latin America and the Caribbean. In this respect, the main obstacles to the adoption of these types of production systems are not the geographic or climatic location of the unit of production, but the availability of capital for carrying out the productive conversion,

²⁰ Pagiola, S. 2005. *Curso: PSA, desde la teoría a la práctica* [Course: PES, from theory to practice]. CIPAV [Centre for Research on Sustainable Agricultural Production Systems], Colombia.

access to information associated with technical assistance, and planning capacity at the countryside level, among other similar factors. The incentive policies and a proactive role for the state in terms of the provision of information, technical assistance, and certification play an essential role in the adoption of the described good practices.

The second part of the document reviews the current situation of the markets for ecoproducts and the potential of the region of Latin America and the Caribbean to effectively insert itself into the international flow of commerce of those products. In this respect, it was concluded that there is significant potential for the agricultural and forest sectors, and the need was identified to develop a list of things that must be done at the state level to make it possible to eliminate or reduce the obstacles identified (lack of information and training, difficult access to marketing chains, lack of rural infrastructure, and so forth) and reinforce the region's advantages, including, currently, a significant amount of surface area under organic agriculture, good climatic conditions, good geopolitical location, and so forth.

Finally, the third part of the document describes the central elements of the design of schemes for payment for environmental services based on the analysis of functional experiences and experiences in process in the region. This section also develops a basic scheme for categorizing experiences and good practices and for analyzing them on the basis of criteria of effectiveness. This section is, then, the basis for the selection, categorization, and analysis of the case studies that must be developed next.

In a later stage, 6 case studies should be selected (Activity 2) and analyzed to identify good practices in the design and implementation of PES schemes or ecoproduct marketing schemes. Finally, the consulting service concludes with an analysis of lessons learned in Activity 1 and 2, which should result in a list of things to be accomplished at the government level in order to encourage adoption of good agricultural and forest practices in a context of private and social profitability.